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VOLUME VII.

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THE PENNY CYCLOPÆDIA

OF

THE SOCIETY FOR THE DIFFUSION OF USEFUL KNOWLEDGE.

CHARLESTON, the largest city in the state of South Carolina, is situated in the county of Charleston, upon a narrow tongue of land formed by the confluence of the rivers Ashley and Cooper, in 32° 47′ N. lat. and 79° 48′ W. long. The harbour, which is spacious and convenient, is formed by the æstuary of the two rivers, and protected from the Atlantic by Sullivan's Island on the N. and Folly Island on the S. The entrance, which is between these islands, is obstructed by a range of sand-banks, which make three channels by which vessels of considerable burthen may enter the port, but the passage is rendered so difficult and uncertain by the tides and the shifting of the sands, that it is customary for all vessels, including even constant traders to the port, to be taken in by licensed pilots.

Charleston was founded in 1680, seventeen years after the granting of the colony by Charles II. to the Earl of Clarendon. For rather more than a century it was the capital of the province, Columbia, now the seat of government, not having been founded until 1787. The town is regularly laid out in parallel streets extending between the two rivers and crossed by other streets at right angles. The houses are for the most part spacious and lofty, and furnished with balconies and verandahs, in order to protect the interior from the sun. The streets are generally narrow and unpaved, and the soil being sandy, considerable annoyance is experienced in windy weather from dust and sand. To shelter the passengers from the sun, rows of a tree called the 'pride of India' are planted on each side of the streets; this tree does not grow to any considerable height, but its branches are spreading and its foliage thick, and it possesses the further advantage of not harbouring insects.

The town contains a city-hall, exchange, custom-house, guard-houses, theatre, orphan-house, hospital, alms-house, two arsenals, two markets, a college, and nineteen places of public worship. The yellow fever has made frequent ravages in Charleston, but its effects have been chiefly confined to strangers, and especially those from more northern climates. The place is not considered unhealthy by natives.

The population of the city, in 1790, was 16,359, of whom 7684 were slaves. In the next forty years the number of inhabitants has nearly doubled, as appears from the following statement:

	Free Whites. Males.	Free Whites. Females.	Free Persons of Colour.	Slaves.	Total.
1800	..	..	..	..	18,712
1810	5863	5705	1472	11,671	24,711
1820	5809	5330	1475	12,652	25,356
1830	6326	6502	2107	15,354	30,289

These numbers do not include the population of the suburbs, which in 1830 amounted to 10,054.

Charleston is a place of very considerable trade. A great part of the cotton and nearly all the rice exported from the state are shipped from this port. The amount of registered and licensed tonnage belonging to the port in 1835 was 13,759 tons, of which 7559 tons were employed in the coasting trade. The tonnage of steam-vessels in the same year was 1889. In the year ended 30th September, 1835, the vessels that entered and left the port in the prosecution of foreign trade were—

—	Inwards. Ships.	Inwards. Tons.	Outwards. Ships.	Outwards. Tons.
American	115	22,466	186	43,703
Foreign	127	30,938	133	38,476
Total	242	53,404	319	82,179

The trade of Charleston in the two principal articles of export during the last seven years has been as follows—the season for shipping cotton and rice is considered to begin on the 1st of October, and to end on the 1st of April following

Years.	Arrivals.			Exports.			Stocks on hand.		
	Cotton.			Cotton.			Cotton.		
	Sea Island.	Upland.	Rice.	Sea Island.	Upland.	Rice.	Sea Island.	Upland.	Rice.
	Bales.	Bales.	Tierces.	Bales.	Bales.	Tierces.	Bales.	Bales.	Tierces.
1829-30	11,538	149,250	89,356	6,651	119,209	76,503	6,784	32,473	11,280
1830-31	11,420	118,054	81,333	9,042	89,415	63,509	7,082	30,843	13,888
1831-32	14,922	139,020	98,383	11,548	115,389	82,805	4,277	31,279	11,75
1832-33	17,914	133,327	99,689	16,280	119,430	85,102	2,124	16,424	12,94
1833-34	12,500	138,382	88,605	8,639	121,314	75,422	4,329	20,964	11,776
1834-35	11,378	135,482	89,328	7,925	121,899	82,571	4,663	16,174	5,400
1835-36	10,958	163,639	94,000	8,144	156,837	83,013	3,098	11,284	9,003

The exports of the two shipping seasons ending April 1, 1835, and 1836, were distributed as follows:

Countries and Ports.	From October 1, 1834, to April 1, 1835.			From October 1, 1835, to April 1, 1836.		
	Cotton.			Cotton.		
	Sea Island.	Upland.	Rice.	Sea Island.	Upland.	Rice
	Bales.	Bales.	Tierces.	Bales.	Bales.	Tierces.
Liverpool	4,891	44,905	4.912	5,507	53,279	5,278
London	..	1,928	6,075	..	2,155	4,392
Greenock and Glasgow	662	7,879	6	331	6,767	14
Hâvre	1,647	20,289	4,158	1,982	33,193	3,243
Other Ports in France	106	5,297	881	..	7,346	2,729
Holland	..	7,912	10,052	..	8,322	9,703
North of Europe	..	809	11,189	..	7,327	16,653
Other Foreign Ports	..	3,944	2,084	..	4,400	95
West Indies	..	..	13,340	..	3	13,924
Total Foreign Ports	7,306	92,463	52,642	7,820	122,792	56,041
Ports in the United States	619	29,436	29,929	324	34,047	26,972
Total	7,925	121,899	82,571	8,144	156,839	83,013

The Ashley and Cooper rivers are not navigable to any considerable distance from their mouths. To remedy this disadvantage a canal has been cut connecting the Cooper with the Santee river. The internal communication has been greatly improved by means of a railroad from Charleston to Hamburg on the Savannah, opposite to Augusta, a distance of 136 miles. This railroad was opened in 1834, and has proved very successful.

The Charleston college was chartered in 1785, but until 1824 it could be considered only as a grammar-school. In that year some alterations were made in its plans and government by means of which it was placed on a respectable footing as a college: At that time its funds had become very low, but it has since received 22,500 dollars by gift from two individuals, and its income from students has also since 1824 amounted to 10,000 dollars annually. The number of students in 1833 was 177, of whom 46 attended the scientific department, 76 the classical department, and 55 the English department. The college building is commodious: it possesses a good philosophical apparatus, and a library of 3000 volumes, besides several hundred volumes belonging to the students. The medical college, which was established in 1824, is empowered to confer medical degrees. The locality is a handsome building, for which the city council of Charleston appropriated 15,000 dollars, and the establishment has been further assisted by the states' legislature, which has granted to its funds the sum of 17,000 dollars.

Printing was introduced into South Carolina at Charleston in 1730, and the first newspaper was published in January, 1732; there were in 1834 three daily and three weekly papers published in the city. There are five banks established in Charleston with capitals amounting in the aggregate to 4,600,000 dollars; and two insurance companies, with capitals of 300,000 and 450,000 dollars respectively.

CHARLESTOWN, the principal town in Middlesex county, Massachusetts, is situated on a peninsula, formed by the river Mystic on the East, and Charles river on the West, by which latter it is separated from Boston, of which it may be said to form a suburb. The settlement at Charlestown somewhat preceded the founding of Boston. In the year 1628, Mr. Endicot, one of the patentees to whom King James the First had eight years before granted an extensive territory in America, went to New England, with about a hundred followers, and settled at the spot now called Salem. In the following year this small colony was joined by about two hundred other persons from England; but, in the course of the year, about 100 of the colonists removed, and with the consent of Mr. Endicot, settled themselves at Charlestown, then called by its Indian name of Mishawum.

In the early part of the American Revolutionary war Charlestown was destroyed by the English troops; previously to that time it was a thriving place, in which many branches of manufacture were carried on. It was speedily rebuilt, and became much more considerable than before the war. The population in 1830 amounted to 8787 souls. Besides the Charles-river bridge, by which the town is connected with Boston, there is a bridge across the river Mystic, which connects Charlestown with the town of Malden, in the same county. [BOSTON.]

CHARLEVILLE, a town in the department of Ardennes in France, in the immediate vicinity of Mézières, the capital of the department, and on the left bank of the Meuse, about 145 miles from Paris through Soissons, Reims, and Rethel. This town is of modern origin, having been built in 1609 by Charles de Gonzague, Duke of Nevers, afterwards Duke of Mantua. It is very regularly laid out, and the streets are very straight; there are four principal ones, into which the others run. The houses are of uniform height, covered with slate. There is a handsome square, surrounded by a piazza, and with a fountain in the middle. The town possesses a theatre, a considerable public library, and a museum of natural history and antiquities. Charleville was originally fortified, and had a citadel called Mont Olympe; but these fortifications were destroyed about 1687, by order of Louis XIV. of France, into whose hands the town had come. A stone bridge unites this town with the neighbouring town of Mézières.

The population of Charleville, in 1832, was 7400 for the town itself, or 7773 for the whole commune. The inhabitants manufacture iron wares, especially nails and fire-arms, of which last there is a government manufacture. Brass founding and the manufacture of soap are also carried on. There is a commodious port on the Meuse, and considerable business is transacted.

CHARLEVOIX, PIERRE FRANÇOIS XAVIER DE, born at St. Quentin in 1682, was educated by the Jesuits, and was admitted into their order in early life. In 1720 he was appointed to one of the Jesuit missions in Canada, and, embarking at Rochelle, he arrived at Quebec in the autumn of that year. He explored a large part of Canada, and examined several of the rivers and lakes, which were then not much visited by Europeans. In going from North America to St. Domingo, he suffered shipwreck; but a second voyage was more fortunate, and he reached that island in September, 1722. After two or three weeks' stay in St. Domingo, he sailed for France, and arrived at Hâvre in the month of December. He afterwards made a journey into Italy on some business of his order, which frequently entrusted him with important employments. Besides producing the voluminous works that bear his name, he wrote during twenty-two years in the 'Mémoires de Trevoux,' a literary journal conducted by the Jesuits. He died at La Flèche in 1761.

He was a laborious compiler, and the documents and accounts of foreign countries (furnished by Jesuit missionaries, who were scattered in almost every corner of the world) upon which he principally worked, were numerous and occasionally valuable; but both he and his authorities were partial, prejudiced, credulous, and superstitious, and too much given to tedious details of the proceedings and ceremonies of their own order. To this we must add that Charlevoix's style is somewhat heavy and diffuse. His separate works are, 1. 'History and Description of Japan,' which is taken almost entirely from Kämpfer; 2. 'History of St. Domingo,' which is derived from a MS. sent him by Father Le Pers, who lived twenty-five years in that island, and from some documents which existed in the bureaux of the French ministry of Marine; 3. 'History of New France,' which contains a good account of all the French establishments in Canada and North America, together with a tedious confused journal of his own travels in that part of the world; (the latter portion was translated into English in 1760, under the title of 'Journal of a Voyage to North America;') 4. 'History of Paraguay,' which was translated into English in 1769.

His thick quartos are a compound of travels and history not very skilfully mixed; but although Charlevoix had neither the order and philosophy necessary to an historian, nor the enterprise and vivacity of a traveller, he was a very industrious man, and collected many things which still render his books valuable for occasional reference.

CHARLOCK, the vulgar name of Sinapis nigra and alba, common annual weeds which infest corn-land. They are so easily destroyed by a little care, that their presence can only be looked upon as evidence of slovenly agriculture.

CHARLOTTENBURG, a small town about a mile from Berlin, is built on the river Spree, and united to the capital by an excellent road, which is lighted by lamps. It contains a royal palace with a fine park, in which there is the sepulchral monument of Queen Luise, who died in 1810. There are also statues of the Great Elector and King Frederic I. Charlottenburg is a great place of resort for the people of Berlin, some of whom have fine country houses here. The population is about 6100. There are a few manufactures of cotton goods on a small scale.

CHARLOTTESVILLE, a post-town, and the county-town of the county of Albemarle, in the State of Virginia, on the bank of the Rivanna, a branch of the James river. It is situated in a beautiful and healthy country, about twenty miles from the Blue Ridge. Monticello, the former residence of Mr. Jefferson, is on the summit of a hill, about two miles from Charlottesville. Mr. Jefferson is buried in the grounds near the house. During the revolutionary war Colonel Tarleton made an attempt, in which he nearly succeeded, to surprise the Virginia legislature, then sitting at Charlottesville. Mr. Jefferson, who was then governor of Virginia, narrowly escaped being taken in his own house.

The university of Virginia, which is about one mile from Charlottesville, was founded by the legislature of Virginia, under the superintendence of Mr. Jefferson, who was appointed the first rector and one of the visitors. The regulations for the government of this institution, and the general course of instruction, were formed by Mr. Jefferson. It is one of the few colleges in the United States which has not a clergyman for its president: no theological or religious instruction is given by the university.

The branches of instruction are the Greek, Latin, and Hebrew languages, the most important modern languages, mathematics, natural philosophy, moral philosophy and political economy, law, and chemistry. There is also a small medical school. The university possesses a well selected library of about 10,000 volumes, a philosophical and chemical apparatus, an anatomical and general museum, a cabinet of minerals, and an observatory.

CHAROLLES, a town in France, in the department of Saône and Loire. [SAÔNE et LOIRE.]

CHAROLLOIS, or **CHAROLOIS**, a district deriving its name from the above town, which was the capital of it. Charollois was a subdivision of the duchy of Bourgogne, and Philippe le Bon and Charles le Téméraire, the two last of the great feudal dukes, took, during their father's lifetime, their title from this district, being known as counts of Charollois. It is included in the department of Saône et Loire, except a small part west of the Loire, which is for the most part comprehended in the department of Allier. [ALLIER, SAÔNE ET LOIRE.]

CHAROLLOIS, CANAL DU, otherwise called the **CANAL DU CENTRE**, one of the most important canals in France. It was commenced A.D. 1783 and finished A.D. 1793, and runs through the district from which it takes its name, connecting the navigation of the Loire at Digoin with that of the Saône at Châlons. From its junction with the Loire it follows the valley of the Arroux, a feeder of the Loire, for a very short distance, and then that of the Bourbince, a feeder of the Arroux. The only town of any importance near the canal, in this part of its course, is Paray (population, 2722, town; 3400, whole commune). The canal then passes through the étang or pool of Long Pendu, and follows the valley of the Dheune, a feeder of the Saône, to near the town of Chagny (population 2989), and then, turning off to the right, opens into the Saône at Châlons. Its whole length is given in the table subjoined to Malte Brun's *Géog. Universelle*, at 116,812 *mètres*, or about 72 English miles. It is the seventh of the French canals in respect of length. Its length, as measured on the maps of France by A. H. Brué, and by the Society for the Diffusion of Useful Knowledge, is, as near as can be, 70 miles.

CHARON, a native of Lampsacus, on the Hellespont, one of those numerous Greek historical writers now only known by their names and a few fragments. Charon lived before Herodotus, who was born B.C. 484, and he was younger than Hecatæus, who was probably in the vigour of his life about B.C. 500. Charon wrote a history of his native town, a history of Persia, a history of Crete, and other works. The loss of the Cretan history is to be regretted, as we possess so few materials for the antient state of that island. (See Suidas, Χάρων; Creuzer, *Historicorum Græcorum Antiquiss. Fragmenta, &c.* Heidelberg, 1806, 8vo.)

Suidas mentions two other writers of the name; one of Carthage, and the other of Naucratis, in Egypt.

CHARON, the fabulous boatman who conveyed the shades of the departed across the rivers which girt the infernal regions. (Eurip. *Alcest.* 253, 441; Aristoph. *Ran.* [illegible]; Virgil, *Æneis*, v. 298.) His fare was an obol (the sixth part of a drachme), which was laid in the mouth of a person about to be buried, in order that he might have therewith to pay the freight. (ναῦλον, δανάκη. Aristoph.; J. Pollux, ix. 82; and Juvenal, iii. 267.) Charon does not appear in Homer; his origin is referred to Ægypt (Diodor. [illegible]), where he had a representative in Amenthes, the emblem of a future state: his name is thought to point to the joy produced by a freedom from sublunary troubles. (See Creuzer, *Symbolik*, i., p. 341.)

CHART, or **SEA-CHART**, a hydrographical map, or a projection of some part of the sea, in plano, for the use of navigation. Fournier, in his *Hydrographie*, (fol. par. 1667, p. 505.) ascribes the invention of charts to Henry, son of John, king of Portugal: certain it is that marine charts appear first to have issued from the Portuguese. Bagford says, the first step that was made toward a knowledge of our own coasts was by an almanac, with a chart of the coasting part of England, printed on vellum or parchment, by Wynken de Worde, 1520, and bound in a small portable volume. This was the first he had seen of the kind. (See Bagford's *Letter to Hearne*, prefixed to Leland's *Itinerary*, vol. i., p. lxxx., and *Spicileg. ad Gul. Neubrig.*, p. 749.) John Rotz, a native of Dieppe, and servant to King Henry VIII., made for the king's use a Book of Hydrography, so called, being an account of the compass, elevation of the pole, latitude, sea coasts, &c., 1542, finely painted on eighteen very large skins of parchment, still preserved among the royal manuscripts in the British Museum, marked 20 E., ix. Of this description also is a very curious chart, preserved in the same collection, formerly belonging to Lord Oxford, and probably of as early if not an earlier date than Rotz's charts. New Holland is laid down upon it as an island, under the name of Java le Grand. The writer of the present article, many years ago, consulted the late Captain Flinders for his opinion whether this portion of the chart could have been laid down from actual observation. The answer was, 'most certainly; for lines of red dots are made to border the coast exactly to the extent to which it is coral-bound, and no farther; I was wrecked upon one of those reefs, and have reason to remember them.' The names of places are occasionally given upon the different shores in this chart, in French; and the very spot upon it which Captain Cook afterwards named Botany Bay is designated as *Côte des Herbages.*

The generality of the early Portuguese charts seem to have been made toward the close of the fifteenth century.

The particular species of charts most used at sea will be explained under the head MERCATOR'S PROJECTION. See also MAP, and STEREOGRAPHIC, ORTHOGRAPHIC, GNOMONIC, and CONICAL PROJECTIONS, under which last head look for Flamsteed's and the modern French projections.

CHARTA, MAGNA. [MAGNA CHARTA.]

CHARTE, from charta, 'paper,' was the name given to the letters of franchise granted by the kings of France during the middle ages to several towns and communities, by which they were put in possession of certain municipal rights or privileges, such as the free election of their local magistrates, &c. At present the word charte is used in France to signify the solemn acknowledgment made by Louis XVIII. on his restoration in 1814 of the rights of the nation, which is the fundamental law of the French constitutional monarchy, and the principle of which resembles that of the English constitution as founded on Magna Charta and the Bill of Rights. The legislative power is vested in two chambers, peers and deputies, subject to the king's sanction. All laws are promulgated by the king. The executive power is vested solely in the king, who appoints to all the offices of the administration, both civil and military, and has the command of all the military and naval forces. He also appoints the judicial officers, who however, when once appointed, cannot be removed by him. The king makes all treaties of peace, alliance, or commerce. His person is inviolable; but the ministers are responsible. One article of the Charte, having given occasion to a false interpretation, of which the ministers of Charles X. availed themselves to issue the famous ordonnances which gave rise to the revolution of July, was altered on the accession of Louis Philippe, and it was clearly explained that 'the king issues the necessary ordonnances and regulations for the execution of the laws, without having the power in any case to suspend the course of the law or to delay its execution.' The Charte, with this and one or two more modifications of minor importance, was sworn to by Louis Philippe on the 9th of August, 1830. Since that date, a change has been made by the legislature in the constitution of the Chamber of Peers. The Peers are for life, and the peerage is not hereditary in their families.

The Charte consists of sixty-nine articles, and is inserted in the 'Almanac Royal et National,' which is published every year. [LOUIS XVIII.]

CHARTER, or **CHARTA**. The primary meaning of Charta, or Carta, is paper, or any material to write upon, as charta pergamena (parchment). It then came to signify any deed or writing, in the same manner as liber (the inner bark of a tree), from which a sort of paper was made, now signifies any description of book.

The word Charter, though formerly used as synonymous with deeds and writings (Co. Litt., 6a), is now applied only to those grants of the king which create corporations, or confer some privilege or exemption; in fact, the word has acquired the secondary meaning of privilege or immunity.

Many charters, of great antiquity, are extant. The city of London possesses two granted by William the Conqueror in 1066, and several copies of Magna Charta and the Charta de Forestâ are in good preservation. Blackstone, quoting Matthew Paris, says, that an original great charter, under seal, was sent to every county in England, and to those which had forests within them a charter of the forest also; notwithstanding which, he continues, it is surprising how few of these originals are at present extant.

CHARTER-HOUSE, London. Sir Walter de Manny, knight, a stranger born, lord of the town of Manny, in the diocese of Cambray, in the Netherlands, who for services rendered to King Edward III. was made one of the first knights of the order of the garter, in the year of the great plague, 1349, bought a piece of ground without the bar of West Smithfield, which he inclosed and had consecrated for the burial of the dead, and where, in that year alone, more than 50,000 bodies are said to have been interred. It was thereupon called the New Church-Hawe, and a chapel was built, wherein, about the year 1360, Sir Walter de Manny intended to found a college for a warden or dean, and twelve secular priests; but in the next year that design was altered, when Michael de Northburgh, bishop of London, joined with him in the building and endowing a priory in this place for double the number of Carthusian monks, which was to be called 'The Salutation of the Mother of God,' and the foundation appears to have been finished about A.D. 1370. The gross revenue of this house at its surrender to King Henry VIII., June 10, 1535, amounted to *736l. 2s. 7d.*, its clear income to *642l. 0s. 4½d.* per annum. Bearcroft, in his 'Historical Account,' says the site of this house was first granted June 12, 1542, to John Bridges and Thomas Hale, for their joint lives; and April 14, 1555, to Sir Edward North, who was made a baron 1st Mariæ: his son, Roger Lord North, sold it May 31, 1565, to the duke of Norfolk, for 2500*l.*, whose son, Thomas Howard, earl of Suffolk, sold it in the 9th Jac. I. to Thomas Sutton, Esq., for 13,000*l.*, who founded upon it, and largely endowed, a most magnificent hospital, consisting of a master, preacher, a head schoolmaster, and second master, with forty-four boys and eighty decayed gentlemen, who have been soldiers or merchants, besides a physician, chirurgeons, register, and other officers and servants of the house. Beside the scholars upon the foundation, whose number is now limited to forty-two, the masters are allowed to receive certain others, whose number fluctuates from one to two hundred. The Charter-House is considered one of the first schools of the metropolis. Among the eminent persons who have received their education there, may be enumerated Dr. Isaac Barrow, the mathematician; Addison; Steele; Dr. Benson, bishop of Gloucester; Sir William Blackstone; the late earl of Liverpool; and the late Rev. Dr. Charles Burney.

The Charter-House, no doubt, derives its name from a corruption of *chartreux*, a monastery of Carthusians. The persecution of certain monks of this house forms a striking feature in the history of the Reformation of the time of Hen. VIII.

(See Dugdale's *Monasticon*, new edit., vol. vi., p. 6. Tanner's *Notit. Monast.*, edit. Nasmith, *Midd.* viii., 3. Bearcroft's *Hist. Account of Thomas Sutton, Esq.*, 8vo., Lond., 1737. Carlisle's *Descr. of the Endowed Grammar Schools in Engl. and Wales*, 8vo., Lond., 1818, vol. ii., p. 2.)

CHARTRAIN, a district in France, bounded on the N.E. by the Isle de France, on the N.W. by Perche, on the S. by the Orléanois and Dunois. It formed part of the more extensive district of Beausse. [BEAUSSE.] It takes its name immediately from its capital, Chartres, but originally from the people, Carnutes, by whom, at the time of the Roman invasion, it was peopled. This nation is mentioned by Livy as one of those which, in the time of Tarquin the elder, king of Rome, contributed their contingent to the force which crossed the Alps and inundated the north of Italy. [CELTÆ.] In the time of Cæsar they extended from the Seine to the country south of the Loire. It was in the territory of this people (which Cæsar informs us was held to be the central region of Gaul), that the Druids held their great annual convention. It is not very easy to judge of the relative political and military importance of this nation: they appear to have been under the protection of the Remi ('quorum erant in clientela' is Cæsar's expression, *De Bel. Gal.*, vi. 4), and their part in the struggle against the Romans is not such as to indicate pre-eminent power or valour. They slew Tasgetius, whom Cæsar had appointed to be their chief, and allied themselves with their neighbours, the Senones, to oppose the Romans; but the vigour and activity of Cæsar, who, in his sixth campaign, B.C. 53, took the field before the usual period of the year, led them to submit without striking a blow. In the following year they were active in forming a general confederacy of the Gauls against the Romans, and offered to take the lead in the revolt. On the appointed day, therefore, under the command of Cotuatus and Conetodunus, they assembled at one of their towns, Genabum (now Orléans), and murdered all the Roman traders whom they found there. So rapidly was the news of this stroke spread, that 'what was done at Genabum at sunrise was known before the conclusion of the first watch (i.e. before 9 p.m.), in the territories of the Arverni (Auvergne), which is 160 (Roman) miles off.' Their quota of the force destined to raise the siege of Alesia was 12,000, and they probably shared in the defeat consequent on that attempt. Towards the close of that summer, or early in the following winter, between the seventh and eighth years of Cæsar's command, they attacked the Bituriges, who had submitted to Cæsar; but Cæsar, hastily leaving his winter-quarters with a part of his troops, advanced into their country and compelled them to disperse, and left part of his army to pass the rest of the winter in quarters at Genabum. In the course of the following summer they were finally reduced by Cæsar's lieutenant, Fabius. (Cæsar, *de Bel. Gal.*, lib. v., vi., vii., viii.)

CHARTRES, a city in France, in the department of Eure et Loir, of which it is the capital. It stands on the river Eure, a feeder of the Seine, 46 miles in a straight line S.W. by W. of Paris, or 52 miles by the road through Versailles, Rambouillet, and Epernon; in 48° 26′ N. lat., and 1° 28′ E. long.

Chartres is a very antient city. Under the Roman dominion it bore the name of Autricum, but in the fourth century this name was replaced by that of the people, the Carnutes [CHARTRAIN], whose capital it was. It does not appear to retain any relics of Roman antiquity, save the remains of some subterranean aqueducts for conveying to the town the water of some springs about four or five miles south of it, and some subterranean passages leading from the town, and extending about seven miles to the W. and W.N.W.

In the civil dissensions of the Merovingian kings, and in the ravages of the Northmen, Chartres suffered. In 858 it was pillaged and burnt by the Northmen, taken again by them under their famous leader Hastings, but given up by him on the townsmen and the bishop agreeing to pay a certain sum as a ransom. Their neglect to pay this tribute caused another siege and capture of the town. In 911 the townsmen successfully resisted the attacks of the famous Rollo, the first duke of Normandie.

In the middle ages, Chartres was the capital of a county, which was, in the tenth century, united with that of Blois and Tours. At a later date, the town was troubled by quarrels between the clergy and the townspeople or the nobility; those between the count of Chartres and the chapter of the cathedral were made up by express agreement in 1294; but they were succeeded by long disputes between the bishop and the chapter, carried on by interdicts and excommunications, the usual weapons of ecclesiastical warfare. The county of Chartres had come by purchase into the hands of the King Philippe IV. le Bel, and had been bestowed by him on his brother Charles of Valois. Upon the accession of Philippe of Valois, son of Charles, to the crown, it was reunited to the royal domains, and continued so till it was given as dowry to the daughter of Louis XII. when married to the duke of Ferrara. During this interval it was disputed by the Bourguignon and Armagnac factions, passed under the dominion of the English, and was taken from them by surprise by Dunois, bastard of Orléans, and others. The bishop, a zealous partizan of the Bourguignon and English party, was killed in the struggle on this last occasion. In the religious wars of the sixteenth century, the town was taken and retaken by the different parties; and it was here that Henry IV. was consecrated after mastering the place by force of arms. The county of Chartres, when bestowed on the duchess of Ferrara, was erected into a duchy: it subsequently came by marriage to the dukes of Nemours, by whom it was resigned to the crown. Louis XIII. bestowed it upon his brother Gaston, duke of Orléans. upon his death, Louis XIV. gave it to his own brother Philippe, duke of Orléans, from whom the duchy was inherited up to the period of the Revolution by his lineal descendants, the present royal family of France. The eldest son of the present king, Louis Philippe, bore the title of duke of Chartres up to the time of his father's accession.

The city of Chartres is situated on the brow of a hill, at the foot of which is the river Eure, which flows here in two channels, one within and the other without the antient ramparts, which yet remain, and are surrounded by a circuit of public walks. Chartres is divided into the upper and lower towns; the upper has some tolerably commodious streets, and contains the principal public edifices: the lower town is ill built and ill laid out; the streets which unite the two are so steep as to be almost inaccessible to carriages. Every thing about the place has an air of antiquity: the houses are for the most part old; many of them still have the door-way in the form of a pointed arch, with Gothic ornaments. The suburb of Bourgneuf, by which the road from Paris enters the town, is long and straggling, presenting for the most part the appearance of a mere village consisting of cottages with their gables towards the street. There are in Chartres four squares; one in the lower town, that of St. Pierre, bordered with two rows of trees, and adjacent to the antient Gothic church, from which it takes its name; two in the upper town, viz., the corn-market and the herb-market; and one, the handsomest of all, called La Place des Barricades, outside the walls. The herb-market is adorned by an obelisk, erected by the inhabitants (A.D. 1801) to the memory of their fellow townsman, General Marceau.

But the finest edifice in Chartres is the Cathedral. The first cathedral had been burnt by the Normans, A.D. 858, but it was repaired: in the 10th century it was again burnt; and a third fire, in 1020, occasioned, according to general belief, by lightning, consumed not only the Cathedral, but nearly the whole city. By the zeal of the then bishop, Fulbert, liberal contributions were obtained towards the rebuilding, and the work was commenced; the building however proceeded slowly, and it was not until 1260 that it was dedicated. Even at that period only one of the great towers was surmounted by a spire, the second spire not having been added till the 16th century.

The principal front is one hundred and fifty French feet in breadth, and is formed by two square towers and the interval between them, the towers and the intervening part of the structure being each fifty feet in breadth. The spires which surmount the towers are of different architecture and of different heights. The old spire is a pyramid of many sides, rising to the height of three hundred and forty-two French feet from the ground: the architecture is plain and heavy; but it is cased with stone curiously carved like the scales of a fish: it always appears to be leaning towards the spectator wherever he may be standing. The new spire is 378 French feet high: it is of much more florid architecture than the other, and is so much admired as to have become proverbial for its beauty. That part of the front which is between the towers has a portal with three doorways, with pointed arches, and is adorned with statues, which were preserved at the destruction of the former cathedral, and are interesting as memorials of the state of the arts in the dark ages. Above the doorways are three arched windows with stained glass, and still higher a superb circular window, or rose. The north and south sides of the church are of equal interest with the principal front. The transepts have each a handsome portal of three doorways, built out from the church; over these are windows, and over the windows a large rose.

The interior of the church is admirable for the justness of its proportions; it has a peculiarly sombre character, which arises from the windows being so charged with colour as to exclude more light than usual. It is only in very clear weather that there is light enough to read. The choir is beautiful: it is adorned with statues and bas-reliefs of various merit: the Descent from the Cross, a bas-relief by Bridan, is a chef-d'œuvre: and the Presentation of our Saviour in the Temple, by the same sculptor, is much admired. There is a noble group behind the high altar, of the Assumption of the Virgin, also by Bridan. A curious anecdote is connected with this piece. During the revolutionary troubles, the barbarians who were predominant proposed to destroy it, and were proceeding to execute their purpose, when one of those present, anxious for its preservation, proposed to crown the figure of the Virgin with the *bonnet-rouge*, and thus transform her into a goddess of liberty. The offer was accepted, and the sculpture was thus preserved. The inner dimensions of the cathedral are as follows:—length, three hundred and ninety-six feet; breadth at the transept, one hundred and ninety-five feet; height to the point of the vaulted roof, one hundred and six feet. The above dimensions are in French feet, which exceed the English feet in the proportion of 16 to 15. Under the cathedral is a subterranean church, with several chapels, one of which, the chapel of the Virgin, was formerly much resorted to by pilgrims.

Chartres had formerly seven parish churches. That of St. André (St. Andrew), which was collegiate, stood on the bank of the Eure, and having to be enlarged, a bold arch was thrown over the river, and upon this arch the choir was built. The choir has since been destroyed, and the rest of the church, used as a store-house, is falling to ruin. The church of St. Pierre (St. Peter) has some fine painted windows: this was once the church of a Benedictine abbey, now converted into a barrack. There were formerly several religious houses. The office of the Prefect is a new building, with pleasant gardens round it: and there is a handsome modern theatre.

The population of Chartres, in 1832, was 13,576 for the town, or 14,439 for the whole commune. The chief trade of the place is in corn and flour; the corn-market is the first in France. Some serges and other woollen goods are manufactured, and some hosiery; a good quantity of leather is made, and there are several dye-houses. There is a museum of natural history, and a public library of 30,000 volumes and 700 manuscripts. A noble hospital or almshouse has been lately founded by M. d'Aligre, who has devoted to its erection and endowment a sum of more than 80,000*l.* It is intended for 100 infirm persons, of each sex, and 100 foundling children.

The arrondissement of Chartres contained in 1832 a population of 103,783. (Dulaure, *Hist. des Environs de Paris;* Vaysse de Villiers; Malte-Brun.)

CHARTREUSE, a celebrated monastery of the Carthusians (*les Chartreux*) [CARTHUSIANS], the first established of that order, and therefore distinguished by the epithet *La grande Chartreuse.* It is in the department of Isère, in France, and amidst the sublime scenery of the Alps. Travellers who wish to visit it usually go from Grenoble on account of the better accommodation for the journey to be procured there, although the post town of les Echelles in Savoy is considerably nearer. However, in going from Grenoble, travellers frequently make a circuit which brings them into the road from les Echelles at the village of St. Laurent du Pont, the approach in that direction being more picturesque. From St. Laurent the road runs along the bank of a mountain-torrent, the Guier, through a narrow pass, which is closed by a house with an arched gateway under it and a double door. This doorway is the entrance to the inclosure of the Chartreuse, which is formed by a group of mountains, the loftiest, steepest, and wildest in the neighbourhood, covered from their base to their summit by a dark pine-forest. In this inclosure the road runs through a thick pine-forest, a lofty mountain rising precipitously on the right, and on the left is the abyss through which the Guier flows. After a while the valley widens, the forest is no longer so dense as to exclude the light, and the beech replaces the pine, which is seen only on the summit of the rocks; at length the forest ceases, and the traveller emerges into a large meadow, at the farther end of which the monastery appears in all its extent.

The other approach, and the more direct from Grenoble, is by a mountain, Le Sapey, from the summit of which is a fine view of Grenoble and the valley of Grésivaudan, in which it is situated. The road from Le Sapey to the inclosure of the Chartreuse lies through pine-forests with some intervals of pasture; there are even some farm-houses and a small hamlet. The inclosure of the Chartreuse is entered on this side by a narrow pass and by a house with a gateway under it, similar to that already described; and at a short distance from this entrance is the village of Chartreuse, from which the monastery derives its name.

This awful solitude was the cradle of the Carthusian order. [BRUNO.] Bruno himself did not give any rules of his own to his followers; to reduce the Carthusian discipline to a system was the work of a remote successor. The cell of St. Bruno is now converted into a chapel, and the fountain is still shown at which he quenched his thirst.

This monastery has been burned eight times; twice by the Calvinists in the religious wars of the sixteenth century.

Our authorities do not state when the present building was erected; it is a substantial edifice of simple architecture, but magnificent by its extent and situation. The buildings inclose a large oblong square or cloister, 714 English feet in length: the cells of the fathers, eighty in number, are around this cloister, with mottoes from scripture or some religious book painted outside the doors; each cell includes two rooms, besides a closet for books, and a wood-room on the ground floor, opening into a little inclosed garden. The hall is adorned with portraits of all the generals of the order; the table of the kitchen is formed of two coarse marble slabs of enormous size; there are extensive cellars, and a place where cheese is made similar to that of Gruyères.

Before the French Revolution, the monks had considerable property in the woods around the monastery, but at the Revolution they lost this as well as the monastery itself. The woods were sold, but the building, not being suited for any purpose, found no purchaser. Upon the return of the Bourbons, the monks came back and recovered the monastery, with the meadows around it, and the right of gathering fuel in the woods. In 1830 there were about 150 persons, monks and lay brethren, in the monastery: they visit the sick, and perform spiritual duties in the small churches or chapels scattered over the surrounding mountains. (Vaysse de Villiers; Expilly; *Penny Magazine*.)

CHASE, that part of a gun which is between the ring near the trunnions, and the astragal mouldings near the muzzle.

CHASMO'DIA, a genus of coleopterous insects of the section *Lamellicornes* (*Scarabæus*, Linn.), and sub-section *Xylophili* (Latreille). Technical characters:—Body rather convex and broad: scutellum large, somewhat triangular, equalling in length at least one third of that of the elytra: the mesosternum is prolonged into a blunt point, and extends as far as the base of the femora of the anterior pair of legs: the mandibles are entire, and obtuse at the apex: maxillæ with only two teeth, and furnished with a tuft of fine hairs at the extremity; mentum elongated: elytra shorter than the abdomen, broad behind and obtusely rounded. The male Chasmodia has the upper claw of the fore tarsi very broad and bifid, or divided at the apex: the inner claw is small and entire; the claws of the four posterior legs are entire and of large size. The female has all the claws of small size; those of the anterior pair of legs simple; the four posterior legs have the outer claw bifid*. The tarsi of the male are thicker than in the female, particularly those of the anterior pair of legs.

All the species of this genus are of large size, and may be readily distinguished from the Cetoniæ by their large scutellum and convex form, combined with their smooth and glossy appearance. The thorax is convex, and has the posterior margin considerably waved; the part joining the scutellum has a segment of a circle as it were cut out to admit the fore part of the latter, which is rounded: this character is also observed in the genus Cetonia and Macraspis, and affords a good point of distinction between these and the groups nearest allied. The genus Macraspis has also a very large scutellum, but differs in the tarsi and other parts, which will be described under the proper head.

Chasmodia viridis is about an inch in length and of a deep blue-green colour throughout, with the exception of the antennæ, the basal joints of which are pitchy red, and the club is black.

There are four other species known, some of which are of a glossy brown or chestnut colour; they all inhabit South America: the species above named is common in collections from the Brazils. [MACRASPIS.]

CHASTELLET, GABRIELLE-EMILIE LE TONNELIER DE BRETEUIL, MARQUISE DU, the translator of Newton into French, was the daughter of Baron de Breteuil, and was born in 1706. In what manner she was led to study mathematics is not stated; she also became a proficient in Latin, English (in which Voltaire, as he tells us, was her instructor), and Italian. She was married very early to the Marquis du Chastellet, and died August 10, 1749, her death having been hastened by close application to her translation of Newton. She died in the palace of Luneville, at the court of Stanislas, where Voltaire also was then residing. Her *liaison* (as the French call it) with Voltaire furnished sundry anecdotes for the scandalous chronicles of her day. The state of manners however, and in particular the method in which marriage was contracted among the French, are too well known to require any comment.

In 1738 Madame du Chastellet wrote, for the prize of the Academy of Sciences, on the nature of fire. In 1740 she published at Paris her 'Institutions de Physique,' addressed to her son, and a second edition appeared at Amsterdam in 1742. This work is a series of letters, in which the systems of Leibnitz and of Newton (the latter then almost new in France) are explained in a familiar style, and with a degree of knowledge of the history of the several opinions, and of sound language and ideas in their discussion, which we read with surprise, remembering that they were the production of a Frenchwoman thirty years of age, written very few years after the introduction of the Newtonian philosophy into France. She takes that intermediate view between the refusal to admit the hypothesis of attraction, and the assertion of it as a primary quality of matter, from which very few who consider the subject would now dissent. At the end of this work is an epistolary discussion with M. de Mairan, on the principle of *vis viva*, the metaphysical part of which then created much controversy.

The translation of Newton was published at Paris in 1759, with a 'préface historique,' and an *éloge* in verse by Voltaire, who probably owed to Madame du Chastellet the smattering of knowledge upon which he wrote his 'Elémens de la Philosophie de Newton,' published in 1738. From it we learn that the translation was submitted to the revision of Clairaut, who was the instructor of the authoress in mathematics. To the work is added a commentary, which bears the name of Clairaut, being in fact his lessons committed to writing and arranged by Madame du Chastellet, and afterwards revised by their author. We here find, 1. a popular account of Newton's system; 2. investigations of various points by the analysis of the continental school, to the exclusion of the geometry of Newton; 3. an abridgment of Clairaut's work on the figure of the earth; 4. another of Daniel Bernoulli's essay on the tides. The translation itself is a close copy of the original in form and matter, but does not profess to be perfectly literal, where the Latin is concise or obscure. It was used by Delambre in his citations (*Hist. d'Astron.*, xviii. siècle), expressly that he might have the sanction of Clairaut in his versions of Newton. In 1806 the correspondence of Madame du Chastellet with the Count d'Argental was published at Paris, to which was appended a life, and a treatise 'Sur le Bonheur.' (*Biog. Univ.; Mémoires pour servir à la Vie de Voltaire, écrits par lui-même; la Vie de Voltaire, par* Condorcet.)

CHATEAUBRIAND. [LOIRE INFERIEURE.]

CHATEAU CHINON. [NIEVRE.]

CHATEAUDUN, a town in France, in the department of Eure et Loir, on the banks of the river Loir (which uniting with the Sarthe flows into the Loire), and on the road from Paris to Tours. It is 68 miles in a straight line S.W. of Paris, or 81 miles by the road through Rambouillet and Chartres, and 29 miles S. by W. from the latter town, which is the capital of the department: 48° 5′ N. lat., and 1° 18′ E. long.

This town was formerly the capital of the Dunois, a district included in the general government of Orléans, and in the diocese of Chartres. It is a town of considerable antiquity, being mentioned by Aimoin and Grégoire of Tours. In the tenth century it appears to have been subject to Thibaut le Tricheur, Count of Blois, Tours and Chartres, who built here an old tower, part of the castle, which is still standing. Afterwards Châteaudun had viscounts of its own until the fifteenth century, when it was united with the county of Dunois. The counts of Dunois built the rest of the castle.

Châteaudun was burnt in 1723, and rebuilt on a regular plan, which renders it one of the handsomest towns in France. The streets are broad and straight, with neat and uniformly built houses, and some good public buildings, such as the town-hall, the office of the sub-prefect, formerly a convent, and the college or high school. The castle is a Gothic building, and one of the finest of the kind in France. The walls of the old tower, built by Thibaut, are about 16 feet thick. There is a good *place*, or square, and a handsome public walk.

The inhabitants, in 1832, amounted to 6461. They do not seem to be engaged to any great extent in trade or manufactures except that of blankets. There is a public library.

Châteaudun was erected into the capital of a bishopric in the sixth century, by one of the Frankish Merovingian princes; but the act having been irregular, the pretended bishop could not maintain his station. It is now the capital of an arrondissement, which had, in 1832, 59,758 inhabitants.

CHATEAU GONTHIER, a town in France, in the department of Mayenne, on the right bank of the Mayenne, and on the road from Laval to Angers. It is about 154 miles W.S.W. of Paris, in 47° 50′ N. lat., and 0° 41′ W. long.

This town was built by Foulques, or Fulk Nerra, count of

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* We have been more than usually minute in these characters, because in two works referred to they are wrongly described. In the 'Règne Animal' the claws are described as being entire.

Anjou, about A.D. 1037. It would be a handsome town if its streets were not so crooked. The houses have a cheerful aspect, and several of them are handsome.

There is a pleasant promenade commanding a delightful prospect of the country through which the Mayenne flows; the banks of the river are adorned with pleasant meadows, orchards, and walnut-trees, and crowned with steep slopes. One of the principal suburbs is separated from the town itself by the river.

The inhabitants amounted, in 1832, to 6143. The chief branches of trade are in linen cloth, of superior quality, which is made and bleached here, and in wax: serges, and other woollens, hats, and leather, are also made, and the town serves as an emporium for the wine, coal and slate of Anjou. There is a good High School, and three hospitals, or almshouses. The arrondissement of Château Gonthier had, in 1832, a population of 72,888: it is the chief grain district of the department.

CHATEAULIN. [FINISTERRE.]

CHATEAUROUX, a town in France, capital of the department of Indre, on the river Indre, and on the road from Paris by Orléans to Limoges, 144 miles S. by W. from Paris, in a direct line, or 157 miles by the road; in 46° 48′ N. lat., and 1° 40′ E. longitude.

The town takes its name from a Frankish noble, Raoul de Déols, who built both the town and castle: Châteauroux is therefore a corruption of Château Raoul. Its feudal history has neither importance nor interest. The town is situated in an extensive plain, in which a great number of cattle are fed. The castle stands at one end of the town, on a hill, and notwithstanding its great antiquity, still serves as the office of the prefect. Mr. J. Cobbett describes the town as 'a confined and dirty assemblage of streets and houses, on a rapid declivity, under which runs the Indre.' There is an antient church in the lower town almost destroyed, and a prison, consisting of two towers and an archway, formerly, no doubt, one of the gates of the town, though from the continued increase of the place it is now nearly in the middle of the town. (*Letters from France.*)

The population, in 1832, was 10,851 for the town, or 11,587 for the whole commune. The principal manufacture carried on is that of woollen cloth. There is a library, a Society of Agriculture, Commerce, and the Arts, a college or high school, and a theatre. The population of the arrondissement, in 1832, was 90,545.

CHATEAU THIERRY, a town in France, in the department of Aisne, on the bank of the river Marne, and on the road from Paris to Bar, Nancy, and Strasbourg. It is 47 miles E. by N. of Paris in a straight line, or 56 miles by the road: 49° 2′ N. lat., and 3° 21′ E. longitude.

The town derives its name from a castle built about A.D. 720, by Charles Martel, as a residence for Thierry IV., a child whom he had made nominal king. Round this castle a town was gradually formed, which became at a later period the residence of the counts of Champagne.

Château Thierry rises in the form of an amphitheatre on the right bank of the river. It is well built, and is overlooked by the ruins of an antient castle. The population, in 1832, was 3749 for the town, or 4697 for the whole commune. The chief articles of manufacture are linens, cottons, earthenware, and leather. Considerable trade is carried on in corn, wool, cattle, wine, gypsum, and mill-stones.

This town suffered severely in the invasion of France by the allies, in 1814: the town and suburbs were three times pillaged. It is the native place of La Fontaine, whose statue has been erected upon the bridge over the Marne. Château Thierry is the capital of an arrondissement, which had, in 1832, 60,771 inhabitants.

CHATELET, or CHASTELET, properly a little fortress. This name was afterwards given to certain courts of justice, formerly established in several cities of France, as at Orléans, Montpellier, &c. The Grand Châtelet, at Paris, was the place where the presidial and ordinary court of justice of the provost of Paris was held. It consisted of a presidial, a civil chamber, and a chamber of policy. The Little Châtelet, at Paris, answered to its proper name; it was an antient fort, serving as a prison. (See Furetière, *Diction. Universel, in voce.*)

CHATELLERAULT, a town in France, in the department of Vienne, on the river Vienne, and on the high road from Paris to Bordeaux. It is 164 miles S.W. by S. from Paris in a straight line, or 190 miles by the road: in 46° 50′ N. lat., 0° 32′ E. long.

This town owes its origin and name to Hérault, lord of the soil in the eleventh century, who built here a castle, Château d'Hérault, which is no longer in existence. The town stands on the right or east bank of the Vienne, which separates i from one of its faubourgs or suburbs. This suburb is united to the town by a fine stone bridge, built by the celebrated duke of Sully, the approach to which on the town side is by an avenue forming a public walk, and by a gateway passing through a castle with four towers, also built by Sully. Some have confounded this with the old Château d'Hérault, which, as observed above, has been demolished. The town itself is ill built, but has been improved during the present century by several new houses, the result of the increasing trade of the town.

The inhabitants amounted, in 1832, to 9437. They were formerly engaged in the manufacture of clocks and watches and cutlery. The manufacture of clocks and watches is not, however, mentioned by the more modern of our authorities; that of cutlery still continues to be the staple article of the town. Five hundred families are said to be engaged in this branch of industry, but they are supported rather than enriched by it. Their knives are particularly in repute; they are cheaply and nicely got up, but their temper wants hardness: they are stamped by appointed officers, who are particular in rejecting such as are not properly finished. The sale of these articles to passengers through the town is considerable, and M. Millin (*Voyage dans les Départements du Midi*, Paris, 1811,) gives the following account of the eagerness with which the dealers press the sale of their articles. 'As soon as the traveller reaches Châtellerault, he is assailed by a swarm of women, whose object is to urge by every means the sale of their knives. However he may entrench himself in his carriage, there is no means of escape; they immediately hang on the doors or clamber up the naves and spokes of the wheels, or get upon chairs: the mind anticipates with alarm the accidents which might happen if the horses were to start; and the traveller, apprehensive of causing some disaster, opens the window, and is immediately beset with more urgent entreaties. Harassed and worried, he at last makes a purchase; and then the roguish postilion, who was in league with these clamorous petitioners, whips on his horses; but up to the purchase he always finds something to do, or some part of his harness that wants to be adjusted.' The manufacture of serges and other woollen stuffs, *sabots* or wooden shoes, leather, and lace, is carried on; and there are three places for bleaching wax. To the above articles of trade may be added wine, grain, wool, hemp, fruits, wax, honey, nut oil, and other agricultural produce, and millstones. The trade of the place is much favoured by its situation on the river Vienne, the navigation of which commences about seven miles above the town, and on which there is a good port. During the last war, when the maritime superiority of England interrupted the coasting trade of France, Châtellerault became the centre of considerable internal trade. The wines and brandies of the south were brought hither by land, and transmitted to the north of France by the Vienne, the Loire, the Canal d'Orléans, and the Seine; while the linens and woollens of the north, arriving at Châtellerault by water-carriage, were dispatched by land to Bordeaux.

Châtellerault is the capital of an arrondissement, which contained, in 1832, 50,413 inhabitants. It contains a high school, an agricultural society, and a theatre. It was the native place of Jean Daillé, a celebrated Protestant minister and writer. The Scotch duke of Hamilton bears the title of duke of Châtellerault, which was bestowed on one of his ancestors in 1548.

CHATHAM, a market-town and parliamentary borough on the Medway, in the lathe of Aylesford, Kent. The town (including Brompton, which is a village connected with the dock-yard and naval and military establishments, at a little distance from what is strictly the town of Chatham) is in the two parishes of Chatham and Gillingham, and joins Rochester on the east. Its distance from London by the Dover road, which varies but little from the direct distance, is about thirty miles E. by S. By the Reform Act, Chatham was created a parliamentary borough, with a boundary extending considerably on the S. and E. sides of the town, and it now returns one member. The population within the boundary was estimated at 19,000; the returns of 1831 give 16,485 as the population of the town.

From various discoveries made in erecting the fortifications which inclose the naval and military establishments at Chatham, it seems probable that the Romans had a burying ground here. A number of antient graves and other excavations were opened, and Roman bricks, tiles, coins, and weapons were found. The name of the town is Saxon, and was written Ceteham or Caettham, which is supposed to signify 'the village of cottages.' It continued an insignificant place until the formation of the dock-yard, since which time the town has sprung up. The parish of Chatham is very extensive; a small part of it is within the liberties of the city of Rochester. The parish church was almost entirely rebuilt in 1788; in addition to it there is a church, erected in 1821 by the commissioners for building new churches, the patronage of which is held by the incumbent. The parish is in the diocese of Rochester.

The extensive naval and military establishments are at Brompton, a little distance from the town, and entirely separated from it by a line of fortifications. The dock-yard was founded by Queen Elizabeth, previous to the invasion of the Armada, on the site of what is now termed the Ordnance Wharf, and occasionally the Old Dock. It was removed to its present situation in 1622, the demands of the navy requiring increased accommodation. Elizabeth erected Upnor Castle, on the opposite side of the Medway, for the purpose of defending the dock-yard and shipping. But this fort proved ineffectual for protection from the attempt of the Dutch, under De Ruyter, who, in 1667, having taken Sheerness, dispatched his vice-admiral, Van Ghent, with seventeen sail of light ships, and eight fire ships, to destroy Chatham. He succeeded in breaking a chain stretched across the Medway, and, in spite of the fire from the castle, burnt and sunk some ships. Finding the country alarmed, he retired, carrying off a ship of war named the Royal Charles. It appears from Pepys's *Diary*, that this attempt of the Dutch created great alarm, and that the greatest confusion and imbecility prevailed at this time in the English councils. After the affair was over, the various parties connected with the admiralty strove, with characteristic meanness, to shift the blame on others. This event was the cause of stronger and additional fortifications being erected.

In the reign of Queen Anne two acts of parliament were passed for the extension of the dock-yards and arsenals of Chatham, Portsmouth, &c. But nothing very important was effected at Chatham until after 1757, when, from that period down to 1805, according as alarm respecting French invasion prevailed, or as the rapidly increasing navy required, new buildings were erected, and the extensive area occupied by the different establishments was inclosed by a strong line of fortifications on the land side, and protected on the river side by strengthening Upnor Castle, by the erection of a martello tower called Gillingham Fort on the Chatham side, and other defences. Upnor Castle is at present merely a powder magazine.

The naval and military establishments consist of a dock-yard, nearly a mile in length, which has four wet docks capable of receiving vessels of the largest class; an extensive arsenal; barracks on a large scale for artillery and engineers, infantry and royal marines; a park of artillery; magazines and store-houses; besides a handsome dock-chapel, and a number of habitations for the civilians who are employed. The principal mast-house is 240 feet long by 120 wide. The rope-house is 1128 feet in length, and 47½ wide, in which cables 101 fathoms in length and 25 inches in circumference are made. The machinery used in all the departments is of the very best kind. A duplicate of Brunel's block-making machine is kept here, ready for use in case the machine at Portsmouth should get out of order. The engineer barracks are built in a plain and simple style, and are extensive and convenient. There is a school for engineers, which was established in 1812, in which young officers and recruits of the engineer service are trained to a practical knowledge of their duties. Near the dock-yard gate is a large naval hospital, which was erected at the suggestion of the present king (William IV.) when lord high admiral.

At Rochester Bridge, the Medway, which discharges into the same æstuary with the Thames, is a large tide river. The rise is eighteen feet at spring and twelve at neap tides at Chatham. Above Rochester the high lands approach each bank of the river, forming a kind of amphitheatre about Chatham and Rochester on the east side, and also on the west, closing on the river at Upnor Castle. Below Chatham dock-yards the high lands decline, first on the right, and then on the left bank forming a flat, marshy country, to the spacious outlet of the Medway at Sheerness.

There is an establishment for convicts at Chatham, consisting of four ships, one being appropriated for juvenile offenders, and another used as an hospital. The prisoners are employed in different departments of the dock-yard and arsenal.

The 'Chest' at Chatham was established in the reign of Elizabeth, and was originally a voluntary contribution from the monthly wages of seamen for the support of their maimed and superannuated brethren, but which soon settled into a compulsory payment. Several notices occur in Pepys's *Diary* of complaints of maladministration of this charity. On the recommendation of the Commissioners of Naval Inquiry, it was, by the 43 G. III. c. 119, removed to Greenwich. The monthly payment from the wages of seamen is now abolished by the 4 W. IV. c. 34, and the amount is charged annually on the consolidated fund.

An hospital for lepers was established at Chatham by bishop Gundulph, in the reign of William the Conqueror. It appears to have been incorporated. Its revenues, which were small, escaped confiscation at the time of the dissolution of the monasteries, though attempts were afterwards made in the reigns of Elizabeth and James I. to wrest them from the hospital. The building does not now exist, with the exception of a small chapel, but the revenues of the estate are in the hands of the dean of Rochester. On the north side of the High-street, or principal street of Chatham, there is an hospital for decayed mariners and shipwrights, which was founded by Sir John Hawkins in 1592, and incorporated by Elizabeth in 1594. It is a neat and convenient building: the funds support ten pensioners. There are several minor charities.

The Education Returns of 1835 give nine daily schools, and ten sunday schools as then existing at Chatham.

(Hasted's *Kent*; Douglas's *Nenia Britannica*; Pepys's *Diary*; Dupin's *Military and Naval Power of Great Britain*; *Boundary Report*; *Population Returns*.)

CHATHAM, EARL OF. [PITT.]

CHATILLON, the name of several towns in France, of which we shall only observe here that Chatillon-sur-Seine [CÔTE D'OR] was the scene of fruitless negotiations between Napoleon and the allied powers before the capitulation of Paris, 1814; and that the castle of Chatillon-sur-Loire [LOIRET] was the property of the great Coligni, hence called 'the admiral of Chatillon.'

CHATOE'SSUS, a genus of fishes of the herring family. [CLUPEIDÆ.]

CHATRE, LA, a town in the department of Indre, in France, on a cross road leading from Châteauroux to Guéret. It is 159 miles S. by W. of Paris, in 46° 35′ N. latitude, and 1° 59′ E. longitude.

This little town is situated in a pleasant country, on a gentle slope, on the left bank of the river Indre. The inhabitants, who amount to 3913 for the town, or 4343 for the whole commune, manufacture some serges, and trade in cattle, wool, and leather. It is the capital of an arrondissement, which contained in 1832 52,497 inhabitants.

CHATSWORTH, an extra-parochial liberty, in the hundred of High Peak, county of Derby, 3 miles from Bakewell, and 16 from Buxton, is the seat of the duke of Devonshire, who is constable of the Peak. The present mansion stands on the site of a former one, in which Mary, queen of Scots, passed the greater part of her long captivity in England, and which, during the civil wars, was alternately in possession of the parliamentarians and royalists, and withstood the siege of the parliamentarian troops in 1645. It was taken down at the close of that century to make room for the present beautiful structure, which was not completed until 1706. During the time that it was building, it was the residence of Marshal Tallard, the French general, who had been made a prisoner at the battle of Blenheim. The house is built in the Grecian style, with Ionic columns, with a flat roof and balustrade round it. It is about 190 feet square, inclosing a court with a fountain in the centre. The stone was hewn out of a neighbouring hill. The park is ten miles in circumference, through which, and in front of the mansion, flows the Derwent. The water-works, which are so ornamental to the pleasure grounds, are supplied from a reservoir on the summit of the nearest hill. Chatsworth is part of the duchy of Lancaster, and within the jurisdiction of a court of pleas held at

Chapel en le Frith for the recovery of debts under 40*s*; but its population is returned with the parish of Edensor

CHATTELS (Catalla). This term comprehends all property moveable or immoveable, which are not freehold. Chattels are called real, which, in the language of the earlier law writers, savour of the reality; that is, relate to or are interests in land. Chattels personal are moveable goods, as horses, plate, money, &c. Chattels of each description pass to the personal representatives of the deceased proprietor, and are comprehended under the general term 'personal property.' The laws which govern this description of property are now, from the growth of the mercantile system and the change of manners, equal in importance with those relating to realty; but during the prevalence of the feudal system, and the laws to which it more immediately gave rise, chattels (including even terms for years) were considered of small importance in a legal point of view, and, indeed, prior to the reign of Henry VI., were rarely mentioned in the law treatises and Reports of the day. (Reeve's *Hist. Eng. Law*, 369.) Many articles of property, intrinsically chattels, from their intimate connexion with other property of a freehold nature, and being necessary to its enjoyment, descend therewith to the heir, and are not treated as chattels. Thus, for instance, the muniments of title to an estate of inheritance, growing trees and grass, deer in a park, and such fixtures as cannot be removed from the freehold without injury to it, are not chattels, because they pass to the heir. In the hands of a person however who has a limited interest in such things, they become his chattels, and pass to his executor. Chattels, except so far as they may be impressed with the nature of heir-looms, cannot be entailed, though they may be limited so as to vest within 21 years after the death of a person or persons in being. They are not within the statute of Uses, inasmuch as the proprietor of a chattel is said to be *possessed* of it, not *seised*, which is the word used in that statute; nor are the same formalities required in passing a chattel by devise, as in the case of real property. A will of chattels may also be at an earlier age than one which disposes of real estate; at fourteen years of age by a male, and twelve by a female. They do not go in succession to a corporation sole, except only in the cases of the king and the chamberlain of the city of London. (Co. Litt.; Bl. *Comm.*)

CHATTERTON, THOMAS, was born at Bristol on the 20th of November, 1752. His father (who died three months before the birth of his son) was a singing master at the cathedral, and also master of a charity school in Pyle-street. At the age of five years he was placed under the care of Mr. Love, who succeeded his father as master; but his progress was so slow, that after his master had exhausted his patience in attempting to teach him, he sent him back to his mother as a 'dull boy, and incapable of further instruction.' His mother now took him under her care, and at the age of six years he first learned his letters from the illuminated capitals of an old musical MS., with which, to use her expression, he 'fell in love;' and it is probable that his passion for antiquarian pursuits received its first impulse from this circumstance. His progress was now as rapid as it had before been slow; books of all kinds, but more especially those which treated of ancient customs, were his chief companions. On the 3rd August, 1760, when not quite eight years of age, he was admitted into Colston's school, Bristol, an establishment much upon the same plan with Christ's Hospital, in London. He remained here seven years, during which time he wrote some minor pieces of poetry, chiefly satirical, and the celebrated De Bergham pedigree. On the 1st July, 1767, he left the charity school, and was bound apprentice to Mr. John Lambert, attorney, of Bristol, for seven years. While in Mr. Lambert's service he communicated to Felix Farley's Bristol Journal the article by which he first attracted attention. In the beginning of October, 1768, the new bridge at Bristol was completed, and at that time there appeared in Farley's Journal an article purporting to be the transcript of an ancient MS., entitled, 'A Description of the Fryars first passing over the Old Bridge, taken from an Antient Manuscript.' This paper, so singularly curious, and exhibiting such strong powers of invention, was traced to Chatterton, who was at first rather harshly interrogated as to the manner by which it came into his possession. After several contradictory statements, he asserted that he had received the paper in question from his father, who had found it, with many others, in some chests in Redcliff church, where they had been deposited in the muniment room, in 'Canynge's cofre.' Soon after this occurrence he became acquainted with Mr. Catcott, a gentleman fond of antiquarian researches, and with Mr. Barrett, surgeon, who was engaged in writing a history of Bristol. To the former gentleman he took, very soon after his introduction to him, some of the pretended Rowleian poems, among which were 'The Bristow Tragedy,' Rowley's Epitaph upon Mr. Canynge's Ancestor, with some other small pieces. This Rowley, according to Chatterton, was a priest of the fifteenth century, who had been patronized by Canynge. (BRISTOL, p. 432.) He shortly afterwards presented to Mr. Catcott the Yellow Roll. To Mr. Barrett he furnished an account of every church and chapel in Bristol, which he stated to have been found by him among the old parchments. The pretended originals bore all the marks of antiquity, which he had made them assume by rubbing them with ochre, stamping on them, and blacking them in the chimney, or by the flame of a candle. Mr. Barrett published these statements in his work, fully believing them to be genuine. After his introduction to these gentlemen Chatterton's ambition increased daily, and he often spoke in raptures of the undoubted success of the plans that he had formed for his future life. His pursuits were various—heraldry, English antiquities, metaphysics, mathematics, astronomy, music, and physic, by turns occupied his attention; but the two first were his favourite pursuits.

His attention, however, was not confined to the Rowley poems. He wrote various pieces, chiefly satirical; and several essays, both in prose and verse, which he forwarded to the periodicals of the day. Most of his pieces appeared in the 'Town and Country Magazine.' Growing disgusted with a profession ill suited to his tastes, and with a master whom he disliked, he made an application in March, 1769, to Mr. Horace Walpole: the ground of which was an offer to supply him with some accounts of a succession of painters who had flourished at Bristol, which Chatterton affirmed to have been lately discovered, with some old poems, in that city. Walpole accepted the offer with warmth, but afterwards seems to have cooled upon it, either from suspecting the forgery of the accounts, or ascribing but little value to them; and on being importuned by Chatterton for his assistance to release him from his profession, he neglected to answer his letters. At last, when he had received a dignified and spirited letter from Chatterton, demanding his MSS. (a letter which he termed 'singularly impertinent'), he returned the MSS. and letters in a blank cover.

Being determined to relinquish his profession, Chatterton made every effort to accomplish this object. The idea of suicide became familiar to his mind, and he often intimated to Mr. Lambert's servants that he would put an end to his existence. On hearing this the family of his master became alarmed; but Mr. Lambert himself could not be persuaded that his threats meant anything, until he found one day on his desk a paper entitled, 'The last Will and Testament of Thomas Chatterton,' in the following terms —'This is the last will and testament of me, Thomas Chatterton, of the city of Bristol, being sound in body, or it is the fault of my last surgeon; the soundness of mind the coroner and jury are to be judges of, desiring them to take notice that the most perfect masters of human nature in Bristol distinguish me by the title of the mad genius; therefore if I do a mad action it is conformable to every action of my life, which all savoured of insanity. Item. If, after my death, which will happen to-morrow night before eight o'clock, being the feast of the resurrection, the coroner and jury bring it in lunacy, I will and direct,' &c. &c. This alarmed Mr. Lambert, who considered it imprudent to keep him any longer, and accordingly he dismissed him after he had been in his service about two years and nine months.

Chatterton went up to London, having received liberal offers from the booksellers. 'My first attempt,' said he, 'shall be in the literary way: the promises I have received are sufficient to dispel doubt; but should I, contrary to my expectation, find myself deceived, I will in that case turn Methodist preacher. Credulity is as potent a deity as ever; and a new sect may easily be devised. But if that too should fail me, my last and final resource is a pistol.' His first letters from London to his mother and sister are full of enthusiasm. 'I am settled,' says he, 'and in such a settlement as I can desire. What a glorious prospect!' Party-writing seems to have been one of his favourite employments. It was agreeable to his satirical turn, and by raising him into immediate notice gratified his pride, which was unbounded. When recommended by a relation to get into some office, he stormed like a madman, and asserted that 'he hoped, with the blessing of God, very soon to be sent prisoner to the Tower, which would make his fortune.' His writings during his residence in London were numerous; but they failed to procure him a comfortable income, and he was plunged from the highest pinnacle of hope to the depths of despair. In the month of July, 1770, he removed from Shoreditch, where he had lodged, to an apartment in Brook-street, Holborn, where, on the 24th of August following, being literally in a state of starvation, he terminated his existence by poison. He was buried on the following day in the burying-ground of Shoe-lane workhouse.

Chatterton was only seventeen years and nine months old when he died. The controversy as to the Rowleian poems engaged numerous writers of the day; but few people now believe the Rowley poems to be anything else than the production of Chatterton himself.

No monument has yet been erected to the memory of the boy-bard of Bristol. The circumstances attending his death have hitherto prevented any such testimonial; but while the beautiful church of St. Mary Redcliff stands, with which his name is inseparably associated, he will not need any other monument; and in the construction of the Rowley poems, he himself built,

'Ere his young days were spent,
An early but enduring monument.'

The person of Chatterton was, like his genius, precocious. One of his companions says he looked 'like a spirit.' His eyes were uncommonly piercing, and one more so than the other. His habits were domestic, and his affection for his relatives unbounded. The two following passages, one from the Rowleian papers, and the other from one of his acknowledged poems, may be safely pronounced to be from the same hand, notwithstanding the antiquated disguise of the passage from the Rowley papers:—

'The gatherd storme is rype; the bigge drops falle;
The forswat meadowes smethe, and drencke the raine;
The comynge ghastness do the cattle pall,
And the full flockes are drivynge o'er the plaine;
Dashde from the cloudes the waters flott again;
The welkin opes; the yellow levynne flies;
And the hot fierie smothe in the wide lowings dies.'
Ballade of Charitie.

Pale rugged Winter bending o'er his tread,
His grizzled hair bedropt with icy dew;
His eyes, a dusky light, congeal'd and dead;
His robe, a tinge of bright ethereal blue.

'His train, a motley'd, sanguine, sable cloud,
He limps along the russet dreary moor;
Whilst rising whirlwinds, blasting, keen, and loud,
Roll the white surges to the sounding shore.'
Elegy to the Memory of Mr. Thomas Phillips.

The last edition of Chatterton's works is in 3 vols, 1803.

CHAUCER, GEFFREY, a very distinguished name in the long catalogue of eminent Englishmen. He lived much in the court of Edward III., and in familiar intercourse with several members of his family. He was also employed in the public affairs of the realm. But it is as a writer, and especially as a poet, that he claims the notice of posterity. Most of the scholars of his age were accustomed to write in Latin; but Chaucer wrote in the vernacular language of his own age and country: he refined it indeed, but neither his labours, nor those of his contemporaries, Longland, Gower, and Wickliffe, were able to fix the language. The English of Chaucer is so unlike the English of our time, that few persons can read it with ease, and none without the assistance of a dictionary. Yet a little pains would enable any one to master his language and versification, and the pains would be amply rewarded, for his writings are valuable not only as illustrating the manners and habits of the time, but as the productions of a mind eminently poetical. His chief work is a collection of stories, entitled by him, 'Canterbury Tales;' being a series of tales told by the individuals of a party of pilgrims going from Southwark to Canterbury, who had agreed thus to beguile the tediousness of the way. A competent judge, the late Mr. Godwin, says, that 'after the dramas of Shakspeare there is no production of man that displays more various and vigorous talent.'

The æra of Chaucer was the reigns of Edward III. and Richard II., for he was born within a year or two of the accession of Edward, and he died in 1400, soon after the deposition and death of Richard. His most remarkable contemporary was Wickliffe, and it is to the honour of John of Gaunt, one of the sons of King Edward, that he was the associate, friend, and patron, of both these illustrious men.

Chaucer has himself told us that London was the place of his nativity. He was educated at Cambridge, and also at Oxford, and some of his biographers represent him to have gone to Paris, then one of the most celebrated schools of the sciences in Europe. He studied the law, moreover, in the Inner Temple.

While at the university he produced two of his larger works, the 'Court of Love,' and 'the book of Troilus and Cresseide;' but he soon entered on public life. Whether his marriage was the cause or effect of his connexion with the court is not completely ascertained: some would refer his marriage to so late a date as 1370, but this proceeds upon the presumption that his wife was Philippa Pycard, an attendant on Queen Philippa, who appears not to have been married before that year. The old biographers of Chaucer, with some probability, represent him to have been married some years earlier, and to have taken to wife another lady of the court of Queen Philippa, also named Philippa, a daughter of Sir Payne Roet, of Hainault, and sister of Katherine Swinford, the mistress, and afterwards the wife, of John of Gaunt, the mother of the Beauforts.

In 1358 John of Gaunt married Blanch of Lancaster. It was on occasion of this suit or courtship that Chaucer wrote his 'Parliament of Birds.'

In the next year he appears as a soldier. One of the most authentic and interesting memorials we possess of him is a deposition given by him in the suit between Scrope and Grosvenor, on the question of right to a particular figure in their coat armour. The depositions are preserved on the rolls at the Tower. Chaucer deposes among other things, that he was in the expedition of 1359, when Edward III. invaded France, and was then made prisoner by the French, near the town of Retters. How long he remained in captivity is not known, and it is not till 1367 that we meet with him again in the national records, which are almost the only deposits of authentic information concerning the illustrious Englishmen of that period. In that year he had an annual pension of twenty marks granted to him, a sum which his biographer, Mr. Godwin, estimates as equivalent to 240*l.*; the grant is entered on the patent rolls there is proof of the payment of it in the issue roll of the Exchequer of the 44th year of Edward III., and also of the payment of ten marks a year, granted to Philippa Chaucer, his wife.

In 1369 he wrote 'the book of the Duchess,' a funeral poem, on the death of Blanch, duchess of Lancaster.

It is by the light of the national records that we are enabled to trace other facts in the life of Chaucer. In 1370 he had letters of protection, being about to depart beyond sea. In 1373 he was in an embassy to Genoa, to treat on some public affairs. This visit to Italy was one of the most remarkable events in his life, inasmuch as it seems probable that he there saw and conversed with Petrarch, of whom he speaks in the induction to one of his tales. On his return, he had a royal grant of a pitcher of wine, to be taken daily at the port of London, and was soon after made comptroller of the customs in that port. He is found also on the rolls as having a grant of a wardship in 1375, and another of a portion of contraband wool in 1376. About this time it is supposed that he wrote the poem which Pope afterwards modernized, called by him the 'House of Fame.'

In 1377 he was employed in an embassy of a delicate and honourable nature. It was to negotiate a marriage between Richard, prince of Wales, and Mary of France, daughter of the French king.

King Edward III. died in May, 1377. To the early years of his successor are referred Chaucer's poems entitled 'The Black Knight,' 'The Legend of Good Women,' and 'The Flower and the Leaf.' If Mr. Godwin's authorities are sufficient, it would appear that he was in disgrace and misery during much of the period from 1384 to 1389. He is represented as having been implicated in the affairs of John de Northampton, in his struggle for the mayoralty of London, and to have been in consequence driven into exile, flying to Hainault, and afterwards to Zealand, and on his return to England being imprisoned in the Tower, from whence he was not released but at the expense of some disclosures, which are said not to have been creditable to him. It is remarkable, however, and it renders somewhat doubtful what is above stated respecting him, that in 1386 he was returned a knight of the shire for Kent, and that in 1389 he was appointed clerk of the works, an office which he did not long hold.

In the last ten years of his life he seems to have lived retired from public affairs, though receiving from time to time marks of royal favour. A house at Woodstock, which had been assigned to him by the king, and the castle at Donnington, near Newbury, the ruins of which are visible on the right hand of the road from London to Bath, are believed to have been at this period his usual place of abode. It is certain that it was in this part of his life that he wrote the 'Canterbury Tales,' and the tradition, both at Woodstock and at Donnington, is, that portions of the work were written at those places. All his biographers concur in saying that he died in London, and it is certain that he was buried in the Abbey Church of Westminster. The monument which is there erected to his memory was a tribute paid to him, a century and a half after his decease, by Nicholas Brigham.

Chaucer had two sons, Sir Thomas and Lewis; of the latter little is known, but Sir Thomas was speaker of the House of Commons, and, marrying an heiress of the house of Burghersh, obtained with her Ewelme, in Oxfordshire, and other possessions. He had an only dauhgter Alice Chaucer, who married De la Pole, duke of Suffolk.

The 'Canterbury Tales' were printed by Caxton, but it was not till 1542 that any general collection of his writings was made and committed to the press; they have been often reprinted. Mr. Tyrwhitt's edition of the 'Canterbury Tales' is justly celebrated for the greater purity of the text, and for the valuable illustrations which he has annexed.

We have noticed in this article Chaucer's principal works, without professing to enumerate all. Warton, in his 'History of English Poetry,' thus sums up the poetical character of Chaucer.—

'In elevation and elegance, in harmony and perspicuity of versification, he surpasses his predecessors in an infinite proportion: his genius was universal, and adapted to themes of unbounded variety: his merit was not less in painting familiar manners with humour and propriety, than in moving the passions, and in representing the beautiful and the grand objects of nature with grace and sublimity. In a word, he appeared with all the lustre and dignity of a true poet, in an age which compelled him to struggle with a barbarous language and a national want of taste, and when, to write verses at all, was a singular qualification.'—*History of English Poetry*, vol. i., p. 457.

CHAUCI, a nation of antient Germany, who lived N.E. of the Frisii, along the coast of the N. ocean, and on both banks of the Visurgis (Weser) and as far as the Albis, or Elbe. To the S. they bordered upon the Catti. Tacitus (*German.* 35) says that their country was extensive and thickly inhabited, and that they were a people distinguished among the Germans for their love of justice and of peace; powerful and yet unambitious, they did not provoke war, but were always ready to resist aggression. They were at one time friends to Rome, and furnished auxiliaries to Germanicus in the war against the Cherusci. (*Annal.* i. 60, ii. 17.) But later, under Claudius, we find the Chauci, under Gannascus, a chief of the Batavian tribe of the Canninefates, crossing the Rhine to make incursions into the Roman province of Germania Inferior, but they were driven away by Corbulo, and Gannascus was killed. (*Annal.* xi. 18.) They afterwards joined in the revolt of the Batavian chief, Civilis. (*Histor.* iv. 79, v. 19.) The Chauci do not appear to have ever been permanently subjugated by the Romans.

CHAUDET, ANTOINE DENIS, a French sculptor, who is entitled to distinction, chiefly for having been among the first who broke through the trammels in which a perverted and bad taste had long confined art. He was born in 1760, at which period a style of design prevailed in which purity and simplicity, both of form and expression, were entirely superseded by affectation and over-attention to unworthy minutiæ of detail.

Chaudet began to study his art at an early age, and obtained the prize from the French Academy for a basso-rilievo of Joseph sold by his brethren, in which, according to the taste of the school in which he was educated, he introduced every sort of accessory—landscape, cattle, a bridge, &c. Upon seeing this work in after-life, he remarked, 'I wonder they did not order me to represent rain. I should have obeyed them.' He afterwards went to Italy, where he diligently studied the antique and the works of Raffaelle. His own productions have great merit, particularly as regards the composition, invention, and improved taste displayed in them; in the execution they are open to criticism. Chaudet was a member of the 'Institut,' and contributed to the 'Dictionnaire de la Langue des Beaux Arts.'

CHAUDIÈRE. [CANADA.]

CHAUFFPIE'. [BAYLE.]

CHAULI'ODUS, a genus of fishes belonging to the abdominal malacopterygians. [STOMIAS.]

CHAUMONT, a town in France, capital of the department of Haute Marne, on the road from Paris to Langres, Belfort, and Bâle or Basel. It is on the left bank of the Marne, and near the right bank of the little river Sure or Suize, which flows into the Marne just below the town; 139 miles E.S.E. of Paris in a straight line, or 148 miles by the road through Provins, Troyes, and Bar-sur-Aube. 48° 7′ N. lat. and 5° 8′ E. long.

Chaumont was originally an insignificant place with a castle called Haute-Feuille, which belonged first to its own lords, afterwards to the counts of Champagne, though it was in the domain of the bishops of Langres, to whom those counts paid homage. The town was walled in by Louis XII., in 1500, and some fortifications were added by his successors, François I. and Henri II. All these fortifications were, in the middle of the last century, falling into ruin; but in 1821 they were repaired, and Chaumont ranks again among fortified places. In 1814, Russia, Prussia, and Austria, here concluded a treaty of alliance against Napoleon.

Chaumont is a handsome town, built on the slope of a hill the town-hall, the portico of the church or chapel attached to the high school, and the hospital, are worthy of notice. The inhabitants, who amount to 6104 for the town, or 6318 for the whole commune, manufacture druggets and other woollens, gloves, which are in high repute, linen, hosiery, cutlery, and candles; and trade in corn, and in sheep fed in the neighbouring country for the supply of Paris. There is a college or high school, an agricultural society, and a theatre.

The arrondissement of Chaumont had, in 1832, a population of 84,965. Bouchardon, an eminent sculptor was a native of this town.

CHAUNA. [PALAMEDEIDÆ.]

CHAUNY, a town in France, in the department of Aisne; it is on the river Oise, the navigation of which commences here, 65 miles N.E. of Paris in a direct line, or 70 miles by the road through Senlis, Compiègne, and Noyon.

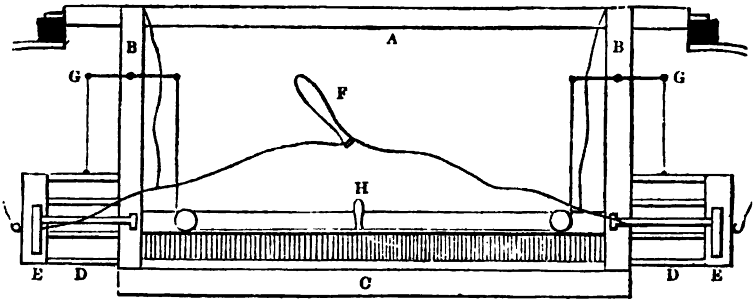
The town is pleasantly situated, and the inhabitants, who amount to 4290, carry on considerable commerce, favoured not only by the navigation of the Oise, but also by the junction here with that river of a canal which communicates with Peronne, St. Quentin, and Cambray. The inhabitants manufacture linens, sacking, cotton-yarn, knit woollen socks, and leather. The looking-glasses of St. Gobain are polished here, for which purpose there is an hydraulic machine. Beside the above articles, the inhabitants trade in wood, grain, cider, oil, horses, &c.

CHAUSSEY, a small island belonging to France, in the English Channel; it belongs to the department of Manche, and is the principal of a cluster of islands nearly opposite to the town and port of Granville, distant about 10 miles. Its length, measured on Brué's map of France, is about 2 miles, the breadth half as much: but the geographical dictionaries of France (Expilly and the *Dictionnaire Universel*), exaggerate these dimensions. This island was once inhabited by hermits, who here sought retirement from the world. At a subsequent period there was a convent of Cordeliers, containing many of those monks; but the English having twice pillaged the convent, the monks withdrew to the main land. Since their retirement the place has been inhabited only in summer, by the workmen who come from Granville to quarry granite, which is here found of good quality, but hard to polish. It is used for building at Granville and St. Malo. The smaller islands of the group are many of them inhabited.

CHECK, a species of chequered cloth, in which coloured lines or stripes cross each other rectangularly, like a chess board. This manner of beautifying webs is probably very antient. Many of the figures in Rosellini's Egyptian work are dressed in chequered cloths. Bishop Anselm's book concerning *Virginity*,' written about the year 680, when the art of weaving in this country was probably in a comparatively rude state, contains a distinct indication that chequered robes were then in fashion. 'It is not a web of one uniform colour and texture, without any variety of figures that pleaseth the eye and appeareth beautiful, but one that is woven by shuttles, filled with threads of purple, and many other colours flying from side to side, and forming a variety of figures and images in different compartments with admirable art.' These compartments, defined and bounded by coloured threads, constitute the fabric called a check. Sometimes, however, the check is formed, not by differently coloured threads, but by threads of different fineness and quality. Thus if the chain, warp, or longitudinal yarns of the web be composed of alternate parcels of white cotton and woollen threads, and the transverse yarns or the woof be also composed of such alternate parcels, we shall have a check very distinctly brought forth without any distinction of colour, properly so called.

Cotton handkerchiefs chequed of various colours have been manufactured in India probably from time immemorial under the name of *pullicates*. They were first imported into this country from Madras, whence they derived the name by which this style is still known in the trade. The ground of these has usually a pale buff colour, and is woven with the nankin yellow cotton. Checks in this country are mostly manufactured for the coarser purposes of seamen's shirts, aprons, and bed-gowns of females in the lower ranks of life. The quantity required is so great as to make it a very important branch of business, and to render every mechanism which facilitates the fabrication an object of consequence. Blackburn, in England, and Kirkaldy, in Scotland, are the two chief seats of the check trade, the former in cotton, and the latter, till of late years, chiefly in linen yarns.

For the decussation of woof yarns of different kinds or colours in one web, different shuttles must be in readiness for alternate use. The mode in which this is effected is shown by the figure.



Here we see the picking peg F, which the weaver seizes in his right hand, and with a dexterous jerk causes one of the shuttles lodged in the separate cells at DD, to move from the one side of the loom to the other across the line of the warp, by means of the string which extends from that peg to the drivers or peckers EE, seen at the end of the cells. The three shuttle boxes here shown are so constructed as to be made to slide up and down in a vertical plane, so that each box with its appropriate shuttle may at pleasure be brought on a level with the shuttle race, or open shedding of the warp, and thus be thrown across. These three boxes are suspended by cords from the cross levers G, G, which turn upon centres, in the suspending bars marked B, B, or the swords of the lay; being the levers which make it vibrate backward and forwards in the act of weaving. A represents the cross bar of wood on which the lay C oscillates upon iron gudgeons, or pins driven into each of its ends, and resting upon the upper rails of the loom as shown in section. The under part of the lay is seen at C, and the upper part, called the lay-cap, H, is seized by the weaver's left hand in driving home each shute or shoot of weft. The two pieces of buffalo hide called the drivers or peckers E, E, are perforated, and traverse or slide horizontally upon smoothly polished iron rods. These pieces give the immediate impulsion to the shuttle. The weavers' twitch at the picking peg H must be sufficiently smart to communicate adequate velocity to the shuttle, so as to lodge it in the opposite box, and overcome its friction along the warp race, without however giving it too forcible a pull, which might do injury to its point, or throw it out of the shed. The pin H is made to slide freely from right to left upon the upper bar of the lay, and thus give such motion to the levers G, G, as may bring the proper box opposite to the shuttle driver.

As diversity of woof renders diversity of shuttles necessary, it becomes expedient to shift them rapidly, otherwise the operation would be much impeded. The above plan is not the one originally employed, but is in many respects better. The pin H being fixed by friction only, so as to slide from right to left on the upper shell of the lay, the levers G, G, connected with it may be readily moved, being within reach of the weaver's hand, as he works the lay. The driver, if drawn forward, would present an obstruction to the shifting of the boxes, but this may be easily avoided by an experienced operative.

Mr. Robert Kay, of Bury son of the most ingenious but persecuted inventor of the fly shuttle, invented the above-described drop box, for making checks, by means of which, as we see, the weaver could at pleasure use any one of three shuttles without rising from his seat, each shuttle containing a differently coloured weft.

CHEDDAR, a decayed village in Somersetshire, near the stupendous chasm in the Mendip Hills, known by the name of Cheddar Cliffs. Cheddar is said to be derived from *ced*, a conspicuous brow, or height, and *dwr*, water. The village consists of three or four irregular streets. It was formerly a market-town. In one of the streets a beautiful old market-cross is still standing. The population of the parish in 1831 was 1980.

An extensive flat, called Cheddar Moor was, until within these few years, covered with British barrows, or tumuli; but all trace of these has been destroyed by cultivation and enclosure.

Cheddar Cliffs are the sides of a chasm, extending across one of the highest ridges of the Mendip Hills. 'The chasm across the diameter of Mendip is more than a mile in length. The opening yawns from the summit to the roots of the mountain, laying open a sublime and tremendous scene, exhibiting a combination of precipices, rocks, and caverns of terrifying descent, fantastic form, and gloomy vacuity. The approach from the village is extremely picturesque.' (Rutter's *Delineations of the North-Western Division of Somerset.)*

The entrance to one of the caves in these cliffs is nearly 100 feet above the valley; and it is stated to penetrate upwards of 300 feet beneath the rocks. A rough carriage road winds for nearly two miles through the cliffs, until it reaches the summit of the hills.

Nine springs rise from the foot of the rocks, and almost immediately uniting, form a clear and beautiful stream, called Cheddar Water, which falls into the Ax.

The greater part of the land between Axbridge and Cheddar has the appearance of a continued garden. It is sheltered by the Mendip Hills on the N. and E., and is chiefly occupied in the culture of vegetables, large quantities of which are obtained early in the season, and forwarded to Bristol.

CHEESE, caseous matter or caseum, one of the component parts of milk, which may be considered under two points of view: first as uncoagulated, and secondly in a state of coagulation, in which it resembles fibrin and albumen. Uncoagulated caseous matter exists in solution in milk. In order to obtain it, skimmed milk is to be mixed with dilute sulphuric acid, which combines with and precipitates it in the state of a white clot; this is to be washed on a filter to deprive it of the milk which it contains, and it is then to be mixed with water, and digested with carbonate of lime or barytes. The acid combines with he earth, and the caseous matter separated dissolves in the water; it is to be freed by filtration from the earthy salt and butter which are mixed with it.

The filtered solution of caseous matter is of a pale yellow colour, and rather mucilaginous, like a solution of gum. When evaporated, it exhales a smell of boiled milk, and is gradually covered with a white pellicle, which may be removed like that which forms on milk. By evaporation to dryness, the caseous matter remains as a dry mass of an amber colour, which may be redissolved in water.

The aqueous solution is coagulated by acids, even by the acetic acid, especially when heated. When a strong aqueous solution of caseous matter is kept, it changes, emits a smell of old cheese, soon putrefies, and yields ammonia.

Acids act upon caseous matter very much in the same way as upon albumen; with a small portion of acid it forms a compound which is soluble in water; and with a larger quantity of the same acid even, the compound is but slightly soluble; but when it is deprived of the excess of acid by washing, it again becomes soluble in water. The character which principally distinguishes caseous matter from albumen is the precipitation of the former by acetic acid; this precipitate may be indeed redissolved by acetic acid, but it requires much more than albumen does. It is soluble in alcohol. Caseous matter is dissolved by cold weak solutions of the alkalis, without suffering any change; but when they are strong and heated, the caseous matter is decomposed, ammonia is evolved, and the solution contains an alkaline sulphuret; tannin decomposes both the aqueous and alcoholic solution of caseous matter.

It has been already observed that caseous matter may exist both in an uncoagulated and in a coagulated state; what has been already mentioned relates to it in the former condition. The coagulation of caseous matter occurs in a mode which is peculiar to this substance; it is not effected by boiling, but it takes place when either the aqueous solution of caseous matter or milk itself is gently heated with the mucous membrane of the stomach of a young calf, or what is called *rennet*.

According to Berzelius, the action of this substance has not been hitherto explained. In order to investigate the subject, he washed and dried the stomach of a calf, and yet he found that one part of this mixed with 1800 parts of skimmed milk, and heated to 122° Fahrenheit until the operation was complete, so perfectly coagulated the caseous matter that no trace of it remained in solution. When caseous matter coagulated by rennet is burnt, it leaves 6½ per cent. of ashes, which are principally phosphate of lime, precipitated by the rennet from the milk in combination with the caseous matter.

According to Gay-Lussac and Thénard, caseum consists of

Carbon . . .	59·781
Oxygen . .	11·409
Hydrogen . .	7·429
Azote . . .	21·381
	100·

Berzelius, however, considers that this analysis is not correct, because the substance analyzed contained, as he states, lactic acid and butter.

The poorer kinds of cheese consist almost entirely of caseum, while the better sorts contain a considerable quantity of butter mixed with it. Cheese obtained from skimmed milk, which contains but little butter, is hard, translucid, yellowish, and has a greasy lustre, owing to a small quantity of butter which it contains, and which may be separated by æther without altering its properties. When put into water, it swells and softens, but does not dissolve. When strongly heated, it softens without melting, may be drawn into threads, and becomes elastic like caoutchouc. At a higher temperature, it melts, swells, burns with flame, and yields ammonia. Its compounds with acids and alkalies are generally similar to those of uncoagulated caseum; but when the acid is removed by carbonate of lime, the residual caseous matter, being in a coagulated state, is not dissolved by water, as the uncoagulated is under similar circumstances.

When cheese has been long kept, it undergoes peculiar changes; when recently coagulated, it contains nearly 80 per cent. of liquid, which is removed by pressing and drying; it may then be kept for a long time, and becomes more agreeable to the taste. When cheese has not been carefully pressed, it undergoes a peculiar kind of putrefaction; and, according to Proust, two substances, which he calls caseous oxide and caseic acid, are produced. Braconnot has since examined the subject. He mixed about 9 ounces of fresh cheese from skimmed milk with nearly 4¼ pints of water, and suffered the mixture to putrefy during a month between 62° and 77° of Fahrenheit; the greater part of the cheese dissolved, and the solution was filtered; it had a putrid smell, but contained no sulphur in any form; and by evaporation to the consistence of honey, it became, after some time, a granular mass, one part of which was soluble and another insoluble in alcohol; the latter was dissolved in water, and the solution, rendered colourless by animal charcoal, yielded by spontaneous evaporation small brilliant slender crystals in the form of rings and cauliflowers; but in order to render these white, it was requisite to dissolve and crystallize them several times. Instead of caseous oxide, Braconnot called this substance *aposepidine* (from ἀπὸ and σηπεδών, produced by putrefaction). It has the following properties it is inodorous, taste rather bitter, but somewhat like that of roast meat; it is gritty between the teeth, heavier than water, easily pulverized; it burns totally; and when heated in a tube open at both endu, part sublimes, without suffering any change, in slender crystals; and another portion is decomposed. When heated on silver, it blackens it, on account of the sulphur which it yields. It is soluble in 22 parts of water at 57° Fahrenheit; the solution readily putrefies and exhales a very disagreeable smell. In alcohol it is but slightly soluble, but most readily so when hot; the solution, on cooling, deposits the aposepidine in the state of a fine white powder. Muriatic acid dissolves a larger quantity than water: neither alum nor persulphate of iron precipitates the aqueous solution; but infusion of galls occasions an abundant precipitate, which an excess redissolves.

The substances contained in the decayed cheese, which the water did not dissolve, were oleic acid coloured brown by an animal matter, a little margaric acid, much margarate of lime, the base of which was derived from the lime existing in the caseous matter, whilst the acids came from the butter.

It has been observed that badly prepared cheese has sometimes, though rarely, become poisonous by keeping. The cause of this change has not been ascertained.

CHEESE. The milk of animals consists of three distinct substances, which are separated from one another by a slight change, which begins as soon as it is exposed to the air. The oily part rises to the surface by its less specific gravity; and when it is collected into a solid mass by agitation it forms butter; the curd, coagulated by the action of any acid, and pressed, becomes cheese; and the fluid which remains is the serum or whey.

In the making of cheese there are certain general principles which are essential, but slight variations in the process produce cheeses of very different qualities; and although the most important circumstance is the nature of the pasture on which the cows are fed, yet much depends on the mode in which the different stages of the fabrication are managed; and hence the great superiority of the cheeses of particular districts or dairies over those of others, without any apparent difference in the pasture. By skill and great attention excellent cheeses are made in places where the pastures are not considered so well adapted to produce milk of a proper quality; and in those countries where the cows are chiefly kept tied up in stalls, and are fed with a variety of natural and artificial grasses, roots and vegetables, superior cheese is often made.

The first process in making cheese is to separate the curd from the whey, which may be done by allowing the milk to become sour, but the cheese is inferior in quality, and it is difficult to stop the acid fermentation and prevent its running into the putrefactive. Various substances added to milk will soon separate the curd from the whey. All acids curdle milk. Muriatic acid is used with success for this purpose in Holland. Some vegetables contain acids which readily coagulate milk, such as the juice of the fig-tree, and the flowers of the *Galium verum*, or yellow lady's bed straw, hence called *cheese-rennet*. Where better rennet cannot be procured, they may be substituted for the most natural curdler of milk, which is the gastric juice of the stomach of a sucking calf. This juice rapidly coagulates the milk as the calf sucks; and the only difficulty is in collecting and keeping it from putrefaction, which begins from the instant the stomach is taken from the calf. The preparation of the *rennet*, as it is called, is a most important part of the process of cheese-making. The following may be considered as the simplest, and perhaps the best. As soon as a sucking calf is killed, the stomach should be taken out, and if the calf has sucked lately, it is all the better. The outer skin should be well scraped, and all fat and useless membranes carefully removed. It is only the inner coat which must be preserved. The coagulated milk should be taken out and examined; and any substance besides curd found in it should be carefully removed. The serum left in it should be pressed out with a cloth. It should then be replaced in the stomach with a large quantity of the best salt. Some add a little alum and sal prunella; others put various herbs and spices, with the view of giving the cheese a peculiar flavour, but the plain simple salting is sufficient. The skins or vells, as they are called, are then put into a pan, and covered with a saturated solution of salt, in which they are soaked for some hours; but there must be no more liquor than will well moisten the vells. They are afterwards hung up to dry, a piece of flat wood being put crosswise into each to stretch them out. They should be perfectly dried, and look like parchment. In this state they may be kept in a dry place for any length of time, and are always ready for use. In some places, at the time of making cheese, a piece of a vell is cut off and soaked for some hours in water or whey, and the whole is added to the warm milk. In other places, pieces of vell are put into a linen bag and soaked in warm water, until the water has acquired sufficient strength, which is proved by trying a portion of it in warm milk. The method employed in Switzerland is as follows:—A dry vell is taken and examined; it is scraped with a knife, and where any veins or pieces of tough membrane appear they are removed. The whole surface is examined and washed carefully, if any dust or dirt has adhered to it; but otherwise it is only wiped with a cloth. A handful of salt is then put into it, and the edges of the vell are folded over and secured with a wooden skewer stuck through it. In this state it forms a ball of about three inches diameter, and is laid to soak twenty-four hours in a dish containing about a quart of clear whey, which has been boiled, and all the curd taken out. The next day the vell is well squeezed, and put into fresh whey; the first infusion being put into a proper vessel, the second is afterwards mixed with it and bottled for use. Half a pint of this liquor of a proper strength is sufficient to curdle forty gallons of milk. Experience alone enables the dairyman to judge of the strength of his rennet; for this purpose he takes in a flat ladle some milk which has been heated to about 95° of Fahrenheit and adds a small measure of rennet. By the rapidity with which it curdles, and the form of the flakes produced, he knows its exact strength, and puts more or less into the cauldron in which the milk is heated for curdling. A simple instrument might easily be invented, by which the exact degree of strength might be ascertained, and a rule given to guide the less experienced; but as long as a man feels a superiority acquired by experience alone, he is not likely to encourage any contrivance which would place others on a level with himself. From this cause even the thermometer has not been introduced generally into any great dairy, nor have any certain rules been given to ascertain the exact heat required in the milk, when the rennet is added, to form the best curd.

There are different kinds of cheese, according to the mode of preparing it: soft and rich cheeses are not intended to be kept long; hard and dry cheeses are adapted to be kept and stored for provisions. Of the first kind are all cream cheeses, and those soft cheeses, called Bath cheeses and Yorkshire cheeses, which are sold as soon as made, and if kept too long become soft and putrid. Stilton and Gruyere cheeses are intermediate; Parmesan, Dutch, Cheshire, Gloucestershire, and similar cheeses, are intended for longer keeping. The poorer the cheese is the longer it will keep; and all cheese that is well cleared from whey and sufficiently salted will keep for years. The small Dutch cheeses called Edam cheeses are admirably adapted for keeping, and form an important article in the victualling of ships.

The Gruyere and Parmesan cheeses only differ in the nature of the milk, and in the degree of heat given to the curd in different parts of the process. Gruyere cheese is entirely made from new milk, and Parmesan from skimmed milk. In the first nothing is added to give flavour; in the latter saffron gives both colour and flavour: the process in both is exactly similar. A large cauldron in the shape of a bell, capable of holding from 60 to 120 gallons of milk, hangs from an iron crane over a hearth where a wood fire is made. The milk, having been strained, is put into this cauldron, and heated to nearly blood-heat (95° to 100°). It is then turned off the fire, and some rennet, prepared as stated above, is intimately mixed with the warm milk by stirring it with the hand, in which is held a flat wooden skimming-dish, which is turned round in the milk while the hand and arm stir it. A cloth is then laid over the cauldron, and in half an hour, more or less, the coagulum is formed. This is ascertained by pressing the skimming-dish on the surface, when the whey will appear on the part pressed. If it is longer than an hour in coagulating, the milk has been too cool, or the rennet not strong enough. The weather has a great influence on the process of the dairy, and there is much yet to be learned by accurate observations with meteorological instruments, especially electrometers. When the curd is properly formed, it is cut horizontally in thin slices by the same skimming-ladle. Each slice, as it is taken off, is poured along the side of the cauldron which is nearest to the operator; by this means every portion of the curd rises successively to the surface, and is sliced thin. The whole is then well stirred, and the cauldron is replaced over the fire. A long staff, with a small knob of hard wood at the end, and which has smaller cross pieces or sticks passed through holes in it at right angles to each other near the end, is now used to stir and break the curd, and the heat is raised to about 135°, which is as hot as the arm can well bear, even when used to it. The cauldron is again swung off the fire, and the curd is stirred with the staff, which is moved round with a regular rotatory motion, the knob running along the angle formed with the side by the bottom of the cauldron, which is in the form of a bowl. After stirring in this manner nearly an hour, the curd is found divided into small dies about the size of a pea, which feel elastic and rather tough under the finger. Experience alone can teach the exact feel they should have. The whey, of which a portion is removed occasionally, now floats at top, and the curd is collected in the bottom by giving a very rapid rotatory motion to the contents of the cauldron by means of the staff. A cloth is now introduced into the bottom, and all the curd collected over it; it is raised by the four corners, and laid on an instrument like a small ladder, which is placed across the mouth of the cauldron. The whey runs out through the cloth, which is a common cheese-cloth woven with wide interstices; and the curd in the cloth is placed in a shape or hoop made of a slip of wood four inches and a half wide, the two ends of which lie over each other, so that the diameter can be increased or lessened. A cord fixed to one end of the hoop is passed with a loop over hooks on the outer surface of the other end, and prevents the ring from opening more than is required. The curd is pressed into this ring with the hands, and the ends of the cloth are folded over it. A round board, two inches thick, and strengthened by cross pieces nailed on it, is placed over the curd, and the press let down upon it.

The cheese-press is a simple long board or frame forming a lever, loaded at one end and moving in a frame at the other; it is lifted up by another lever connected with it, and let down on a strong stick, which stands with its end on the centre of the board last-mentioned. Thus the weight is easily removed or replaced. The hoop containing the cheese is placed on a similar board, and from it the table of the press slopes towards a wooden trough, which receives the whey as it runs out. In an hour after this, the curd is examined; the edges, which are pressed over the ring, are pared off, and the parings are put on the centre of the cheese; a fresh cloth is substituted, and the whole cheese is turned. The ring, which opens readily by unhooking the cord, allows the cheese to come out, and is put on again and tightened. This is repeated two or three times in the day. In the evening, a small portion of finely powdered salt is rubbed on each side of the cheese, and it remains in the press till the next morning. It is now again rubbed with salt, and placed on a shelf with a loose board under it. The wooden ring remains on the cheese for two or three days, and is then taken off. This is the whole process.

During the next six or eight weeks, the cheeses are turned and wiped every day and a small quantity of fine salt is sifted on the surface and rubbed in with the hand until it will take no more. The cheese-room is always very cool, and little light is admitted. A free circulation of air is essential. The cheeses are in perfection in about six months, and will keep two years. A quantity of elastic fluid is disengaged in the ripening, and forms those round eyes which are a peculiar feature in these cheeses. The smaller and rounder the eyes, the better the cheese is reckoned. They should contain a clear salt liquor, which is called the tears; when these dry up, the cheese loses its flavour. These particulars will give any one unacquainted with the dairy a tolerable notion of the process of cheese-making in general.

In Cheshire the making of cheese is carried on in great perfection, and the greatest pains are taken to extract every particle of whey. For this purpose, the curd is repeatedly broken and mixed, the cheeses are much pressed, and placed in wooden boxes which have holes bored into them. Through these holes sharp skewers are stuck into the cheese in every direction, so that no particle of whey can remain in the curd. The elastic matter formed also escapes through these channels, and the whole cheese is a solid mass without holes, which in this cheese would be looked upon as a great defect. The salt is intimately mixed with the curd, and not merely rubbed on the outside. This checks internal fermentation, and prevents the formation of elastic matter. The whole process of cheese-making is minutely described in the *Agricultural Report for Cheshire*.

Gloucester and Somersetshire cheeses are similarly made, with this difference, that the curd is not so often broken or the cheese skewered, and a portion of the cream is generally abstracted to make butter. After the curd has been separated from the whey and is broken fine, warm water is poured over it for the purpose of washing out any remaining whey, or perhaps to dissolve any portion of butter which may have separated before the rennet had coagulated the milk; for although cream adds to the richness of cheese, butter tends to make it rancid.

Stilton cheese is made by adding the cream of the preceding evening's milk to the morning's milking. The cream should be intimately incorporated with the new milk; great attention should be paid to the temperature of both, and much of the quality of the cheese depends on this part of the process. To make this cheese in perfection, as much depends on the management of the cheese after it is made as on the richness of the milk. Each dairy-woman has some peculiar method which she considers as the best; and it is certain that there is the greatest difference between cheeses made in contiguous dairies. The rennet should be very pure and sweet. When the milk is coagulated, the whole curd is taken out, drained on a sieve, and very moderately pressed. It is then put into a shape in the form of a cylinder, eight or nine inches in diameter, the axis of which is longer than the diameter of the base. When it is sufficiently firm, a cloth or tape is wound round it to prevent its breaking, and it is set on a shelf. It is occasionally powdered with flour, and plunged into hot water. This hardens the outer coat and favours the internal fermentation, which ripens it. Stilton cheese is generally preferred when a green mould appears in its texture. To accelerate this, pieces of a mouldy cheese are sometimes inserted into holes made for the purpose by the scoop, called a *taster*, and wine or ale is poured over for the same purpose; but the best cheeses do not require this, and are in perfection when the inside becomes soft like butter, without any appearance of mouldiness. In making very rich cheeses the whey must be allowed to run off slowly, because, if it were forced rapidly, it might carry off a great portion of the fat of the cheese. This happens more or less in every mode of making cheese. To collect this superabundant butter, the whey is set in shallow pans, as is done with milk when butter is made; and an inferior kind of butter called *whey butter* is made from the cream or fat skimmed off.

Cheeses are frequently coloured, a practice which probably arose from the notion of making the cheese look richer; but now it deceives no one. Yet if some cheeses were not coloured, they would not be so marketable, owing to the association that subsists between the colour and the quality of the cheese. The substance used for colouring is most commonly arnotto. [ARNOTTO.] It is ground fine on a stone, and mixed with the milk at the time the rennet is put in. The juice of the orange carrot, and the flower of marygold, are also used for this purpose. This last give a more natural tint than the arnotto, which is too red. Cheddar, a cheese made in Somersetshire, which is highly prized, Stilton, Derby, and some other cheeses, are never coloured: Cheshire slightly; but Gloucester and North Wiltshire deeply. Foreign cheeses are only coloured very slightly, if at all; the Dutch cheeses are made in a very similar manner to the Gloucester cheeses, but the milk is generally curdled by means of muriatic acid or spirits of salt: and great care is taken to prevent fermentation, and to extract the whole of the whey. For this purpose the curd is repeatedly broken and pressed; and before it is made up into the round shape in which it is usually sold, the broken curd is well soaked in a strong solution of common salt in water. This diffuses the salt throughout the whole mass; and effectually checks fermentation. When the cheeses are finally pressed, all the whey which may remain is washed out with the brine; salt is likewise rubbed over the outside, and they are set to dry on shelves in a cool place. The flavour of the cheese is perhaps impaired by the stoppage of the fermentation; but it never heaves, and it acquires the valuable quality of keeping well even in warm climates. From the place where this cheese is commonly made, it is known by the name of Edam cheese. A finer cheese is made at Gouda and other places, by imitating the process in making Gruyere cheese; but this cheese is always full of small cavities, and will not keep so long as the Edam. The cheese most commonly met with in Holland is a large kind of skim-milk cheese, which is made very like Cheshire cheese. It grows hard and dry, and has not much flavour. To supply this defect, cummin seeds are mixed with the curd, which those who are accustomed to it consider a great improvement. On the whole it is a better cheese than our Suffolk skim-milk cheese, and forms an important part of the provisions usually stored for a Dutch family. In France the Roquefort cheese is compared to our Stilton, but is much inferior, although a good cheese. The little cheeses made from cream and folded in paper, called Neufchâtel cheeses, are imported from France as a delicacy. They can be easily imitated, being nothing more than cream thickened by heat, and pressed in a small mould. They undergo a rapid change, first becoming sour and then mellow, in which state they must be eaten.

A small cheese, much relished by all ranks, is made in the north of Germany in the simplest manner. It is usually made from milk from which the cream has been taken off to make butter,—although the entire milk is much better. This is curdled by being placed near a fire. When it has become somewhat sour, it is put into a linen bag, and all the whey well pressed out. When it is tolerably solid, it is broken by the hand in a tub, and made very fine. It remains in this state several days, until a considerable alteration takes place, and the putrid fermentation begins, as is readily perceived by the odour. It is then taken in small portions, and formed into flattened balls three or four inches in diameter, by beating them in the hands. These balls are ranged on a board, and set to dry. A portion of carraway seed is generally mixed with the curd. In a few days the mellowing goes on, and the centre becomes very soft. In this state it is a great dainty for those who disregard a pungent and fetid smell. They are sometimes placed in the smoke of a chimney where the putrid fermentation is checked and confined to the centre by the pyroligneous acid arising from a wood fire. They remain in the chimney a considerable time; and when they are used the outer part is peeled off like the rind of an apple. A whole cheese is a mere mouthful. It gives a relish to the sour black rye bread generally eaten by the lower orders.

The green Swiss cheese, commonly called *Schabzieger*, which is made in the canton of Glarus, and is by many persons highly esteemed, is made somewhat in the same manner. The curd is pressed in boxes with holes to let the whey run out; and when a considerable quantity has been collected and putrefaction begins, it is worked into a paste with a large proportion of a certain dried herb reduced to powder. This herb, called in the country dialect *Zieger kraut* (curd-herb), is the *Melilotus officinalis*, which is very common in most countries, and has a peculiar aromatic flavour in the mountains of Switzerland. The paste thus produced is pressed into moulds of the shape of a common flower-pot, and the putrefaction being stopped by the aromatic herb, it dries into a solid mass, which keeps unchanged for any length of time. When used it is rasped or scraped, and the powder mixed with fresh butter is spread upon bread. It is either much relished or much disliked, like all those substances which have a peculiar taste and smell.

A species of cheese or rather hard curd is made in the mountains of Switzerland from the whey which has run from the common cheese made of the whole milk. It is called *serre*. When the Gruyere or the Jura cheese, which is often sold by the same name, has been put under the press, a quantity of fermented whey, about two or three gallons, is poured into the cauldron with the new whey, and the whole is heated over the fire till a thick scum rises. This is taken off when the whey is nearly boiling, and put into a square box with holes in it; the whey which remained mixed with the curd, and which is now very blue, is allowed to run out, and a small pressure assists it. When a cheese of sixty pounds has been made, the serré will often weigh twenty pounds. This mass of curd readily dries on the shelf, and becomes hard. It has little flavour, but it serves the people on the mountains for bread. They cut slices of it, spread some butter over, and put a thin slice of cheese upon this; washed down with a cup of fresh or of fermented whey, it forms the chief food of the mountain herdsmen. The only luxury indulged in is an occasional glass of *kirsch-wasser*, a spirit distilled from cherries, or of gentian brandy, from the root of the *Gentiana officinalis*.

When a cheese which has been much salted and kept very dry is washed several times in soft water, and then laid in a cloth moistened with wine or vinegar, it gradually loses its saltness, and from being hard and dry, becomes soft and mellow, provided it be a rich cheese. This simple method of improving cheese is worth knowing. It is generally practised in Switzerland, where cheeses are kept stored for many years, and if they were not very salt and dry they would soon be the prey of worms and mites. A dry Stilton cheese may thus be much improved.

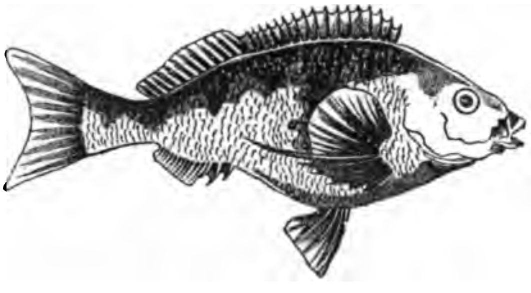
The cheese trade is one of considerable importance.

CHEESE-RENNET, a wild flower with square stems, shining whorled leaves, and loose panicles of small yellow flowers. It is the *Galium verum* of botanists, and derives its popular name from having been formerly employed to curdle milk.

CHEILI'NUS. [Labroides.]

CHEILODA'CTYLUS, a genus of fishes, of the section *Acanthopterygii*, and family *Scienoïdes*. Characters:— mouth small; dorsal fin with numerous spiny rays; lower ays of the pectoral fins simple and continued beyond the membrane.

Cheilodactylus monodactylus (*Chætodon monodactylus*, Carmichael; *Linn. Transactions*, vol. xii.), will serve to illustrate this genus. This fish is about eighteen inches in length; the body is somewhat oval and compressed; the teeth are small and crowded; the pectoral fin is large, and has fifteen rays, the six lower of which are simple and protrude beyond the membrane; the sixth ray from the bottom is very much elongated. The colour is olive, or bronze, with six dark stripes on the back: the fins are blackish, with the exception of the pectorals, which are amber-coloured.



[Cheilodactylus monodactylus.]

This species is very common on the coast of the small island of Tristan da Cunha, and feeds upon the *fucus pyriferus*.

CHEILODI'PTERUS (Lacépède), a genus of fishes of the section *Acanthopterygii*, and family *Percidæ*. Technical characters:—Body rather short; pre-operculum double-edged, the edges finely serrated; scales large, easily dislodged, continued on to the pre-operculum; the two dorsal fins widely separated.

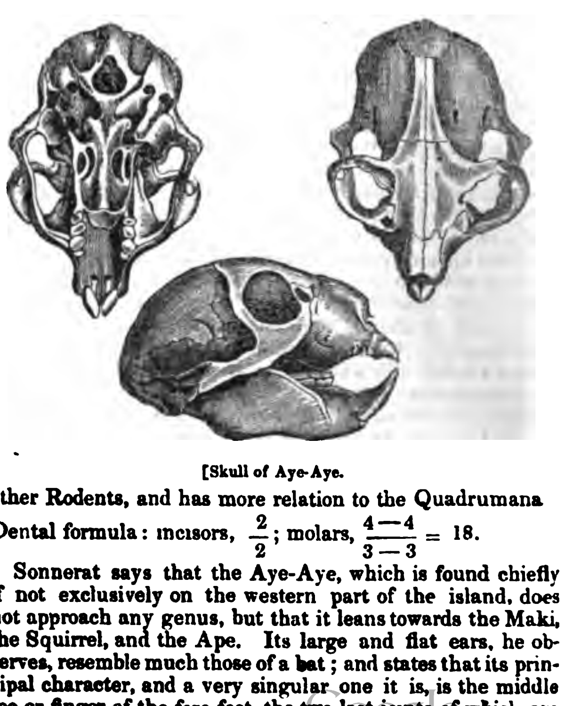
The characters here detailed are those of the genus Apogon, from which the present genus differs chiefly in having the jaws furnished with long and pointed teeth. But three species of Cheilodipterus are known; they are all of small size, and furnished with slender longitudinal stripes. *C. octo-vittatus*, as its name implies, has eight stripes. *C. quinquelineatus* has five longitudinal black stripes, the ground colour of the body being silvery white it is about four inches in length, and comes from the Society Islands. The third species, *C. Arabicus*, is of an olive green colour above, and has the under parts silvery with a pinkish hue; this species has from fourteen to seventeen longitudinal stripes.

As an example of the genus Apogon, of which there are several species, we may notice the Apogon, *Rex Mullorum*, or Roi des Rougets (Cuvier): this species rarely exceeds six inches in length, and is of a beautiful red colour with three large black spots on the back; one under each of the dorsal fins, and one towards the tail; the whole surface is also sprinkled with small black dots. The remaining species are also small, and most of them are of a red colour; a few have been found off the coast of New Holland, but most of them frequent the Indian seas.

CHEIROGA'LEUS. [Lemuridæ.]

CHEIRO'MELES. [Cheiroptera.]

CHEI'ROMYS (Zoology), the scientific name for the Aye-Aye, a singular quadruped (which must not be confounded with the Ai, or Sloth [Ai], from which it very strongly differs in organization, though its habits are lazy) discovered by Sonnerat at Madagascar, and described by him in the second volume of his 'Voyage aux Indes,' under the name of Aye-Aye, which, it appears, is an exclamation of the natives; and it is conjectured that the name was attached to the animal in consequence of a supposed resemblance to its cry. Sonnini, who formed the genus, observing that it is the only species known, censures Gmelin with some reason for denominating it *Sciurus Madagascariensis* (Madagascar Squirrel), because a quadruped of the latter genus really exists in Madagascar. Cuvier places the form next to the Flying Squirrels, *Polatouches* (*Pteromys*), and immediately before the Rats (*Mus*, Linn.), remarking that the lower incisors are much more compressed, and especially more extended from before backwards, than those of the squirrels, and resemble ploughshares (socs de charrue). The feet, he adds, have all five toes, of which four of those on each anterior extremity are elongated, the middle toe being much more slender than the others; in the hind feet, the great toe is opposable to the others, so that in this respect the animal is among the Rodents what the Opossums (Sarigues) are among the Carnassiers. The structure of the head, he continues, is very different from that of the other Rodents, and has more relation to the Quadrumana.



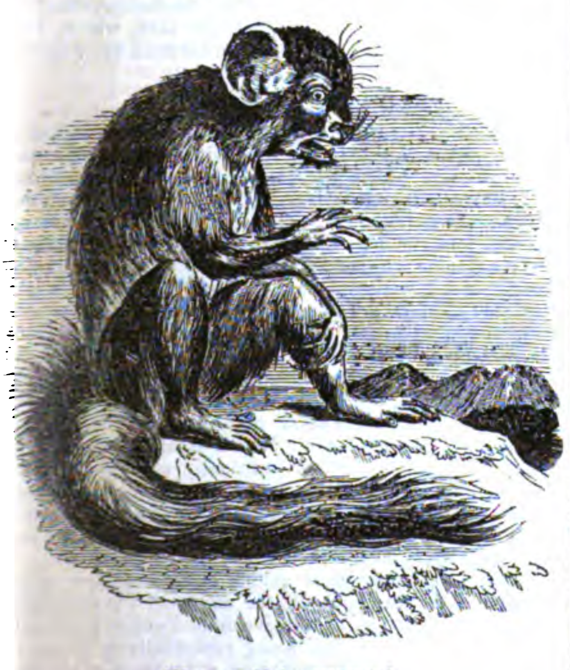
[Skull of Aye-Aye.]

Dental formula: incisors, $\frac{2}{2}$; molars, $\frac{4-4}{3-3} = 18$.

Sonnerat says that the Aye-Aye, which is found chiefly if not exclusively on the western part of the island, does not approach any genus, but that it leans towards the Maki, the Squirrel, and the Ape. Its large and flat ears, he observes, resemble much those of a bat; and states that its principal character, and a very singular one it is, is the middle toe or finger of the fore foot, the two last joints of which are very long, slender, and denuded of hair. This memoer, he adds, is useful to it in drawing worms out of holes in the trees, and that it seems also to be of service in holding on to the branches of trees. He says that it appears to be a subterranean animal, and does not see during the day, and that its eye resembles in colour that of the owl. He describes it as being very slothful, but good tempered, remaining always at rest and requiring a good deal of shaking to make it move. The subject of his observations lived two months upon no other nourishment than cooked rice, and it fed itself with its two fingers like the Chinese with their chopsticks. All the time M. Sonnerat had this animal alive, he never saw it carry its tail elevated like the squirrel. It always dragged. But Buffon's figure, or rather that of the *Supplement*, sets the tail up, notwithstanding the observation in the text.

Buffon (*Supplement*) states, that he examined the skin of one which Sonnerat gave to the Cabinet du Roi, and that it appeared to him to approach the squirrels more than any other race; and also to bear some relation to the Tarsier. The length of the animal, measured in a straight line from the tip of the muzzle to the insertion of the tail, was one foot, two inches, two lines (French), and following the curvature of the body, one foot six inches and six lines, and the length of the stump of the tail was one foot three inches. In the anterior extremities, the length of the internal finger, which acts in some measure as a thumb, was one foot one line, and the nail six lines; the next finger, or first finger, two inches nine lines, and the nail six lines; the second, which is much more delicate and slender, being only one line in thickness, was two inches and seven lines long, and the nail three lines. The third finger was three inches, two lines in length, and the nail six lines. The fourth finger was one inch, nine lines, and the nail six lines. The hind feet to the extremity of the fingers were three inches and two lines long. This was a female.

Buffon describes the colour as a musk brown mixed with black and grey-ash. On the head, round the eyes, on the body, thighs and legs, the colour was deep musk, in which, nevertheless, black predominated upon the back and many parts of the body and legs. The tail was entirely black; the sides of the head, the necks, the jaw, and the belly were greyish. There were woolly hairs of this grey colour below the great black or white hairs, of two or three inches long, which were on the body and legs; but the legs and thighs were of a reddish brown. Black predominated at the approach of the feet, which were covered with small hairs of that colour. The head was like that of a squirrel, and the ears large, naked, erect, and round at their extremities, with a wide opening.



[Cheiromys Madagascariensis.]

This animal is the *Aye-Aye Squirrel* of Pennant. Shaw considered it to be a species of *Lemur*, and Schreber named it *Lemur psilodactylus*, a name adopted by Shaw. Our figure is reduced from that given by Sonnerat.

CHEIRONECTES, or **CHIRONECTES** (Mammalogy), Illiger's name for a genus of Marsupial animals. [DIDELPHIDÆ.*]

CHEIRO'PODA†, **CHEIROPEDS**, a name proposed by Mr. Ogilby for all the mammiferous animals that are possessed of hands. The following is an abstract of Mr. Ogilby's arrangement of his Cheiropeds.

Class - - Mammalia.
Order - - Cheiropoda.

Mammals with opposable thumbs on the anterior extremities only - - - - Bimana.
On both anterior and posterior extremities, Quadrumana.
And with anthropoid teeth.

Monkeys of the Old World.

——— abnormal teeth,

Lemuridæ.

On the posterior extremities only - - Pedimana.
And with anthropoid teeth,

Monkeys of the New World.

——— rodent teeth,

Cheiromys.

——— abnormal teeth,

Didelphidæ.

Observations, commenced in 1829 and continued for more than six years, have assured this zoologist that the non-opposable character of the inner finger of the anterior extremities, which he first remarked in *Mycetes Seniculus*, is not confined to that genus, but extends throughout the whole of the genera of the South American monkeys, individuals of all of which have, he states, been seen by him in a living state. In none of them, consequently, he observes, does a true thumb exist on the anterior limbs; and he considers that it follows as a further consequence that the whole of them have been hitherto incorrectly referred to the *Quadrumana* by zoologists generally. He speaks of D'Azara's remark, that the anterior extremities of some of the species observed by him had five fingers, originating on the same line with each other, as a solitary exception, and as having been either unnoticed by other authors, or to have been considered as unworthy of attention, so entirely were they at variance with the preconceived notions of all.

As Mr. Ogilby's views on this subject differ from those of other zoologists, and appear to be the result of much attentive examination, principally made on the living animals, we proceed to give the substance of his 'observations on the opposable power of the thumb in certain *mammals*, considered as a zoological character; and on the natural affinities which subsist between the *Bimana*, *Quadrumana*, and *Pedimana*,' as set forth in the abstract of that paper in the 'Proceedings of the Zoological Society of London,' read on the 8th of March, 1836.

'Of the eight natural genera which include all the known monkeys of the western hemisphere, one, *Ateles*, is entirely destitute of a thumb, or has that member existing only in a rudimentary form beneath the skin. In five others, *Mycetes*, *Lagothrix*, *Aotus*, *Pithecia*, and *Hapale*, the anterior thumbs (using the ordinary expression for them) are placed absolutely on the same line with the other fingers, are of the same form with them, act invariably in the same direction, and are totally incapable of being opposed to them. In the two remaining genera, *Cebus* and *Callithrix*, the extremities of the anterior limbs have a greater external resemblance to the hands of man and of the monkeys of the Old World: the internal finger is placed farther back than the general line of the other fingers, and has, on that account, when superficially noticed, the semblance of being opposed to them; but, as has been correctly observed by D'Azara, with reference to *Cal. capucinus*, it is less separated than in *man*: it is, besides, of precisely the same slender form with the rest, is weaker than them, absolutely without power of opposition to them, and habitually acts in the same direction with them. The impression derived from contemplating the hands of the Old World monkeys might induce the belief that the extremities of the *Cebi* are similarly constituted; but if the knowledge that in *Mycetes*, *Pithecia*, &c., there are no opposable thumbs, leads to a close observation of the anterior extremities of the *Cebi*, it will be found that they do not act as hands, and cannot be considered as possessing the powers of those organs. From innumerable observations of many species of that genus, Mr. Ogilby states that it was very evident, notwithstanding the fallacious appearance occasioned by the backward position of the organ, that they had not the power of opposing the thumbs to the other fingers in the act of prehension; and, in fact, their principal power of prehension seems to be altogether independent of the thumb, for, generally speaking, that member was not brought into action at all, at least not simultaneously with the other fingers, but hung loosely on one side, as Mr. Ogilby has seen it do, in like circumstances, in the *Opossums*, *Phalangers*, and other arboreal *Mammals:* when actually brought into play, however, the thumb of the *Cebi* invariably acted in the same direction as the other fingers. *Cebus* consequently agrees in the character of non-opposableness of thumb with the nearly allied genera. And in this hitherto unsuspected peculiarity zoologists obtain a far more important character by which to distinguish the monkeys of the Old and New World than that hitherto relied on, the comparative thickness of the *septum narium*, or than the accessory aids afforded by the absence of cheek-pouches and callosities. Hence, according to Mr. Ogilby, as the monkeys of America have now been ascertained to be destitute of anterior hands, they can be no longer included among the *Quadrumana;* and he proposes, in consequence, to regard them as *Pedimana.* He considers that the latter series, the monkeys of America, form a group parallel to that of the monkeys of the Old World among the *Quadrumana:* and viewing the *Quadrumana* as consisting of two primary groups, that of which *Simia* forms the type, and the *Lemuridæ*, he proceeds to analyze the *Pedimana*, in order to determine whether any group analogous to the *Lemurs* exists in it. He finds such a group in the association of the genera *Didelphis*, *Cheironectes*, *Phalangista*, *Petaurus*, and *Phascolarctos* (together with a new genus, *Pseudochirus*, which he has found it necessary to separate from *Phalangista* as at present constituted); and for this association he uses the name of *Didelphidæ.* Aware that the modifications observable in the dentary systems of these several genera have been regarded by many zoologists as betokening a difference of regimen, which has led to their being viewed as constituting distinct families, he, in the first place, states, as the result of his observation of the habits of the numerous species of all these genera which have been, from time to time, exhibited in the Society's gardens, that there is little or no difference, in this respect, between the *Opossums* and *Phalangers*, but that all are equally omnivorous; and then proceeds to discuss the modifications that exist among them in the number and form of the several kinds of teeth, which are not, in his estimation, so very different in reality between the *Opossums* and *Phalangers* as they appear to be at first sight. In further support of his opinion that this association of genera forms a natural family, Mr. Ogilby refers to the gradual and uninterrupted transition from the naked-prehensile-tailed *Opossums* of South America, through the equally naked-tailed *Couscous*, *Balantia*, of the Indian Isles, to the true *Phalangers;* and from these to the *Petaurists* directly on the one hand, and, by means of the *Pseudocheirs*, to the *Koalas* on the other.

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* N.B. *Chironectes* (Ichthyology) is the name adopted by Cuvier for a genus of Acanthopterygians (*Antennarius* of Commerson), comprising some of those fishes popularly known under the name of *Anglers*. This may be the source of confusion both to the hearer and the reader, and the name of the latest date should be changed.

† Χεὶρ a hand; πούς, a foot.

'On the prehensile power of the tail Mr. Ogilby particularly insists, as on a faculty possessed by the greater number of the *Pedimana*, and as one which is, in truth, almost confined to them; only three known genera belonging to other groups, *Synetherus*, *Myrmecophaga*, and *Cercoleptes*, being endowed with it. He remarks on this faculty as on one of considerable importance, affording as it does, in some degree, a compensation for the absence of opposable thumbs on the anterior limbs. Combined with the prehensile tail, in every known instance, whether among the *Pedimana* or in other groups, is a slowness and apparent cautiousness of motion, not observable in any of the *Quadrumana*, except in the *Nycticebi.* In none of the true *Quadrumana* is the tail prehensile.

'Another evidence of the distinctness, as two groups, of the *Quadrumana* and the *Pedimana*, is furnished by their geographical distribution. The *Quadrumana* are strictly confined to the limits of the Old World; the *Pedimana* almost as exclusively to the New World; for Mr. Ogilby considers the continent of Australia to belong more properly to America than to Asia. The very few apparent exceptions that occur to this latter position are in the presence of some species of *Phalangers* in the long chain of islands that connect the south-eastern shores of Asia with the north-eastern coast of Australia; islands which may, in truth, be fairly regarded as belonging partly to the one and partly to the other, and the productions of which might consequently be expected to partake of the character of both.

'Mr. Ogilby subsequently adverts to another *Pedimanous* animal, the *Aye-Aye* of Madagascar, constituting the genus *Cheiromys;* respecting the affinities of which he speaks with hesitation, because, having never had an opportunity of examining the animal itself, he is acquainted with its characters only at second hand. He is, however, disposed to regard it as representing a third group among the *Pedimana*, to be placed in a station intermediate between the *Monkeys* of the New World and the *Didelphidæ.* With the latter he would, in fact, be disposed to associate it, were it not destitute of the marsupial character which belongs to all the other animals comprised in that group. In some of the *Didelphidæ*, the *Phalangers* and *Petaurists* especially, there is a marked approximation to that rodent form of incisor teeth which obtains in *Cheiromys*, and which has hitherto been regarded as especially attaching to it an abnormal character.

'*Man* is the only other animal furnished with hands, and however distinct he may be as regards his moral and intellectual powers, he must, zoologically, be considered on physical grounds. By his structural characters he becomes associated with all those of which mention has previously been made in Mr. Ogilby's communication; although he unquestionably constitutes among them a peculiar group, sensibly exalted above the rest, as well as above all other *Mammals.*'

CHEIROPTERA * (Zoology), the name of a natural family or division of mammiferous animals; the *Bats* or *Flittermice*, of the English; *Fledermäuser* of the Germans; *Vespertiliones* of the Latins; *Pipistrelli* and *Nottoli* of the Italians; *Chauve-souris* of the French; for we agree with those zoologists who are of opinion that *Galeopithecus*, which, taking its organization and habits into consideration, can hardly be called a bat, should be rather referred to the *Lemuridæ* than to this family, though its place among created beings is, as yet, hardly agreed on. [GALEOPITHECUS.]

The animals then which we consider to belong to this wing-handed family are those which would come under the genus *Vespertilio* of Linnæus. They all have the faculty of sustained flight, and their organization and habits point them out as a separate and well-defined group, distinguished by a folding extension of the membranous skin, which, rising from the sides of the neck, is spread between their fore-feet and their fingers.

ORGANIZATION.

Skeleton. The skull is thin, and there is a marked difference between that of the so called frugivorous group (*Pteropus* and *Cephalotes*) and the true or insectivorous Bats, *Vespertilionidæ* of Gray, the former being much more elongated than the latter. The bony *tentorium*, so strongly developed in the majority of the carnivora, is entirely absent; but there is a considerable development of the auditory portion of the temporal bone. The occipital bone is remarkably narrow. The superior maxillary is very much elongated, particularly in the so called frugivorous order, a term which we would change for omnivorous, for their well developed sharp canines, and the structure of some of their other teeth, would seem to be more trenchant than fruit-eating habits alone would require; and indeed Cuvier, in the last edition of the 'Règne Animal,' says of the genus *Pteropus*, 'they live principally on fruit, of which they destroy a great deal; but they know, nevertheless, how to pursue birds and small quadrupeds,' and we think it highly probable that they occasionally prey on the large insects which are found in the climates they inhabit. All the family have four great canine teeth, but there is considerable difference between the molars of the fruit-eating section and of that whose diet is confined entirely to insects, the crowns of the former being comparatively blunt and hollowed out or grooved lengthwise, while those of the latter are shorter and sharper, and beset with points. The molars vary in number in the different genera, the smallest development being three in each jaw, and the largest five above and six below, or *vice versâ*. The incisors set in the small and short intermaxillary bones vary also in the different genera. The smallest number in the upper jaw is two, and the largest four; the smallest number is also two in the lower jaw, and the largest six. The *atlas* is of considerable size, but the *dentata* is not large. The greatest number of the *dorsal vertebræ* is twelve, the smallest eleven. The canal for the spinal chord is large in these vertebræ. The *lumbar vertebræ* vary in number; the smallest number is four, the largest seven. The *ossa coccygis* are slender and elongated: their use seems only to be to assist (somewhat like a spreat) in spreading the interfemoral portion of the membranes, by the aid of which the animal sails in the air: their smallest number is six, and their largest twelve; for in the majority the tail extends to the margin of the membrane, while in some it protrudes beyond it, and in others it does not reach more than half way. In *Pteropus* there is no trace of these bones.

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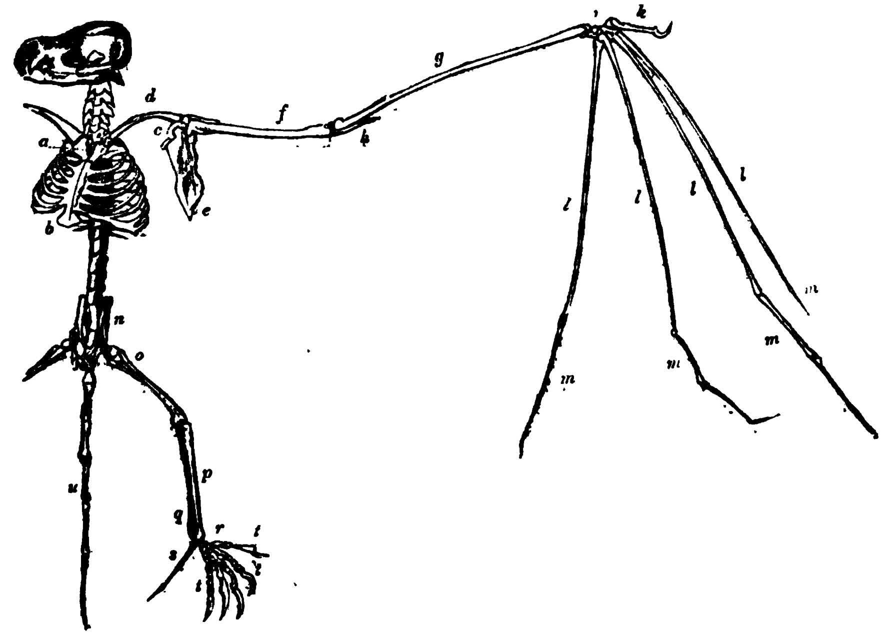
* χεὶρ, a hand, and πτερὸν, a wing.

The *ribs* are remarkably long, except the first pair, which is very short, and remarkably broad, especially in the cartilage, which is ossified; and the *sternum* is highly developed, as might be expected from the exigencies of the animal. The anterior portion is expanded laterally into what is termed the *manubrium*, which seems to be largest in the *Horse-shoe Bat* (*Rhinolophus*), forming a suitable point of attachment for the strong, long, arched clavicles, which are articulated both to the *sternum* and *scapula;* the latter is very large and elongated, and the lower surface is very concave. The *fossæ* for the strong muscles, both above and below the spine of this bone, are deeply marked. The habits of the animal required an ample development of these parts to give the shoulder the required solidity for working the mechanism of the wing, and we accordingly find the strength thrown into the *sternum*, *clavicles*, and *scapula*. But these same habits would have rendered the rotatory motion of the fore-arm worse than useless, for such a disposition would have weakened the power of the limb in beating the air with the extended membrane. We accordingly find that this power is absent: the *ulna*, indeed, is remarkably small, and in some the bone is merely rudimentary, forming a mere flat process, only partially separated from the *radius:* there is no *olecranon* (elbow) The *humerus* is long, slender, and cylindrical, and the head of the bone large and round. The structure of the *wrist* is peculiar: first come two bones next to the *radius*, and on these that bone rests; one of these is very large, and the other very small—the second series consists of the usual four bones; but it is in the bones of the *metacarpus* and of the fingers that the adaptation of the osseous parts of the animal to its necessities is, perhaps, most strongly shown. These, with the exception of the phalanges of the thumb, are greatly elongated, and run outwards and downwards to the edge of the wing-membrane, something after the fashion of the whalebones that assist in spreading an umbrella. The first finger is the shortest, and extends to the upper angle of the outer edge of the membrane; the second is generally the longest, and the third and fourth nearly of a length; the three last descend to the lower edge of the membrane. The *pelvis* is straight and lengthened, and rather wider below than it is above, the *ilia* being very narrow and elongated. The *ossa ischii* approach even to the contact of their tuberosities, and in some examples touch the *ossa coccygis*. The *ossa pubis*, in some species, recede from each other, the intermediate space being filled by a ligament; and in others these bones touch each other in the male, and are separated in the female. The *sacrum* and *ilia* are anchylosed early in life. The lower extremities do not offer any very striking differences from those of other mammifers, excepting that the thighs being directed outwards, the bones of the leg are partially turned round as it were (the *fibula* appearing at the inner side of the *tibia*, and a little posterior to that bone), and that there is a singularity about the heel. An elongated delicate bony process is given off from the back part of the foot, is inclosed in the margin of the interfemoral membrane, and proceeds about half way to the tail. Cuvier thought this a portion of the *os calcis;* Daubenton, that it was a distinct bone; and Meckel, that it is only a development of the tuberosity of the bone, disunited from its body. Mr. Daniell, on the 11th November, 1834, exhibited to the Zoological Society of London skeletons of the male and female *Pipistrelle* and *Noctule Bats*, for the purpose of pointing out a peculiarity in the female, connected, as he conceives, with the mode of parturition, described under the head of '*Habits*'. This peculiarity consists of a prolongation of the *os calcis* along the margin of the membrane, extended between the hinder extremities and the tail, of much greater length and strength in the female than in the male. By means of this process, Mr. Daniell believes the female to be capable of giving greater tension to the pouch formed of that membrane for the reception of the young in the act of parturition.



[Vespertilio murinus. Skeleton of Bat.]

a, manubrial bone; *b*, xiphoid cartilage; *c*, coracoid bone; *d*, clavicle; *e*, shoulder-blade; *f*, humerus: *g*, radius; *h*, rudiment of ulna; *i*, carpus (wrist); *k* metacarpus of thumb, terminated by a hook-shaped phalanx; *l*, metacarpal bones of the fingers; *m*, digital phalanges; *n*, pelvis; *o*, femur; *p*, tibia; *q* fibula; *r*, tarsal bones of foot; *s*, styliform appendage to os calcis; *t*, metatarsus and toes; *u*, tail.

Digestive Organs. Besides the difference of the molar teeth in the fruit-eating (or omnivorous) and the insectivorous Bats, already alluded to, the stomach and intestines present a remarkable corresponding variance. The stomach of the former is very complicated, and the intestines very long: in *Pteropus*, for example, they are seven times as long as the body. In the latter the stomach is very simple, and merely divided into the cardiac and pyloric portions, and the intestines are not more than twice the length of the body. These differences, together with that of the greater or less development of the tail, which is powerful, generally speaking, in the true insectivorous bats, and either absent, rudimentary, or comparatively inefficient in the fruit-eaters, which last do not require to turn so rapidly as the desultory flight of the prey of the former makes it necessary for them to do, form, it is true, a marked distinction between the two groups; but we are, notwithstanding, of opinion that very few Bats confine themselves entirely to a vegetable diet.

Nervous System and Senses. Taste.—This sense is probably well developed. In *Pteropus* the surface is rough. In *Phyllostoma* there is a peculiar structure, the tongue being suctorial by the aid of several wart-like elevations, capable of forming a disk for extracting the juices of fruits or the blood of animals through the operation of muscular fibres acting on these wart-like elevations by a tendon transmitted to each. *Smell*, most probably acute, especially in the *Rhinolophinæ*. *Sight and Hearing.*—The eye is diminutive in the Insectivorous Bats, and of fair proportion in the other section; but this is compensated for in the former by the extraordinary development of the external and part of the internal *auditory apparatus*, while that of the latter offers nothing remarkable. The external ear of the British long-eared bat (*Plecotus auritus*) almost equals the body in length. *Touch.*—This, or a sense analogous to it, must be highly developed. Spallanzani—we cannot compliment him on his humanity—extracted the eyes of bats and covered the empty sockets with leather; yet, in this condition, they flew round his room, avoiding the sides, never striking against anything, and flying out of the door without touching the door-case. In flying through a sewer which made a right angle, they turned at the proper point, though at a distance of two feet from the walls. They found their resting-place on a cornice, and flew through threads, suspended perpendicularly from the ceiling, without touching them, though scarcely farther apart than would admit their extended wings; and they avoided all obstacles with equal facility when the whole head was covered with varnish. But, according to the experiments of Carlisle, the British long-eared bat was entirely at a loss if, when blinded, its ears were stopped,* for in that condition the blinded bats struck against the sides of the room, and seemed to be quite unaware of their situation. The following additional note to the English translation of Blumenbach, however, corroborates Spallanzani. 'Bats have been supposed to possess a peculiar power of perceiving external objects, without coming actually into contact with them. In their rapid and irregular flight, amidst various surrounding bodies, they never fly against them; yet it does not seem that the senses of hearing, seeing, or smelling, serve them on these occasions, for they avoid any obstacles with equal certainty when the ear, eye, and nose, are closed. Hence naturalists have ascribed a sixth sense to these animals; it is probably analogous to that of touch. The nerves of the wing are large and numerous, and distributed in a minute plexus between the integuments. The impulse of the air against this part may probably be so modified by the objects near which the animal passes, as to indicate their situation and nature.' Cuvier, in his *Leçons d'Anatomie Comparée*, had, in a great measure, solved the mystery by observing, as is remarked in the note just quoted, that the whole surface of the flying membrane, on both sides, is endowed with extraordinary sensibility, and may be considered as one continuously expanded organ of touch. Nor is this the only peculiarity connected with the integument of the bats, for, in the genus *Nycteris* there exists a power of inflation to such a degree, that when the faculty is exerted the animal looks, according to Geoffroy, like a little balloon fitted with wings, a head and feet. The subcutaneous tissue is the part inflated, and as the skin adheres to the body at particular points only, the connexion being by means of loose cellular membrane, spaces are left which can be filled with air at the will of the *Nycteris*, through the cheek pouches, which are perforated at the bottom so as to communicate with those spaces. When the *Nycteris* wishes to inflate its skin, it draws in its breath, closes its nostrils, and transmits the air through the perforations of the cheek pouches to the subcutaneous spaces, and the air is prevented from returning by the action of a sphincter, which closes those openings, and by valves of considerable size on the neck and back.

Reproduction.—The male organs nearly approach those of the quadrumana and man in many respects. The principal organ is pendulous, but it is furnished with a small bone. The testicles are situated in the abdomen, excepting in the breeding season, when they descend and are placed on each side of the vent, and the epididymis lies behind them on either side of the insertion of the tail. There are *vesiculæ seminales*, a *prostate gland*, and *Cowper's glands*.

There is no great peculiarity in the female organs. The two teats are placed on the breast as in man and in the quadrumana. As for those so-called teats, discovered in the groin of the *Rhinolophi* by Montagu and Geoffroy, Kuhl could discover no trace of mammary glands in them.

Geographical Distribution.—The cheiroptera are widely spread over the globe. They are to be found in the Old and New World and in New Holland. A tolerably temperate climate seems necessary for them, and the greatest development of the form takes places in warm countries. Dr. Richardson (*Fauna Boreali-Americana*) notices two species, *Vespertilio pruinosus* (Say) caught at Cumberland House, on the Saskatchewan in lat. 54, and *Vespertilio subulatus* (Say) which the Dr. observes is the most common species near the eastern base of the Rocky Mountains on the upper branches of the Saskatchewan and Peace rivers.

Habits.—Generally speaking they remain in concealment during the day in caverns, ruinous buildings, hollow trees, and such hiding places, and flit forth at twilight or sunset to take their prey. White, in his 'Selborne,' thus describes the mode of feeding of a tame bat: 'It would take flies out of a person's hand; if you gave it anything to eat it brought its wings round before the mouth, hovering and hiding its head, in the manner of birds of prey when they feed. The adroitness it showed in shearing off the wings of flies, which were always rejected, was worthy of observation and pleased me much. Insects seemed to be most acceptable, though it did not refuse raw flesh when offered; so that the notion that bats go down chimneys and gnaw men's bacon, seems no improbable story. While I amused myself with this wonderful quadruped I saw it several times confute the vulgar opinion, that bats, when down on a flat surface, cannot get on the wing again, by rising with great ease from the floor. It ran, I observed, with more dispatch than I was aware of, but in a most ridiculous and grotesque manner.' The large-eared bats, collected by Carlise, refused, according to Shaw, every species of food for four days, as did a large number which were afterwards caught and preserved in a dark box, for above a week. During the day-time they were extremely desirous of retirement and darkness; and, while confined to the box, never moved or endeavoured to get out the whole day; and when spread on the carpet they commonly rested some minutes, and then, beginning to look about, crawled slowly to a dark corner or crevice. At sunset the scene was quite changed: every one then endeavoured to scratch its way out of the box; a continual chirping was kept up, and no sooner was the lid of their prison opened than each was active to escape; either flying away immediately, or running nimbly to a convenient place for taking wing. When these bats were first collected, several of the females had young ones clinging to their breasts in the act of sucking. One of them flew with perfect ease, though two little ones were thus attached to her, which weighed nearly as much as the parent. All the young were devoid of down, and of a black colour. But one of the most interesting and detailed accounts of the habits of these animals is to be found in the statement made by Mr. George Daniell to the Zoological Society of London on the 11th November, 1834, and we accordingly give it from the 'Proceedings' of that society. The bats consisted of two species, the *Pipistrelle* (*Vespertilio Pipistrellus* of Geoffroy) and the *Noctule* (*Vespertilio Noctula* of Schreber). Mr. Daniell stated that in July, 1833, he received five specimens, all pregnant females, from Elvetham in Hampshire. Many more were congregated together with them in the ruins of the barn in which they were taken, but all the rest escaped. They had been kept in a tin powder canister for several days, and on being turned loose into a common packing case, with a few strips of deal nailed over it to form a cage, they exhibited much activity, progressing rapidly along the bottom of the box, ascending by the bars to the top, and then throwing themselves off as if endeavouring to fly. They ate flies when offered to them, seizing them with the greatest eagerness, and devouring them greedily, all of them congregating together at the end of the box at which they were fed, and crawling over, snapping at, and biting each other, at the same time uttering a grating kind of squeak. Cooked meat was next presented to them, and rejected; but raw beef was eaten by them with avidity, and with an evident preference for such pieces as had been moistened with water. This answered a double purpose; the weather being warm numbers of the blue-bottle flies (*musca vomitoria* of Linnæus) were attracted to the meat; and on approaching within range of the bats' wings were struck down by their action, the animal itself falling at the same moment with all its membranes expanded, and cowering over the prostrate fly, with its head thrust under in order to secure its prey. When the head was again drawn forth the membranes were immediately closed, and the fly was observed to be almost invariably taken by the head. Mastication appeared to be a laboured operation, consisting of a succession of eager bites and snaps, and the sucking process (if it may be so termed), by which the insect was drawn into the mouth, being much assisted by the looseness of the lips. Several minutes were employed in devouring a large fly. In the first instance the flies were eaten entire, but Mr. Daniell afterwards observed detached wings in the bottom of the box. These, however, he never saw rejected, and he is inclined to think that they are generally swallowed. A slice of beef attached to the side of the box was found not only to save trouble in feeding, but also by attracting the flies to afford good sport in observing the animals obtain their food. Their olfactory nerves appear to be very acutely sensible. When hanging by their posterior extremities, and attached to one of the bars in front of the cage, a small piece of beef placed at a little distance from their noses would remain unnoticed; but when a fly was placed in the same situation they would instantly begin snapping after it. The beef they would eat when hungry; but they never refused a fly. In the day-time they sometimes clustered together in a corner; but towards evening they became very lively, and gave rapid utterance to their harsh grating notes. One of them died on the fifth day after they came into Mr. Daniell's possession; two on the fourteenth; the fourth survived until the eighteenth; and the fifth until the nineteenth day. Each was found to contain a single *fœtus*.

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* Shaw says that, from Mr. Jurine's anatomical observations on these animals, it appears that a very large proportion of nerves is expanded on the upper jaw, the muzzle, and the organ of hearing; and thus appeared to him, in a great degree, to account for the extraordinary faculty above described.

On the 16th May, 1834, Mr. Daniell procured from Hertfordshire five specimens of *Vespertilio noctula*, four females and one male. The latter was exceedingly restless and savage, biting the females, and breaking his teeth against the wires of the cage, in his attempts to escape from his place of confinement. He rejected food and died on the 18th. Up to this time the remaining four continued sulky; but towards evening they ate a few small pieces of raw beef, in preference to flies, beetles, or gentles, all of which were offered to them: only one of them, however, fed kindly. On the 20th one died, and on the 22nd two others, each of which was found to be pregnant with a single *fœtus*. The survivor was tried with a variety of food, and, evincing a decided preference for the hearts, livers, &c., of fowls, was fed constantly upon them for a month. In the course of this time large flies were frequently offered to her, but they were always rejected, although one or two *May chafers*, *Melolontha vulgaris*, were partially eaten. In taking the food the wings were not thrown forward as in the *Pipistrelle*, and the food was seized with an action similar to that of a dog. The water that drained from the food was lapped, but the head was not raised in drinking, as Mr. Daniell had observed it to be in the Pipistrelle. The animal took considerable pains in cleaning herself, using the posterior extremities as a comb, parting the hair on either side from head to tail, and forming a straight line along the middle of the back. The membrane of the wings was cleaned by forcing the nose through the folds and thereby expanding them. Up to the 20th June the animal fed freely, and at times voraciously, remaining during the day suspended by the posterior extremities at the top of the cage, and coming down in the evening to its food; the quantity eaten sometimes exceeded half an ounce, although the weight of the animal itself was not more than ten drachms. On the 23rd Mr. Daniell, observing her to be very restless, was induced to watch her proceedings. The uneasiness was continued for upwards of an hour, the animal remaining all this time in her usual attitude suspended by the posterior extremities, on a sudden she reversed her position, and attached herself by her anterior limbs to a cross wire of the cage, stretching her hind legs to their utmost extent, curving the tail upwards, and expanding the interfemoral membrane so as to form a perfect nest-like cavity for the reception of the young. In a few moments the snout of the young one made its appearance, and in about five minutes the whole of its head was protruded. The female then struggled considerably until the extremities of the radii had passed, after which the young one by means of a lateral motion of its fore limbs relieved itself. It was born on its back, perfectly destitute of hair, and blind; and was attached by an umbilical cord of about two inches in length. The female then licked it clean, turning it over in its nest, and afterwards resuming her usual position, and placing the young in the membrane of her wing, proceeded to gnaw off the umbilical cord and eat the *placenta*. She next cleaned herself, and wrapped up the young so closely as to prevent any observation of the process of suckling. The time occupied in the birth was seventeen minutes. At the time of its birth the young was larger than a new-born mouse, and its hind legs and claws were remarkably strong and serviceable, enabling it not only to cling to its dam, but also to the deal sides of the cage. On the 24th the animal took her food in the morning, and appeared very careful of her young, shifting it occasionally from side to side to suckle it, and folding it in the membranes of the tail and wings. On these occasions her usual position was reversed. In the evening she was found dead, but the young was still alive, and attached to the nipple, from which it was with some difficulty removed. It took milk from a sponge, was kept carefully wrapped up in flannel, and survived eight days, at the end of which period its eyes were not opened, and it had acquired very little hair. From these observations it is evident that the period of gestation in the *Noctule* exceeds thirty-eight days. We have only to add to this interesting account that the *Cheiroptera* hybernate.

SYSTEMATIC ARRANGEMENT.

Among the antients Aristotle says but little about the bat, and Pliny is considered to have placed it among the birds, none of which, he observes, with the exception of the bat, have teeth. (*Hist. Nat.* lib. xi., c. xxxvii.) Again (lib. x., c. lxi.), he notices it as the only winged animal that suckles its young, and observes on its embracing its two little ones and flying about with them[*]. In this arrangement he was followed by the older of the more modern naturalists; Belon, Gesner, and Aldrovandus, for instance. The former, after expressing some doubt, places it at the end of the night birds, in his *Histoire de la Nature des Oyseaux* (folio, 1555), and it occupies the same position in the small 4to. (1557), with the following quatrain:

> 'La Souris Chauve est un oiseau de nuict,
> Qui point ne pond, ains ses petits enfante,
> Lesquels de laict de ses tetins sustante,
> En petit corps grande vertu reluit.'

The bat, *Attaleph* (bird of darkness), was one of the unclean animals of the Hebrews (*Deut.* xiv. 18), where it is placed among the forbidden birds.

Under the title 'Vespertilio,' the fourth and last genus of his first order, *Primates*, Linnæus arranged all the *Cheiroptera* known to him, and the number of species recorded in the twelfth edition of the *Systema Naturæ* amounts only to six. In the thirteenth edition (Gmelin's) the number of species given amounts to twenty-three. This edition was printed in 1789, and few families afford stronger evidence of the great influx of the new species within the last five and forty years than is to be found in the numbers of *Cheiroptera* which have been described within that period. Of English bats alone Jenyns enumerates sixteen species, and the general numbers have been increased more than six-fold. Cuvier made the *Cheiroptera* the first family of his third order of Mammifers, placing them next to the *Lemuridæ*, which close his second order, *Quadrumana*. Jenyns, in his 'Manual of British Vertebrate Animals,' places them under the order *Primates*, which he makes the second in his arrangement of British Mammalia, the *Feræ* being the first, and they come immediately after the shrews and the hedgehog.

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[*] In the index to the Leyden edition (folio, 1548), the expression used is 'Vespertilio sola avium lacte nutrit;' but 'volucrum' is the expression in the text—both in book x., and book xi. The tenth book begins 'Sequitur natura avium,' and the bat is placed (c. lxi.), at the end of the chapters on birds; the rest of the book being occupied with general zoological observations.

D'Azara, Illiger, Geoffroy St. Hilaire, Desmarest, the Cuviers, Lesson, Bechstein, Kuhl, Leisler, Natterer, Temminck, Rüppel, and Spix, are among the most distinguished foreign writers on this family; and Pennant, Montagu, Sowerby, Gray, Horsfield, and Bell, among those of our own country. Zoologists seem generally to have agreed that the teeth should be made the great ground-work of classification in this as in other mammiferous families. Temminck, however, in his sixth *Monographie de Mammalogie*, shows that the genus *Dysopes* of Illiger is synonymous with the *Molossus* of M. Geoffroy St. Hilaire, and also with *Nyctinomus*. *Cheiromeles torquatus* of Horsfield is also regarded by Temminck as a *Dysopes*. To establish the identity of *Molossus* and *Nyctinomus* with *Dysopes*, the distinction of which rested only on the number of the incisor teeth of the jaw, Temminck shows that the character of these teeth varies according to the age of the individual, and that those of the upper jaw also vary in number, the dentary formula, with regard to the incisors, being either $\frac{4}{6}$, $\frac{2}{6}$, $\frac{2}{4}$, $\frac{2}{2}$, and even $\frac{2}{0}$. The lower incisors are displaced gradually by the development of the base of the canine teeth, and the projecting lateral points eventually perform the office of incisors, being opposed while in action on food to the incisors of the upper jaw, which are worn away by them. The author of the review on Temminck's sixth monograph*, where the latter describes the facts as they were observed by him in seven of the eleven species, thus proceeds: 'In order to show the mode of proof adopted by him, we follow him through one of the instances which he has adduced, that of the *Dysopes nasutus*, described by M. Isidore Geoffroy St. Hilaire as the *Nyctinomus Brasiliensis*. In one young individual of this species there existed in the lower jaw six incisors; in another five, three being on one side and two on the other; in a third four only; and in the upper jaw of this specimen, three incisors, with the alveolus, partly closed, of a fourth; in about thirteen other specimens, the number of incisors in the lower jaw was four; and in two full-grown individuals there were only two. The entire absence of even these has been found in *Dysopes obscurus*. Another observation will carry almost beyond the possibility of doubt the proof of the identity of *Nyctinomus* with *Molossus*. The type of the former genus, *Nyctinomus Ægyptiacus*, Geoff., possesses in its early age the four incisor teeth, which have been made to characterize the group, but loses two of them, when arrived at its full growth, and thus becomes an undisputed *Molossus*. On the importance of these remarks we need not observe. The anomalies which exist in the dentary system of the *Cheiroptera* have long been a stumbling block to zoologists, and can only be explained by a continued and extensive series of minute examinations, similar to those to which M. Temminck has subjected them. They afford an additional proof, if such were wanting, that a system founded on any one set of organs, however important, must become in some of its parts deficient and inadequate; it must degenerate into a mere artificial method, the natural one being attainable only by a well-directed study of the whole organization. Having drawn the attention of the reader to these observations, we proceed to a classification of the family, taken, in great measure, from the French authors, and adopted by Desmarest and Lesson. *Galeopithecus*, which is the type of the first tribe of *Cheiroptera*, according to Lesson, we have removed, in accordance with the opinions of other zoologists, from this family; and though the *Vespertilionidæ* may be divided into two natural sections, the insectivorous bats and the fruit-eaters, we have, in consideration of the gradual shades of form when the numerous species are brought under observation, followed M. Lesson's arrangement, with the exception above alluded to.

VESPERTILIONIDÆ.

§ 1. Istiophori, Spix.

Bats having a membrane in form of a leaf upon the nose. Molar teeth with sharp tubercles.

1. Sub-family, *Phyllostomatina*.

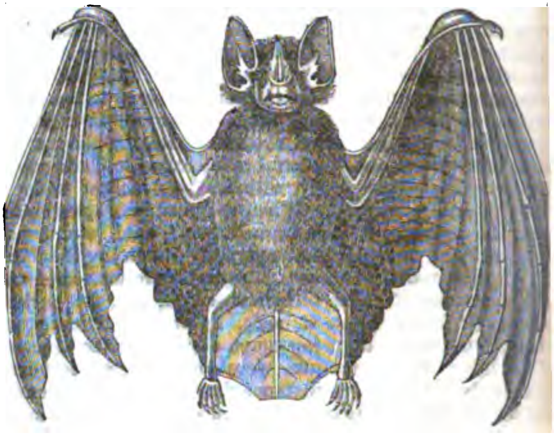
Nose-leaf simple, solitary or unequal, the forefinger composed of two joints.

Genera, Phyllostoma, Geoff.

Four incisors above and the same number below. Canine teeth very strong. Nose supporting two nasal crests, one leaf-like, the other like a horseshoe. Ears large. Internal *oreillon* dentelated. Tongue bristled with papillæ. Tail variable in length, sometimes none. Dentary formula: Incisors $\frac{4}{4}$, canines $\frac{1-1}{1-1}$, molars $\frac{5-5}{5-5} = 32$.

a. Tail shorter than the interfemoral membrane.

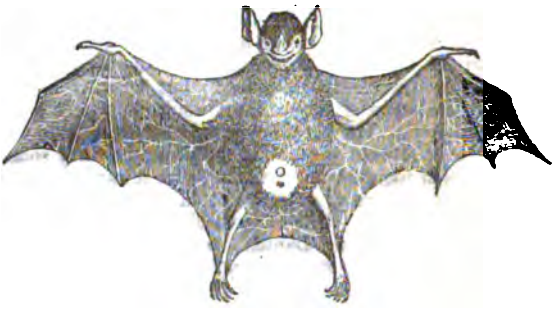
Example. *Phyllostoma crenulatum*. The borders of the nasal leaf are dentelated, the end of the tail free. Locality unknown.



[Phyllostoma crenulatum.]

b. No tail.

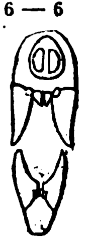
Example. *Phyllostoma perspicillatum*, Geoff. *Vespertilio perspicillatus*, Linn.



[Phyllostoma perspicillatum.]

Vampirus, Geoff. and F. Cuvier.

The same character as in the *Phyllostomata*, with the exception of the dental formula, which is as follows: incisors $\frac{4}{4}$, canines $\frac{1-1}{1-1}$, molars $\frac{5-5}{6-6} = 34$.



[Teeth of Vampirus Spectrum.]

Example. *Vampirus spectrum*. This is the celebrated Vampire Bat of which so many bloodthirsty stories have been told; the *Phyllostoma spectrum* of some authors, *Vampirus sanguisuga* of others, the *Andira-guacu* of Piso, and the *Vespertilio spectrum* of Linnæus. The nose-leaf is entire, higher than it is wide, although it becomes widened at the base. The following is Piso's account of its habits. 'They seek out every kind of animal and suck their blood. But in Maranhan (Maranham) there is a certain kind of bats which approach by night the naked feet of men, and wound them with their *rostrum*, for the sake of sucking human blood. The bite is so slight and subtle that the wounded do not feel it before the bed covered with blood gives token of the wound. So great a quantity of blood flows from the envenomed bite that it can only be stopped with difficulty, and the peril is imminent unless a cure by the prescribed remedies be effected. The inhabitants first wash these wounds with hot sea-water, and afterwards apply hot ashes, or even cautery, if the blood be not stopped.' Captain Stedman, who states that he was bitten, thus describes the operation: 'Knowing by instinct that the person they intend to attack is in a sound slumber, they generally alight near the feet, where, while the creature continues fanning with its enormous wings, which keeps one cool, he bites a piece out of the tip of the great toe, so very small indeed that the head of a pin could be scarcely received into the wound, which is consequently not painful; yet through this orifice he continues to suck the blood, until he is obliged to disgorge. He then begins again, and thus continues sucking and disgorging till he is scarcely able to fly; and the sufferer has often been known to sleep from time into eternity. Cattle they generally bite in the ear, but always in places where the blood flows spontaneously. Having applied tobacco ashes as the best remedy, and washed the gore from myself and my hammock, I observed several small heaps of congealed blood all round the place where I had lain, upon the ground, on examining which, the surgeon judged that I had lost at least twelve or fourteen ounces during the night.' This is sufficiently circumstantial, and the narrative is assisted by Mr. Wood, who quotes the passage in his *Zoography*, and who informs us 'that it is said to perform the operation by inserting its aculeated tongue into the vein of a sleeping person with so much dexterity as not to be felt; at the same time fanning the air with its large wings, and thus producing a sensation so delightfully cool that the sleep is rendered still more profound, and the unfortunate person reduced almost to death before he awakes.' And the same author further informs us that 'there is reason to believe that this thirst after blood is not confined to the bats of one continent, nor to one species, since at Java they seldom fail to attack those persons who lie with their feet uncovered.' The same sort of stories are to be found in most books of Natural History up to a late period. Wood's work was published in 1807, and the tales are continued in Bewick in the edition of 1820. Cuvier, in the last edition of the *Règne Animal* (1829), says, 'They have accused this species of having caused men and beasts to perish by sucking them, but it contents itself with making very small wounds which may sometimes become envenomed by the climate.' Lesson (1827), in his notice of the genus, says, 'The single American species is celebrated by the fables with which they have accompanied its history.' Dr. Horsfield, who paid particular attention to the Javanese bats, does not say a word of their blood-thirsty propensities. That some of the *Phyllostomata* suck the blood of animals as well as the juices of succulent fruits, zoologists are agreed, and we have above endeavoured to describe the peculiar apparatus with which they are furnished. Where the 'aculeated tongue' fitted for insertion 'into the vein of a sleeping person' is to be found among the known bats, we are ignorant. The rough tongue of the genus *Pteropus* has been supposed to have been employed for abrading the skin to enable the animal to suck the part abraded, but zoologists are now agreed that the supposition is groundless. It is more than probable that the celebrated vampire superstition and the blood-sucking qualities attributed to the bat have some connexion with each other.

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* Zool. Journ., vol. iii., p. 459.

Piso describes the bodies of his Bats (*Andira-guacu*) as being as large as European pigeons.

[Vampirus Spectrum.]

Madateus, Leach.

Characterized by four incisors in each jaw; the two intermediate upper ones are longer than the lateral; they are bifid; the lower incisors are equal, simple, and pointed. Four molar teeth in the upper and five in the lower jaw on each side. Two nasal leaves. No tail. Lips furnished with soft fringed and compressed papillæ. Tongue bifid at the point.

Example. *Madateus Lewisii*. Nasal leaf suddenly pointed; ears moderate and rounded. Fur blackish. Interfemoral membrane notched. Expansion 16 inches. Locality, Jamaica.

Glossophaga.

Four incisors in each jaw; canines moderately strong. Tongue very long, extensile, and terminated by a sort of sucker. Nose surmounted by a crest in form of a pike-head. Tail none, or variable in length. Interfemoral membrane very small, hardly any. Dental formula: incisors $\frac{4}{4}$, canines $\frac{1-1}{1-1}$, molars, $\frac{3-3}{3-3} = 24$. Locality entirely American. The extensile tongue, says Lesson, enables the species to suck the blood of animals.

Example. *Glossophaga soricina* of Geoffroy, *Vespertilio soricinus* of Pallas and Gmelin. Interfemoral membrane comparatively large. No tail. Locality, Surinam and Cayenne.

Rhinopoma, Geoff.

Two incisors in the upper jaw, four in the lower. Nose long, conical, cut square as it were at the end, and surmounted with a small leaf. Nostrils straight, transversal, and operculated. Ears large, earlet (*oreillon*) external. Tail long, enveloped at its base in the interfemoral membrane, which is cut, as it were, square, and free at the extremity. Dental formula: incisors $\frac{2}{4}$, canines $\frac{1-1}{1-1}$, molars $\frac{4-4}{5-5} = 28$. There are two species only, one African, the other American.

Example. *Rhinopoma microphylla*. This is Belon's *Chauve-souris d'Egypte*. The fur is ash-coloured, and the tail very long and slender. It is the species that abounds in the long and dreary galleries of the Egyptian Pyramids.

Artibeus, Leach.

Four incisors in each jaw, of which the upper ones are bifid, and the lower ones truncated. Two canines above and the same number below; the upper ones have an internal border at their base. Four molars above and five below on each side. Two nasal leaflets, one horizontal, the other vertical. No tail.

Example. *Artibeus Jamaicensis*, the only species known. Brown above, greyish below. Flying membranes, and ears brownish. The lips are surrounded with a regular series of warts, and the mouth is provided internally with a narrow, fimbriated, cribriform membrane. Expansion about one foot, three inches. Length from the muzzle to the extremity of the interfemoral membrane, four inches, ten lines. Dr. Horsfield calls it *Phyllostoma Jamaicense*, and says that in many particulars it agrees with *Phyllostoma planirostrum* of Spix, though it is clearly distinguishable from it.

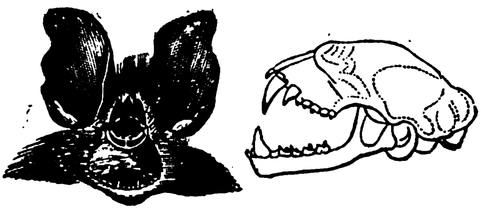
Monophyllus, Leach.

Four unequal incisors in the upper jaw, of which the two middle ones are longer than the lateral, and bifid, none in the lower jaw: Two canines in each jaw. Five molars above and six below on each side. A single straight leaf upon the nose. Tail short.

Example. *Monophyllus Redmannii*. Brown above, greyish below. Ears rounded. Nose-leaf, which is sharp, covered with small white hairs. Membranes brown. Locality, Jamaica.

2. Sub-family, *Rhinolophina*.

Nasal leaf complicated, membranous. Index with a single phalanx. Wings largely developed. Females with pectoral teats often accompanied by pubic warts simulating mamillæ.

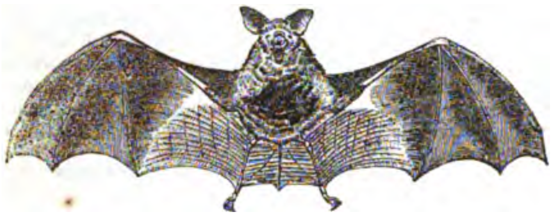


[Head and skull of Rhinolophus tridens.]

Genera, Rhinolophus, Geoff.

Nose at the bottom of a cavity bordered by a wide crest of a horseshoe shape, and surmounted by a leaf. Ears moderate, lateral, without an earlet (oreillon). Tail long, entirely enveloped by the interfemoral membrane, which is very much developed. Dental formula: incisors, $\frac{2}{4}$, canines, $\frac{1-1}{1-1}$, molars, $\frac{5-5}{6-6} = 32$. Several species.

Example. *Rhinolophus nobilis*, a rare and fine Javanese species; *Kĕbblĕk* of the natives, described by Dr. Horsfield, who observes that it belongs to the second section of the genus. The nasal apparatus consists of a broad membrane stretching transversely across the nose in form of a shelf; the sides are bounded by several parallel folds, and inferiorly it constitutes a semicircular envelope, which has a short, obtusely-rounded point in the middle. Colour above, pure brown; beneath, brown variegated with grey. Fur remarkably long and silky, and supplied with a most delicate down at the base, so as to be throughout very soft to the touch. Body four inches in length. Expansion nineteen inches and a half.

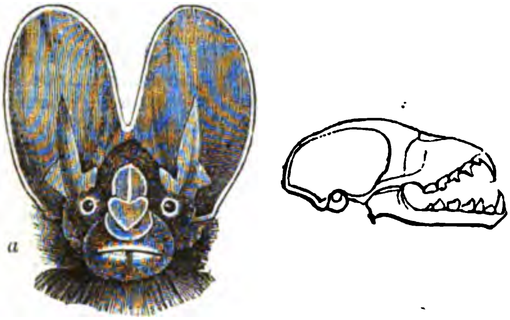


[Rhinolophus nobilis.]

Megaderma, Geoff.

Ears very much developed, and brought forward on the head. Earlet internal, wide. Three nasal crests, one vertical, one horizontal, and one inferior of a horseshoe shape. No tail. Interfemoral membrane cut square. Dental formula: incisors, $\frac{0}{4}$, canines, $\frac{1-1}{1-1}$, molars, $\frac{4-4}{5-5} = 26$.

Example. *Megaderma trifolium*. Locality, Java, where it is the *Lovo* of the natives.

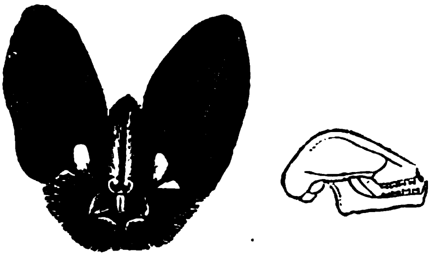


[a, Head of Megaderma Trifolium; b, Skull of Megaderma Frons.]

Nycteris, Geoff.

A very deep longitudinal *sillon* upon the *chanfrein*. Nostrils covered by a cartilaginous moveable operculum. Ears large, united at their base. Earlet external. Interfemoral membrane very large, comprehending the tail, the last vertebra of which is terminated by a bifurcated cartilage. Dental formula: incisors, $\frac{4}{6}$, canines, $\frac{1-1}{1-1}$, molars, $\frac{4-4}{5-5} = 32$.

Example. *Nycteris Geoffroyi*. Fur, grey-brown above; brighter below. Ears very large. A well-developed wart placed upon the lower lip, between two *bourrelets* having the form of a V. Locality, the Thebaïd and Senegal.

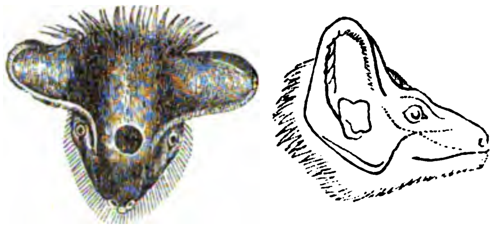


[Nycteris Geoffroyi, and Skull.]

Taphozous, Geoff.

Chanfrein with a *sillon*. Upper lip thick. Ears moderate and wide apart. Tail fine towards its point, beyond the interfemoral membrane, which is large, prolonged and angular at its external border. Dental formula: incisors, $\frac{0}{4}$, canines, $\frac{1-1}{1-1}$, molars, $\frac{5-5}{5-5} = 28$. Several species.

Example. *Taphozous Mauritianus*. Fur chestnut above, ruddy below. Earlet terminated by a sinuous border. Locality, Isle of France.



[Taphozous Mauritianus, and profile of the same.]

Mormops, Leach.

Four upper unequal incisors, of which the intermediate ones are widely notched, and four below which are equal and trifid; two canines in each jaw, the upper ones twice the length of those below, almost compressed and canaliculated before; five molars above, and six below on each side. A single nasal leaf united to the ears, which are very complicated.

Example. *Mormops Blainvillii*, the only species; and it is remarkable for the extreme elevation of its front, the excavation of its chanfrein, the lobated, crenelated form of its upper lip, and the division of the lower one into three membranous lobes, the existence on the tongue of papillæ, of which the anterior are bifid and the posterior multifid, the folding of the nasal leaf, and the division of the upper border of its ears into two lobes. Locality, Jamaica.

Nyctophilus, Leach.

Two upper, elongated, conical, pointed incisors; six lower ones equal and trifid with rounded lobes; two canines above and two below, the lower ones having a small point at the back part of their base. Four molars on each side of the jaws, with crowns furnished with pointed tubercles. Two nasal leaves, of which the posterior is the largest. Tail projecting a little beyond the interfemoral membrane.

Example. *Nyctophilus Geoffroyi*, the only species known. Fur, yellowish above. Belly, breast and throat dirty white. Ears large. Membranes brownish-black.

§ 2. Anistiophori, Spix.

Bats without any nasal appendage.

3. Sub-family, *Vespertilionina*.

Molar teeth with pointed tubercles. Wings wide and extended. A single phalanx to the forefinger (index). Head elongated. The lips simple. Tongue short. Tail long.

Genera, Vespertilio, Linn., Geoff.

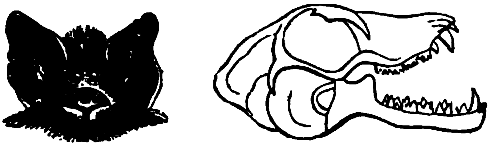
Upper incisors four, sometimes two. Lower incisors six. Muzzle very simple. Ears separated, but sometimes united at their base. Earlet internal. Tail long, entirely enveloped in the interfemoral membrane. Cheek pouches. Dental formula: incisors, $\frac{4}{6}$, canines, $\frac{1-1}{1-1}$, molars, $\frac{4-4}{5-5} = 32$.

Lesson observes that many Vespertiliones have but two incisors. The species of the genus are many in number, and their geographical distribution is very wide.

a. European species.

These are numerous. We select as an example *Vespertilio murinus* of Linnæus. This is the *Flitter-mouse*, *Flutter-mouse* and *Rear-mouse* of the English; *La Chauve-souris* of Buffon, and, according to Pennant, the *Ystlum* of the antient British; *Nattola*, *Notula*, *Sporteglione*, *Vispistrello* and *Vilpistrello* of the Italians; *Murcielago* and *Morciegalo* of the Spaniards; *Morcego* of the Portuguese; *Speckmaus* and *Fledermaus* of the Germans; *Vledermuys* of the Dutch; *Laderlap* and *Fladermus* of the Swedes; and *Flugermaus* and *Aftenbakke* of the Danes. The ears are oval, of the length of the head; the earlets falciform. The fur of the adults is ruddy-brown above, whitish-grey below; that of young individuals is grey-ash.

Locality. *Vespertilio murinus* is common in Europe. It has been supposed to exist in Asia, and even in Australia. Its haunts are caves, ruined buildings, church-towers, the roofs of houses or churches, and hollow trees, where it hybernates during the whole winter, snugly wrapped up in the wing-membranes, and suspended by the hind feet. We have given the skeleton of this species, and below will be found a head and skull of *Vespertilio pipistrellus*, another European species.



[Head and Skull of Vespertilio Pipistrellus.]

β. African species.

Example. *Vespertilio nigrita.* Adanson discovered this species at Senegal. The ears are oval, triangular, very short, one-third of the length of the head. Earlet long, and terminating in a point. Fur yellowish-brown above, and yellowish-ash below.

γ. Asiatic species.

Example. *Vespertilio pictus.* The ears are shorter than the head, oval, wider than they are high. Earlet oval-shaped. The fur is reddish, passing into bright yellow upon the back, and of a tarnished yellow on the belly. Citron-coloured rays mark the course of the fingers in the wings, which are chestnut-brown. Locality, Ceylon, where the native name is *Kirivoula.*

δ. American species.

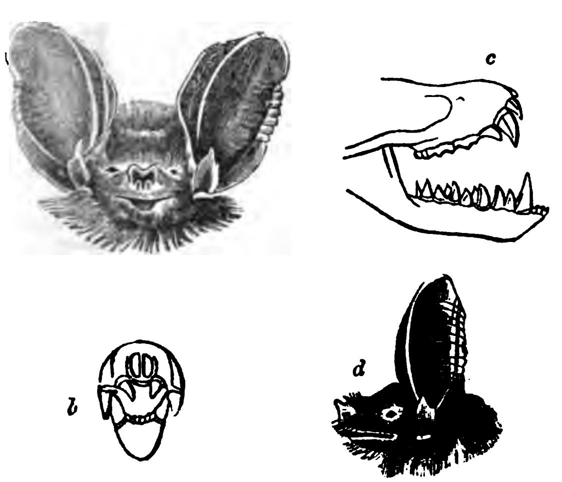
These are very numerous.

Example. *Vespertilio Naso.* This species, remarkable for the length of its nose, was first described by the Prince de Neuwied. The nasal organ is elongated in a straight line above the upper jaw, almost like a proboscis. The ears are small, and very much pointed. The fur is greyish-brown above, and yellowish-grey below. Locality, Brazil, in trees.

Plecotus, Geoff.

This genus in many of its characters agrees with *Vespertilio*, but the ears are very much developed, being larger than the head. Dental formula: incisors, $\frac{4}{6}$; canines, $\frac{1-1}{1-1}$; molars, $\frac{5-5}{6-6}$ = 36. There are several species, and the form occurs in all the four quarters of the globe.

Example. *Plecotus Timoriensis.* This species was discovered by Péron and Lesueur in the island of Timor, one of the Moluccas. The ears are ample, united at their base by a small membrane. The fur is blackish-brown above, and ash-brown below.



[Plecotus Timoriensis.]

b, front view of the teeth &c. *c*, profile of the skull; *d*, profile of the head.

The genera *Atalapha*, *Hypexodon*, and *Nyctioc* Rafinesque, are considered doubtful by Lesson and ot

Myopteris, Geoff.

The chanfrein is united and simple. The ears are large, insulated and lateral, with an internal earlet. Tail long, half enveloped in the interfemoral membrane. Muzzle short and large. Dental formula: incisors, $\frac{2}{2}$; canines, $\frac{1-1}{1-1}$; molars, $\frac{4-4}{5-5}$ = 26.

Example. *Myopteris Daubentonii*, Geoff.; *Le Rat volant* (flying-rat) of Daubenton. The locality of this species is unknown. The upper part of the head and body is brown; beneath, the colour is dirty white, with a slight tinge of yellow.

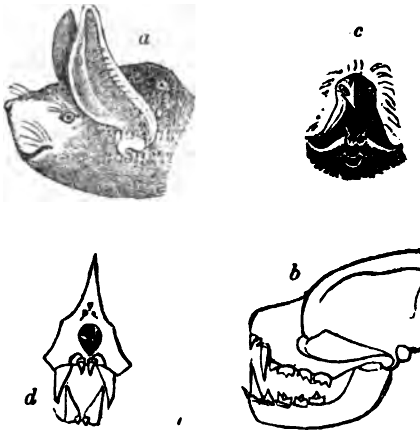
4. Sub-family, *Noctilionina.*

Molars tubercular. Wings long and straight. Two phalanges to the forefinger (index). Head short and obtuse. Lips very large. Tail recurved. The females often furnished with lateral pouches for the reception of the young in nursing.

Genera, Noctilio, Geoff.

Canines very strong. Muzzle short and swollen, and divided and studded with fleshy tubercles or warts. Nose simple, and losing itself in the lips. Ears small and lateral. Interfemoral membrane very much developed. Tail enveloped at its base. Dental formula: incisors, $\frac{4}{2}$; canines, $\frac{1-1}{1-1}$; molars, $\frac{4-4}{5-5}$ = 28.

Example. *Noctilio leporinus.* Size of a rat. Fur of a uniform reddish-yellow. This is the *Vespertilio leporinus* of Gmelin; *Noctilio unicolor* of Geoffroy. Localities, Brazil, Peru, and Paraguay.



[Noctilio Leporinus.]

a, profile of head; *b*, profile of skull; *c*, front view of muzzle; *d*, front view of teeth, &c.

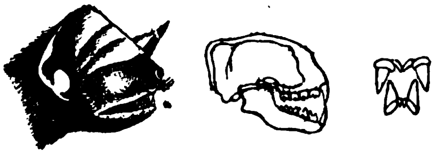
Dysopes, Illiger.

We have already noticed M. Temminck's opinion of the identity of *Molossus*, *Nyctinomus*, and *Cheiromeles* with *Dysopes.* The following is the character of the teeth, according to F. Cuvier: two incisors above and four below; two canines in each jaw; four molars on each side of the upper jaw, that is to say, two false and two normal; ten molars in the lower jaw, *viz.*, four false and six true. Type, *Dysopes Moops.* We proceed to give the definition of *Molossus*, *Cheiromeles*, and *Nyctinomus*, for the assistance of the student.

Molossus.

Head short; muzzle swollen. Ears large; earlet external. Interfemoral membrane straight, with a square termination. Tail long, enveloped at its base, and most frequently free at its extremity. Dental formula: incisors, $\frac{2}{2}$; canines, $\frac{1-1}{1-1}$; molars, $\frac{5-5}{5-5}$ = 28. The geographical distribution of this form is wide: Africa, Asia, and South America possess it; but the species which are numerous occur principally in the two last-mentioned localities.

Example. *Molossus obscurus*, *Molossus fumarius* of Spix, *Dysopes obscurus* of Temminck. Size of the *Barbastelle* of Europe. Fur composed of hair of two colours, blackish-brown above, and ash-brown below Whiskers at the border of the lips. Length about three inches, three lines. Expansion nine inches. Localities, Brazil and Guiana.



[Head of Molossus obscurus. Skull and front teeth.]

Cheiromeles, Horsfield.

Two incisors above and two below; the upper ones large, approximate, semiconical, and acute, the lower very small and simple. Muzzle conical, sulcated, and with setiferous glandules. Ears distant, patent, with a short, semicordate, obtuse operculum. Axillary pouch ample; but the hind foot, according to Dr. Horsfield, constitutes the chief distinguishing character. The hind foot, or rather hand, 'consists of four fingers, which have the same disposition and structure as in other animals of this family, and of a distinct thumb, essentially agreeing with this member in many *Quadrumana*, and in several animals of the *Rodentia* and *Marsupialia*. It is a complete antagonist to the fingers, enables the animal to take hold of objects, and thus constitutes a perfect hand.'

Example. *Cheiromeles torquatus*, Horsfield, Researches in Java, *Molossus Cheiropus*, Auct.; *Dysopes cheiropus*, Temminck. Length, five inches and a half. Expansion nearly two feet. Localities, Siam and Western Asia.

Nyctinomus, Geoff.

Nose flat, losing itself in the lips, which are deeply slit and wrinkled. Ears large; and hanging with an external earlet. Interfemoral membrane moderate and angular. Tail long, and nearly half of it enveloped. Dental formula: incisors, $\frac{2}{4}$; canines, $\frac{1-1}{1-1}$; molars, $\frac{5-5}{5-5} = 30$. Localities: this form occurs in Africa, Asia, and South America.

Example. *Nyctinomus Ægyptiacus*, Geoff.; *Dysopes Geoffroyii*, Temminck. Reddish above and brown below. Tail slender; Interfemoral membrane enveloping only half of the tail. Locality, ruins and subterraneous places in Egypt.

Dinops, Savi.

Ears united and extended on the front. Lips pendent and plaited. Tail enveloped for half its length in the interfemoral membrane. Dental formula · incisors, $\frac{2}{6}$; canines, $\frac{1-1}{1-1}$; molars, $\frac{5-5}{5-5} = 32$.

Example. *Dinops Cestonii*, Savi. Fur thick and soft, grey-brown, tending slightly to yellowish, but a little browner on the back. Wings black-brown. Muzzle, lips, and ears black, the latter large, rounded, and a little notched on their external border. Tail long, of a brown-black. Locality, the environs of Pisa, where Savi discovered it.

Stenoderma, Geoff.

Nose simple. Ears small, lateral, and isolated; earlet internal. Interfemoral membrane rudimentary, and bordering the legs. No tail. Dental formula: incisors, $\frac{4}{4}$; canines, $\frac{1-1}{1-1}$; molars, $\frac{4-4}{4-4} = 28$: but it should be remembered that Cuvier only allows of two incisors in the upper jaw, instead of four, the number given by Geoffroy.

Example. *Stenoderma rufa*. Fur uniform, chestnut-red. Ears moderate, oval, and a little notched on their external border.

Celæno, Leach.

Two upper incisors pointed and simple; four lower ones contiguous and cylindrical. Two canines above and below, the upper ones largest. Four molars on each side of the jaws, the first pointed and simple, and the three last with their crowns beset with points. Third and fourth finger with three phalanges, the fifth or external with two only. Interfemoral membrane prolonged a little below the toes of the hind feet. Ears separated; earlets simple. No tail.

Example. *Celæno Brooksiana*. Back ferruginous; belly and shoulders yellowish-ferruginous. Ears pointed with the anterior border rounded and the posterior one straight Membranes black.

Aëllo, Leach.

Two upper incisors large, compressed, bifid, and with rounded lobes. Two lower equal, trifid, with rounded lobes. Two upper canines, long, very sharp, with a small projecting point before and behind their base; the two lower smaller and less pointed. Four upper molars on each, the two first pointed and triangular, the second largest, the third bifid, and the fourth trifid externally. Third finger of the wings with four phalanges, fourth and fifth with three. Interfemoral membrane straight. Ears contiguous, short, very large; no earlet. Tail not exceeding the membrane.

Example. *Aëllo Cuvieri*. Colour ferruginous-Isabella. Wings obscure brown. Ears truncated, as it were, at the end.

Scotophilus, Leach.

Four upper incisors unequal, pointed, the intermediate ones being largest and simple, and the lateral ones bifid with equal lobes: six lower incisors indistinctly trifid. Two canines above and below, the upper ones with a small point behind their base, and the corner ones with a similar one in front. Four molars with crowns armed with points. Fourth and fifth fingers of the wings with three phalanges.

Example. *Scotophilus Kuhlii*. Fur ferruginous. Ears nose, and wings brown.

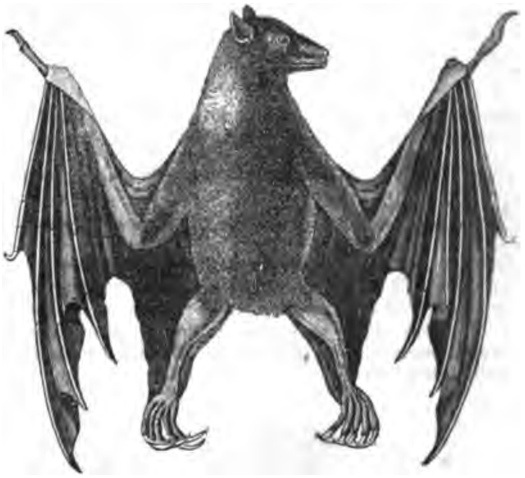
5. Sub-family, *Pteropina*.

We now come to a numerous and widely distributed family containing some of the largest forms of the Vespertilionidæ, and subsisting principally on vegetables and fruits. It is not improbable that the fabulous harpy may have had its origin in some of these enormous bats with their well developed pectoral mammæ.

Molar teeth tuberculated and grooved longitudinally. Wings rounded. Interfemoral membrane and tail often wanting. Index with three phalanges. Head long and hairy. Females for the most part with nursing pouches.

Genera, Pteropus, Brisson. (*Roussettes* of the French.)

A small nail on the index wing-finger. Head conical. Ears short. Tail absent, or rudimentary. Interfemoral membrane very little developed.



[Pteropus Dussumieri.*]

a. Tail-less.

Example. *Pteropus Javanicus*. Upper part of the neck smoky red, rest of the fur blackish, some white hairs mingled with the black ones of the back. Expansion five feet. This is the *Kalong* of the Javanese, which, according to Dr. Horsfield, is extremely abundant in the lower parts of Java, and uniformly lives in society. The more elevated districts are not visited by it. 'Numerous individuals,' continues the Doctor, 'select a large tree for their resort, and suspending themselves with the claws of their posterior extremities to the naked branches, often in companies of several hundreds, afford to a stranger a very singular spectacle. A species of Ficus, in habit resembling the Ficus religiosa of India, which is often found near the villages of the natives, affords them a very favourite retreat, and the extended branches of one of these are sometimes covered by them. They pass the greater portion of the day in sleep,

* For the arrangement of teeth in Pteropus, see Carnivora.

hanging motionless: ranged in succession, with the head downwards, the membrane contracted about the body, and often in close contact, they have little resemblance to living beings, and by a person not accustomed to their economy are readily mistaken for a part of the tree, or for a fruit of uncommon size suspended from its branches. In general these societies preserve a perfect silence during the day: but if they are disturbed, or if a contention arises among them, they emit sharp piercing shrieks, and their awkward attempts to extricate themselves when oppressed by the light of the sun, exhibit a ludicrous spectacle. In consequence of the sharpness of their claws, their attachment is so strong, that they cannot readily leave their hold without the assistance of the expanded membrane: and if suddenly killed in the natural attitude during the day, they continue suspended after death. It is necessary therefore to oblige them to take wing by alarming them, if it be desired to obtain them during the day. Soon after sunset they gradually quit their hold, and pursue their nocturnal flight in quest of food. They direct their course, by an unerring instinct, to the forests, villages, and plantations, occasioning incalculable mischief, attacking and devouring indiscriminately every kind of fruit, from the abundant and useful cocoa-nut which surrounds the dwelling of the meanest peasantry, to the rare and most delicate productions which are cultivated with care by princes and chiefs of distinction. By the latter, as well as by the European colonists, various methods are employed to protect the orchards and gardens. Delicate fruits, such as mangos, jambus, lansas, &c., as they approach to maturity, are ingeniously secured by means of a loose net or basket, skilfully constructed of split bamboo. Without this precaution, little valuable fruit would escape the ravages of the *Kalong*. There are few situations in the lower parts of Java, in which this night wanderer is not constantly observed: as soon as the light of the sun has retired, one animal is seen to follow the other at a small but irregular distance, and this succession continues uninterrupted till darkness obstructs the view. The flight of the Kalong is slow and steady, pursued in a straight line, and capable of long continuance. The chase of the Kalong forms occasionally an amusement of the colonists and inhabitants during the moonlight nights, which in the latitude of Java are uncommonly serene. He is watched in his descent to the fruit trees, and a discharge of small shot readily brings him to the ground. By this means I frequently obtained four or five individuals in the course of an hour.'

[Pteropus Javanicus.]

β. with tails.

Example. *Pteropus stramineus.* Fur reddish yellow; tail very short. Expansion two feet. Brought from Timor by Péron and Lesueur.

γ. with wings on the back.

Cephalotes, Geoff.

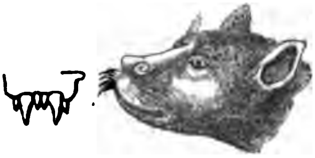
A small nail on the index in one species. Head conical; ears short; tail but little apparent. Interfemoral membrane notched. Flank-membrane springing from the mesial line of the back. Dental formula: incisors, $\frac{4}{6}$; canines, $\frac{1-1}{1-1}$; molars, $\frac{5-5}{4-4}=32$.

Example. *Cephalotes Peronii.* Fur brown or red, and very short. No nail on the index. Wings springing from the middle of the back. Expansion two feet. Locality, Timor. N.B. Temminck thinks that the *Pteropus palliatus* of Geoffroy is the young of this species.

Harpya, Illiger.

Differing from Cephalotes in the want of lower incisors and of the last small molars in both jaws. Geoffroy thinks that the difference between the system of dentition in *Harpya* and *Cephalotes Peronii* is attributable to age only. Dental formula (Pallas): incisors, $\frac{2}{0}$; canines, $\frac{1-1}{1-1}$; molars, $\frac{4-4}{5-5} = 24$.

Example. *Harpya Pallasii*, *Cephalotes Pallasii*, Geoff. Fur consisting of scanty and soft hairs, greyish-ash above, pale white below. A nail on the index. Expansion 1 foot 11 inches. Locality, the Moluccas.



[Head of Harpya Pallasii.]

Cynopterus, F. Cuvier.

Four incisors and two rudimentary false molars in each jaw, like the Pteropi, but they entirely want the last molars. The jaws are abbreviated, and the heads much resemble those of Cephalotes.

Macroglossa, F. Cuvier.

A genus approaching very closely to *Pteropus* and formed by M. F. Cuvier for the *Lowo-assu* of the Javanese, *Pteropus minimus* of Geoffroy, *Pteropus rostratus* of Horsfield. Its character depends upon the extreme length of the head, the absence of false molars, the great development of the posterior molar and the extensile tongue. Dental formula. incisors, $\frac{4}{4}$; canines, $\frac{1-1}{1-1}$; molars, $\frac{5-5}{6-6}=34$.

Example, *Macroglossa Horsfieldii*, *Pteropus rostratus* Horsfield. Temminck is of opinion that *Macroglossa Kiodotes*, *Pteropus minimus*, Geoff., and *Macroglossa Horsfieldii* are identical.

δ. Wings placed extremely backwards.

On the 13th October, 1835, at a meeting of the Zoological Society, Mr. Bennett called attention to a *Pteropine Bat* which had recently been obtained from the neighbourhood of the river Gambia, and which was exhibited. He directed especial notice to two large tufts of white hairs placed upon its shoulders and forming a very conspicuous feature in its appearance. Those, he remarked, might probably cover cutaneous glands destined for the preparation of a secretion fitted to defend that part of the animal in its passage through the air, or perhaps to attract the opposite sex. It could scarcely be conceived that they have any influence in increasing the buoyancy of the animal; although the backward position of the wings might seem to render necessary such a supplemental aid; their position in advance of the ordinary alar membranes gives them, in fact, some resemblance to supplementary wings.

He stated that on account, chiefly, of the position of the wings so far backward as almost to seem to be placed behind the centre of gravity, he was disposed to consider the bat exhibited might be regarded as the type of a new genus, to which the name of *Epomophorus* might be given. But the genus would, he conceived, rest almost entirely on this single character, and he hesitated to propose it definitively until he had an opportunity of examining a specimen preserved in spirit, and consequently not liable to that distortion to which the individual skin exhibited might have been subjected. In one of the two other species of *Pteropi* previously obtained from the same country by Mr. Rendall, and brought under the notice of the Society on July 14th (*Pteropus Gambianus* and *Pteropus macrocephalus*), by Mr. Ogilby, the same backward position of the wings exists. In dentary characters the new species agrees with those just referred to, the only exception being in the presence of a third abnormal incisor on the left of the upper jaw.

Regarding it as a form of some interest to zoologists, Mr. Bennett stated his intention to describe it more fully in a paper which he proposed to prepare on the subject. He characterized it as the *Pteropus epomophorus**. Pale brown, the colour being paler posteriorly; belly white; humeral brush (or epaulette) white and large. Total length, six inches three quarters; length of the head, two inches and a quarter. Expansion twelve inches†.

On the 26th April, 1836, at a meeting of the Zoological Society of London, characters were read of *Vespertilionidæ* observed in the central region of Nepaul; being a communication transmitted to the Society by B. H. Hodgson, Esq., Corr. Memb. Z.S. They had already been published in the 'Journal of the Asiatic Society of Calcutta.'

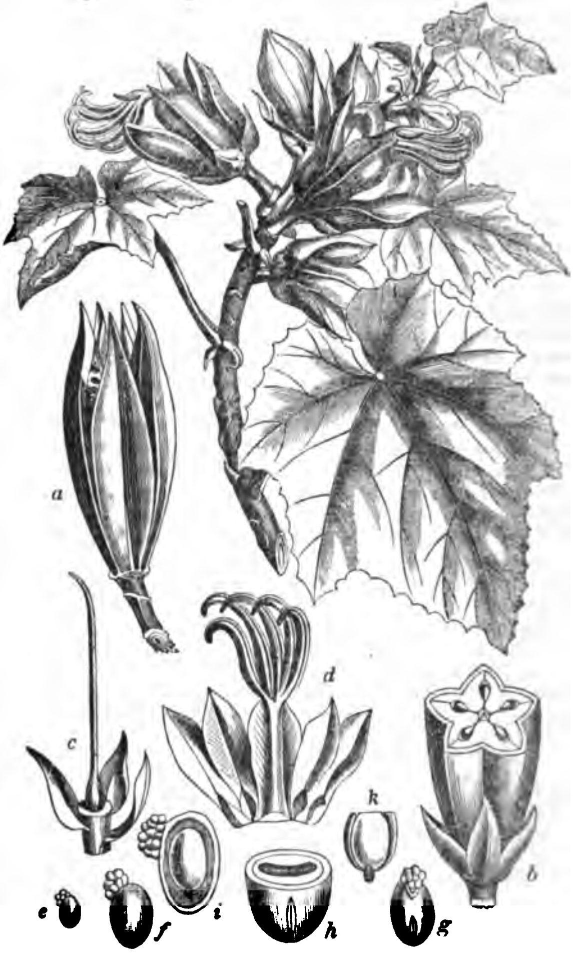
The following are the species characterized in this communication:

Rhinopholus armiger, Hodgs.
Rhin. tragatus, Ej.
Pteropus leucocephalus, Ej.
Pter. pyrivorus, Ej.
Vespertilio formosus, Ej.
Vesp. fuliginosus, Ej.
Vesp. labiatus, Ej.

Mr. Hodgson's characters of these species are accompanied by remarks on the habits of the several genera of bats in the district in which they occur.

Bones of bats of existing species were found in the cavities of the gypsum at Köstritz, mixed with the remains of other existing species, and with the bones of extinct animals.

CHEIROSTE'MON PLATANOI'DES, a most singular plant belonging to the natural order Bombaceæ, and commonly called the 'hand-tree,' in consequence of its stamens being so arranged as to present an appearance somewhat similar to that of a human hand. It is a lofty tree, with the habit of a plane, and a trunk about as thick as a man's body; its head divides into a number of close horizontal branches, which are of a brownish colour towards their extremities in consequence of the number of short fawn-coloured hairs that beset them. The leaves are heart-shaped, slightly seven-lobed, six or eight inches long, and a little toothed; they are a rich deep green on the upper side, and are covered with fawn-coloured hairs on the under side. The flowers are of a bright red, and appear at the ends of the branches; they consist of three external lanceolate brownish bracts, and a bell-shaped fleshy angular calyx, about an inch and a half deep, bright red inside, covered externally with a russet down; it is deeply divided into five lobes, and is marked on the outside at the base with five prominences, which correspond with an equal number of little pits filled with a slightly viscid whitish fluid. There is no corolla. There are five stamens combined into a central column-like tube, from the apex of which proceed five long slender sharp-pointed processes, which are all curved one way, coloured red, and look very much like what one might imagine to be the claws of a demon's hand; on their convex side these processes bear the anthers. The fruit is a large woody five-celled five-valved capsule, with from fifteen to twenty seeds in each cell. The singular form of the stamens and their large size has rendered this tree an object of curiosity and veneration in Mexico from time immemorial; the native Mexicans call it by the unpronounceable name of *Macpalxochiquauhitl*, which the Spaniards translate *Arbol de Manitas*, and the English *Hand-tree*. What made it a greater object of admiration was that in all Mexico only one tree was known, which was near the town of Toluca, about sixteen leagues west of the city of Mexico. The flowers of this plant were so constantly gathered by the Indians as objects of veneration, that the fruit never ripened, and it was not till the year 1801 that cuttings transferred to the Botanic Garden at Mexico struck root, and began to multiply this vegetable wonder. The original tree must be much more antient than the conquest of Mexico, for it has been distinctly described by the Spanish historians. The people of Toluca imagine that the tree is one and indivisible, that no other was ever created, nor any ever propagated; seeds, however, have been produced from the young plants in the Botanic Garden, Mexico, whence they may now be procured without difficulty. Plants of it were thus obtained some years since by Mr. Lambert, of Boyton House, in Wiltshire, and they are not uncommon in large collections. As many Mexican plants are hardy in this country, it has been hoped that this curious tree would prove so too; a plant of it, however, exposed to the winter against a wall in the garden of the Horticultural Society at Turnham Green, near London, perished. And perhaps it is not likely that other attempts will prove more fortunate; for, in the first place, it belongs to the natural order Bombaceæ, which consists entirely of plants impatient of cold; and, secondly, notwithstanding the belief of the Mexicans to the contrary, it is really found wild in Guatemala, where whole forests of it were observed near the city of that name by one of the pupils of Professor Cervantes. The hand-tree is said to form a very large tree, which preserves its leaves all the year round, and forms a fine shady canopy, flowering in November, December, and January. (See Hernandez, *Hist. Plant. Nov. Hisp.*, vol. ii., ed. 2, p. 531; Vetancourt, *Theatr. Mexic.*; Larreategui, *Dissert.*, June, 1795; Tilesius in *Act. Petrop.*, 5, 321, t. ix.; Humb. and Bonpl., *Pl. Æquinoct.*, i., 85.)



[Cheirostemon platanoides.]

a, fruit opened; *b*, section of young fruit, showing the disposition of the seeds; *c*, pistil and bracts; *d*, flower opened to show the tube of the stamens and the five anthers; (all these figures are about one-sixth less than the natural size; those which follow are some of the natural size, and others slightly magnified:) *e*, *f*, *g*, seeds; *h*, *i*, sections showing the situation of the embryo; *k*, the embryo, placed to show the cotyledons.

CHEKE, SIR JOHN, a learned writer of the sixteenth century, descended from an antient family in the Isle of Wight, was born at Cambridge, June 16, 1514. He was admitted into St. John's College, Cambridge, in 1531, where his early studies were chiefly directed to the Latin and Greek languages, the latter of which was then almost universally neglected. After taking his degrees in arts, he was chosen Greek lecturer of the university, and about 1540 became the first professor of that language in the university, upon King Henry VIII.'s foundation. He was highly instrumental in bringing it into repute, and directed his attention more particularly to reform and restore, what he considered, the original pronunciation of it. Cheke, while professor, was at the same time University Orator. In 1543 he was incorporated M.A. at Oxford, where he also studied for a short time; and in 1544 was sent for to court, to be made joint-tutor for the Latin tongue with Sir Anthony Cooke to Prince Edward. He seems also to have had the Lady Elizabeth for some time under his care. About 1544 too he became a canon (it is believed a lay canon, for there

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[*] Called Pteropus Whitei in the index.

[†] Proceedings of the Zoological Society of London. 1835, part iii. p. 149.

is no proof of his having taken orders) of King Henry VIII.'s first foundation of the college in Oxford, which has been since called Christ Church; but upon the dissolution of that foundation in 1545, he was allowed a pension in the room of his canonry. When Edward VI. came to the throne he rewarded Cheke with an annuity of a hundred marks, and made him one or two favourable grants in purchase of monastic property. In 1548 he had a grant of the college of Stoke by Clare, in Suffolk, and in the year following the house and site of the priory of Spalding in Lincolnshire; but surrendered his annuity upon receiving the latter grant. The king likewise caused him, by a mandamus, to be elected provost of King's College, Cambridge. In 1550 he was made chief gentleman of the king's privy chamber, and in 1551 received the honour of knighthood. About this time he was engaged in various conferences and disputations, on the Protestant side, on the subject of the sacrament, transubstantiation, &c. In 1552 he became clerk of the council, and soon after one of the secretaries of state, and privy-councillor. This was the height of Sir John Cheke's fortunes. His zeal for the Protestant religion induced him to approve of the settlement of the crown upon Lady Jane Gray; and he acted for a very short time as secretary to her and her council after King Edward's decease. Upon Mary's accession to the throne he was committed to the Tower, and an indictment was drawn up against him: but he remained in prison, and the year following, having been stripped of his whole substance, received a pardon, and was set at liberty September 3, 1554. Foreseeing the days of persecution, he obtained a licence to travel for some time, and went to Basle, and thence to Italy. At Padua he renewed his Greek studies: and afterwards, in his return from Italy, settled at Strasburg, where he was so reduced in circumstances as to be obliged to read a Greek lecture for subsistence. In the beginning of 1556 he came, by a treacherous invitation, to Brussels, though under misgivings, which were only allayed by the consultation of astrology, a pseudo-science to which Sir John Cheke was unfortunately attached, and which upon this occasion deluded him. Between Brussels and Antwerp he fell into a snare. He was seized by order of Philip II., blind-folded, thrown into a waggon, conveyed to the nearest harbour, put on board a ship under hatches, and brought again to the Tower of London. He soon found that this was on account of his religion. The desire of gaining the reconciliation of so great a man to the Church of Rome induced the queen to send not only two of her chaplains, but Dr. Feckenham, at that time dean of St. Paul's, to endeavour to convert him. The chaplains had no success with their arguments; but Feckenham's were brought into a narrower compass: he said, 'Either comply or burn.' Cheke could not withstand the dreadful alternative. On July 15, after a previous negotiation with Cardinal Pole, he wrote to the queen, and declared his readiness to obey her laws and other orders of religion. He afterwards not only made his solemn submission before the cardinal, but on the 4th of October made a public recantation before the queen, and after that before the whole court. Upon these mortifications his lands were restored to him, but upon condition of an exchange with the queen for others. The papists, by way of triumph, were not merely content with watching him: they obliged him to keep company generally with Catholics, and even to be present at the examinations and convictions of those they termed heretics. Remorse and vexation sate at last so heavy on Cheke's mind, that he pined away with shame and regret. He died September 13, 1557, at the age of forty-three, and was buried in the north chapel of the choir of the church of St. Alban, Wood Street, London. For the list of Sir John Cheke's works, we refer to the authorities whence the present notice of him has been drawn. Some of them are in very elegant Latin. One of his pieces, entitled 'The Hurt of Sedition, how grievous it is to a Commonwealth,' written on occasion of the insurrections in Devonshire and Norfolk in 1549, was reprinted by Dr. Gerard Langbaine of Queen's College, Oxford, in 1641, for the use and consideration of those who took arms against Charles I. Few of Sir John Cheke's works would suit the reading of the present day. Still he was one of the most learned men of his age, one of its greatest ornaments, and one of the revivers of polite literature in England. (Strype's *Life of Cheke*, 8vo. Lond. 1705; *Biogr. Brit.*, old edit., vol. ii. p. 1309; Bliss's edit. of Wood's *Athenæ Oxonienses*, vol. i. p. 241; Chalmers's *Biogr. Dict.*, vol. ix. p. 225.)

CHELIDO'NIUM, a small Papaveraceous genus, the only species of which is a glaucous rather hairy annual, with small yellow flowers, a siliquose capsule, and orange-coloured juice, not at all uncommon in waste places in this country; it is commonly called Celandine, and possesses no useful properties worth naming.

CHE'LMON, a genus of fishes. [CHÆTODON.]

CHELMSFORD, a market-town and parish in the hundred of Chelmsford, and nearly in the centre of the county of Essex, of which it is the county town, 28 miles N.E. by E. from London, on the high road to Ipswich.

Chelmsford derives its name from its situation in the vicinity of an antient ford on the river Chelmer, near its confluence with the river Cam. In the reign of Edward the Confessor, and at the time of the Norman survey, it was in the possession of the bishops of London. But it was never a place of any importance till the reign of Henry I., when Maurice, then bishop of London, built a stone bridge over the river Cam, and diverting the road which previously passed through Writtle, made Chelmsford the great thoroughfare to Suffolk and Norfolk. From this time the town has gradually increased in importance. It consists principally of three streets, which are macadamized, and partially lighted with gas. The houses are generally well built. The inhabitants are well supplied with water from a spring, called Burge's Well, about one mile from the town. The water is conducted through pipes into a reservoir, over which is a dome supported by six Doric columns. A handsome stone bridge was erected over the Cam in the latter part of the last century, connecting the town with the hamlet of Moulsham, and replacing the old bridge built by Bishop Maurice.

The shire hall is a handsome building, fronted with Portland stone. The basement, which is rustic, supports four Ionic pillars; between the pillars are three figures in basso-rilievo, of Wisdom, Justice, and Mercy. In the upper part of the building, besides two commodious courts, are a grand-jury-room and witness-room, and an assembly-room, 86 feet by 30 feet, where public balls are held at Easter and Christmas. Over the chimney-piece of the grand-jury room is a handsome bust of Thomas Gardiner Bramston, Esq., twenty years a chairman of the quarter-sessions. The old jail, built in 1779, is now only used for debtors, and the house of correction, which adjoins it, for female convicts. A new jail has lately been erected about a mile from the town, at Springfield. It is built on the radiating principle, and is capable of accommodating 272 prisoners, although it has contained many more. During the late war two extensive barracks were erected near the town, which could accommodate 4000 men, but they have recently been pulled down. The theatre is a neat building. Races take place annually at Galley-wood Common, about two miles from the town. The market-day is Friday; and fairs are held on the 12th May and 12th November, principally for horses and cattle. The assizes for the county are held here, as well as four quarter-sessions and four petty sessions.

The population of Chelmsford in 1831 was 5435, of whom 2885 were females.

The living is a rectory in the jurisdiction of the commissary of Essex and Kent. The church is dedicated to St. Mary; the body has lately been rebuilt, and is a handsome building, in the later style of English architecture. The tower is square and embattled, and is surmounted by a lofty spire. The archdeacon holds his court in this church, and the wills and records are deposited in an office over the south porch. A new chapel is now being erected by subscription (August, 1836). There are two places of worship for Independents, one for the Society of Friends, and one for Wesleyan Methodists.

The free grammar-school was founded and endowed by Edward VI. The school, in common with those at Maldon and Brentwood, has an exhibition of 6*l.* per annum at Caius College, Cambridge. The management of the school is vested in four hereditary trustees. The school-house was rebuilt in 1782, by R. Benger, Esq., on the site of a more antient one built by Sir John Tyrreil.

Chelmsford has a charity school, for the maintenance, clothing, and education of fifty boys, founded in 1713, and one for twenty girls, founded in 1714, both supported by voluntary contributions; a Lancasterian, an infant, and a national school for children of both sexes; six alms-houses, founded by Sir Thomas Mildmay, were rebuilt in the end of the last century by William Mildmay, Esq. There are also four almshouses in Baddow-lane. (*Communication from Chelmsford.*)

CHELONA'RIUM, a genus of Coleopterous insects. [ELATERIDÆ].

CHELO'NIA (Godart), a genus of Lepidopterous insects, of the section *Nocturna* (Latreille), and family *Arctiidæ* (Leach). Before we proceed with an account of this genus, which contains two of the most conspicuous and beautiful of the British moths, it may be well briefly to state the characters of the family *Arctiidæ*, as far as the diversified habit of the species will admit. The palpi are two in number, mostly three-jointed and hairy. The antennæ have a double series of pectinations; thorax large; the apex of the body generally furnished with a tuft; wings closing so as to form an angle by their junction, or folding horizontally. The males are usually larger than the females; larvæ generally very hairy, frequently furnished with numerous tufts, those on the tail and towards the head the longer.

The genus *Chelonia* is synonymous with *Arctia* of Schrank; the latter name is generally adopted by British entomologists from its priority: the term Chelonia is open to another objection, being commonly used to designate a section of tortoises.

Arctia Caja, *the large Tiger Moth*, is very common in the South of England, but apparently less so in the North. The expanded wings measure from two and a half to three inches in width; the upper wings are of a chocolate-brown colour, with numerous irregular cream-coloured markings; the under wings are scarlet, with five or six large blue-black spots; the body is also scarlet, or pinkish above, with several transverse black bands; on the under side the ground-colour is black, with pink bands: the head and thorax are brown, separated with a red ring; the legs are red at the base, and the antennæ are white.

The caterpillar of this moth is found in great abundance near London, and is frequently seen crawling on pathways: it is covered with long black hairs, and when touched will roll itself up in a ring: it feeds upon a great variety of plants, but seems most fond of lettuce, groundsel, and chickweed. The larva is found in the spring months, and turns into a pupa about June; the pupa is enclosed in a loose web of a white colour; the moth appears in the autumn.

This species is extremely variable in its imago state; we have seen specimens in which the upper wing is nearly all white, and others in which the white is almost obliterated: the spots on the under wing vary also considerably; they sometimes run one into the other so as to form a band.

Arctia Villica, the cream-spot tiger moth, is the only other well authenticated British species; it is far less abundant than the other. The upper wings are black, with about eight large cream-coloured spots; the under wings are yellowish, spotted more or less with black, and has an irregular black fascia near the margin; the abdomen is reddish, spotted with black; the head and thorax are black; the latter has two cream-coloured spots.

The caterpillar very much resembles the one last described, but has a red head and legs of the same colour; like the last it feeds upon various plants, particularly the chickweed. The moth appears about the end of June, and is rather less than the large tiger.

CHELO'NIA (Herpetology.) [TORTOISES.]

CHELO'NIANS. [TORTOISES.]

CHELO'NOBIA. [CIRRHIPEDA.]

CHELONU'RA. [TORTOISES.]

CHELSEA, formerly a village reckoned about two miles from London, but now constituting a portion of the suburbs. It is on the north bank of the Thames, in the hundred of Ossulston, Middlesex. The parish of St. Luke, Chelsea, is stated in the returns of 1831 to contain 780 statute acres and 32,371 inhabitants.

Chelsea is on a slight eminence, about fifteen feet above the Thames. The etymology of the name has raised considerable discussion; in 'Domesday' it is written Cercehede and Chelched, and Sir Thomas More, who had a house here, wrote it Chelchith. In the 16th century it began to be written Chelsey. It was once a favourite place of resort, and many of the nobility and gentry had residences here, and there were several noted taverns and public-houses with gardens, which were much frequented in the 17th and 18th centuries.

The Royal Hospital for invalid soldiers is at Chelsea. In the reign of James I., Dr. Sutcliffe, dean o Exeter, projected a college for the study of polemical divinity, which met with the king's approbation. The foundation-stone of the building was laid on May 8th, 1609. In the charter of incorporation it is termed 'King James's College at Chelsey.' But though royally patronized, and also endowed with considerable revenues by Dr. Sutcliffe, the college never flourished. It was ultimately seized by the parliament during the civil wars, and appropriated to different purposes. Charles II. gave it to the then newly-established Royal Society; but not being adapted to their use, it was restored to the king for 1300*l.* in order that the site might be occupied by the Royal Hospital.

The architect of the Royal Hospital was Sir Christopher Wren. The foundation-stone was laid on the 16th February, 1682, by the king, who was attended by a great concourse of nobility and gentry. The building was completed in 1690, at an expense, it is stated, of 150,000*l.* It is of brick, ornamented with stone quoins, cornices, pediments, and columns. The building consists of three courts, two of which are spacious quadrangles; the third, the central one, is open on the south side next the Thames. It consists of three sides of a square, ornamented with porticos and piazzas, and has a pleasing appearance. The north front is simple in its style, and consists of a centre and wings, in a straight line, with no other ornament than a plain portico. In the centre of the hospital are the chapel and the great dining-hall.

The business of the Royal Hospital at Chelsea is managed by commissioners appointed under the great seal. The establishment consists of a governor and lieutenant-governor, with various subordinate officers. There are usually upwards of 500 invalids in the hospital, who are divided into classes, and regulated by military discipline. In addition to their provision and clothing, they receive a weekly pay, varying, according to rank and service, from 8*d.* to 3*s.* 6*d.* The out-pensioners of Chelsea hospital amounted lately to upwards of 85,000, who receive from 5*d.* to 3*s.* 6*d.* per day.

There is also in Chelsea the Royal Military Asylum. The building is on an extensive plan; the foundation-stone was laid by the Duke of York in 1801, and it was completed in 1805. It is appropriated to the support and education of children (especially orphans) of soldiers and non-commissioned officers.

The Apothecaries' Company of London have a botanical garden at Chelsea. In the centre of it is a statue, by Rysbrack, of Sir Hans Sloane, from whom the company received the freehold of the ground, the consideration paid being an annual presentation of plants to the Royal Society.

The old parish church of Chelsea not being adapted to the wants of the rapidly-increasing population, a new church was erected, which was consecrated in 1824. It is a spacious and magnificent building, in the pointed style of architecture. The old church is now the parish chapel. The parish is in the diocese of London. The average gross annual income of the rector of St. Luke's, Chelsea, is 1003*l.*; he appoints the minister of the parish chapel, whose income is 300*l.*

In the educational returns of 1835, it was stated that there were forty daily schools (exclusive of the Royal Military Asylum) in Chelsea, in several of which there were endowments for educating children gratuitously, and thirty other schools, besides several not enumerated in the return. (Lysons's *Environs of London*; Faulkner's *Chelsea.*)

CHELTENHAM, a town and parish in the hundred of Cheltenham, eastern division of Gloucestershire, 88 miles W. by N. from London, 8 miles N.E. from Gloucester, and 39½ miles N. by E. from Bath. The area of the parish is 3740 acres. The town lies in the east quarter of the parish; it is rapidly increasing, particularly N.W. and S., in which directions the limits of the parish afford ample space for its extension. Cheltenham was created a parliamentary borough under the Reform Act; the borough is co-extensive with the parish, and returns one member. The town is a polling place for the eastern division of the county.

The town of Cheltenham owes its existence to its mineral springs and its pleasant situation. The Cotswold hills form an immense amphitheatre on the N.E.; and the valley in which it lies being open on the S. and W. renders its temperature equable and agreeable. A saline spring was discovered here about the year 1716; some years afterwards it was inclosed, and invalids began to visit the place in summer; but it was not till near the end of the eighteenth century that the few houses constituting Cheltenham assumed the appearance of a town. The discovery of a number of additional springs favoured its increase. In 1811 the population of the parish, more than one-half of which was concentrated in the town, was 8325; in 1821 it was 13,396; and by 1831 it was 22,942, showing an increase of 9546 in ten years. The number of houses in 1821 was 2,550; in 1831, 4349, of which latter number 2067 were taxed at 10*l.* and upwards. The amount of assessed taxes paid by the entire parish (which includes the town) was, in 1830, 21,184*l.*

Cheltenham is entirely dependent on its visitors, who are generally either persons who have no occupation or invalids of the more affluent classes. This circumstance, and the additional one, that the town is of recent creation, will sufficiently account for the fact that as to the construction of the buildings and the general arrangement of the place, Cheltenham is a very agreeable residence. The town consists of one spacious street, about a mile in length, with several branching from it at right angles. The different places of public amusement, the pump-rooms, hotels, and lodging-houses, are rather superior to what are usually found in places of similar resort. There is a large gravelled promenade, called the Well Walk, about 600 feet in length, and 20 in breadth.

In addition to the parish church, which is a fine old building, there are four episcopal chapels. Two of these, in 1835, were held by the parish incumbent, whose gross average annual income is returned at 1170*l.*; the ministers of the other two chapels have 250*l.* each. The parish is in the diocese of Gloucester. In 1835 the number of schools, daily and Sunday, in Cheltenham was 52, of which two were charity schools. There is an hospital and some minor charities. There is a railroad from Cheltenham to Gloucester. A small rivulet called the Chilt, which has given name to the parish and hundred of Cheltenham, runs past the town, and falls into the Severn. There are a variety of detached houses, some of them very handsome, in the vicinity of Cheltenham, which add to the beauty of the surrounding country.

CHELTENHAM, WATERS OF. In all the springs which emerge from the sandy vale of Cheltenham, the sulphate of soda or chloride of sodium predominates; so that they belong to the class of saline waters. It is worthy of notice that most of the saline springs of Great Britain take their rise in the new red sandstone formation. Mr. Gairdner remarks however that those of Cheltenham rise in a stratum of blue clay abounding in iron pyrites, which reposes on the inferior oolite limestone; a circumstance which, according to him, furnishes an explanation of the well-known fact, that these mineral waters are strongest when first opened, and gradually decrease in strength until it becomes necessary to sink new wells in order to obtain water of the requisite strength. The specific gravity of the water of four of the springs belonging to Thompson's Spa was observed to be diminished, and two to be increased, between 1817 and 1820, to such a degree as to excite the surprise of chemists. The number of springs at present is fourteen, each of which presents some slight difference in the amount of the saline ingredients and their concomitants. The most important differences are owing to the presence of iron in some, occasionally accompanied with carbonic acid and sulphuretted hydrogen. Iodine in the proportion of about one grain to a gallon of the water exists in most of them, except the Pittville spring, in which however bromine is found in the proportion of one grain to six gallons of the water. Those in which no iron exists partake much of the nature of sea-water, and resemble it in effects when used internally; while those in which it is present are of a chalybeate nature, and, especially when the quantity of carbonic acid is considerable, can be borne by persons who cannot tolerate the simple saline waters, and can likewise be used for a much longer time without inducing debility. It is sometimes advisable to change from one kind to another, according to the state or progress of the patient; all which points will be regulated by physicians on the spot.

The persons most benefited by the Cheltenham waters are those who, after a long residence in hot climates, are affected with diseased liver; and also those who by indulgence in good living have weakened the stomach and intestines. The mucous accumulations which occur in the bowels of children subject to worms are best removed by a course of the pure saline waters, followed by the aërated chalybeate or the sulphureous chalybeate. Children subject to glandular enlargements derive much benefit from those which contain iodine along with iron.

CHEMISTRY, from χημεία (*chemeia*). According to Suidas (in voc. χημεία) it was 'the making of silver and gold,' or what is now more generally known by the name of alchemy. [ALCHEMY.] Suidas adds that Diocletian burnt all the antient books of the Egyptians on chemistry (as above explained), in order that the Egyptians might no longer be able to acquire wealth by the practice of this art, and thus be encouraged to resist the Romans. We may probably infer from this that cheméia is an Egyptian word; and if so, its resemblance to Cham or Chem, the genuine name of the country, is a confirmation of this supposition as to its origin. But whatever may have been the original meaning of the word, it no longer includes the imaginary process above-mentioned. Various definitions of its present meaning have been given, which do not materially differ; there is a collection of these definitions in the 'Supplement to the Encyclopædia Britannica,' vol. iii. p. 1. From these we shall select Dr. Black's, which is as follows: 'Chemistry is the study of the effects of heat and mixture, with a view of discovering their general and subordinate laws, and of improving the useful arts.' According to Dr. Thomson, 'the object of chemistry is to determine the constituents of bodies, and the laws which regulate the combinations and separations of the elementary particles of matter.'—*Inorganic Chemistry*, vol. i. p. 1.

It would be useless to attempt an early history of chemistry: indeed it has been asserted, and perhaps truly, that it sprang from delusion and superstition, and was at its commencement on a level with magic and astrology. The knowledge possessed of this science before the time of Constantine has been thus summed up by Bergman: 'Some general idea may be formed of the state of chemistry in those days, from the consideration of the several subjects of the art with which they seem to have had no acquaintance. Except the acetous, no trace can be discovered of any other acid. The mineral alkali (carbonate of soda) was known to them by the name of nitre; but of the vegetable alkali (potash) they knew little; of the volatile (ammonia) they were altogether ignorant. Of neutral salts they had the marine (common salt), and the ammoniac (muriate of ammonia). Of earthy salts, they had native alum only; and of the metallic salts, copperas and native green vitriol.'

Of earths, they seem to have distinguished the calcareous and argillaceous; and of stones, a very considerable number.

Of inflammable simple substances, they were acquainted with sulphur, expressed oils, and oils distilled *per descensum*. But they knew no other method of extracting the essential oils than by the means of the unctuous. We find no account whatever of spirit of wine or æther.

Of the seven perfect metals hitherto known, they were acquainted with all but platinum; but they were ignorant of the imperfect. Some authors, indeed, make a distinction between tin and white lead, which was perhaps zinc, bismuth, or regulus of antimony. But it is impossible to draw any certain conclusion with respect to this; when even Pliny distinguishes between hydrargyrum and argentum vivum.

Expressions, digestions, and decoctions, were almost the only operations in their chemistry. Perhaps indeed they used some varieties of elixation, evaporation, and inspissation; as likewise of crystallization, sublimation, calcination, distillation *per descensum*, fusion, eliquation, vitrification, and fermentation. From the authorities, therefore, already cited, continues Bergman, 'it may be naturally inferred, that at the period under consideration the dawn only of chemistry had made its appearance; and that it was rather a collection of unconnected and ill-founded axioms, the result of observation and remarks, than a science established upon the broad basis of an infinite variety of experiments. At this time they were in want also of the proper instruments, and unacquainted with the necessary steps by which the principles of natural bodies can be exactly separated, collected, and properly defined. They were, therefore, without those means so necessary to the evolution of truth, and the construction of a genuine system.'—*Physical and Chemical Essays*, vol. iii. p. 91.

From the seventh to the seventeenth century, or what Bergman terms the middle age, many important facts were discovered, and several products were added to the meagre list which has been given. We shall now notice the various new preparations, which include some most important instruments of analysis. It has been mentioned that up to the present period, the acetic acid was the only one known; but several new acids were now added. Basil Valentine described the process for making what he calls oleum vitrioli, a name by which it is commonly yet known, though more correctly called sulphuric acid, from green vitriol, or sulphate of iron; and Dornæus describes another process for preparing the same acid, which, on account of the form of the vessel used in making it, was called oleum sulphuris per campanam. Nitric acid was obtained by Raymond Lully from nitre; his process was much improved by Glauber, who employed, as at the present time, sulphuric acid to decompose the nitre; by this he produced the acidum nitri fumans, or Glauber's spirit of nitre; from common salt the same chemist procured by means of sulphuric acid the spiritus salis Glauberi, since called marine, muriatic, or hydrochloric acid. Aqua regia was prepared by Hollandus, by distilling a mixture of nitre and brine; this fluid was so named on account of its power of dissolving gold, the king of metals.

Several salts and some alkaline bodies were also discovered, or more perfectly known, during this period. Geber describes the process of rendering the alkali of tartar (carbonate of potash) caustic by means of lime; he takes some notice also of the carbonate of soda, and he mentions borax. Glauber described the salt which yet bears his name, the sal mirabile Glauberi, or sulphate of soda; he described also what he terms sal secretus, which is sulphate of ammonia. Raymond Lully added some important observations: he mentions the deliquescent property of potash, and the production of the volatile alkali, or ammonia, by putrefaction; and Basil Valentine notices its evolution from sal ammoniac by the fixed alkalis.

To Crollius chemistry is indebted for the preparation, or at any rate for the description, of several saline substances: thus he terms the salt obtained by saturating vitriolic acid with the alkali of tartar tartarus vitriolatus, a name not yet quite extinct; but he does not appear to have been aware that this salt, when obtained by other processes, was similar in its nature. Crollius also mentions the salt or acid of amber; and Bartholetus, sugar of milk. The digestive salt of Sylvius was also discovered by the chemist whose name it bears: it has since been named muriate of potash: its present appellation is chloride of potassium.

Of the earths in general but little was known, and even that little, Bergman remarks, was unsupported by the principles of chemistry; clay was distinguished from sand, but not by its genuine chemical characters. Except alum, few earthy salts were known. Hollandus describes chloride of calcium under the name of sal ammonia fixus.

Among the metals, antimony was described by Basil Valentine in 1490; bismuth by Agricola in 1530; and zinc by Paracelsus also in the sixteenth century. Bergman says that Schroeder describes the process of reducing arsenic in his Pharmacopœia of 1649; but Brandt first examined it with considerable accuracy in 1733. Many metallic salts were known and examined in this period. Nitrate of silver was called magisterium argenti, vel chrystalli Dianæ; when fused it was, as now, used as a caustic, and was called by Angelo Sala lapis infernalis. Crollius gave the appellation of luna cornua to chloride of silver; he mentions also mercurius dulcis, or calomel. The binoxide of mercury prepared by nitric acid, he calls Arcanum Corallinum Paracelsi; acetate of tin, sal Jovis; and deutoxide of antimony, antimonum diaphoreticum.

Basil Valentine gives an account of acetate of lead, under the name of saccharum Saturni, and mentions the butter of antimony, or chloride; and the white precipitate obtained from it by water is called mercurium vitæ by Paracelsus, and pulvis angelicus by Algarotti. That important medicine, the tartrate of potash and antimony, was first used by Mynsicht, and called tartarum emeticum. Basil Valentine and Paracelsus observed, that muriate of ammonia combined and sublimed with some metallic oxides, producing in the case of iron a compound originally called flores martiales. It has been already noticed, that the sulphates of iron and copper were known by the names of green and blue vitriol, and their nature was understood; in this period the white vitriol, or sulphate of zinc, was made, though its composition was imperfectly elucidated.

That sulphur was known before the age we are now treating of has been already mentioned; but in this period Basil Valentine describes a solution of it in the fixed alkali, potash. Beguinus mentions it as dissolved in the volatile alkali, or ammonia, and Vigenerus suspected that it was composed of phlogiston and vitriolic acid. Basil Valentine mentions the sulphuric and nitric æthers, but very slightly; but Crollius has described distinctly the art of preparing the former. Thaddeus, Villanovanus, and Raymond Lully describe spirit of wine, and the last calls the strongest spirit alcohol, a name which it yet retains; he mentions the separation of the water by means of carbonate of potash, while Basil Valentine prefers lime for the same purpose. Raymond Lully described the aërated volatile alkali, or carbonate of ammonia. Aëriform bodies began to excite attention at this period. Van Helmont noticed some of the properties of what he calls gas sylvestre, or carbonic acid gas; he observes that it is invisible, but that it was fixed in bodies, and he attributes the phenomena of the Grotto del Cane to its presence.

From the middle till towards the end of the seventeenth century several learned societies were formed. The Academy del Cimento was founded at Florence in 1651, the Royal Society at London in 1660, and the Academy of Sciences at Paris in 1666: these societies greatly promoted and advanced physics and experimental chemistry. In 1700 the Prussian Academy also took its rise, on the model of that of France. Before, however, these societies existed, a curious work was published in 1630 by Jean Rey, a physician of Perigord; it is entitled *Sur la Recherche de la cause par laquelle Estain et le Plomb augmentent de poids quand on les calcine.* In this work, which excited little or no attention among his contemporaries, the author, without apparently making any experiments, but relying upon those of others, shows that the weight which metals acquire during calcination is derived from the union of air with the metal; he supposes that air is miscible with other bodies besides metals, and states that it may be expelled from water. Rey is generally considered as the person who first showed that air is fixed in bodies during calcination; but in support of this opinion he quotes Libavius, Cardan, and others, as having ascertained the increase of weight in lead by its conversion into a calx.

Newton himself contributed some new and general ideas on chemical phenomena to the Royal Society; he observes that sugar dissolves in water, alkalis unite with acids, metals dissolve in acids, and he inquires whether these effects are not occasioned by an attraction between their particles. Copper dissolved in aquafortis is thrown down by iron. Is not this, he inquires, because the particles of the iron have a stronger attraction for the particles of the acid than those of copper; and do not different bodies attract each other with different degrees of force?

The principal and early chemical investigators of the Royal Society were Boyle, Hooke, and Slare. The first of these was the greatest chemist and one of the most active experimenters of his age; to him the science is indebted for the introduction of tests, or re-agents, for detecting the presence of other bodies; he overturned the idea which was then commonly entertained, that the results of the operation of fire were the real elements of things. Respecting inflammable bodies, acids, alkalis, and combination, he ascertained several important facts. The air pump, which had been invented by Otto von Guericke of Magdeburg, was improved by Boyle and Hooke, and rendered an important instrument in chemical investigations respecting air; they concluded, also, that air was absolutely necessary to respiration and combustion, and that a portion only of the atmosphere was employed in these processes. Hooke, indeed, arrived at the sagacious conclusion, that the part of the air necessary to the above-named processes is the same as that contained in nitre, and that during the chemical process of combustion this matter combines with the burning body.

In 1674, Mayow of Oxford published his tracts on various philosophical subjects. He seems to have been struck with the analogy subsisting between the phenomena of respiration and combustion; many of his conclusions were correct, though some of them were erroneous. He burned a candle under a bell glass, and found the residual air so deteriorated as to be incapable of continuing combustion; he then caused a mouse to breathe a similar quantity of air, and the necessity of its renewal was soon apparent; after this, he put a mouse and a candle together under the same glass vessel, and he found that it lived only half as long as it had existed when alone under the glass. He then reversed the order of experimenting, and endeavoured to fire combustible matter in air which had been spoiled by breathing, and finding no combustion took place, he concluded that 'the nitro-aërial particles are absorbed both by the candle and the animal.' Mayow's work contains a chapter relating to the 'mutual action of salts of a contrary kind,' or to chemical combination and decomposition. A great number of new and curious facts are described in this dissertation.

Although a certain degree of similarity is observable in the views of Boyle, Hooke, and Mayow, respecting the operations of combustion and respiration, yet hitherto no theory had been attempted on a broad basis to account for chemical phenomena. But about this period, Germany, which still continued the great school of practical chemistry, gained additional credit by the labours of Becher, who was born at Spires in 1645; he studied metallurgy and mineralogy with great assiduity, and although he did not greatly add to the collection of chemical experiments, he improved the instruments of research, and rendered manipulation more simple. His opinions were, that the elements of bodies are air, water, and three earths, one of which is inflammable, another mercurial, and another fusible; these three earths, combined with water, he supposed to constitute a universal acid which is the basis of all other acids. He entertained several other notions which are now known to be utterly at variance with the results of experiment; his greatest merit was the contrivance of a theory by which all known facts were connected, and deduced from one general principle. This theory was adopted and considerably modified by Stahl, and was by him promulgated in so imposing a form as to be received by the chemical world almost universally for nearly a century. We shall therefore now give a brief account both of this author and his opinions, long known as the Stahlian theory.

George Ernest Stahl was born in the year 1660, at Anspach. The most important of his works is his 'Fundamenta Chymiæ Dogmaticæ et Experimentalis,' which is divided into a theoretical and practical part. The idea that the metals were earthy substances impregnated with an inflammable principle had been advanced by Albertus Magnus. Becher maintained the existence of this principle, not only as the cause of metallization, but likewise of combustibility; and Stahl much improved this view of the subject, and supported it by many ingenious and elaborate experiments. To the peculiar principle he gave the name of phlogiston; the doctrine was called the Stahlian theory. It raised the reputation of the author to the highest degree, and placed him in the first rank of chemical philosophers.

In explaining the phlogistic or Stahlian theory, it is to be understood that Becher and Stahl considered all combustible bodies as compounds; during combustion one of the principles is supposed to be dissipated, while the other remains. Thus when charcoal is burnt, it is entirely dissipated. Stahl therefore supposed that it was phlogiston, or the inflammable principle, nearly pure; by heating charcoal with metals which had been reduced to calces, or what were termed metallic earths, they resumed their metallic appearance and properties; therefore the metals are compounds of metallic earths and phlogiston. Again, by heating Glauber's salt, which is a compound of sulphuric acid and soda, or the fossil alkali, with charcoal, a compound of sulphur and alkali is obtained. Sulphur, therefore, was supposed to be a compound of sulphuric acid and phlogiston. Now though it had been shown by Boyle that sulphur would not burn without air, and though he had stated that sulphur was contained in the acid, and not the acid in the sulphur, yet Stahl entirely neglected, in forming his theory, the influence of air in producing the phenomena on which it was founded. The first promulgation of the theory overlooked the simple fact which had been before stated, that metals, instead of becoming lighter by being burnt, as ought to have happened, had they lost anything, actually become heavier by the operation. Those who afterwards refined upon the theory, endowed phlogiston with a principle of levity, and thus the difficulty was for a time removed, but only to be revived with redoubled force, and this difficulty, when it came to be duly appreciated, proved fatal to the theory of phlogiston.

The merits of Stahl are thus briefly stated by Sir H. Davy:—'Though misled in his general notions, few men have done more than Stahl for the progress of chemical science. His processes were, many of them, of the most beautiful and satisfactory kind: he discovered a number of properties of the caustic alkalis and metallic calces, and the nature of sulphurous acid; he reasons upon all the operations of chemistry in which the gaseous bodies are not concerned with admirable precision. He gave an axiomatic form to the science, banishing from it vague details, circumlocutions, and enigmatic descriptions, in which even Becher had too much indulged; he laboured in the spirit of the Baconian school, multiplying instances and cautiously making inductions, and appealing in all cases to experiments, which, though not of the most refined kind, were more perfect than any which preceded them.'

Several chemists of the phlogistic school followed, who contributed to the advancement of chemical science. Caspar Neumann was born at Züllichau, in Germany, in 1682. In 1724 he was appointed professor of chemistry in the Royal College of Physic at Berlin. Dr. Lewis, in the year 1759, published a translation of his works, entitled 'The Chemical Works of Caspar Neumann, M.D.,' &c. It would perhaps be difficult to mention any very important discovery contained in this work; but there are several facts, which, as facts are always valuable, must still give it a place in the library of a chemist.

John Henry Pott was born at Halberstadt, in the year 1692, and died in 1777. On the death of Neumann, in 1737, he succeeded to the chair of practical chemistry. He was a chemist of great learning and industry. The greater part of his works were collected and translated into French in 1759. In his dissertation on bismuth and zinc, he has collected the statements of all former writers, and described their properties with minute accuracy.

In the year 1709, Andrew Sigismund Margraaf was born at Berlin: he died in 1782. He made some valuable experiments on phosphorus, and on the method of extracting it from urine; he first determined the properties of alumina, demonstrated the nature of soda, and gave an easy process for preparing pure silver from its chloride. His chemical papers, down to the year 1762, were published in Paris, 1762, in two small volumes: but they do not contain all his memoirs.

In 1630 John Kunckel was born in the duchy of Schleswig; he died in 1702. In 1678 he published a treatise on phosphorus which had been originally discovered in 1669 by Brandt, an alchemist of Hamburg; all that Kunckel knew of its properties was that it was procured from urine, &c., and from this, after some years' application, he succeeded in obtaining it. The remainder of his works, excepting a treatise on glass-making, are not of great importance.

Nicholas Lemery was born at Rouen in 1645, and died in 1715. He was not the author of any very prominent discovery, but his 'System of Chemistry' contained nearly all that was known respecting the science, and the language in which it was written was more simple than that of those who preceded him. He attempted to explain the cause of earthquakes by an experiment which showed the vivid action that occurs when large quantities of iron filings and sulphur are mixed and allowed to act upon each other.

Homberg was born in 1652, in the island of Java. His papers on chemical subjects were numerous; there are however but few of them which are likely to excite much attention in the present state of the science, nor did they greatly contribute to enlarge its boundaries. The pyrophorus known by his name was prepared by mixing human fæces and alum, and heating the mixture to redness till it became a carbonaceous powder. It has been since found that carbonaceous matter in preferable forms may be used with the alum, as honey, flour, or gum. The nature of the combustion of this pyrophorus was first explained by Davy.

Henry Louis Duhamel was born at Paris in 1700, and died in 1781. He published many papers on chemical subjects. His chief contribution to the science was that of pointing out the difference between potash and soda, which had been formerly confounded.

Peter Joseph Macquer was born at Paris in 1718, and died in 1784. He first pointed out the existence of arsenic acid and the nature of several of the salts which it forms with bases; he afterwards published some important experiments on Prussian blue, and such as tended to the discovery of the nature of its colouring ingredient. He made severa experiments on platinum, though without any very beneficial results to chemistry. He was the author of a Chemical Dictionary, which has been translated into many languages.

We have mentioned most of the chemists who contributed valuable additions to the science before the introduction of pneumatic chemistry. To speak of them all would require a volume. We now therefore approach, or rather commence a most important æra in the history of chemical research and discovery. Hitherto, except what had been done by Rey, Mayow, and Boyle, the effects produced by aëriform bodies, and their relation to the phenomena of chemistry, had almost entirely escaped observation; or at any rate they had been but very slightly and imperfectly considered, as shown with respect to the increase of weight which occurs during the calcination of metals, and which was rather attributed to a principle of levity in the phlogiston lost by them, than the acquisition of weight from the air.

Dr. Hales was born 1677, and died in 1761. About 1724 he recommenced the examination of aëriform bodies which had previously engaged the above-named philosophers; he attempted to ascertain the chemical relations subsisting between air and other bodies, and to determine the circumstances under which air is absorbed or extricated by natural processes. The results which he obtained were curious and important; but, owing to a fundamental error in his ideas, he drew but few inferences which contributed to elucidate the intricate and hitherto imperfectly explored paths of the science. The idea which he entertained of one elementary principle as constituting elastic matter modified by the effluvia of fluid or solid bodies, greatly aided the formation of those more just views which later and more refined experiments have since contributed to unfold. He subjected a vast number of bodies to the action of heat, and obtained gaseous products from them; thus he found that the air which he obtained from wood was fatal to animals; from nitre he procured nearly 200 times its volume of air, and from coal one third of its weight. He found that oil of vitriol, when poured on iron filings, produced very little air, but that the addition of water occasioned its evolution in large quantity. In no case, however, were the gaseous products thus procured examined with the attention which might have been expected from the novelty of the results. He also found that when phosphorus was burnt in air, the quantity of air was diminished, and white fumes were produced; but he neither examined the residual air, nor did he inquire into the nature of the white fumes resulting from the combustion of the phosphorus.

The experiments contained in his Statical Essays, published in 1727, were made to prove the transpiration of trees, and also the force with which they imbibe moisture. These experiments are not however immediately connected with our present subject.

In 1718 Geoffroy published tables of affinity; and although the affinity has since been discovered to be modified by a variety of circumstances, yet these tables have certainly been of use.

Dr. Black, Professor of Chemistry in Edinburgh, published, in 1756, his researches on calcareous, magnesian, and alkaline substances. He showed that there existed in these substances an aëriform body, possessing chemical and physical properties, perfectly distinct from the air of the atmosphere; he proved that marble and chalk contained this body capable of an aëriform existence, and that its presence constituted the difference between them and quicklime; he showed also, that it was capable of being expelled from earthy and alkaline substances by the action of an acid, and when the air thus set free was collected and examined, he found it to possess the properties of a weak acid.

Great opposition was offered to the new and important conclusions which were promulgated by Dr. Black: thus, among others, Meyer, a German chemist, attempted to prove that limestone became caustic by combining in the fire with a peculiar substance, and not, as Dr. Black had proved, by losing aëriform matter. The loss of weight which the limestone suffered was however almost a sufficient proof of the accuracy of Dr. Black's views; and, in a few years from the date of their promulgation, the opinions of Black were universally admitted to be correct.

The existence of an elastic fluid different from that of the atmosphere, greatly excited the attention of experimentalists, and they were soon led to inquire whether others might not also exist. The various gases obtained by Hales were now regarded with different views; and, before many more years had elapsed, numerous and peculiar aëriform bodies were discovered by various processes. Dr. Black's experiments on what he termed latent heat are remarkable for their simplicity, and the precision of the inferences drawn from them.

Mr. Watt derived great advantage from these in his celebrated improvements on the steam-engine.

About the year 1765, Mr. Cavendish (who was born in 1731, and died in 1810) discovered and described the properties of inflammable air, since called hydrogen gas; and he invented an apparatus for collecting and examining elastic fluids, which, although extremely simple, has been completely set aside by the more convenient methods proposed by Dr. Priestley. He ascertained the relative densities of fixed air, inflammable air, and common air.

Having stated the general properties of hydrogen gas, he shows that different metals, when dissolved in similar portions of the same acid, afford different quantities of this gas: that zinc yielded more than iron, and iron more than tin, facts which are perfectly consistent with and explained by the doctrine of equivalents; he ascertained the exact proportions of the constituent gases of the atmosphere. His most celebrated discoveries were however those of the composition of water and nitric acid; and he first determined the freezing point of mercury.

His character, as a philosopher, is thus sketched by Sir H. Davy:—'Cavendish was possessed of a minute knowledge of most of the departments of natural philosophy: he carried into his chemical researches a delicacy and precision which have never been exceeded: possessing depth and extent of mathematical knowledge, he reasoned with the caution of a geometer upon the results of his experiments; and it may be said of him, what perhaps can scarcely be said of any other person, that whatever he accomplished was perfect at the moment of its production. His processes were all of a finished nature; executed by the hand of a master, they required no correction; the accuracy and beauty of his early labours even, have remained unimpaired amidst the progress of discovery, and their merits have been illustrated by discussion, and exalted by time.'

The important discoveries of Dr. Joseph Priestley next claim attention. He was born in 1733, and died in 1804. No person ever commenced a career of discovery under circumstances less likely to insure success than Dr. Priestley. He was but imperfectly acquainted with chemical science he had but little leisure, his apparatus was very deficient, he had frequently to invent new modes of operating, and with means which were extremely scanty. All these difficulties he surmounted with indefatigable industry and ingenuity, and to him we owe the most important discoveries which have ever been made.

Pneumatic chemistry had, to a certain extent, been studied, as already shown, by Boyle, Mayow, Hales, and especially by Black and Cavendish, when Dr. Priestley began his experiments. His first memoir was published in 1772, and was on the method of impregnating water with carbonic acid gas. This paper was the result of his accidentally living near a brew-house, in which he had made experiments on the carbonic acid evolved during fermentation. Among the gaseous products which Dr. Hales obtained was that now called nitric oxide, but he did not inquire into its properties. It was again discovered, and minutely examined by Dr. Priestley, who applied it to the purposes of eudiometry, a branch of the science which may almost be said to have originated with him, and in consequence of this discovery.

Azotic gas had undoubtedly been obtained, but was not examined by Hauksbee when he passed atmospheric air over ignited metals; Dr. Rutherford also noticed it about 1772, and to him the priority of the discovery is generally assigned. It appears however that Dr. Priestley had obtained it, and noticed its properties at least as early, and perhaps sooner, for he gives an account of it in the *Philosophical Transactions* for that year.

His greatest discovery was that of what he called dephlogisticated air, now called oxygen gas. This important accession to chemical science was made on the 1st of August, 1774. He procured it by strongly heating red oxide of mercury, formed by the action of heat and air upon the metal, and collecting the gas which was evolved from it. The consequences of this discovery would require a volume its description; it has served as the basis for all that is known respecting the nature of the atmosphere, water, acids and alkalis; and the nature of combustion has been greatly illustrated by it.

Sulphurous acid, fluosilicic acid, muriatic acid, and ammonia were first made known in the gaseous state by Dr. Priestley; he discovered nitrous oxide gas, and first obtained carbonic oxide gas, the nature of which however he mistook. He did not discover hydrogen gas, but his experiments upon it are interesting; he pointed out the existence of carburetted hydrogen gas, though he did not make many experiments upon it.

The action of electricity on various compound gases was examined by him, and he showed that an acid is formed when sparks are passed through a confined portion of atmospheric air; this fact served as the basis of Cavendish's discovery of the composition of nitric acid. In the same way the increase of bulk which he found to take place by the action of the same agent on ammoniacal gas led Berthollet to determine the nature of it. His experiments on the amelioration of atmospheric air by the process of vegetation are highly curious, and have been repeated and confirmed by subsequent investigations. His work entitled 'Experiments and Observations on different kinds of Air' contains a vast number of experiments, from which various inferences might be drawn, which he seems, in his rapid career of discovery, himself to have overlooked: such are those just mentioned; and the composition of atmospheric air and water might be added to the list.

His additions to the means previously known for experimenting on gaseous bodies have afforded the greatest facilities to those who have followed him: such are the invention of the pneumatic trough, and the substitution of mercury for water in those gases which are soluble in the latter fluid. To conclude with the observations of Sir H. Davy: 'Chemistry owes to him some of her most important instruments of research, and many of her most useful combinations; and no single person ever discovered so many new and curious substances.'

The works of Torbern Bergman (born in 1735, died in 1784) have been collected and translated into English. The first paper which he published was in 1774, 'On the Aërial Acid,' now called carbonic acid gas. If the contents of this paper be compared with the previous one of Cavendish on the same subject, it will be seen that the latter had anticipated Bergman on many of the more important facts. No notice however is taken of Cavendish's experiments in it.

He afterwards published papers on the 'Analyses of Mineral Waters,' and though the methods which he adopted are by no means accurate, they were preferable to any which had been previously used.

He published a paper on oxalic acid, of which however the discovery is said to be due to Scheele. It will be scarcely possible to enumerate even the various papers of Bergman, and much less to give an analysis of their contents. His 'Essay on Electric Attractions' is however a work of importance, and requires a more detailed notice. The intention of the author was to point out the nature of chemical affinity, and to account for the anomalies which that complicated subject appears to present. He adopts it as a principle that chemical combination is the result of an absolute force. Berthollet attempted to show that this conclusion is erroneous, and though it must be admitted that there are various circumstances which modify the action of this power, we are not so nearly without a guide to just conclusions as the experiments and opinions of Berthollet would lead us to admit.

Bergman published tables in fifty-nine columns, in which he showed the relative attraction of bodies, or what he terms elective affinity. As the order of decomposition often varies, according as it is made in the dry way or the moist, each of the fifty-nine columns was divided into two; the first exhibiting the order of decompositions in the moist, and the second in the dry way: he also stated various cases of double decomposition. These tables are constructed upon the now well-known principle, that any substance, whether and alkali, or metallic oxide, being placed at the head of a column, and others under it, such substance has the greatest affinity for that next to it, and for the rest, according to the nearness of their place.

It has been already observed that Bergman's processes for analyzing mineral waters were more correct than any which had been previously adopted, and although his experiments on the analysis of precious stones are far removed from perfection, yet they possess the rudiments of the methods which are now adopted. He first proposed the analysing of minerals by combining them with the fixed alkalis, by which they were rendered partially soluble in water, and totally so either in that fluid or in an acid.

He found fulminating gold to contain ammonia, and he explains the detonation to arise from the sudden decomposition of that gaseous body.

The discoveries which next claim attention are those of Charles William Scheele, who was born at Stralsund in 1742, and died in 1786. Like Priestley, Scheele began his experiments under very unfavourable circumstances with respect to apparatus and the means of procuring it.

Scheele, observing that air was requisite to combustion, subjected it to analysis. He found that certain substances, especially what was then termed liver of sulphur, and now sulphuret of potassium, when exposed to a given bulk of air, diminished it to about four-fifths of the original quantity; he found also that the flame of burning sulphur and of hydrogen gas produced the same effect. Without any acquaintance with what Priestley had previously done, he obtained, by various processes, oxygen gas, which he termed empyreal air; and he showed that this air was absorbed by liver of sulphur; and that upon adding fresh empyreal air to that left unacted upon by it atmospheric air was reproduced.

His experiments on the nature of air were followed by some on heat and light, and he gave the name of radiant heat to that portion of it which emanates from hot bodies, and, as he found, in right lines. He observed the blackening effect which is produced by the sun's rays on chloride of silver, and that the violet rays produce this effect most speedily. He made experiments on Homberg's pyrophorus, and showed that ammonia alum is incapable of forming it. In his dissertation on manganese he made the discovery of chlorine gas, or, as he called it, dephlogisticated marine acid. His essays on fluor spar contained several valuable facts, but he committed the error of supposing that the silica which he obtained in his operations, from the retort, was formed by the combination of water and fluoric acid. He pointed out the difference between plumbago and sulphuret of molybden, and he first described the molybdic and arsenic acids, and formed a compound of the latter with oxide of copper, or arsenite of copper, which has since been extensively used as a pigment, under the name of Scheele's or mineral green. He made experiments on milk, and sugar of milk; and the acid of the sugar of milk, now called lactic acid, was noticed by him. He gave a method of obtaining citric, tartaric, gallic, and some other vegetable acids; and published essays on tungsten, æther, calomel, benzoic acid, and urinary calculi, all of which contain valuable information.

He particularly examined the colouring matter of Prussian blue, which was nearly his last contribution to chemical science. The subject was one of great difficulty, considering that it involves the agency of azote, which had not long been discovered. He treats the subject however with his usual sagacity, and having obtained what is now called prussic or hydrocyanic acid, he has stated several of its properties. Besides the discoveries which have been enumerated, it is to Scheele that we are indebted for the first knowledge of barytes and of the characters of manganese.

Antoine Laurent Lavoisier was born in Paris in 1743, and died a victim to the revolution in 1794. Although the original discoveries of Lavoisier have less merit than those of Priestley and Scheele, yet his contributions to the science are numerous and important, especially as to what regards its theory. His 'Elémens de Chimie' were published in 1789. In this work he considers heat as a subtile fluid or a material substance, which he calls caloric. He argues that the different forms of matter depend in general upon the quantity of caloric which they contain. His analysis of atmospheric air, though conducted perhaps on more philosophical principles, does not offer so great precision of results as those deducible from the very simple experiment of Priestley; but it must be admitted that they had the merit of settling the question as to the nature of the atmosphere.

Van Helmont, and after him Macquer, had employed the term gas to denote all elastic fluids which differ from atmospheric air. This word Lavoisier also adopted; and as he found that the portion of the atmosphere which supported animal life also entered into the composition of acids, he called it oxygen gas; the other constituent of the air he called, from its fatal effects upon animal life, azotic gas; by this name it is yet designated by many chemists, while others prefer that of nitrogen, derived from its forming a part of nitric acid.

Lavoisier and his coadjutors effected various improvements in chemical nomenclature, most of which remain in use at present, but some alterations and additions have been rendered necessary by the highly-cultivated state of the science. The nature of the diamond had excited the attention of the Florentine Academy as early as 1690; the subject was resumed by Lavoisier, who proved, that when air was excluded it underwent no change; on the other hand he showed, that by burning it in oxygen gas carbonic acid was formed, and hence he argued, what is indeed now generally admitted, that the diamond, in its chemical nature, is similar to common charcoal.

In adverting to the solution of metals in acids, he notices the necessity of their oxidizement previously to it, and hence he argues the probability that the alkaline earths are metallic oxides, the oxygen serving as a bond of union between them and the acids: this sagacious remark has been verified by the discoveries of Davy. In his additional observations on the combinations of oxygen, he mentions the conditions necessary for its union with different bodies; the compounds arising from the union of various combustible bodies are also treated of, and those of the acids and some other compound substances. Sir H. Davy remarks, that 'Lavoisier must be regarded as one of the most sagacious of the chemical philosophers of the last century; indeed, except Cavendish, there is no other inquirer who can be compared to him for precision of logic, extent of view, and sagacity of induction. His discoveries were few, but he reasoned with extraordinary correctness upon the labours of others. He introduced weight and measure, and strict accuracy of manipulation into all chemical processes. His mind was unbiassed by prejudices; his combinations were of the most philosophical nature; and in his investigations upon ponderable substances he has entered the true path of experiment with cautious steps, following just analogies, and measuring hypotheses by their simple relation to facts.'

It is, however, matter of history, and ought not to be suppressed, that Lavoisier was not content merely to employ the discoveries of others, even without acknowledgment, but that he made a distinct claim to the discovery of oxygen, which Dr. Priestley has most satisfactorily refuted, by asserting, what might have been contradicted, but which was not, that he had mentioned this gas and the mode of procuring it at the table of M. Lavoisier himself. He makes scarcely any, if any, acknowledgment of the labours of his predecessors, and his friends have claimed for him the discovery of azotic gas, previously described by Priestley and Rutherford.

Claude Louis Berthollet (born in 1748, died in 1822) was the author of more than eighty memoirs on chemical subjects. His earlier papers on sulphurous acid, ammonia, and the decomposition of nitre, were published while he was yet a believer in the phlogistic theory, which he zealously defended, but afterwards renounced. One of his most important contributions to chemistry was that of demonstrating, in 1785, the nature and properties of the elements of ammonia. About the same time he made his experiments on the dephlogisticated marine acid of Scheele, which, from experiments well calculated to give rise to the opinion, he supposed to be a compound of muriatic acid and oxygen, and it was called oxygenized muriatic acid. These views, in consequence chiefly of the experiments of Davy, have been shown to be erroneous, and this gas is now called chlorine, and is admitted to have hitherto resisted all attempts at decomposition. It was stated by Scheele, in his experiments on this gaseous body, that among other properties which it possessed, was that of destroying vegetable colouring matter. In consequence of this remark Berthollet applied it to the purpose of bleaching, in which it is now most extensively and almost universally used.

The experiments which Berthollet made on prussic acid and its compounds advanced but did not complete our knowledge respecting those bodies. In examining the properties of sulphuretted hydrogen, he observed that it possessed acid properties; it was not however by the French chemists admitted to the class of acids, because it was inconsistent with the theory just adopted, that all acids must contain oxygen. Berthollet also discovered fulminating silver, and first employed alcohol as a solvent for obtaining potash and soda in a pure state.

In 1803 Berthollet published a work entitled 'Chemical Statics,' the object of which was to controvert the opinions of Bergman on chemical affinity; but although he pointed out some difficulties attendant upon them, they were by no means refuted. In this work Berthollet also maintained the opinion that quantity may be made to overcome the force of the chemical affinity existing between bodies. There were however several points of the argument which he neglected, or with which he was unacquainted; indeed, at the period at which he wrote, the doctrine of definite proportions had not been promulgated,—a doctrine which will explain many of the apparent anomalies that occurred to Berthollet. Indeed, in a discussion with Proust, in which the latter had decidedly the advantage, Berthollet asserted that bodies were capable of uniting with each other in all proportions. But whatever may have been the erroneous views of Berthollet in some particular cases, chemistry is greatly indebted to him for many valuable discoveries and minor details; and the application of the bleaching power of chlorine is a practical scientific improvement which has, for its extent and usefulness, scarcely been equalled, except in the construction of the steam-engine.

Louis Bernard Guyton de Morveau was born at Dijon in 1737, and died in 1816. Although the publications of this chemist were very numerous, and contributed much to the extension of the science, yet he was not the author of any very prominent discovery. His papers are scattered through the 'Dijon Mémoires,' 'Journal de Physique,' and 'Annales de Chimie.' There are however some circumstances connected with the history of chemistry, in which his participation must not be overlooked. In 1787, in conjunction with Lavoisier, Berthollet, and Fourcroy, he published a work in one volume, 8vo., entitled 'Méthode de Nomenclature Chimique,' in which the important improvements projected and subsequently adopted, are detailed. In 1801 he published a tract, 'Des Moyens de désinfecter l'Air.' For this purpose he used various acids, and especially muriatic acid; but he afterwards adopted chlorine, which is now so generally used for the same purpose. The application of these disinfectants was made in 1782, although the history of it was not given to the public till the year abovementioned He was the author of a considerable portion of the chemical articles in the 'Encyclopédie Méthodique;' and that on 'Acid' has been justly commended for its accuracy, both as to experimental and historical details.

Antoine François de Fourcroy was born at Paris in 1755, and died in 1809. This chemist was more celebrated as one of the first authors, if not the earliest, of a treatise on chemistry and as a lecturer, than as a promulgator of any very great discovery. His chemical work went through several editions, and is in general written with perspicuity and attention to the history of the science: his 'Philosophy of Chemistry' is also a work of considerable merit. As a discoverer, he is to be mentioned as having first shown that the salts of ammonia and magnesia have a tendency to form double salts; and he particularly pointed out the ammoniaco-magnesian phosphate. He ascertained that biliary calculi resemble spermaceti in their nature, and that muscular flesh is convertible into a fatty substance which he has named adipocire. He published several papers in conjunction with Vauquelin, but what belongs to each it is impossible to tell. It has been supposed that the facts were principally ascertained by Vauquelin, and the account of them written by Fourcroy: among other papers, they published one giving a method of obtaining barytes from the nitrate by heat; they discovered also the existence of phosphate of magnesia in bones, and of phosphorus in the brain and in the melts of fishes.

It has been mentioned that the analysis of precious stones had, though imperfectly, been attempted by Bergman this department of chemistry received vast accessions from the labours of Martin Henry Klaproth, who was born at Wernigerode in 1743, and died in 1817. This chemist introduced into the art of analysis more improvements than we can even allow room to detail. The vast progress which he made in the science will be fully estimated, when it is known that at the time at which he commenced his labours the correct analysis of scarcely any minerals was known, and that he analyzed nearly two hundred with so much accuracy that his results have been generally confirmed, and the simplicity of his method of operation is greatly to be commended.

In 1789 he discovered a new metal in a mineral called pechblende, to which he gave the name of uranium; and in the same year in analyzing the zircon he found a new earth, which he called zirconia, and which has since been shown by Berzelius to be a metallic oxide. In 1795 he found the same substance in the hyacinth; in this year he also found in the red schorl the same metallic oxide which Gregor had previously met with and called menachine; Klaproth named it titanium, and this appellation is now generally employed. Apparently ignorant of the fact that strontia had been previously described as a peculiar earth, he in 1793 showed the difference between it and barytes, they having been confounded in Germany up to that time. In 1798 he gave an account of tellurium as a new metal, but it had been before noticed by Müller. In 1804 he described a new substance, which he called ochroita. Berzelius and Hisinger considered it a metallic oxide, and called the metal cerium. Besides these more important contributions to science, he made many discoveries of minor importance, which may be found in his 'Analyses,' of which two volumes have been published and translated into English. Besides minerals, there will be found analyses of some mineral waters, an account of the effects produced by intense heat upon various minerals, and the details of the methods of analysis, which are extremely valuable and instructive, both as to the nature and method of employing various chemical re-agents.

M. Vauquelin was one of the most distinguished analysts of the present century. He was born in Normandy, in what year we know not: but he died in 1829. His analyses were not confined to any particular class of bodies, and he published more and perhaps included a greater variety in his operations than any other chemist; his researches included the three kingdoms of nature, but his greatest discoveries were in the mineral. In the emerald and beryl he found a new earth, to which, on account of the sweetness of the salts which it formed with acids, he gave the name of glucina; but his discovery of chromium, in the state of chromic acid, in the red lead of Siberia, was an æra in chemical history. Originally met with in a scarce and valuable mineral, it has since been found in various parts of the earth combined with iron, and in immense quantity; it is largely employed for various uses; in the state of oxide for giving a green to porcelain; in that of acid, combined with oxide of lead, it forms both a fine yellow and orange chromate, which is used in painting and calico printing. It would be in vain to attempt an analysis of Vauquelin's various papers; they are chiefly to be found in the 'Annales de Chimie,' and will amply repay perusal. He was also author of a work entitled, 'Manuel de l'Essayeur,' which he was particularly competent to write, not merely on account of his great skill, but also as being assay-master of the mint.

Mr. Smithson Tennant was born in Yorkshire in 1761, and died in 1814. In 1791 he made an experiment, which confirmed the previous statement of Lavoisier as to the composition of carbonic acid. He effected this by passing phosphorus through red-hot carbonate of lime, and he found that the phosphorus was acidified at the expense of the oxygen of the carbonic acid, and that while phosphoric acid was formed charcoal was developed. In 1796 he heated the diamond with nitrate of potash in a gold tube, and he found that the diamond, by combining with the oxygen of the nitric acid, was converted into carbonic acid, and this combined with the potash of the decomposed nitrate to form carbonate of potash. He observed in 1799 that certain limestones, on account of the carbonate of magnesia which they contain, are hurtful to vegetation; he examined the substance known by the name of emery in 1802, and showed that it is a variety of corundum; and in 1804 he discovered two new metals, viz., osmium and iridium, in the grains of native platinum.

John Gottlieb Gahn (born in 1745 in South Helsingland, died in 1818) was the pupil of Bergman. He was particularly skilled in the use of the blow-pipe; and he ascertained that bone is a compound of phosphoric acid and lime. He proved the metallic nature of manganese, and stated the properties of the metal.

The Rev. William Gregor was born in 1762, and died in 1817. In the year 1791 he discovered a peculiar substance in a black sand, found in the parish of Menaccan in Cornwall. This substance was afterwards detected by Klaproth, and by him proved to be a metallic oxide, to the metal contained in which he gave the name of titanium. In 1805 Mr. Gregor described a hydrate of alumina found in Cornwall; he analyzed the uranite, and also the arseniate of lead.

Dr. William Hyde Wollaston was born about 1767, and died in 1828. His knowledge was not confined to chemistry: he made acoustics and more particularly optics also his study. His first chemical paper on urinary calculi contained much new information on this subject; he showed that the mulberry calculus is oxalate of lime mixed with animal matter; he pointed out a new calculus, which he named cystic oxide, the nature of the triple phosphate, and of the chalk stones formed on the joints of gouty persons. He discovered two new metals in the grains of native platinum, viz., palladium and rhodium; he showed that oxalic acid and potash combine in three different proportions, forming the oxalate, binoxalate, and quadroxalate of that alkali. He pointed out the nature of some small copper-coloured crystals found in the slag of an iron furnace, proving by a series of experiments, in a paper which is a perfect model of conciseness and accuracy, that they were metallic titanium. He perfected the method of rendering platinum available for the purposes of chemistry and the chemical arts, and his 'Scale of Chemical Equivalents' more effectually elucidated and extended the doctrine of definite proportions than all that had been previously done both by theory and practice. He first showed that the evolution of voltaic electricity is dependent upon chemical action, a fact which has been since amply and ably illustrated by Faraday. His 'Reflective Goniometer' has given to crystallography all the minute accuracy which it previously stood in need of; for it showed that three substances, viz., the carbonate of iron, lime, and magnesia, which were previously supposed to crystallize in rhomboids measuring the same angles, had all different angles. His paper on the finite extent of the atmosphere is replete with curious and acute observations; and he invented some optical instruments, which we need not here particularly describe.

Humphry Davy was born at Penzance, in Cornwall, in 1778, and died in 1829. To the researches and discoveries of this justly celebrated chemist it will be impossible to do justice in the space to which we are confined. His first contributions to chemical science were published in 1799, in a work edited by Dr. Beddoes, entitled 'Contributions to Physical and Medical Knowledge.' The first paper is 'An Essay on Heat, Light, and the Combinations of Light,' and the second 'On the Generation of Phos-oxygen (oxygen gas), and on the Causes of the Colours of Organic Beings;' these, although stamped with the mark of genius, are more remarkable for the speculative than experimental nature of their contents. In 1800 he published a work, entitled 'Researches, Chemical and Philosophical; chiefly concerning Nitrous Oxide, or Dephlogisticated Nitrous Air, and its Respiration.' In this, which is a work of high merit, he details the effects produced by the respiration of nitrous oxide both on himself and others. The very high reputation which he had acquired by this work was greatly increased by his paper in the 'Philosophical Transactions' for 1807, entitled, 'On some Chemical Agencies of Electricity.' In this paper he showed that the acid and alkali which had before been observed to be developed by galvanic agency were derived from the decomposition of some previously existing salt, and were not formed by the electric action. He arrived at the conclusion, from the numerous experiments described in this paper, that all bodies possessing chemical affinity for each other are in different electrical states, and that the degree of the affinity is proportional to their intensity. By the agency of voltaic electricity he decomposed the alkalis, potash and soda, and obtained from them metallic bases, to which he gave the names of potassium and sodium; he succeeded also in separating metallic bases from lime, barytes, strontia, and lithia; he was not however equally successful in decomposing those earths which have no alkaline properties, as alumina, glucina, yttria, and zirconia, though these have since yielded to other modes of decomposition. In 1807 he also discovered boron, the base of boracic acid.

In 1811 Davy read a paper to the Royal Society, in which he showed that what was called oxymuriatic acid by Berthollet, instead of being, as he supposed, a compound of oxygen and muriatic acid, was, in fact, an undecomposed substance, and therefore must be regarded as an element, and he gave to it the name of chlorine from its green colour. These views, though at first strongly opposed by Berthollet and Dr. Murray, are now universally adopted. In the following years he contributed various important papers to the

Royal Society, and among them on the following subjects:—on a compound of chlorine and oxygen; on chloride of azote; on iodine; the combustion of the diamond; on the salts called hyperoxymuriatic; on fire-damp, and the means of preventing accidents in mines; and his invention of the safety lamp. In succeeding years he published various papers on electricity, electro-magnetism, and on a method of preventing the corrosion of copper sheathing; this plan, though based on perfectly scientific principles, failed in its object from the very unexpected cause of its being rendered foul. His last paper was in 1819, on the electricity of the torpedo.

In 1812 Davy published the first part of the 'Elements of Chemical Philosophy,' a work which was never completed. It embodied the results of his discoveries, and an account of certain views of the author up to the time in which it appeared. This work bears occasional marks of haste, yet it contains evidence of its emanating from a genius of the highest order.

In concluding this brief sketch, it is hardly necessary to remark that the discoveries alluded to in it placed their author at the head of the science which he illustrated, not merely in England but in Europe; and his fame will rest on the durable base of experimental discovery and unrivalled talent for generalization.

In giving a history of chemistry, it is impossible not to notice the doctrine of definite proportions, or the atomic theory; under which head we have entered pretty fully into the history of its discovery, and mentioned the contributors to its development, whether deceased or living. In that article the discoveries and labours of Wenzel, Dr. Higgins, Mr. Higgins, Richter, Proust, Dalton, Wollaston, Berzelius, Gay-Lussac, Dr. Prout, and Faraday, are detailed so amply as to require no further notice here.

There are still some other subjects which it is necessary to mention, though we cannot allude to all the discoveries which their respective authors have made. In 1803, Sertuerner, a German apothecary, discovered in opium the first of a new class of bodies, or the vegetable alkalis; but this discovery excited little notice, till the author published a second paper in 1816; this alkali is morphia. Since this time numerous others have been found; they are all of them very active substances, and frequently poisonous. Thus the different kinds of cinchona have yielded two alkalis, quina and cinchonia, to which their virtues are owing: these were discovered by Pelletier and Caventou, in 1820. It has been found that many of the most active vegetable substances, such as hellebore, ipecacuanha, colchicum, and many others, contain an alkali. That those alkalis should not have been sooner discovered is readily accounted for by their existing combined with acids, so as not to exhibit any alkaline properties.

In 1812, iodine, a peculiar elementary substance, was discovered by M. Courtois, of Paris. The nature of this body was made the subject of numerous experiments both by Davy and Gay-Lussac. Its discovery served the purpose of illustrating and confirming the new views of Davy as to the simple nature of chlorine.

In 1818 Berzelius discovered a peculiar inflammable elementary body, to which he gave the name of selenium. In 1824 he obtained the metallic bases of silica and zirconia; and in 1829 he found a new metal, to which he gave the name of thorium. In 1818 Stromeyer discovered cadmium, a new metal; and in the same year lithium was discovered by Arfwedson; Bussy obtained magnesium from its oxide in 1829, and in 1830 Sefstrom discovered the metal vanadium.

In 1823 Mr. Faraday showed that various gases, which had previously resisted condensation, might be rendered fluid; we particularly mention this important acquisition to chemical science, because unjustifiable attempts have been made to transfer the honour of it to Sir H. Davy. Eight compound gases were rendered fluid, but chlorine is the only elementary one which yielded to the same treatment. If our space allowed, we should be happy to give a more extended view of the important discoveries of Mr. Faraday in electro-chemical and electro-magnetical science, as well as to notice his other important contributions to chemical philosophy.

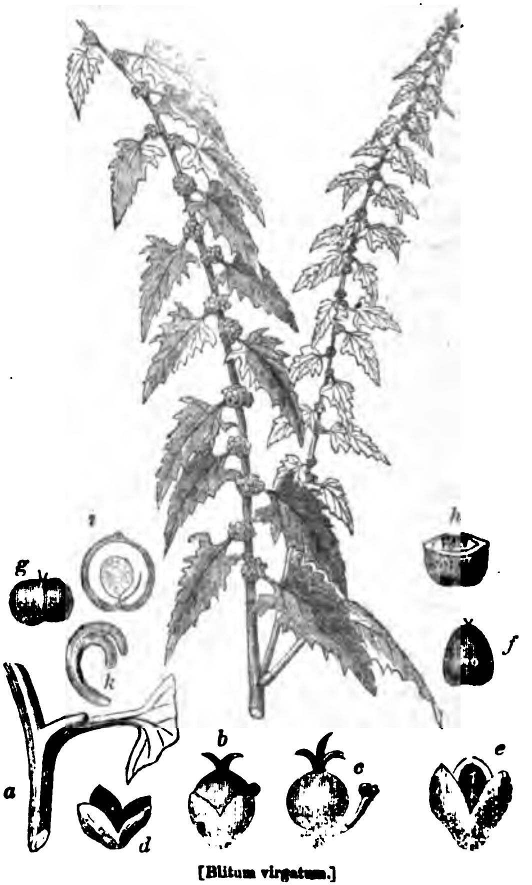
In 1826 Balard made known the new elementary body bromine, which is remarkable as being the only elementary fluid except mercury.

We cannot better conclude this slight sketch of the progress of chemistry than by adopting the words of Sir H. Davy on a similar occasion:—'To dwell more minutely upon the particular merits of the chemical philosophers of the present age will be a grateful labour for some future historian of chemistry; but for a contemporary writer it would be indelicate to assume the right of arbitrator, even where praise only can be bestowed.'

CHEMNITZ, a town in Saxony, the capital of the Erzgebirg circle, is situated at the foot of the Erzgebürge, in a plain which extends about ten miles in every direction. It is in 50° 50′ N. lat., and 17° 55′ E. long., and about 976 feet above the level of the Baltic. Chemnitz is one of the most industrious towns in Germany. In no place indeed have all the English improvements been introduced with such care and skill as in Chemnitz. The number of persons employed in weaving exceeds 2000. There are twelve manufactories for printing cotton goods, and some in which the yarn is dyed red like Turkish yarn. The woollen manufactures, which were formerly very considerable, have much decreased in the last fifty years; but in the town as well as in its neighbourhood there are many stocking manufactures. Chemnitz carries on a considerable trade, being situated where the road between Prag in Bohemia and Leipzig and that which unites Bavaria with Dresden cross one another. The town contains about 16,000 inhabitants, and is well built; the streets are spacious and mostly straight, and many of its houses look more like palaces than dwelling-houses. It is remarkable for the great cleanliness of its streets, and is lighted with lamps. The public edifices are in a good style, but none of them particularly distinguished.

CHE'NNIUM, a genus of Coleopterous insects. [PSELAPHUS.]

CHENOPODIA'CEÆ, a natural order of exogens, consisting of numerous species, used either for culinary purposes or for the manufacture of soda. They are apetalous plants, with minute green herbaceous flowers, a small number of stamens, which are opposite the segments of the calyx, and a one-celled membranous fruit, containing one single erect seed or a very small number. The leaves are soft and



[Blitum virgatum.]

a, angle of the petiole, showing the peduncle; *b*, flower; *c*, flower deprived of its calyx, showing the ovary, surmounted by three pistils; *d*, calyx; *e*, fruit imbedded in the succulent calyx; *f*, *g*, fruit separated from the calyx; *h*, horizontal section of fruit; *i*, vertical do.; *k*, embryo. All these figures, excepting *a*, magnified in various degrees.

rather succulent, without any trace of stipules. Most of them are found in the cold and temperate parts of the world. They differ from Polygonaceæ and Urticaceæ in the want of stipules, and from Amarantaceæ in their flowers not being coloured and enveloped in membranous bracts. Spinach, beet, orach, and other spinaceous plants, belong to this order, in which no deleterious species has been discovered.

CHENOPO'DIUM, the genus after which the last-mentioned order has been named, consists of weedy plants, common on dunghills and in waste places, and known by the strange names of Fat-hen (*Ch. album*), Good King Henry (*Chenopodium Bonus Henricus*), &c. They are generally insipid plants, whose leaves and young shoots may be eaten as spinach, but which have no particular merit. In this genus is however found the celebrated Quinoa of Peru (*Chenopodium Quinoa*). This plant, whose seeds are said to be of as much importance to the Peruvians as the maize, potato, and wheat, is an annual weedy species, with an appearance similar to that of garden orach, to the size of which it grows. Its flowers appear in close clusters about the ends of the branches, and are succeeded by a profusion of little black or white seeds (according to the variety) about the size of grains of millet. Its leaves are employed as spinach, and the seeds in soup or broth as rice, and in some parts of South America they are in as much use as rice in India. They are said to yield a pleasant beer when fermented. It is chiefly upon the highest land of Southern Peru, where neither barley nor rye will ripen, as, for instance, at the height of nearly 13,000 feet on the table-land of Chiquitòs, that quinoa forms the great article of agriculture; it there forms fields, the limits of which the eye can hardly reach, of a monotonous and unpleasant aspect, scarcely mixed with a single other species, and very unlike the rich and waving greenness of our standing corn. It is also extremely common about the great lake of Titicaca. The seeds are ripened in England, and may now be purchased at any of the seed-shops; but the plant can hardly be considered worth the attempt at cultivating it where any thing else will grow. (*Gardener's Magazine*, vol. x., 587; and Meyen, *Die Pflanzen Geographie*, 361.)

CHEPSTOW, a port and market-town, on the Wye (about 2½ miles from where it falls into the æstuary of the Severn), in the hundred of Caldicot, Monmouthshire, 110 miles nearly due W. from London. The parish of Chepstow contains 1020 acres; it is in the diocese of Llandaff. The population in 1831 was 3524; the average gross annual income of the incumbent of the parish was returned in 1835 at 214*l.* The parish then contained 21 daily and Sunday schools; one of which, containing 18 children, is endowed with 7*l.* per annum arising from land, and the interest of 100*l.*

The advantageous situation of Chepstow near the mouth of the Wye is supposed to have rendered it a desirable position both in Roman and Saxon times. It was formerly strongly fortified. The town is built on a hill gradually ascending from the river, and has a cheerful and lively appearance. From different points near the town the views are exceedingly beautiful—the scenery not being surpassed perhaps by any thing similar in Britain. The ruins of Chepstow Castle occupy an extensive area; the walls on one side are almost perpendicular with the cliff which overhangs the Wye; the erection of the edifice is attributed to the Normans in the eleventh century, but the architecture bears marks of a later date. In this castle Henry Marten, one of the judges of Charles I., was confined for upwards of twenty years after the Restoration, but his imprisonment does not appear to have been rigorous, though it only ended with his death. His family was permitted to live with him.

The Wye is navigable for large vessels only to Chepstow bridge, which is a massive structure of iron, erected in 1816; but barges from eighteen to thirty tons burthen can go as high as Hereford. The spring tides at Chepstow frequently rise above 50 feet.

There are no manufactories in the town or neighbourhood of Chepstow, but the town has a considerable export and import trade. It is lighted with gas, the expenses of which are defrayed by a donation from a private individual; it is also well paved, and kept clean. The gross receipt of customs' duty at Chepstow, in 1834, was 902*l.*

CHER, a river of France, from which the department which it traverses receives its name. The source of its principal branch is in the eastern extremity of the department of Creuse, a little to the south of the town of Auzance. Two other branches, which rise in the same department, form a junction with it, as it enters in its northward course the department of Allier. It continues in the same direction through the western extremity of this department, passes by Montluçon, and enters the south-east boundary of the department of Cher. Near Saint Amand it takes a N.N.W. course to Châteauneuf, and to Vierzon, where it unites with the Auron. Turning due west, it receives the Aron, passes the town of Selles, a little below which it is joined by the Sauldre and the Fouzon, and continuing its western course past St. Aignan, Montrichard, and Bléré, it falls into the Loire, a short distance below the city of Tours. This river is subject to great inundations. It has 29 locks to facilitate navigation; but from its source to St. Aignan, a distance of 48 leagues, it is serviceable only for the floating of timber. The remaining portion of 19 leagues, from St. Aignan to the Loire, is navigable for boats, which convey wood, corn, charcoal, and fodder for cattle. The whole of its course is nearly 200 miles. It supplies several kinds of edible fish. The canal du Duc de Berri runs along the Cher from Chambon, on one of its upper branches, nearly as far as Ainay. A smaller river of the same name rises in the duchy of Bar, and falls into the Meuse. (*Encyc. Méthod. Géog. Phys.*, tom. iii.; Cassini's *Map of France*; Expilly.)

CHER, a department nearly in the centre of France, comprehends that part of the antient province of Berri called Haut Berri, and a portion of Bourbonnais. Its northern boundary is formed by the department of Loiret, on the south it has the department of Allier; on the west that of Loir et Cher, and of Indre, and on the east the department of Nièvre and the river Loire. It is included between 46° 25′ and 47° 40 N. lat., and 1° 50′ and 3° 5′ E. long. The figure formed by its boundary line is very irregular. Measured north and south its greatest length is 86 British miles, and its greatest width, east and west, 56 miles. The whole area contains 1,450,134 acres (*Diction. Universel*, by Prudhomme), or 2265 square miles. Bourges, its capital city, has a population of 18,000, and is due south of Paris, from which it is distant 125 miles in a straight line. The population of this department, in 1826, was 249,000 (Balbi, *Abrégé Géog.*), that is, between 109 and 110 to a square mile. The surface of the country is generally level, and the whole department is extremely well wooded. There are six forests: that of Allogny, of Aubigny, of Bornacq, of Haute Brune, of Vierzon, and of Yvoy. They cover 150,000 hectares*, or 371,040 English acres, and furnish excellent timber for house and ship-building. Besides the Cher, there are several other considerable streams, namely, the Auron, Aron, and Sauldre, all of which belong to the basin of the Cher. In the southern and south-western parts the soil is only of a medium quality, and rushy ponds are numerous; in the northern and north-western portions are marshes, surrounded with tracts either entirely barren and sandy, or covered with furze and thistles.

In the central parts, as well as on the banks of the Auron and Cher, the land is remarkably rich, and especially on the eastern side, along the border of the Loire, where it possesses the highest productive qualities. About two-thirds of the whole surface of this department are more or less sterile and useless, and the rest exhibits the greatest fertility. Pasturage for sheep and horned cattle is abundant, and consequently great numbers are reared. The wool produced in this district is considered the best in France: the mutton also is said to be very good. Horses are generally diminutive in size. Game, poultry, and fish are abundant. All the various sorts of grain yield plentiful crops. Still, there is no perceptible improvement in agriculture; nor indeed in any other of the industrious arts. It is remarked by Malte Brun (*Géog. Univers.*, tom. iii. p. 492, 1832) that the inflexible perseverance with which the inhabitants adhere to the clumsy routine of their ancestors prevents any development of the great natural resources of this department, and accounts for the fact, that, while they have at hand a large supply of the finest wool, only a very few manufactories of inferior woollen cloths exist among them, that while they grow abundance of hemp and flax, they manufacture no linen fabric; that, with a very large home production of wax, the making of wax candles appears never to have been attempted, &c. One fact alleged as a cause of the want of improvement in agriculture, is, that the land is generally the property of great proprietors, who let the farms on short leases, and consequently destroy every incentive to exertion. Fruits of various kinds are produced in profusion, as well as the finest esculent vegetables. The vine is cultivated with considerable success, and produces the white wine which is sold in Paris under the name of Chablis. There are also small manufactures of paper, potass, porcelain, delf-ware, nut-oil, and saltpetre. The mineral productions of this department are important. Silver mines once existed; but they have ceased to be worked. Ochre is said to be obtained of a quality preferable to that of England. There are quarries of granite and marble Mention is also made of manganese, potter's clay, and gypsum; but by far the most valuable object of mining operations in this department is iron, which is found in great abundance and of very superior quality. It does not lie at a great depth, but is procured a few feet below the surface, where it appears in a granulated form, rather roundish and of a reddish colour. Numerous and extensive iron-works are established for the manufacture of iron and steel implements, nails, &c. The vigour with which this species of industry is prosecuted presents an exception to the general supineness which we have mentioned. The iron trade forms indeed, with the sale of wool, cattle, and timber, the chief source of wealth to the inhabitants. The great deficiency of means of conveyance has been partially supplied by the opening of the canal of Berri. [CHER, River.]

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* A hectare is equal to 2·4736 English acres.

This department is divided into three arrondissements, which are subdivided into 29 cantons and 307 communes. The seat of the prefecture is at Bourges. The other considerable places are Sancerre, which stands on the highest hill in the department, and is engaged in the wine trade; population about 3000. St. Amand, on a branch of the river Cher, in a pleasant valley; population about 5000; and Vierzon, on the Auron. At Yvoy le Pré there is a glass manufactory. Henrichemont was built by Sully in honour of Hen. IV.: it has a large tannery. This department sends four members to the Chamber of Deputies: it is comprised in the 15th military division; and is within the jurisdiction of the Cour Royale of Bourges.

The department of Indre and the department of Cher form the metropolitan diocese of Bourges. (*Encyc. Méthodique, Géog. Phys.*, tom. iii.; Malte Brun; *Dict, Geog. Universelle*, 1825; Balbi, *Abrégé de Géog.*, 1833.)

CHERBOURG, a fortified city and sea-port of France, on the northern coast of the department of Manche, and one of the principal stations of the French navy. It is situated at the southern extremity of the bay and roadstead of La Manche, in lat. 49° 38′ N., and long. 1° 40′ W., opposite the Isle of Wight, 190 miles W.N.W. from Paris. Cherbourg is of great antiquity. By Froissard it is said to have been founded by Cæsar, when he invaded Britain, but by others it is denied that Cæsar ever visited this portion of Gaul. In 1418 the city was besieged by the English, to whom, after three months' resistance, it surrendered; but in 1450 it was re-taken by Charles VII., who finally expelled the English from the coasts of Normandy. Its castle, in 1680, was demolished by Louis XIV. For a detailed historical account, see the work of Expilly. It contains several capacious arsenals for marine and military stores; but that which is most remarkable at Cherbourg is the great *digue*, or breakwater, and the excavated dock for the navy. The latter, which was made by Napoleon, was opened in 1813, and is scooped out of the earth and solid rock, a little to the west of the city. It is 1000 feet in length, 770 in width, 50 in depth, and occupies about 18 acres. At low water it has a depth of 25 feet, and is capable of receiving 60 ships of the line: there is also a commodious commercial dock, distinct from that for the navy. The cost of both was about 5,000,000*l*., as it is stated in several recent English works, but it must mean francs, which would be about 200,000*l*. The breakwater is to the north of the port, and extends from east to west 4095 yards, so as to leave a passage at each end. It was commenced under Louis XVI., and although continued at great expense by Napoleon, it is still not completed. The work was begun by the submersion of enormous conical frames of oak, having at the base a diameter of 140 feet, and 60 feet at the summit. These, and the intermediate spaces, were afterwards filled by dropping in large unhewn blocks of granite and sandstone, of which the whole mass is much overrated by some authorities. (Malte Brun.) The *rade* or road, thus formed on the southern side of this rampart, is sufficiently spacious for the anchorage of 100 vessels. A full description is given in Arthur Young's 'Voyage en France,' tom. i., p. 234, et seq. Cherbourg contains a population of about 15,000: it has a school for navigation, a college, a royal academy, a board of trade, a theatre, public baths, and a promenade.

The houses are of stone, and roofed with slate, of which there are several quarries in the neighbourhood. The church was founded in 960. The streets are narrow, gloomy, irregular, and very uncleanly, though water is abundantly supplied from several public fountains. There is some trade in corn, cattle, cheese, butter, and bacon, the produce of the neighbouring districts, and a small manufactory of coarse cloths and druggets. The environs furnish an ample supply of esculent vegetables and flax. In the adjoining forest of Tour la Ville there is a very extensive manufactory of glass, which employs about 200 workmen. The temperature of Cherbourg is very mild with respect to its latitude; the thermometer being constantly five degrees higher than at Paris. (Malte Brun.) The views of Napoleon respecting Cherbourg, as given in the Journal of Las Cases, are very interesting. (*Dic. Universel de Géog.*, 1825; Expilly; *Encyc. Méthodique;* Reichard's *Road Book of France.*)

CHERIMOYER, the fruit of a Peruvian downy-leaved species of Anona, the A. Cherimolia: it is described as the fruit most esteemed by the people of the western parts of South America, and is very like the Custard Apple of the West Indies. [ANONA.] It is a tree about twelve feet high; the leaves are oval, pointed at both ends; the flowers solitary, very fragrant, of a greenish-white colour, and the fruit somewhat heart-shaped, with a scaly appearance on the outside; when ripe it is greyish-brown, or black. The flesh is white and sweet, mixed with several seeds of the colour of coffee. The Creoles think this fruit the best of the country; Baron Humboldt speaks of it in terms of high praise, and his account is completely confirmed by the testimony of many officers who have been in the South American service; but Feuillée says, one European pear or plum is worth all the cherimoyers of Peru. The latter author has figured it in his *Journal des Observations, &c.*, 3, t. 17.

CHEROKEES, the name of one of the native tribes, inhabiting the southern states of the North American Union. A century ago they formed a numerous and powerful nation which was in possession of the southern portion of the Appallachian Mountains and the countries on both sides of the range, so that their hunting-ground extended over a part of the States of Tennessee, North and South Carolina, and Alabama, and over nearly half the State of Georgia. After a British colony had been settled in Georgia (in 1732), the native tribes began to lose ground. The Cherokees however maintained their footing for a long time, even after these countries had obtained their independence. Since 1790, they have sold different portions of their territories to the government of the United States. In 1809 they consisted of 12,359 individuals. In 1816 they ceded the country still possessed by them within the State of South Carolina, and some districts in Georgia and Alabama, receiving in consideration of this cession, besides presents and annuities, a tract of country of equal extent west of the Mississippi, to which some families emigrated. At the census of 1830 the Cherokees remained only in Georgia, where they amounted to about 5000 individuals; and in Alabama, where they were about half that number. In 1834 the State of Georgia resolved to expel them from that extensive tract of Georgia which lies to the west of the river Chatahoochee; and the better to effect this, they ordered the Moravian Brethren, who had settled among them for the purpose of instructing them in the Christian religion, to leave the country. No sooner had the intention of the government of Georgia become evident, than the Indians applied to Congress for protection, and Congress declared that the decree of the legislature of Georgia was illegal. But the State of Georgia decreed that Congress had exceeded its powers, and they enforced their own law by sending soldiers into the territory of the Cherokees in 1835 and expelling the Indians. Alabama at present is the only place east of the Mississippi where Cherokees are found: they occupy in this State the country about the upper branches of the river Coosa, and may consist of between 2000 and 3000 souls. [ALABAMA.] The remainder of this once powerful tribe is wandering about west of the Mississippi, on the banks of the Arkansas and White River.

The Cherokees are considered the most civilized of the American Indians. They have made considerable progress in agriculture and domestic manufactures, and in the raising of cattle. They chiefly cultivate cotton and Indian corn. They have a written language; the alphabet, which was invented by a native Cherokee, consists of 85 characters. Their language is derived from the same source as that of the Creeks, Chickasaws, Choctaws, Pasiagoulas, and some other tribes; and as all these tribes lived in the neighbourhood of Florida, these languages have obtained the name of the Floridian languages. (Franklin's *First Journey to the Polar Sea;* Darby.)

CHERRIS, an intoxicating drug, prepared from the common hemp.

CHERRY. [Cerasus.]

CHERRY, a valuable fruit, of which great numbers of varieties are known in our gardens; they are all the produce of *Cerasus avium*, or *C. vulgaris* [Cerasus], or of plants obtained by the intermixture of those two original species. Independently of their value as an article of luxury, and as yielding by distillation such liqueurs as Maraschino (so called because the Dalmatian *Maraschi* cherry is employed in its manufacture) and Kirschenwasser, cherries contribute essentially to the support of the poorer classes in some countries, not only in puddings and tarts, but as a principal ingredient in a kind of soup, and as a dried provision for winter. Their timber moreover is valuable for the more common kinds of cabinet-maker's work, and as in favourable soils they grow fast, they often afford to the planter a quick and good return for the outlay of his money. It is however only upon light sharp well-drained soil that the cherry thrives; when planted in stiff and wet soils it grows slowly, gums very much, and falls into a state of incurable bad health. Its varieties are multiplied by budding or grafting: the former is best performed upon the common wild cherry, the stones of which are collected by the nurserymen for that purpose. Like all other fruit trees that have been objects of cultivation, the cherry has given rise to a multitude of varieties, from among which it is difficult for any but professed gardeners to know how to make a selection. We should say that for all useful purposes the following are sufficient. The earliest are the Black Tartarian, and the Early Purple Guigne; the Early May, which ripens close about the same time, is not worth cultivation; these are succeeded by the May Duke, the Bigarreau, the Elton, and the Black Eagle; the Late Duke is the latest of the sweet cherries. For puddings there is the Kentish; for preserving in brandy, the Morello; for drying, the Belle de Choisy, the Flemish, and the Kentish. These are amply sufficient for a small garden, and are all good bearers: the Morello only actually requires a wall. If more variety is wished for, the Black Heart and the Downton may be added: and these are all out of the two hundred and nineteen varieties mentioned in the Horticultural Society's valuable Fruit Catalogue which are at all worth cultivating.

CHERSON (pronounced Kherson), a town in Southern Russia, 46° 40′ N. lat., and 32° 40′ E. long., was founded in 1778, on the right bank of the Limán, or æstuary of the Dnieper, which is here nearly four miles wide, when its numerous shoals are covered with water. It was designed to be the principal station for the Russian navy in the Black Sea, but it has not answered this purpose. It is only during the spring-flood that vessels of considerable size can pass from the town to the fortress of Kinburn, at the mouth of the Limán, and then only by means of camels. Still it contains docks for vessels of war, and merchant ships. It continues to be the principal depôt for all the stores which are required for the equipment of the fleet on the Black Sea, principally on account of the ease with which they may be conveyed to this port from the interior of Russia down the Dnieper. The town, which is regularly and well built, consists of four parts—the fortress, the admiralty, the Greek suburb, and the suburb of the marine soldiers. Its commerce is not considerable, and is carried on by the Greeks who inhabit the Greek suburb. The country about the town is very barren. In one of the villages, called Dauphigny, is a monument erected in honour of John Howard, who died here in 1796. Population 14,000.

CHERSONE'SUS (χερσόνησος), a Greek word signifying 'peninsula.' The term was applied more particularly to the small peninsula between the Hellespont and the Gulf of Melas, then called the Thracian Chersonesus; and to the peninsula now called the Crimea, which was called by the Greeks the Taurica Chersonesus.

CHERTSEY. [Surrey.]

CHERUSCI, a people of antient Germany, who bordered on the Catti and the Chauci, living inland or south of the latter, and near the banks of the Visurgis or Weser. The Cherusci being excited by Arminius, joined the Catti and others in the attack and defeat of Varus and his legions. They were afterwards defeated by Germanicus. After Germanicus left Germany and the Romans had drawn their legions back to the banks of the Rhine, the Cherusci quarrelled with the Suevi and afterwards with the Catti. Under Claudius the Cherusci sent messengers to Rome, to ask, as a king, for one Italicus, of the race of Arminius, who was born at Rome, of German parents. Italicus, however, on his arrival in Germany, was looked upon by many of his countrymen as an alien, and a degenerate descendant of Arminius. He was expelled from his kingdom, but afterwards recovered it with the assistance of the Langobardi. (Tacitus, *Annot.* xi. 16, 17.) In the time of Tacitus the Cherusci had declined from their former importance, having been overpowered by the Catti and other neighbouring tribes, and were considered as having degenerated. (*German.* 36.)

CHERVIL, a culinary vegetable, the Scandix cerefolium of botanists; it is an annual, and a native of the south of Europe; its leaves have a slight aromatic taste, and are used in soups and salads: it is little cultivated.

CHESAPEAKE BAY is the deepest indentation on the eastern shore of North America, between Florida Reef and the Bay of Fundy. The entrance, which is about 12 miles wide, lies between Cape Henry and Cape Charles, both in the State of Virginia, and is cut by the parallel of 37° N. lat. From the entrance the bay runs N., with a slight bend to the W. to 39° 33′ N. lat. or about 170 miles. Its breadth varies considerably. From its entrance to the mouth of the river Potomac, or for about 70 miles, its average width is 25 miles; but farther N. up to the river Susquehannah it does not exceed 10 miles. This would give a surface of about 2750 square miles. But in this calculation the smaller bays and channels are not included which are formed by the embouchures of the James River, York, Rappahannock, Potomac, and others, which may cover a surface of about 750 square miles, so that the area of the whole bay probably does not fall short of 3500 square miles.

A great number of considerable rivers fall into this bay which bring down all the waters from the eastern declivity of the Appalachian mountains, and from their numerous ranges between 37° and 43° N. lat. This circumstance might induce us to consider the bay as only a vast æstuary, especially as its shores are mostly low or very little elevated. But on the other hand we find that its depth is so considerable, that it may be navigated by large vessels in all parts, which does not answer the character of an æstuary. Its shores also, even where there are no large rivers, are much indented, and form numerous harbours for vessels of different sizes. The bay and the rivers which flow into it are navigated by numerous steam-boats which keep up a ready communication between all the countries lying on the bay.

The great rivers which flow into the west side of the Chesapeake bay, taken from N. to S., are the Susquehannah, Potomac, and James river, all of which rise within the Appalachian range, where they flow in longitudinal valleys. Besides these there are numerous smaller rivers, such as the Patapsco, Patuxent, Rappahannock and York river, all of which descend from the east slope of the Blue Ridge, and have no part of their course within the Appalachian range. Ships of war can ascend the Potomac to Washington, which is 120 miles from the mouth of that river, measured along its course, and near 200 from the entrance of the Chesapeake.

CHESELDEN, WILLIAM, a distinguished surgeon and anatomist of the last century, was born in Leicestershire, in 1688. His general education appears to have been limited, at least in point of time. At fifteen he commenced his medical studies in London, under the best instructors; and began himself to give lectures in anatomy in 1711, which he continued for twenty years with a reputation not far inferior to that of his master, Cowper. Becoming soon favourably known, he was elected a fellow of the Royal Society in 1712 at the age of twenty-three, and repaid this early distinction by a variety of interesting papers in the

Philosophical Transactions.' The most remarkable of them, communicated in 1728, is an account of the sensations of a youth of fourteen, blind from infancy, on recovering his sight by the formation of an artificial pupil. The memoir has been much quoted by metaphysical writers the operation, now common, was then perfectly new; and has added considerably and justly to Cheselden's fame.

In 1713 he published a work on anatomy which was long the text-book of that science in England, and was frequently republished both before and after his death. The eleventh edition was printed in 1778.

On the retirement of his tutor, Mr. Ferne, Cheselden succeeded him as surgeon to St. Thomas's, and was afterwards appointed consulting surgeon to St. George's and the Westminster hospitals. He turned these opportunities to good account in maturing his own skill and advancing the science of surgery, which is largely indebted to him. He was probably never surpassed in dexterity and success as an operator; his coolness never deserted him; and he is said to have been as much distinguished for the tenderness as for the judgment that directed his hand. We are told that out of forty-two patients whom he cut for the stone in four years, he lost but one; the present average being at least six in that number An eye-witness of many of his operations, the author of his éloge in the Memoirs of the French Academy of Surgery, of which he was the first foreign associate, assures us that he once extracted the stone in fifty-four seconds. Too much weight, however, may be attached to these surprising instances of success; even if truly recorded, they must have been in part the result of good fortune, or of a very judicious selection of cases for operation.

It is in lithotomy that Cheselden has most repute as an innovator as well as an operator. In 1723 he published a volume on this subject, recommending an improved method of performing what is called the *high* operation; but after more experience and investigation, he laid it aside for the *lateral* method, of which, as at present practised, he may almost be considered the inventor. His splendid work on the bones was published by subscription in 1733, with a dedication to Queen Caroline, to whom he held the appointment of surgeon. It consists of a series of plates of the natural size, with short descriptions; and is unequalled in execution, and, except in a few particulars, unsurpassed in accuracy. It was not successful as a speculation, and was attacked with bitterness, as had been his treatise on the high operation, by a lithotomist of the name of Douglas, who seems to have considered Cheselden an intruder.

In 1737, after a brilliant professional career, and, it is said, partly in disgust at the asperity to which his success had exposed him, Cheselden retired from practice at the age of forty-nine, and undertook the honorary duties of surgeon to Chelsea Hospital, which he retained for the rest of his life. His last contribution to science, made subsequently to his retirement, consisted of a series of plates with original remarks appended to Gataker's translation of Le Dran's Surgery.

In 1751 he suffered an attack of apoplexy from which he entirely recovered; but a return of the complaint caused his sudden death at Bath, on the 10th of April, 1752, in his sixty-fourth year. He was married, and left one daughter, the wife of Dr. Cotes, M.P. for Tamworth, who died without issue.

His reputation as a surgeon was solid, and will be lasting. As a man, much that is good is recorded of him, and nothing unfavourable, unless it be his fondness for pugilistic exhibitions, which might have their interest for him as an anatomist. He befriended Thomas Chubb, probably out of simple benevolence, as he is not said to have shared in his opinions. He associated with Pope and other wits of his time; but as his classical merit was certainly not considerable, their intimacy may be ascribed to his professional eminence and strong natural talents, rather than to the taste for literature and art, upon which he seems to have prided himself with no great reason.

CHESHAM. [BUCKINGHAMSHIRE.]

CHESHIRE, a county palatine on the west side of England. The name is formed from the antient city of Chester, and is an abbreviation of Chestershire, formerly written, in Saxon, Ceastre scyre. The boundary line is very irregular. On the N.W. a tract of a peninsular form is included between the æstuaries of the Mersey and the Dee; and on the N.E. a long narrow tract, containing part of Featherbed Moss and Holme Moss, which belong to the central high lands of England, is included between the Thame and the Etherow, which by their junction form the Mersey. The county is said by some writers to be 'like the wing of an eagle stretched forth at length.' (King's *Vale Royal of Cheshire.*) The whole county received the name of Vale Royal of England, from the magnificent abbey so called, which was founded by Edward I. on the Weaver. Cheshire lies between 53° and 53° 34′ N. lat., and 1° 47′ and 3° 11′ W. long. Its northern boundary is chiefly formed by Lancashire, and partially by Yorkshire and the Irish Sea. The Mersey forms the boundary between Cheshire and Lancashire. On the east, the county has Derbyshire and Staffordshire; on the south, Shropshire and a small portion of Flintshire; and on the west, Denbighshire, Flintshire, and the Irish Sea. The greatest length of the county from N.E. to S.W., in a straight line, is about 58 miles; the greatest width from N. to S. about 32 miles: the whole circuit is nearly 200 miles. On the N.W. extremity, a line of sea-coast extends for about 8 miles from E.N.E. to W.S.W., besides about 20 miles on the æstuary of the Mersey, and about 14 on the great æstuary of the Dee. The area of the county is 665,600 acres, or 1040 square miles; to which may be added 10,000 acres as the sands of the Dee. (Ormerod's *Cheshire*, vol. i. p. xliv.) According to Mr. Holland (*Agricul. Survey*) there are 676,000 acres, of which 620,000 are in cultivation, including parks and pleasure grounds; 28,000 in waste lands, commons, and woods; 18,000 in peat bogs and mosses, and 10,000 in sea-lands on the æstuaries of the Dee and Mersey The total population of the county, in 1827, was 270,098; in 1831, 334,410. (*Boundary Report.*) Chester, the county town, is 183 miles N.W. from London.

Surface, Hydrography, and Communications.—The surface of Cheshire is in general a nearly uniform level, but there are a few inequalities. There are several elevated tracts stretching in a general north direction. One is between the Goyt and the Bollin; and a second between the Bollin and the Weaver. A tract of high land extends also from N. to S. across Delamere Forest, terminating to the N. near Frodsham in a high promontory which overlooks the Mersey, and to the S. in the rock on which Beeston Castle stands; the height of this rock is 366 feet above the sea. Alderley Edge, a few miles N.W. of Macclesfield, is an isolated hill which rises abruptly out of a level country, and presents one of the richest and most extensive prospects in the county; but Cheshire, from its general flatness, is not in general remarkable for picturesque beauty. In the eastern part of the hundred of Macclesfield are several extensive tracts of black moor, or bogs of peat-moss; and in the vicinity of Macclesfield are the high lands already referred to between the Bollin and the Goyt, which spread eastward into Derbyshire, and form on the Cheshire side a kind of mountain-wall. These high lands appear also near Congleton, and stretch southward to Talk, in Staffordshire. In former times there were numerous forests in Cheshire; one is mentioned in the Domesday Survey of Alticross as being ten miles in length and three in breadth. At present there are only a few large woods. Some at Dunham Massey contain many noble old oaks. Around Delamere Forest, in the hundred of Eddisbury, there are several extensive plantations, chiefly of Scotch firs and larches. This forest, so called, is a large sterile tract of whitish sand partially covered with heath and peat-moss. It occupies 10,000 acres; of which a considerable part has been enclosed and brought into cultivation. The most extensive plantation in the county is that of Francis Jodrell, Esq., which covers 1000 acres. The timber supplied by the great profusion of hedge-row trees makes ample amends for the loss of the antient forests. It is principally oak, and furnishes abundance of tanner's bark. A large quantity of fine timber is also produced on the numerous estates of the nobility and gentry; especially on those of Earl Grosvenor, of the Earl of Stamford and Warrington, and of the Marquis of Cholmondeley. In many parts land left to itself becomes spontaneously covered with oak and alder.

Cheshire abounds not only with rivers and brooks, but with broad sheets of water called meres, which generally contain fish. The principal are Oak mere, Pick mere, Budworth mere, Rosthern mere, Mere mere, Tatton mere, Chapel mere, Moss mere, Broad mere, Bah mere, and Comber mere, which is three-quarters of a mile in length.

The chief navigable rivers are the Dee, Mersey, and Weaver. The navigation of these rivers is superintended, and has been greatly improved, by companies incorporated by acts of parliament. The source of the Dee is in Merionethshire, where, in conjunction with another rapid stream descending from the heights between Dolgelly and Dinasmowddy, it forms the lake Tegid, or Pimble mere, otherwise called Bala lake, the largest in Wales. Passing Bala and Corwen, it runs E. through Denbighshire, by Llangollen, nearly to Overton, in Flintshire, where it turns northward to Bangor. Continuing in the same direction, it becomes the boundary of Cheshire nearly from Worthenbury to Aldford. It then intersects the northern part of the hundred of Broxton to Chester, which it half encircles. From Chester it flows in a straight artificial cut into the broad æstuary of the Dee. A surface of about 2500 acres has been reclaimed from the S.E. extremity of this æstuary. From Bangor bridge the Dee is navigable for barges. At Chester bridge it is 100 yards wide, and vessels of considerable tonnage can pass by the new channel to Chester. The whole length of the course of the Dee is about 55 miles. It supplies salmon, trout, and other kinds of common fish. This river, called, in Latin, Deva, in British, Pifir dwy, was antiently held in great veneration, and its waters were considered sacred for religious ablution. As such it is celebrated by Drayton, Browne, Spenser, and Milton. (Dr. Warton's note on Milton's *Lycidas*, Todd's ed., vol. v.)

The Mersey in its whole course divides Cheshire and Lancashire. It is formed, and first receives its name, by the confluence (near Stockport) of the Thame and Goyt: the Etherow (which joins the Goyt a little above Stockport) and the Thame rise in the central highlands, N. and N.E. of Stockport; the Goyt rises near Buxton on the east side of the highlands between Macclesfield and Buxton. Leaving Stockport the Mersey runs a general west course to Northenden and Ashton. After passing by Carrington, it receives on the right bank the Irwell from Manchester, and on the left, a little below Warburton, the Bollin. It continues with a very winding course through a low, flat country past Warrington, and expands at its junction with the Weaver into a wide æstuary which forms the Liverpool channel; and though much obstructed by banks of sand, is rendered safe by the excellent system of pilotage. The Mersey is navigable from its confluence with the Irwell. At Warrington it is 40 yards in width; opposite Liverpool the width is a mile and a quarter, with a considerable depth at low water. The greatest width of the æstuary above Liverpool is between Eastham and Frodsham, where it is above three miles wide. Its whole course from Stockport to the outlet of the æstuary is about 55 miles. A large marsh at the confluence of the Weaver, extending to Helsby and Frodsham, is subject to occasional inundations. The river and æstuary contain congers, plaice, flounders, and shrimps; with annual shoals of smelts, called sparlings, remarkable for size and flavour. Some remarks are made in Ormerod's *Cheshire* (vol. ii.) on the antient communication of the S.E. extremities of the æstuaries of the Mersey and the Dee; by which the present peninsula of Wirrall was made an island.

The Weaver traverses the central parts of Cheshire from S. to N. It rises in the north of Shropshire, near the village of Stych, and after receiving several considerable brooks and rivulets, runs by Nantwich, Minshull, and Winsford, to Northwich, where it forms a confluence on the right bank with the Dane, which rises in the same swamp as the Goyt, and, a little farther north, with the Peover. It then winds W.N.W. and falls into the Mersey below Frodsham. From Winsford to Frodsham it has been rendered navigable by ten locks; the total fall being 50 feet. About 120 vessels, from 20 to 100 tons, convey rock-salt down the river, and return with coal. The whole course of the Weaver is about 40 miles. Among the less important rivers is the Dane, which is joined by the Wheelock above Northwich. The source of the Bollin is in Macclesfield forest, near that of the Dane. It passes Macclesfield and Wilmslow, is crossed by the Bridgewater Canal, and enters the Mersey near Warburton, after a course of about 23 miles. The Peover rises S. of Macclesfield, near Gawsworth, and flows W.N.W. to its junction with the Weaver near Northwich.

Several canals intersect the county. The Bridgewater Canal enters Cheshire by crossing the Mersey near Ashton. Its length within the county of Cheshire is about 24 miles. [BRIDGEWATER, DUKE OF.] The Grand Trunk, or Trent and Mersey Canal, which was commenced in 1766, runs south-east from Preston Brook, by Northwich, Middlewich, and Sandbach, and leaves Cheshire at Church Lawton, on the borders of Staffordshire. Between Preston on the Hill and Dutton, not far from its commencement at Preston Brook, it passes through a tunnel 124. yards in length; at Barnton, through another of 572 yards; at Saltersfield, through one of 350 yards; and finally, at Hermitage, through another of 130 yards. The whole of its line in Cheshire is about 20 miles.

The Chester and Nantwich Canal, which connects these two towns, was completed in 1778. At Chester it forms a junction with the Dee, and with the Dee and Mersey Canal, which runs across the peninsula of Wirrall to the Mersey, at Ellesmere Port. Four miles north of Nantwich, a branch from the Chester and Nantwich Canal runs to Middlewich, and is called the Middlewich branch. From the point where the Chester and Nantwich Canal and the Middlewich branch unite, the canal which thence runs south to Nantwich, and past Audlem into Shropshire, is called the Birmingham and Liverpool Junction Canal. The Ellesmere Canal branches off from a point between Nantwich and the point where the Chester and Nantwich Canal is joined by the Middlewich branch, and runs to the neighbourhood of Whitchurch. From Church Lawton the Macclesfield canal runs past Congleton, Macclesfield, and so on northwards to the Peak Forest Canal, which it joins a few miles north of Disley.

The Peak Forest Canal enters Cheshire at Ashton-under-Lyne, where it crosses the Thame, and passing near Disley, quits the county at Whaley Bridge. It crosses the Goyt below the junction of the Goyt and Etherow, by an aqueduct 100 feet in height, which has three arches, each 60 feet span and 78 feet high.

Several important roads traverse this county. The road from London to Manchester by Derby enters the county near Bosley, and passes through Macclesfield and Stockport. Another branch of the same line enters at Whaley Bridge, and leaves the county at Stockport. The road from London to Manchester by Lichfield runs through this county by Church Lawton, Congleton, Wilmslow, and Cheadle. The road from London to Liverpool also enters at Lawton, and runs to Warrington by two branches, one through Knutsford, the other through Middlewich and Northwich. The Birmingham and Liverpool Railway, as projected, enters the county near Belley on the south, and runs a little to the west of Middlewich and Northwich to the Mersey, which it crosses near Warrington.

Geological character.—The general character of the Cheshire soils is a clayey or sandy loam; tracts of peat-moss cover a large extent of the eastern portion of the hundred of Macclesfield. Some mosses of smaller extent are at Warmincham and Coppenhall. The latter, which is almost cleared of peat, contained numerous trunks and branches of trees, chiefly of oak, beech, and fir, apparently broken off at different heights, and partially exhibiting the marks of fire. An antient road of gravel passed through the moss of Coppenhall.

The range of high land to the east of Macclesfield is a sandstone rock, which contains beds of coal: this sandstone range is bounded on the east by the limestone of Derbyshire. The high land, which includes Delamere forest, is also sandstone.

The most important mineral productions of Cheshire are fossil or rock-salt, and coal. The rock-salt is obtained near the banks of the Weaver and its tributary streams. It was first discovered near Northwich, in 1670, in searching for coal; it has since been found very abundantly in the townships of Witton, Wincham, Winnington, and Marston, near Northwich. There are salt-works also at Nantwich, Middlewich, and Winsford. It is of two kinds, the one white and transparent, the other of a reddish-brown. The former has been found by analysis to be an almost pure muriate of soda: the latter contains a small portion of oxide of iron, from which its colour is derived.

The principal salt-works are in the neighbourhood of Northwich, where alone there are mines, in addition to brine-springs. The rock-salt is found from 28 to 48 yards beneath the surface of the earth. The first stratum is from 15 to 25 yards in thickness, extremely solid and hard, and resembling brown sugar-candy. Many tons at a time are loosened by blasting with gunpowder. The second stratum is of hard stone, from 25 to 35 yards in thickness. The salt lies beneath this stratum, in a bed above forty yards thick, generally perfectly white and clear as crystal. The ex ternal surface above these strata is of whitish clay and gypsum. About 60,000 tons of salt are annually taken from the pits in the neighbourhood of Northwich. Besides this quantity of fossil salt, not less than 45,000 tons are annually manufactured at the same place from brine-springs, which are from 20 to 40 yards in depth.

Coal of a good quality is found abundantly in the north-east part of the county, especially in the townships of Worth and Poynton, where there are very extensive collieries, which supply the manufactories of Stockport. At Denwall, in the hundred of Wirrall, there is also coal. Copper and lead are found at Alderley Edge, and the Peckforton Hills; the former place supplies a considerable quantity of cobalt. There are several quarries of excellent freestone in this county, of which those at Runcorn, Manley, and Great Bebington, are the most important. Limestone is found only at Newbold Astbury. Mowcop Hill, or Molecop, which is partly in Staffordshire, has long been famous for its mill-stones. Marl is found in almost every part of the county, and is generally used for manure. Dr. Woodward (*Cat. Brit. Fossils*) speaks of a fibrous stalky substance, a kind of asbestos, as found in great abundance in beds of marl about High Legh. At Bug Lawton is a sulphur-spring, which is serviceable in scorbutic affections; and at Shaw Heath, near Stockport, a chalybeate of considerable strength.

Agriculture.—The soil and climate of Cheshire are peculiarly well adapted for the growth of grass. The soil is mostly composed of loams of various degrees of tenacity, and the climate is moister than the more eastern parts of England. Situated in an extensive plain between the Derbyshire and Welsh mountains, Cheshire is seldom exposed to long droughts. The low meadows along the banks of the rivers are very subject to be flooded, which is one reason for keeping them in grass. Two-thirds at least of the county possesses a soil above mediocrity, of which the greater part is in permanent pasture, and produces the excellent cheese known as Cheshire cheese. The arable land is generally that which is thought too sandy for pasture, or of which the grass has deteriorated by neglect. Hence the arable part of a farm in Cheshire is seldom cultivated with that attention which is paid to similar land in those counties where good grass land is scarce. There are very few farms which consist chiefly of arable land. There is every where a predilection for the dairy. It may be safely asserted that, with the exception of gentlemen who hold farms in their own hands, of whom there are many of considerable wealth in the county, there are few farmers who deviate from the old routine, or seem inclined to adopt improved systems of cultivation. At the same time, there are perhaps few counties in England so susceptible of material improvement as Cheshire. It possesses great advantages; an easy communication by canals and rivers with the most populous manufacturing districts, and consequently a certain market for its agricultural products. According to the report to the Board of Agriculture, the county is divided as follows:

	Acres.
Arable and meadow land, including parks and pleasure grounds	620,000
Waste lands, commons, woods (a considerable part of which has been inclosed since)	28,000
Peat bogs and mosses	18,000
Sea lands in the æstuaries of the Dee and Mersey	10,000
	676,000

There are many large proprietors resident in Cheshire, but the class of yeomen is much diminished, and is replaced by small proprietors, chiefly retired tradesmen and artificers, or small farmers little raised above the common labourer.

Dairy farms require considerable buildings, and some have been erected by wealthy proprietors in the best and most substantial manner. The habitations for the family are quite sufficient for their comfort: many of the cow-houses are constructed on the Dutch plan. The heads of the cows are turned towards each other, with a passage in the middle for a small cart, by which the fodder is brought directly before the cows. It is thus given to them with greater cleanliness and economy than in any other way. Where many cows are kept, this will be found by far the most convenient arrangement of a cow-house. There is a description of one of these cow-houses in the 'Agricultural Report of Cheshire' (p. 84), erected at Ollerton, near Knutsford, which combines simplicity with great convenience. Large farms are not common in Cheshire. The average size may be considered as from 50 to 150 acres, that quantity being sufficient for the full employment of a family, and for a dairy of twelve to twenty cows. The rent of land is higher than that of the same quality in other parts of England, which is owing to the smaller outlay with which a dairy farm is managed. The implements of husbandry are in general such as have been in use for ages; a heavy ill-constructed plough, drawn by four or five horses in a line, with which they plough three-fourths of an acre of the heavy loams in a day. Harrows and rollers, the latter occasionally armed with spikes, are used to break the heavy lumps which the plough turns up, when the sun has baked them. Improved instruments are in use amongst the gentlemen farmers; but their example is seldom followed by the common renters of land. The effect of the dairy husbandry may be observed all through the county. Land is ploughed in order to have winter fodder for cattle, and to improve pastures overrun with weeds. Where the land is fit for turnips, which is not often the case, they are raised for the cows. Cabbages have been cultivated with some success in several farms, but there is no improvement in the mode of cultivating corn crops. It is not uncommon to see two or three crops of oats taken in succession from newly broken up land, and the last laid down with grass seeds. In this exhausted state it produces no good grass for many years, but plenty of weeds. The introduction of a good system of convertible husbandry would double the present produce of Cheshire. But we will not venture to affirm that the dairy produce would be improved at the same time. When land is brought to a high state of cultivation, and the artificial grasses give a great bulk of fodder, the quality of the cheese is often deteriorated; or to speak more correctly, the process must be varied. It is much easier to make cheese that will keep from poor pastures than from rich.

There is a simple instrument in use in Cheshire which deserves notice. It is a small strong scythe, called a hodding scythe, used to cut up rushes in pastures. It has a short handle, and the blade, which is about twenty inches long, is bent like a portion of a hoop. By a dexterous use of this instrument in spring, a man cuts up a tuft of rushes with a great portion of the roots, and as a hollow is left the water enters into the cut part of the remaining roots and rots them. The hollows should then be filled up with earth, and grass seeds sown over them. The rushes and roots cut off are put in a heap to rot, which is readily effected by the addition of quick lime, and thus an excellent compost is formed.

The cultivation of potatoes has been much encouraged in Cheshire, by the demand in Liverpool and the manufacturing districts. In that part of the county which lies along the æstuary of the Mersey, great quantities of very good potatoes are raised. The sandy and turfy soils, which are unfit for permanent pasture, are peculiarly fitted for the growth of potatoes. The neighbourhood of Frodsham has been long noted for the great quantity of potatoes it produces. The produce on good land is upwards of 10 tons per acre, but they require at least 25 tons of manure. The best potatoes grow on land broken up from grass, which had been laid down in a rich state; in this case no manure is required. When potatoes are very plentiful, and the price low, they are given to cattle, either boiled or raw, and in this way they are worth more than any other root, and produce much excellent manure. Early sorts are raised for the Liverpool market by a slight forcing. They are laid in a dry chamber and protected from the frost; they shoot early, and in that state, one shoot only being left, they are put into the ground in February, and occasionally protected by mats or straw. A slope of the beds towards the south-west is reckoned the most favourable exposure. They come in a month earlier than those planted at the usual time, and the land is cleared by the beginning or middle of June: a second crop is then put in, to be dug up in November. A warm sandy soil suits the early potatoes best. Near Warrington early potatoes are set in wide rows, and cabbages are planted between them: when the potatoes are taken up, the cabbages have the mould drawn round their stems, and attain a good size in spring. This is a cultivation which deserves to be more generally introduced on good strong loams.

Grass land is considered so much more valuable than arable, that most leases contain a clause, 'that not more than one-fourth of the farm shall be ploughed.' Many farms have little or no arable land attached to them. A soil which is rather stiff is considered the best for grass, especially if there be a substratum of marl, which is the case in many parts of the county. The marl, when spread over the surface, materially improves the herbage. A very rich loam is not considered so good for pastures where cheese is made, as one less fertile, as it is apt to make the cheese heave. In Nantwich, and the western part of Northwich hundred, the substratum is chiefly marl, and the soil a stiff clay.

The natural grasses found in the good pastures are chiefly of those kinds which have been most approved of for sowing, when arable land is laid down to grass; viz., Poa pratensis, Poa trivialis, Festuca pratensis, or, on sandy loams, Anthoxanthum odoratum. In the Report it is stated that Rhinanthus Crista galli, commonly called yellow rattles, is very common in the pastures, and is said to be readily eaten by the cattle. It is in most places considered a sign of poor land, and lessens the value of the hay. The Cheshire farmers often defer mowing the grass for hay in a dry summer, in the hope of having a greater crop by waiting for showers; but this is a mistake, since it is much more profitable to cut the grass, however light the crop may be, as soon as the principal grasses are in flower, when the stalk contains the most nutritive juices.

Although much of the soil in Cheshire is well suited for fruit-trees, orchards are not common: the marly substratum is not well adapted for the roots of trees; deep, alluvial, and loose soils, are the best. The hedge-rows are in general well filled with trees, which gives the country, when seen from an elevation, the appearance of a continued forest. The forest of Delamere, as it is called, although, like many other antient forests, a great part of it is a mere waste without any woods, formerly contained 10,000 acres. It is now much reduced by enclosures, but a great portion is still waste.

Draining has been introduced extensively, and with the best effect, in order to carry off the superfluous surface water, which is common in many parts of the county. The shoulder drain is common in stiff soils. Paring and burning are not much practised, and this mode of preparing land for crops is in general reprobated by landlords as destructive of the soil; but when old worn-out pastures are overrun with bad grasses and weeds, there is no improvement more effectual.

The abundance of marl found in Cheshire is one of the chief means of improving the poor soils; 130 solid yards, or tumbril loads, of marl are put on an acre in the summer months, and left on the surface all the winter. In spring it is ploughed in, and makes the manure put on afterwards go much farther. Marling is a permanent improvement. Lime, and also sand, are put upon strong heavy lands to ameliorate the texture; the first does so, when put on in any proportions; the latter must be put in considerable quantities, and not ploughed in deep. It is a great improver of cold wet pastures, especially after they have been drained.

In the neighbourhood of the salt mines, refuse salt has been used for manure, and with success; but whether it owes its virtue to the salt, or to the earthy ingredients mixed with it, is still doubtful.

The number of rivulets in Cheshire might naturally suggest the applying of them to the purpose of irrigation; but this has been done in a few instances only.

In some places, where a rivulet could be turned, so as to flow through a farm-yard, and afterwards irrigate meadows situated lower down, advantage has been taken of this, as an easy mode of conveying the manure over the grass; in this they have imitated the common practice in most farms in Switzerland.

From the great number of dairy-farms in Cheshire, one would naturally expect to see considerable attention paid to the breed of cows; but, till lately, this was not the case; there were cows of all breeds, and crossed in every possible way. The great superiority of the improved short-horn breed has however made them more generally sought after. Some of the dairies have very fine herds, or packs, as they are called there, of short-horned cows, and some of Ayrshire cows; but this is by no means yet general; purity of blood is not much thought of. When a cow is a good milker, her cow-calves are weaned; and those heifers which are raised on the farm are thought to produce the most thriving cows. A cow is considered in her prime at four or five years old, and continues so till she is ten or twelve, after which she falls off, and should be fatted for the butcher. 'A good milker has a capacious and thin udder, without much flesh on it, teats standing well apart, and not too large; a deep belly, with very prominent milk veins; a light fore-quarter, wide loins, thin thigh, white horn, thin head, clean about the chaps and throat, and a full lively eye.' (*Agricultural Report.*) A cow that gives much milk is never fat, and her hip-bones project: her ribs appear distinctly under the skin. It is estimated that there are about 100,000 cows in the county, each of which gives on an average 2½ cwt. of cheese in the year; that is, altogether, 250,000 cwt., or 1250 tons. Each cow gives on an average about eight quarts of milk per day; some few give much more, and even as much as 24 quarts per day; but this is extraordinary, and only for a short time. Four quarts of milk make one pound of cheese; it takes from 12 to 15 quarts to make a pound of butter. A cow is in full milk for six months after calving, then three months in half milk, and three months dry. A plentiful supply of good fresh food, such as clover or tares, cut and carried to the stall, will often double the average of milk; but this is seldom practised in dairy counties. The cows are generally housed in November, or kept in yards, which is better. During the winter they are let out for a few hours each day into a paddock, or small meadow, near the homestead; they find nothing to eat there, but it gives them an appetite for their dry food when they come in again. Stall-feeding cows has been attempted, and with success; but this occasions too much trouble for the dairy-farmer, although the produce may be much increased, and the manure will amply repay the expense of the daily cutting and carrying of the fodder. Cow-calves which drop in February and March are usually reared: they are left three weeks to suck the cow, after this they have warm whey given them to drink, or oatmeal-gruel mixed with whey. Flax-seed, steeped in water until a jelly is formed, is also given them by some. For the first winter they have hay, in the next only straw. The heifers take the bull at two years old.

The making of Cheshire cheese is described minutely in the Agricultural Report for the county, to which we refer, as well as to the Article [CHEESE.]

Butter is made from the cream or from the whole milk allowed to coagulate and become sour. Good butter may be obtained in either way; but that made from fresh cream is always the best. An inferior butter is made from the cream which rises on the whey. [BUTTER.]

A considerable part of the profit of a well-managed dairy arises from the feeding and selling of pigs; but fewer pigs are kept in Cheshire than the dairies would warrant. The fatting of calves for the butcher is probably not so profitable, from the want of demand for veal in the country, as it would be nearer the metropolis.

The wages of agricultural labourers are good on the whole, and they are in general laborious and provident. The neighbourhood of manufactures tends to raise the wages.

The sheep husbandry, which is so profitable to the farmer in other counties, is scarcely known in Cheshire. Sheep do not go well with cows, as they pick out the finest herbage before it is long enough for the cow to graze. Some few are kept to consume the grasses which the cows refuse; they are seldom kept over the year, and are sold as soon as any profit is realized.

On the whole Cheshire is inferior to many other counties in agriculture, but it contains more means of improved husbandry than most. It wants only the application of capital, and the superintendence of men of true practical science, to become one of the finest agricultural counties in England.

Fairs.—Altringham, April 29, August 5, November 22; Budworth, February 13, April 5, October 2; Congleton, May 12, July 5, November 22; Chester February 25, April 27, July 5, October 2, November 24; Frodsham, May 15, August 21, December 13; Knutsford, Whit-Tuesday, July 10, November 8; Macclesfield, May 6, June 22, July 11, October 4, November 11; Malpas, April 5, July 25, December 8; Middlewich, Holy Thursday, August 6; Nantwich, February 4, March 15, September 4, December 11; Northwich, April 10, August 2, December 6; Over, May 16, September 25; Sandbach, Easter Tuesday, Tuesday after September 10; Stockport, March 4—25, May 1, October 23; Tarporley, May 1, last Monday in August, December 11; Winsford, May 8, November 25.

Divisions, Towns, &c.—When the Domesday survey was taken, this county exclusively of the lands between the

Ribble and the Mersey, now a part of Lancashire, though then considered a part of Cheshire, was divided into twelve hundreds. Except a few townships, the two antient hundreds of Atiscros and Exertan have also been taken from Cheshire, and added to the counties of Flint and Denbigh. The present division of the hundreds is supposed to have been made in the reign of Edward III.; and Lysons gives the proportion or relative size of old and new hundreds under the following table:—

New Hundreds.	Old Hundreds.
Wirrall,	Wilaveston.
Broxton,	Dudestan and Castra.
Eddisbury,	Riseton and Roelan.
Northwich,	Mildestric.
Nantwich,	Warmondestron.
Macclesfield	Hamestan.
Bucklow,	Bochelau and Tunendune.

It is to be observed that several of the townships which were in Dudestan are now in Eddisbury; and other variations have taken place; but the general arrangement of the hundreds of Cheshire is exhibited by the table.

Lysons states the number of market-towns to be twelve, excluding Chester:—namely, Altringham, Congleton, Frodsham, Knutsford, Macclesfield, Malpas, Middlewich, Nantwich, Northwich, Sandbach, Stockport, and Tarporley. Of the less important of these places we subjoin some account; those which are large enough to receive distinct notices are described elsewhere. [ALTRINGHAM, CONGLETON, MACCLESFIELD, NANTWICH, and STOCKPORT.]

Tarporley, in the hundred of Eddisbury and deanery of Chester, is a small market-town, near Beeston Castle, on the great road from London to Chester, from which it is distant ten miles east-south-east. It was antiently governed by a mayor, but at present by a constable. In 1642 a battle was fought at this place between Sir Wm. Brereton's forces and the Royalists from Chester, who, on this occasion, were victorious. Tarporley is pleasantly situated, cleanly, and neatly built, and is chiefly known as the scene of an annual fox-hunt in November, which is numerously attended by the county gentry, the neighbouring heaths being very favourable for this amusement. The church is an antient structure of the red sandstone, which abounds in this county: its interior contains several monuments, with inscriptions interesting to the antiquary, and some armorial bearings in windows of coloured glass. The living is a rectory, of which the net annual income is 644*l*. The inhabitants are chiefly employed in the manufacture of stockings and leather breeches. The market is on Thursday. There is an alms-house and Wesleyan chapel. Population, 1000.

Sandbach, a market-town in the hundred of Nantwich and deanery of Middlewich, was formerly celebrated for its ale. It occupies a pleasant eminence near the river Wheelock, and commands several extensive and picturesque views of the Vale Royal, the Staffordshire and Derbyshire hills, and the distant mountains of Wales. The worsted trade and manufacture of shoes, which formerly prevailed, have been succeeded by the silk manufacture, by which the town has risen to greater importance. It has some brine springs in the vicinity. In the market-place are two antient crosses, with sculptured images of the crucifixion. The living is a vicarage, of which the net annual income is 213*l*. Market on Thursday. Population, 6516.

Frodsham is 191 miles north-west from London; the population is 1746. This township is pleasantly situated on a rising ground at the foot of the hills which border on Delamere Forest, near the junction of the Weaver and the Mersey. Salt works and cotton manufactures are the chief employments of the inhabitants. The town is formed chiefly by two streets which intersect each other, and there is a graving-dock and yard for building and repairing vessels. The living is a vicarage, in the archdeaconry and diocese of Chester; the patron is Christ Church, Oxford: it is of the annual value of 590*l*. The church is a fine antient structure. Beacon Hill has some pleasant walks and fine views. On a site now occupied by a handsome modern mansion, stood formerly at the west end of the town a castle which Edward I. gave to David Llewelyn, the last sovereign prince of Wales, which was afterwards held by the earls of Rivers, and was consumed by fire in 1642. The parish of Frodsham is about thirty miles in circumference, and it contains eight townships. It abounds in springs, and produces large quantities of potatoes, which are used chiefly by the manufacturers of Lancashire. The Wesleyan Methodists have a meeting-house in Frodsham. There is a free-school, the salary of which is 100*l*., and the teacher has besides a good house in Overton. There is also a charity for the relief of the orphans and widows of the clergy.

Knutsford, situated on the great road from London to Liverpool, is 172 miles north-west by north from London the population is 3040. The market-day is Saturday. The name is said to be derived from Canute, the Dane, who passed with his army over the small branch of the Bollin, which runs past the town. The town is in the hundred of Bucklow, and is divided into Higher and Lower Knutsford by a branch of the river Bollin, which rises about half a mile to the south, and passing the turnpike road falls into Tatton mere. In Lower or Nether Knutsford there are a spacious county prison, a handsome town-hall, and the market-place. Knutsford was formerly part of the parish of Rostherne, but was made a distinct parish in 1741. The living is a vicarage, in the archdeaconry and diocese of Chester, of the annual value of 225*l*. The church is built of brick and stone, with a square tower. The Dissenters have three meeting-houses and two charity schools. Thread, worsted, and leather are the principal manufactures. Races are held every July near the town.

Malpas, situated on an elevation near the river Dee, in the hundred of Broxton, is 168 miles north-west from London: the population of the parish 5565, of the town 1004. The parish contains two rectories, one with the curacy of St. Chad, and the other with the curacy of Whitwell. The church was formerly the chapel of a religious house for monks of the Cluniac order; it is built of unhewn stone, and consists of a nave and chancel, without either aisle or steeple: it is highly ornamented, and some of its decorations have been supposed to be of Saxon origin. Courts leet are held here for the recovery of debts under 40*s*. Besides several meeting-houses, there are here two chapels of ease, an endowed grammar school for 12 boys and 12 girls, and also many charitable institutions. Malpas is the birth place of Matthew Henry, the commentator on the Bible.

Middlewich, situated near the confluence of the rivers Dane and Croke, is 167 miles north-west of London: the population of the parish is 4785, of the town 1325. Market-day is Tuesday. This town derives its name from its position between the wiches or the salt towns. Great quantities of salt are manufactured from the salt-springs here: cotton fabrics are also made. The Grand Trunk Canal runs through the town on its course to the Mersey. The living is a distinct vicarage, in the archdeaconry and diocese of Chester, of the net annual value of 128*l*. The church is large, and on the south side of it are a college and an oratory; the latter founded by the Leigh family of Lyme, the former by Thomas Savage, archbishop of York. The Dissenters have three meeting-houses; and there is a free-school. The petty sessions are held at Middlewich for the hundred of Eddisbury. The Rev. Theophilus Lindsay, a Unitarian divine of some note, was born here.

Northwich, in the parochial chapelry of Witton, is 17 miles east-north-east of Chester, and 173 north-west of London: the population, 1490. Camden states that it was called by the Britons Hellath, or Hellah Du, that is, the Black Salt Town. It is in the line of the northern Watling Street. The town was fortified and garrisoned by the parliament party in 1643, and was taken by the royalists and retaken by their enemies. The principal manufacture is salt. The Weaver runs through the town. Vessels of small burden are built here in the ship-yards. The market-day is Friday. Courts-leet and baron are held, though the general quarter-sessions were removed to Knutsford in 1784. The Independents and Wesleyan Methodists have meeting-houses in Northwich, and there has been a charity school for 12 poor children, with a small endowment, since 1735. The living is a curacy, in the archdeaconry and diocese of Chester. The church, which is spacious, has a semicircular choir, and the roof of the nave is decorated with numerous figures of wicker baskets, such as are used in salt-making.

Over, a small town, about four miles west of Middlewich, is governed by a mayor; but the commissioners appointed to make the recent inquiry into Municipal Corporations say that it does not appear under what warrant or authority the borough of Over is governed by a mayor who is also a justice of the peace within the limits of the borough and lordship. The population in 1831 was 2601.

Ecclesiastical and Legal Jurisdiction.—This county, in antient times, was subject to the ecclesiastical jurisdiction of the bishops of Mercia, who had their seat at Chester. In the time of William the Conqueror, and during three successive centuries, this diocese was styled the bishopric of Chester. (For further historical accounts, see Lysons and Ormerod.) Of these 86 parishes 46 are rectories, 23 vicarages, and 18 donatives, or perpetual curacies; many are of great extent. The parish of Prestbury comprises 32 townships and 14 chapelries. The county is in the diocese of Chester, and province of York: it forms an archdeaconry, and comprises the seven deaneries of Chester, Frodsham, Macclesfield, Nantwich, Malpas, Middlewich, and Wirrall. Cheshire is in the South Wales circuit.

Cheshire, before the Reform Act, sent four members to parliament: it is now formed into a north and a south division, each of which sends two members to parliament. The north division contains the hundreds of Macclesfield and Bucklow, and the south division contains the remaining hundreds.

The boroughs of Cheshire, Macclesfield, and Stockport, each return two members to parliament. The places of election for the north and south divisions respectively are Knutsford and Chester.

Manufactures.—The cotton and silk manufacture is extensively carried on in and around Stockport, Macclesfield, Marple, Congleton, and Sandbach. At Knutsford there is a large manufactory of thread. At Nantwich, and the places just named, are manufactories of hats for exportation, and of shoes at Sandbach. Some woollen cloths are also made in the same district. Tanning is very extensively carried on throughout the county. There is also a large manufacture of gloves, ribbons, and buttons. The copper, lead, and iron, of the Alderley Edge and Peckforton Hills, are manufactured in the county, and constitute a small item in the export trade. But cheese is the principal product, which is not only well known and highly esteemed in every part of England where the consumption is immense, but also in most parts of Europe. The whole annual produce of this article in Cheshire is about 11,500 tons, of which 4000 tons are exported. (Holland's *Agricul. Survey.*) The prime cheese is made chiefly in the districts where the salt abounds; that is, along the banks of the Weaver. Potatoes are raised in very large quantities, especially in the western portion of the county, including the peninsula of Wirrall. In the parish of Frodsham alone about 100,000 bushels are annually produced. Besides a prodigious home consumption, they are exported in great quantity by the Mersey to Liverpool and Manchester.

Civil History and Antiquities.—At the time of the Roman invasion this county formed part of the territory occupied by the Cornavii or Carnabii, a name which Whitaker conjectures the inhabitants of this district derived from the peculiar form of the peninsula between the æstuaries of the Dee and the Mersey. In the first division of Britain by the Romans it was included in Britannia Superior; and in their subsequent subdivision, it became part of Flavia Cæsariensis. The towns possessed by the Cornavii were Deva or Chester, Condate or Kinderton, Banchorium, Banchor, or Bangor, Etocetum or Wall, and Uriconium or Wroxeter; the last of which seems to have been their metropolis. Bangor, Etocetum, and Uriconium are not within the limits of Cheshire. Ormerod mentions a recent discovery of brass tablets, recording a grant of the freedom of the city of Rome to certain troops serving in Britain in the reign of Trajan, A.D. 98—117, some of whom at least may have been stationed near Bickly, where the tablets were found. From inscriptions which have been found, the twentieth legion appears to have continued at Chester as late as the third century, but to have withdrawn long before the final abandonment of the island in the fifth.

On the departure of the Romans, the Britons continued to hold Cheshire until about the year 607, when it was wrested from Brochmael, king of Powys, by the successful arms of Ethelfrid, the Saxon king of Bernicia. Prior to the battle, the Saxon troops are said to have massacred the monks of Bangor, against whom St. Augustine had denounced divine vengeance for their errors, and who aided the Britons with their prayers. Several of the British princes, however, having collected an army and marched to Chester, Ethelfrid was defeated in turn, and this district was not again subjected to the Anglo-Saxon power until about the year 828, when it was taken by King Egbert, and made a part of the kingdom of Mercia. According to Peter Langtoft, Athelwolf held his parliament at Chester after the death of Egbert, and there received the homage of his tributary kings 'from Berwick unto Kent.' About the close of 894, an army of Danes advancing from Northumberland took possession of Chester, and seized the fortress: the Saxons under Alfred, however, having arrived in the vicinity, by destroying the cattle and corn, and intercepting the provisions of the Danes, drove them to such extremities of famine, that they quitted the city and retreated to North Wales. Upon the division of England into three districts by Alfred, Cheshire was included in the Mercian jurisdiction. Cheshire acquired the privileges of a county palatine in the reign of William the Conqueror, who granted it to his nephew, Hugh d'Avranches, commonly called Hugh Lupus, to hold it as freely by the sword as he himself held the kingdom of England by the crown. Lupus created eight barons as soon as he felt himself established in his new dignity, who were bound to attend on him at his court and to furnish him with horses in war. In return for these services, they were invested with the right of holding courts on all pleas, suits, and plaints, and with the power of life and death. The last instance of the exertion of this last privilege occurred in 1597, when the baron of Kinderton's court tried and executed Hugh Stringer for murder. Until the final subjugation of the Welsh, the city of Chester was the usual place of rendezvous for the English army, and the county was exposed to all the evils of a border warfare. In 1237, on the death of John Scot, the seventh earl of Chester of the Norman line, without male issue, Henry III. gave the daughters of the late earl other lands in lieu of the earldom, being unwilling, as he said, to 'parcel out' so great an inheritance 'among distaffs:' the county he bestowed on his son Edward, who did not assume the title, but conferred it on his son Edward of Caernarvon, since which time the eldest sons of the kings of England have always held the title of earls of Chester. The inhabitants of Cheshire took a part in the rebellion of the Percies, and the greater part of the knights and esquires of the whole county, to the number of 200, with many of their retainers, fell in the battle of Shrewsbury, on the 22nd of July, 1403, from which date to the reign of Charles I., Cheshire was not the scene of any important military transactions. From the time of Henry III. to the reign of Henry VIII., the palatinate was governed as independently as it had been by the Norman earls. Henry VIII. however made it subordinate to the crown of England; 'yet,' says Gough, in his 'Additions to Camden,' 'all pleas of lands and tenements and all contracts within the county are to be heard and determined within it; and all determination out of it is deemed void, *et coram non judice*, except in cases of error, foreign plea, and foreign voucher; and for no crime but treason can an inhabitant of this county be tried out of it.' The county being solely under a distinct jurisdiction, and to a certain extent like a separate kingdom, never sent representatives to the English parliament, either for city or shire, until the reign of Edward VI., when, in the year 1549, on the petition of the inhabitants, two members were summoned from each. On the outbreaking of the civil war, as this county was nearly equally divided between the king and the people, the principal persons attempted to preserve its internal peace by a treaty of pacification, which was entered into at Bunbury under the sanction of the commissioners of array, but was rendered nugatory by an ordinance of parliament which required the inhabitants to assist the common cause. The parliament sent Sir William Brereton with a troop of horse, who took possession of Nantwich, which he fortified and made his head-quarters; while Sir Nicholas Byron, on the other side, being appointed colonel-general of Shropshire and Cheshire, and governor of Chester by the king, made it the head-quarters of the royalists. Lord Byron, the nephew of the governor, after successfully reducing several of the parliamentarian garrisons with his Irish regiments, defeated the whole parliamentary forces under Sir William Brereton at Middlewich, in the month of December, 1643. Nantwich, being now the only garrison in Cheshire in the possession of the parliament, was besieged during the greater part of January, 1644, until it was relieved by the united forces of Sir Thomas Fairfax and Sir William Brereton, who defeated Lord Byron and compelled him to retreat with the remains of his forces to Chester on the 25th. Prince

Rupert took Stockport without resistance on the 25th of May; but the royalists were defeated after a severe battle at Castle-heath, near Malpas, on the 25th of August. Next year, on the advance of the king to Chester with a large force, the parliament abandoned all their garrisons, except Tarvin and Nantwich, and, on the 27th of September, the battle of Rowton and Hooleheath was fought near Chester, in which the royalists were defeated; an event which led to the surrender of the garrison of Chester, in February, 1646, and the subjugation of the whole county to the parliament.

In August, 1659, Sir George Booth, having a secret commission from Charles II., appointing him commander-in-chief of all his forces in Cheshire, Lancashire, and North Wales, and being accompanied by several noblemen and gentlemen, appeared in Cheshire at the head of an army of upwards of 3000 men. They mustered on Rowton Heath, and published a declaration that they took up arms to deliver the nation from slavery and obtain a free parliament. The army of the parliament, under General Lambert, met them at Winnington Bridge, near Northwich, on the 16th of August, and soon defeated them. Booth himself, after making his escape from the field in disguise, was taken at Newport Pagnell and sent to the Tower; and Chester, which had been held by Colonel Croxton, surrendered immediately on the approach of the victorious army. The son of Sir George Booth, Lord Delamere, on the eve of the revolution, no sooner heard of the landing of the prince of Orange than he raised a considerable force in Cheshire and Lancashire, declared in his favour, and marched to join him; the Lords Molineux and Aston, with equal promptness, seized Chester for the king; but these warlike preparations were fortunately rendered useless by the abdication.

The Roman roads in the county are found in detached parts: one road, called the Watling-street, was probably more antient than the Roman times. This road enters Cheshire from the north by the ford over the Mersey at Stratford; the marks of the elevated crest, peculiar to the military roads of the Romans, are still visible. A little south-west of Bucklow Hill the roads seem to have divided, the Roman continuing towards Kinderton, and the British pursuing its old direction by Northwich over Delamere Forest, and by Chester to the coast of Caernarvonshire. The Roman road from Manchester to Kinderton crosses the ford of the Mersey, and proceeds to the village of Cross-street. It is seen in the enclosures about Oldfield Hall, and in a field beyond it is still raised several yards. In crossing the adjoining moss it is known by the name of Upcast, whence it runs by Dunham Park to a field called the Harbour-field, in the parish of Kinderton, which is the supposed station of *Condate*. Part of the Via Devana crossed the county from the S.E. to Chester. Besides these, antiquarian conjecture has pointed out several other Roman roads, but the evidence is not so satisfactory in their favour as in the cases of the roads we have traced. That there was a Roman station at Chester is universally admitted—the sites of the others are uncertain.

Besides the castle at Chester, which was built by William the Conqueror, and is now converted into the county-hall, ail, and barracks, there are several others. Beeston Castle, built in 1220, by Randle Blundeville, Earl of Chester, is upon the slope and summit of a sandstone rock, which forms on one side an almost perpendicular precipice of great height. The outer court is irregular in form, inclosing an area of about five acres. The walls are prodigiously thick, and have several round towers. A deep ditch, sunk in the solid rock, surrounds the keep; which was entered by a drawbridge, opposite two circular watch towers, still remaining. The approach within the great gateway between these towers is by rugged steps cut in the natural rock. Camden speaks of a draw-well, bored to the base of the rock, a depth of 90 yards, and communicating with a brook in the vale below. This castle has been in ruins since the civil war of Charles I., when it was dismantled. The others are Halton Castle, of which very few traces now remain; Aldford Castle, of which the foundations are still traced; Shocklach Castle, of which only some earth-works and a high mount are now to be seen; and Shotwick, which appears from the sketch of it in the British Museum to have had a pentagonal wall, with several circular towers inclosing a lofty square one. There are numerous antient mansion-houses. Smith, in his Treatise on Cheshire, calls this county 'the mother and the nurse of the gentility of England.' Another writer (*Harl. MSS.*, No. 1989) speaks of it as 'the seed-plot of gentry.'

Little Moreton Hall, in the parish of Astbury, is the most remarkable antient mansion in the county. The materials of the house are timber and plaster. The singular ornamental style of this very antient edifice, and the curious glazing of its large bay windows, are well exhibited in the plates of Lysons's *Magna Brit.*; Ormerod's *Cheshire*, vol. iii.; and Britton's *Architec. Antiq.*'

Bramhall Hall, the antient seat of the Davenports, about two miles S.W. of Stockport, resembles that of Little Moreton. Ormerod's work contains a beautiful view of this mansion, vol. iii., p. 400.

Saighton Grange, near Chester, was one of the castellated residences of the Abbot of St. Werburg. (Ormerod, vol. ii., p. 240.)

Doddington Hall, the antient seat of the Delves family, is near the road from Nantwich to London. The modern, large, and sumptuous fabric was erected in 1780 by Samuel Wyat. It stands in a spacious park, and overlooks a fine sheet of water. Poole Hall, in the parish of Eastham, was built in the middle of the sixteenth century, and is one of the most venerable specimens of domestic architecture in this county. The style of the architecture is similar to that of all the antient Cheshire mansions, rising into pointed gables, with numerous large bay windows, and having the approach through a line of stables and cow-houses. Brereton Hall, which is in the style of Esher Place in Surrey, was built by Sir William Brereton, and the foundation stone is said to have been laid by Queen Elizabeth herself. The site is on a rising ground near the river Croke. Among the rich decorations of the interior is a curious painting of Queen Elizabeth in full costume, with chains of jewels hanging down to her waist, and with hair extremely red. Another object of great interest is the painted window, which has since been removed from this mansion to Ashton Hall in Warwickshire. Ormerod (vol. iii., p. 50) has given a large coloured drawing of this window, which contains nine full-length figures; the Saxon earls of Mercia, Leofwine and Leofric, and the seven Norman earls of Chester. They are all represented with hair and beards of a deep yellow. Dutton Hall stands on the ridge of a steep declivity overlooking the Weaver. It is surrounded by a broad and deep moat. The great hall is 40 feet by 20, and the whole edifice is a very sumptuous specimen of the domestic architecture of the sixteenth century. Crewe Hall, the seat of Lord Crewe, is an equally fine specimen of the seventeenth century, having been completed in 1636. It is a quadrangular building of red brick, with battlements and large projecting bay windows. An engraving is given in Ormerod, vol. iii., p. 168, and in Lysons's *Magna Brit.* The sculptured oak ornaments of the interior are curious, as well as the painted-glass window of the chapel. There are many portraits by Lely and others of that time. Britton, in his 'Architectural Antiquities,' has a fine drawing of a staircase in this mansion, remarkable for its form and decorations. The seat of Lord Combermere was an antient Cistercian abbey: it is beautifully situated on the margin of the large mere so called. The original edifice has been almost wholly renewed in the pointed Gothic style. Ormerod, vol. iii., p. 210.

Dunham Massey, the seat of the Earl of Stamford and Warrington, was rebuilt in 1730. It is a very spacious quadrangular building of brick, surrounded with a fine park of lofty old oaks, and is interesting for a curious gallery of paintings by Holbein, Lely, Vandyke, and other old masters. Cholmondeley Castle, the seat of the Marquis of Cholmondeley, is in the township of Cholmondeley, in Broxton hundred. The present magnificent modern edifice was built in 1804, on the site of the antient castle. The style of the architecture is the pointed Gothic; and, in approaching the eminence on which it stands, it has the appearance of an antient Norman fortress. The apartments are adorned with some rare and beautiful paintings. Eaton Hall, the seat of Earl Grosvenor, possesses great architectural grandeur, and resembles Cholmondeley Castle, in the pointed Gothic style. The surrounding park and pleasure grounds are laid out with great picturesque effect. Antient crosses occur at the boundary of Lyme Park, at Sandbach, at Oulton, and at Lymm. The crosses at Sandbach are referred by Lysons to a period not long subsequent to the introduction of Christianity among our Saxon ancestors. The sword of Hugh Lupus, the first Norman Earl of Chester, is preserved in the British Museum.

Statistics.—Population. Cheshire is both an agricultural and manufacturing county; in the first respect it ranked higher in 1811 than in 1831, being at the former date the 31st on the list of agricultural counties, and at the latter date, the 34th. Of 78,940 males, twenty years of age and upwards, inhabitants of Cheshire (in 1831), 23,527 were engaged in agricultural pursuits, and 13,305 in manufactures, or in making manufacturing machinery. Macclesfield Hundred is the principal manufacturing district of the county; in 1831 more than 6000 men were employed in manufacturing cotton and calico; nearly 1000 in the manufacture of silk, and about 5500 in manufacturing cotton and silk promiscuously. In Eddisbury and Northwich Hundreds, about 300 were employed in making salt.

The following summary of the population taken at the last census (1831) shows the number of inhabitants and their occupations in each hundred of the county.

HUNDREDS &c.	HOUSES.				OCCUPATIONS.			PERSONS.			Males, twenty years of age.
	Inhabited.	Families.	Building.	Uninhabited.	Families chiefly employed in agriculture.	Families chiefly employed in trade, manufactures, and handicraft.	All other families not comprised in the two preceding classes.	Males.	Females.	Total of Persons.	
Broxton	2,953	3,123	40	88	2,012	604	507	8,201	8,214	16,415	4,087
Bucklow	7,849	8,271	36	280	2,944	3,264	2,063	21,631	21,311	42,942	10,718
Eddisbury . . .	4,917	5,202	13	104	2,623	1,383	1,196	13,622	13,269	26,891	6,492
Macclesfield . . .	21,792	23,454	201	1022	3,048	16,472	3,934	60,033	63,316	123,349	28,272
Nantwich . . .	4,287	4,520	9	134	2,194	1,406	920	11,447	11,625	23,072	5,510
Northwich . . .	7,065	7,473	26	254	1,638	3,757	2,078	19,022	19,127	38,149	9,044
Wirrall	3,296	3,544	66	253	1,458	1,080	1,006	9,537	9,563	19,100	4,570
Chester (city) . .	4,096	4,628	43	388	355	2,665	1,608	9,635	11,709	21,344	4,797
Macclesfield (town) .	4,543	4,740	2	295	125	4,366	249	11,005	12,124	23,129	5,450
Totals .	60,748	64,955	406	2818	16,397	34,997	13,561	164,133	170,258	334,391	78,940

The population of Cheshire at each of the four enumerations was :—

	Males.	Females.	Total.	Inc. per Cent.
1801 .	92,759	98,992	191,751	
1811 .	110,841	116,190	227,031	18·39
1821 .	132,952	137,146	270,098	18·99
1831 .	164,133	170,258	334,391	23·81

Showing an increase between the first and last periods of 142,640 persons, or 74½ per cent., which is 17½ per cent. beyond the general rate of increase throughout England.

County Expenses, Crime, &c.—The sums expended for the relief of the poor at the four dates of

1801	were £ 66,627	which was	6*s.* 11*d.*	for each inhabitant.
1811	„ 114,370	„	10*s.* 0*d.*	
1821	„ 104,081	„	7*s.* 8*d.*	
1831	„ 102,572	„	6*s.* 2*d.*	

The sum expended for the same purpose in the year ending 25th March, 1834, was 92,640*l.*; and assuming that the population had increased at the same rate of per centage since 1831, as in the ten years preceding that period, the above sum gives an average of 5*s.* 1¼*d.* for each inhabitant. All these averages are below those for the whole of England and Wales.

The sum raised in Cheshire for poor's-rate, county rate, and other local purposes, in the year ending 25th March, 1833, was 141,492*l.* 19*s.*, and was levied upon the various descriptions of property as follows :—

	£.	*s.*	*d.*
On land	99,808	18	0
Dwelling-houses . .	29,416	13	0
Mills, factories, &c. . .	7,837	18	0
Manorial profits, navigation, &c.	4,429	10	0
	£141,492	19	0

The amount expended was—

For the relief of the poor . . .	98,572	3
In suits of law, removal of paupers, &c.	7,480	17
For other purposes	37,687	10
	£ 143,740	10

In the returns made up for the year ending March, 1834, the descriptions of property assessed for local purposes are not distinguished; 138,228*l.* 16*s.* was raised in that year, and the expenditure was as follows :—

	£.	*s.*
For the relief of the poor . . .	92,640	0
In suits of law, removal of paupers, &c.	8,569	12
For other purposes	37,105	18
Total .	£ 138,315	10

The saving effected in the sums expended for the relief of the poor in 1834, as compared with the expenditure of 1833, is therefore rather more than 6 per cent.; the second item is, however, greater than that of the preceding year, reducing the whole amount of saving to about 3¾ per cent.

The number of turnpike-trusts in Cheshire, as ascertained in 1829, was 27; the number of miles of road under their charge was 349; the annual income arising from the tolls and parish composition was 16,525*l.*; and the annual expenditure 15,354*l.*

The county expenditure in 1834, exclusive of the relief for the poor, was 41,082*l.* 9*s.* 9*d.*, disbursed as follows :—

	£.	*s.*	*d.*
Bridges, buildings, and repairs, &c.	5,179	2	6
Gaols, houses of correction, &c., and maintaining prisoners, &c.	14,037	6	7
Coroner	488	13	0
Lunatic asylums . . .	225	0	0
Expenses of prosecutions . .	9,570	3	2
„ clerks of the peace .	737	14	3
„ conveyance of prisoners before trial .	1,441	6	11
„ conveyance of transports	817	10	0
„ apprehending and conveying vagrants .	395	19	4
„ high and special constables . .	628	5	2
„ debt—payment of principal and interest .	5,614	9	7
„ miscellaneous . .	1,946	19	3

The number of persons charged with criminal offences in the three septennial periods ending with 1820, 1827, and 1834, were 1675, 2443, and 3862; making an average of 239 annually in the first period, of 349 in the second period, and of 552 in the third period. The numbers of persons tried at quarter-sessions in each of the years 1831, 1832, and 1833, in respect to which any costs were paid out of the county rates, were 377, 356, 398, respectively. Among the persons charged with offences, there were committed for

	1831.	1832.	1833.
Felonies . .	344	339	379
Misdemeanors .	38	39	34

The total number of committals in each of the same years was 399, 403, and 431 respectively of whom

The number convicted was .	332	330	367
„ „ acquitted .	50	48	46
„ „ discharged by proclamation .	17	25	18

At the assizes and sessions (in 1835), 533 persons were charged with crimes in Cheshire; out of which number, 34 were charged with offences against the person, 10 of which were common assaults; 49 for offences against property committed with violence; and 389 for offences against property committed without violence. Of the remaining 61, there were 26 committed for riot, 21 for poaching, 2 for arson, 2 for uttering false money, 6 for perjury and unlawful oaths, 1 for killing and maiming cattle, 1 for forgery, and 2 for keeping disorderly houses. Of those committed, 411 were convicted, and 122 acquitted, or no bills were found against them. The greater part of the punishments awarded to those convicted was very slight: 231 were sentenced to imprisonment for six months or under; 56 for one year or under; 17 for two years, and 1 for three years; 4 were fined, and 7 were discharged on sureties. Of the remaining 95, 18 were sentenced to death, which sentence was commuted to transportation or imprisonment; and 77 were sentenced to transportation for various periods. Of the offenders, 461 were males, and 72 females. Among the whole number, 205 could read and write, 155 could read only, 167 could neither read nor write, and the degree of instruction of 6 could not be ascertained. The proportion of the offenders to the population in 1835 was 1 in 627.

The number of persons qualified to vote for the county members of Cheshire is 10,235, being 1 in 23 of the whole population, and 1 in 5 of the male population above 20 years of age. The expenses of the last election of county members to parliament, were to the inhabitants of the county, 415*l*. 15*s*. 6*d*., and were paid out of the general county rate.

There are ten savings-banks in this county. The number of depositors and amount of deposits on the 20th November, 1832, 1833, 1834, and 1835 respectively, were:—

	1832.	1833.	1834.	1835.
Number of depositors .	8853	9262	10,089	10,985
Amount of deposits .	£327,647	332,483	356,334	381,872

The various sums placed in the savings-banks in 1834 and 1835 were distributed as under:—

£	1834. Depositors.	1834. Deposits.	1835. Depositors.	1835. Deposits.
Not exceeding 20 .	4,774	£34,140	5,291	£ 36,280
„ 50 .	3,005	93,097	3,315	103,075
„ 100 .	1,403	96,344	1,517	105,536
„ 150 .	526	64,355	531	67,608
„ 200 .	315	51,507	288	56,184
Above 200 .	66	16,891	43	13,189
Total .	10,089	£356,334	10,985	£381,872

Education.—The following particulars are obtained from the parliamentary inquiry on education made in the session of 1835:—

	Schools.	Scholars.	Total.
Infant Schools	51		
Number of infants at such schools, ages from 2 to 7 years:—			
Males		547	
Females . . .		629	
Sex not specified		342	
			1518
Daily Schools	845		
Number of children at such Schools, ages from 4 to 14 years:—			
Males		14,210	
Females . . .		11,698	
Sex not specified		4,733	
			30,681
Schools .	896		
Total of children under daily instruction .			32,199
Sunday Schools.	363		
Number of children at such Schools, aged from 4 to 15 years:—			
Males		25,314	
Females		26,831	
Sex not specified		4,827	
			56,972

Assuming that the population between 2 and 15 years increased in the same ratio as the whole of the population between 1821 and 1831, and has continued to increase in the same ratio since, we find that there must have been living in Cheshire (in 1834) 117,243 persons between those ages. A very large number of the scholars attend both daily and Sunday schools; thirty-nine schools, containing 3573 children, are returned from various places as attending both daily and Sunday schools, and there are a still greate number not specified; in what proportion the duplicat entry of children is thus produced is therefore uncertai but we may conclude that not two-thirds of the childre receive instruction.

Maintenance of Schools.

Description of Schools.	By endowment. Schls.	By endowment. Scholars.	By subscription. Schls.	By subscription. Scholars.	By payments from scholars. Schls.	By payments from scholars. Scholars.	Subscrip. and payment from scholars. Schls.	Subscrip. and payment from scholars. Scholars.
Infant Schools	1	6	8	180	43	1,100	4	232
Daily Schools	92	3941	61	3,744	663	20,003	29	2993
Sunday Schools	9	877	338	54,985	1	86	10	1024
Total...	102	4824	407	58,909	707	21,189	43	4249

The schools established by Dissenters, included in th above statement, are:—

	Schools.	Scholars.
Infant Schools	..	..
Daily Schools	17	1,303
Sunday Schools	165	28,572
The Schools established since 1818 are ·		
Infant and other daily schools . .	531	16,686
Sunday Schools	290	44,894

Forty-eight boarding-schools are included in the numbe of daily schools as given above.

No school in this county appears to be confined exclusively to the children of parents of the established church, o of any other religious denomination. Such exclusion is disclaimed in almost every instance, especially in schools established by Dissenters, together with schools for the children of Roman Catholic parents.

Lending libraries of books are attached to eighty-three schools in Cheshire.

CHE'SNE, ANDRE' DU, born in 1584 in the province of Touraine, became distinguished for his historical and philological erudition, and was one of the most learned men of France in his age. The work for which he is best known is his valuable collection of the oldest French chroniclers 'Historiæ Francorum Scriptores coætanei, ab Gentis Origine usque ad Philippi IV. tempora,' of which he edited 4 vol. fol., and his son, François du Chêsne, edited the 5th after his father's death. He also published: 2. 'Histoire des Rois, Ducs, et Comtes de Bourgogne et d'Arles,' 2 vol. 4to. 3. 'Histoire des Cardinaux Français.' 4. 'Bibliotheca Cheniacensis.' 5. 'Bibliothèque des Auteurs qui ont écrit l'Histoire et Topographie de la France.' 6. 'Histoire des Papes,' 2 vol. fol. 7. 'Histoire généalogique des Maisons de Luxembourg, de Montmorency, Vergy, Guisnes, Châtillon, Béthune, &c.,' 7 vol. fol., besides a History of England in 2 vol. fol., Paris, 1634. Duchesne died in 1640 near Paris. He has been called the father of French history.

CHESS, to adopt the definition of Dr. Johnson, is 'a nice and abstruse game, in which two sets of men are moved in opposition to each other.' The best method of learning the names of the pieces, with their moves, and the manner of placing them at the beginning of the game, is to take an hour's lesson from a friend; and we will therefore pass over this part of the alphabet of the game, to make room for more interesting matter; premising, however, two points, which are often unknown to drawing-room as distinguished from club-players. The first is, that though every pawn may be moved two squares at its first move, it may be taken by any pawn which could have taken it, had it moved but one square; and the pawn in such case is said to be taken *en passant*. Thus, suppose the white queen's bishop's pawn to have advanced to the adversary's queen's bishop's fourth square, and the black queen's knight's pawn to be at its own square; if the black should move his queen's knight's pawn two squares, the white may take it with his queen's bishop's pawn, and the white pawn is placed at the black queen's knight's third square, just as if the black pawn had been moved one square only. The second point is, that when a pawn has reached the last square on the adverse side of the board, it becomes a queen, rook, bishop, or knight, as the player to whom it belongs may choose; nor is this privilege limited, as common players often suppose, to cases where the first queen or a rook, &c., has been lost.

Notation used in chess. The board is supposed to be divided into two equal parts, one of which belongs to the white, the other to the black player. The square on which the king stands is called the king's square; the one in front of it the king's second square, the next in front of that the king's third square; then the next the king's fourth square; the next again is called the king's fifth square, or the adversary's king's fourth square, and so on. The bishop standing next to the king is called the king's bishop; the square on which it stands the king's bishop's square; the next square in front is the king's bishop's second square, and so on. In like manner we have the king's knight's square, the king's rook's square, the queen's square, the queen's bishop's square, the queen's knight's square, and the queen's rook's square; and each master-piece gives its name to the other squares on its file. The pawns too take their names from the pieces before which they stand, and are called the king's pawn, the queen's pawn, the king's bishop's pawn, the king's rook's pawn, &c. Suppose we wished to describe a situation in which the queen's pawn was in its original position; we might say that it was at its square, or at queen's second square. If it had been moved one square, we might say that it was at its third square, or at the queen's third square; the former phrase is not strictly accurate, but is sanctioned by the best writers.

This notation, however, is commonly employed in a more compendious form; thus K. stands for king, Q. for queen, R. for rook, B. for bishop, Kt. for knight, P. for pawn, sq. for square, adv. for adversary's, chg. for checking; observing K. may stand for king's as well as king, Q. for queen's, &c. Q. Kt. stands for queen's knight, Q. Kt. P. for queen's knight's pawn, and so on.

There is another method of notation frequently employed by continental writers, which consists in using the first eight letters of the alphabet to designate the eight files, and the first eight figures to designate the squares of those files; thus P. E. 4 means that the player of the white pieces has moved his king's pawn two squares, and P. E. 5 denotes the same move for the black. This notation is shorter than even the most abbreviated form of the first-mentioned one; but it is perplexing and difficult to follow, from its being based on a less natural division of the board.

We may here observe that the ranges of squares running from right to left are called *ranks*, and those running from one player to the other are called *files;* the lines sloping obliquely across the board are termed *diagonals.*

TECHNICAL TERMS. *Castling.* This is a combined move of the king and rook, which is allowed once in the game. The method of castling is as follows: first, with the K. R., the R. must be placed on the K. B. square, and the K. at K. Kt. square; secondly, with the Q. R., the R. must be placed on the Q. square, and the K. on Q. B. square. The space between the king and rook must be unoccupied; neither the king nor the rook must have moved; and the squares over which the king moves must not be attacked at the time by any adverse piece.

Check signifies an attack made on the king by a piece or pawn. A *check by discovery* is when the king is attacked not by the piece that moves, but by one which is behind it; for example, place the white king at his own square, black queen at her king's square, and a black knight at adv. king's third square; by playing the knight to adv. king's knight's fourth square, you give *check by discovery* with the queen; if you play the knight to adv. queen's bishop's second sq., or king's knight's second sq., you give *double check.*

A perpetual check consists in an alternation of checks, from each of which the adverse king escapes only to be subjected to the other. Thus suppose the pieces to be in the following situation:—

Black.	*White.*
K. at K. Kt. sq.	K. at K. R. sq.
P. at K. Kt. 2 sq.	Q. at K. sq.
Q. at adv. Q. R. 2 sq.	
R. at adv. Q. R. 3 sq.	

In this critical position, white having the move can draw the game by checking at adv. K. sq., and then at adv. K. R. fourth sq., and again at adv. K. sq., and so on *ad infinitum.*

Checkmate. When the king is attacked and cannot move out of check, take the piece that checks him, or interpose any piece, he is said to be *checkmated,* and the game is won by the player who gives the *checkmate.* In other words, when the king is so attacked that he would inevitably be taken, if he were not king, he has lost the game.

Doubled Pawn. When two pawns of the same colour are on the same file, the more advanced one is called a doubled pawn; thus if there is a pawn on K. R. second sq., and another on K. R. third sq., the latter is called a doubled pawn.

Drawn Game. When neither party can checkmate the other, the game is drawn. This may happen in many ways; first, if the force remaining on the board is not sufficient to checkmate, as if you have only your king and a bishop, or a knight, or both knights, against the adverse king; secondly, when you have sufficient force, but are unable to checkmate with it: the twenty-second law in Lewis's 'Elements' bears upon this point, and is as follows—'As the game is drawing to a conclusion, if one of the players remain with a rook and bishop against a rook, with both bishops, or with a knight and bishop against a king, he must checkmate his adversary in fifty moves on each side at most; for if at the expiration of fifty moves checkmate be not effected, the game must be considered as drawn,' &c. &c.[*] Thirdly, by a perpetual check on the adverse king; fourthly, when both players act on the defensive, and abstain from attacking the adversary; fifthly, when both players have an equal but small force, as a rook or queen; and sixthly, when one of the kings is stalemated.

Exchange—To gain the. When a player obtains a rook for a bishop or knight, he is said to gain the exchange, a rook being more valuable than a knight or a bishop.

Gambit. This word is derived from the Italian *gambetto,* a tripping up of the heels; the King's Gambit begins in the following manner·

White.	*Black.*
1. K. P. 2 sq.	1. K. P. 2 sq.
2. K. B. P. 2 sq.	

If black abstains from taking the offered pawn, he is said to refuse the gambit.

The following moves constitute the Queen's Gambit:

White.	*Black.*
1. Q. P. 2 sq.	1. Q. P. 2 sq.
2. Q. B. P. 2 sq.	

Stamma, a native of Aleppo, who published a good analysis of this opening, called it the gambit of Aleppo, an appellation which was afterwards adopted by Philidor.

The sacrifice of the knight in the following manner constitutes the Muzio Gambit, which is perhaps the most brilliant opening hitherto invented:

Black.	*White.*
1. K. P. 2 sq.	1. K. P. 2 sq.
2. K. B. P. 2 sq.	2. P. takes P.
3. K. Kt. to K. B. 3 sq.	3. K. Kt. P. 2 sq.
4. K. B. to Q. B. 4 sq.	4. K. Kt. P. 1 sq.
5. Castles.	5. K. Kt. P. takes Kt.

The Salvio and the Cunningham Gambit are likewise varieties of the King's Gambit. The Lopez Gambit, in which the K. B. P. is not sacrificed until the fourth or fifth move, begins in the following or some similar manner:

White.	*Black.*
1. K. P. 2 sq.	1. K. P. 2 sq.
2. K. B. to Q. B. 4 sq.	2. K. B. to Q. B. 4 sq.
3. Q. to K. 2 sq.	3. Q. P. 1 sq.
4. K. B. P. 2 sq.	

In the Bishop's Gambit, the first player moves K. B. to Q. B. 4th square at his third move, instead of K. Kt. to K. B. 3rd square.

Minor Piece is an appellation common to the bishop and knight.

Passed Pawn. A pawn is called *passed* when it is no longer obstructed by any adverse pawn on its own file, or either of the adjoining ones.

Stalemate. This name is given to the termination of the game, when the player whose turn it is to move has his king so placed, that though not in check he cannot move without going into check, and there is nothing else to play. The game is then drawn. It was formerly the law among English players, that the player whose king was stalemated won the game, and many uninstructed players imagine this to be the case still; but the rule has long since been altered, with great propriety. The following is an example of a stalemate:

[*] Of the checkmates mentioned in the text, that with the bishop and knight is remarkably difficult; that with the two bishops very easy; and that with rook and bishop against rook uncertain. Philidor asserted that it could always be forced; but succeeding writers, among whom we may mention Mr. Lewis (*Chess Lessons,* vol. ii. p. 304), believe that in any indifferent position the game is drawn.

White.	*Black.*
1. K. at K. R. sq.	1. K. at K. R. sq.
	2. Q. at adv. K. B. 2 sq.

White has the move, and is consequently stalemated.

This is the case likewise in the following position:

White.	*Black.*
1. K. at K. R. sq.	1. K. at K. R. sq.
2. B. at K. R. 2 sq.	2. Q. at adv. K. B. 2 sq.
	3. R. at K. R. 2 sq.

White is to move; he cannot move the king without going into check of the queen, nor can he move the bishop without exposing himself to check of the rook; he is consequently stalemated. The student who is desirous of seeing remarkable positions where the game is drawn by stalemate, will find them in Lewis's edition of *Sarratt*, pp. 108, 111, 152, 153, 154, 172; in Lewis's *Stamma*, situations 97, 98, 99, 100; and in Lewis's *Chess Problems*, situations 89 and 95.

The following games will exemplify many of the preceding laws and definitions; the fourth is one of the match games played between the London and Edinburgh clubs, in the years 1824—28:

Game 1 (*Fool's Mate*).

Black.	*White.*
1. K. B. P. 1. sq.	1. K. P. 2 sq.
2. K. Kt. P. 2 sq.	2. Q. to adv. K. R. 4 sq. Checkmating.

Game 2 (*Scholar's Mate.*)

White.	*Black.*
1. K. P. 2 sq.	1. K. P. 2 sq.
2. K. B. to Q. B. 4 sq.	2. K. B. to Q. B. 4 sq.
3. Q. to adv. K. R. 4 sq.	3. K. Kt. to K. B. 3 sq.
4. Q. takes K. B. P. Checkmating.	

Black's third move ought to have been Q. to K. second square.

Game 3 (*A Gambit from Greco*).

White.	*Black.*
1. K. P. 2 sq.	1. K. P. 2 sq.
2. K. B. P. 2 sq.	2. K. P. takes P.
3. K. Kt. to K. B. 3 sq.	3. K. Kt. P. 2 sq.
4. K. B. to Q. B. 4 sq.	4. K. B. P. 1 sq.
5. K. Kt. takes K. Kt. P.	5. P. takes Kt.
6. Q. to adv. K. R. 4 sq. chg.	6. K. to his 2 sq.
7. Q. takes K. B. P. and checks.	7. K. to his sq.
8. Q. to adv. K. R. 4 sq. chg.	8. K. to his 2 sq.
9. Q. to adv. K. 4 sq., and checkmates.	

Black's fourth move was a very bad one; he ought to have played either K. B. to K. Kt. 2 square, or K. Kt. P. 1 square: having committed this mistake, however, he should have played K. R. P. 2 squares at his fifth move, instead of taking the Kt. The pawn which white takes at his 7th move, having been just before on the bishop's file, retains the name of K. B. P., though it might also be called K. Kt. P. If black at his 7th move were to interpose K. Kt., white would checkmate on the move by playing Q. to adv. K. 4th sq.

Game 4.

London.	*Edinburgh*
White	*Black.*
K. P. 2 sq.	1. K. P. 2 sq.
2. K. Kt. to K. B. 3 sq.	2. Q. Kt. to Q. B. 3 sq.
3. Q. P. 2 sq.	3. K. P. takes P.
4. K. B. to Q. B. 4 sq.	4. K. B. to Q. B. 4 sq.
5. Q. B. P. 1 sq.	5. Q. to K. 2 sq
6. K. castles.	6. P. takes P.
7. Q. Kt. takes P.	7. Q. P. 1 sq.
8. Q. Kt. to adv. Q. 4 sq.	8. Q. to her 2 sq.
9. Q. Kt. P. 2 sq.	9. Q. Kt. takes P.
10. Q. Kt. takes Kt.	10. K. B. takes Kt.
11. K. Kt. to adv. K. Kt. 4 sq.	11. K. Kt. to K. R. 3 sq.
12. Q. B. to Q. Kt. 2 sq.	12. K. to K. B. sq.
13. Q. to Q. Kt. 3 sq.	13. Q. to K. 2 sq.
14. K. Kt. takes K. B. P.	14. K. Kt. takes Kt.
15. Q. takes K. B.	15. K. Kt. to K. 4 sq.
16. K. B. P. 2 sq.	16. Kt. takes K. B.
17. Q. takes Kt.	17. Q. to K. B. 2 sq.

Game 4.—*continued.*

London.	*Edinburgh.*
White.	*Black.*
18. Q. to Q. B. 3 sq.	18. Q. B. to K. 3 sq.
19. K. B. P. 1 sq.	19. Q. B. to adv. Q. B. 4 sq.
20. K. R. to K. B 4 sq.	20. Q. Kt. P. 2 sq.
21. K. P. 1 sq.	21. P. takes P.
22. Q. takes P.	22. K. R. P. 1 sq.
23. Q. R. to K. sq.	23. K. R. to K. R. 2 sq.
24. K. B. P. 1 sq.	24. K. Kt. P. 2 sq.
25. K. R. to adv. K. B. 4 sq.	25. Q. R. P. 2 sq.
26. Q. to adv. Q. B. 4 sq. chg.	26. K. to K. Kt. sq.
27. K. R. takes P. chg.	27. P. takes R.
28. Q. takes P. chg.	28. K. to K. B. sq.
29. B. to Q. 4 sq.	29. B. to K. 3 sq.
30. Q. to adv. Q. B. 4 sq. chg.	30. K. to K. Kt. sq.
31. Q. to adv. K. Kt. 4 sq. chg.	31. K. to K. B. sq.
32. Q. B. checks.	32. K. to his sq.
33. Q. to adv. Q. 4 sq.	33. Q. R. to its 3 sq.
34. Q. to adv. Q. Kt. 2 sq.	34. Q. to K. R. 4 sq.
35. K. B. P. checks.	35. K. takes P.
36. R. to K. B. sq. chg.	36. K. to Kt. 3 sq.
37. Q. to K. 4 sq. chg.	37. Bishop interposes.
38. Q. to adv. K. sq. chg.	38. Rook interposes.
39. Q. to adv. K. Kt. sq. chg.	39. K. to K. B. 3 sq.
40. K. Kt. P. 2 sq.	40. Q. R. to its sq.
41. Q. takes Q. R.	41. Q. takes P. chg.
42. K. to K. R. sq.	42. R. to Q. 2 sq.
43. B. to Q. R. 3 sq.	43. K. to K. B. 2 sq.
44. Q. to adv. Q. B. 3 sq.	44. R. to adv. Q. sq.
45. Q. takes Q. Kt. P.	45. Q. to adv. K. 4 sq. chg.
46. K. to K. Kt. sq.	46. K. to K. Kt. 3 sq.
47. Q. to Q. Kt. 2 sq.	47. Q. to adv. K. Kt. 4 sq. chg.
48. Q. to K. Kt. 2 sq.	48. Q. takes Q. chg.
49. K. takes Q.	49. B. to adv. K. R. 3 sq. chg.
50. K. takes B.	50. R. takes R.
51. B. to adv. K. 2 sq.	51. Q. R. P. 1 sq.
52. Q. R. P. 1 sq.	52. R. to K. B. 4 sq.

The London club resigned the game.

The London club had the game in their hands until the unfortunate though ingenious sacrifice of the rook at the twenty-seventh move. They might have won, at the twenty-fourth move, by checking with Q. at adv. Q. B. 4 sq., and then playing Q. R. to adv. K. 2 sq., as Mr. Lewis has demonstrated in his excellent edition of the match games, p. 30, *et seq.*: or they might have won at the twenty-sixth move, by playing B. to Q. 4 sq., as Mr. Lewis has shown in his 'Remarks on the Report of the Committee of the Edinburgh Chess Club,' p. 7, *et seq.* Even after the sacrifice of the rook, London might have drawn the game by a perpetual check, by checking again with Q. at adv. Q. B. 4 sq., at the 32 move, and then at adv. K. Kt. 4 sq., &c.

History and Literature of the Game. The game of chess is of great antiquity, and appears to have been invented in China or Hindostan. Sir William Jones inclines to the latter supposition. In the second volume of the 'Asiatic Researches,' he says, 'We may be satisfied with the testimony of the Persians: who, though as much inclined as other nations to appropriate the ingenious inventions of a foreign people, unanimously agree that the game was imported from the west of India in the sixth century of our æra. It seems to have been immemorially known in Hindostan by the name of *Chaturanga*, *i.e.*, the four *angas*, or members of an army; which are these, elephants, horses, chariots, and foot-soldiers; and in this sense the word is frequently used by epic poets in their descriptions of real armies. By a natural corruption of the pure Sanscrit word, it was changed by the old Persians into *chatrang*; but the Arabs, who soon after took possession of their country, had neither the initial nor the final letter of that word in their alphabet, and consequently altered it further into *shatranj*, which found its way presently into the modern Persian, and at length into the dialects of India, where the true derivation of the word is known only to the learned. Thus has a very significant word in the sacred language of the Brahmins been transformed by progressive changes into *axedrax*, *scacchi*, *echecs*, *chess*; and by a whimsical concurrence of circumstances has given birth to the English word *check*, and even a name to the *exchequer* of Great Britain.' He speaks also of 'the *rat'h*, or armed chariot, which the Bengalese pronounced *rot'h*, and which the Persians changed into *rokh*, whence came the *rook* of some European nations;

as the *vierge* and *fol* of the French are supposed to be corruptions of *ferse* and *fil*, the primo minister and elephant of the Persians and Arabs.'

It is perfectly clear that chess was not known to the Greeks or Romans; indeed it is commonly supposed not to have been introduced into Europe till the time of the Crusaders; though there is a set of Latin verses in Hyde, describing the game, which is said to have been written during the time of the Saxons, and therefore a good number of years before the first crusade. Several points in which the eastern game now differs from ours were then observed in Europe. The following are the peculiarities of the Hindostanee game, as given by a native player·

'1. In the Hindostanee game the king is placed to the right hand, so that the king of one party is opposite the queen of the other.

'2. There are three modes of winning the game. The first called Boorj, when the losing party has no piece left on the board—the game is then discontinued. This mode of winning is reckoned the least creditable, and in many parts it is deemed a drawn game. The second is by checkmate with a piece, when the losing party must have one or more pieces remaining. The third is by checkmate with a pawn (pied-mât), the losing party having one or more pieces remaining. This last shows the greatest superiority.

'3. Stalemate is not known in the Hindostanee game; if one party get into that position the adversary must make room for him to move. In some part of India he that is put in this predicament has a right to remove from the board any one of the adversary's pieces he may choose.

'4. No party can make a drawn game by an universal [perpetual] check; he that has the option must adopt some other move.

'5. The pawns on reaching the last square of the board are transformed into the master piece of that file, except the king's pawn, which becomes a queen. If the pawn be on the knight's file, the knight immediately on being made takes one move in addition to the last move of the pawn, unless some other piece command the square to which the pawn was advancing.

'6. No pawn can be pushed up to the last square of the board, nor take any piece on that line, so long as the master piece of that file remains.

'7. The king does not castle, but is allowed the move of a knight once in the game, not however to take any piece—nor can he exercise this privilege after having been once checked.

'8. The two royal pawns and those of the two rooks are allowed to move two squares each at first, so long as their pieces remain at their squares. The other pawns move only one square at a time.

'9. At the beginning of a game, four or eight moves, as may be determined, are played up on both sides. This in a great measure prevents unnecessary exchanges till a general disposition is adopted and the pieces brought out.

'10. The first move at the beginning of a match is arbitrary; afterwards he that has won most games moves first.'

(*Essays on Chess, adapted to the European mode of Play; consisting principally of Positions or critical Situations, calculated to improve the Learner and exercise the Memory.* By Trevangadacharya Shastree. Translated from the original Sanscrit. Bombay. 1814.)

In the Latin verses above mentioned, the queen is directed to be placed on the right hand of the king, and therefore the queen of one party will be opposite the king of the other, as in India.

'Rex paratus ad pugnandum, primum locum teneat,
Ejus atque dextrum latus Regina possideat.'

Other peculiarities mentioned by Trevangadacharya Shastree are found in the older European writers. Thus he says that the king does not castle; and there is no example of castling in Sarratt's translation of 'Damiano.' Again, the king once in the game may move like a knight; and we find instances of this singular privilege in Sarratt's 'Ruy Lopez,' p. 97; in his 'Gianutio,' p. 5; and in his 'Gustavus Selenus,' p. 41.

Other Hindostanee modes are still preserved at Stroebeck, a village of chess-players near Halberstadt, of which Mr. Lewis has given a very interesting account. Our Indian tells us that four or eight moves are played up on each side; and in one of his games the same moves are played by both parties seventeen times! At Stroebeck, in like manner, 'The pieces being placed as usual, each party is obliged to play his king's rook's pawn, queen's rook's pawn, and queen's pawn two squares, and the queen to her third square.' (Lewis's *Chess Lessons*, second series, p. 416. And as in India, the privilege of moving two squares is restricted to the pawns of the king, queen, and rooks, so at Stroebeck it is confined to those of the queen and rooks. At Stroebeck too castling is not allowed, but Mr. Lewis was informed that some players have lately permitted it.

The villagers possess a chess-board which was presented to them by the elector of Brandenburg, on the 13th of May, 1651; 'on the other side the board is divided into 96 squares (12 by 8); this is intended for the courier game, which is played with the usual chess-men, to which are added, for each player, four pawns, two couriers, a man, and a fool, which last two are now called state counsellors.' (Lewis's *Chess Lessons*, second series, p. 414.)

In this game, which has been played at Stroebeck from time immemorial, another one of the antique rules of chess appears to be preserved. In the courier game the move of the bishop is confined to the second square from the one on which he stands; thus, a bishop placed on the king's 4 sq. can be played only to K. Kt. 2 sq., Q. B. 2 sq., Q. B. 6 sq., or K. Kt. 6 sq.; and in the Latin verses above quoted, we are told that 'Cædit calvus per transversum tertiam ad tabulam,' that is to say, 'the bishop attacks the third square in an oblique direction;' the square on which he stands being included in the three, according to the old way of reckoning; just as Damiano, for instance, talks of a pawn moving *three* squares; and Mr. Lewis, adopting this mode, speaks of the bishop's move in the courier game, being limited to *three* squares.

The reader who is inclined to investigate the history of Chess may consult Hyde's treatise, 'Mandragorias, seu Historia Shahiludii. Oxoniæ, 1694;' 'Leibnitzii, Annotatio de quibusdam Ludis,' &c., in 'Misc. Soc. Reg. Berol.,' t. i., an. 1710: the historical disquisition on the game of Chess, by Daines Barrington, in the 9th vol. of the 'Archæologia;' Sir William Jones's 'Essay,' in the 2nd vol. of the 'Asiatic Researches;' and a paper, by Mr. Eyles Irwin, in the 'Transactions of the Royal Irish Academy.' Twiss's work, entitled 'Chess,' 2 vols., 8vo., is an amusing repertory of anecdotes of chess-players, accounts of chess-books, and passages relating to the game, extracted from an infinity of authors.

Jacopo Dacciesole, a Dominican friar, wrote a treatise on Chess before the year 1200, entitled 'Solatium Ludi Scacchorum, scilicet Libellus de Moribus Hominum et Officiis Nobilium.' This was a book of great reputation for several centuries. Caxton's work on Chess, printed in 1474, was a translation from a French translation of Dacciesole's Treatise. The object of the writer however is rather to teach morals than Chess; he merely gives the moves, and then treats of the duties of the various ranks represented by the chess-men. Thus, in Caxton, 'The thirde chapitre of the seconde tractate treteth of the alphyns, ther offices, and maners. The alphyns ought to be made and formed in manere of juges syttynge in a chayer, with a book open to fore their eyen,' &c.

And then comes an account of the offices of these judges, one of whom is supposed to sit in criminal, and the other in civil cases. The alphyn, we may remark, is the bishop.

Catalogue of chess writers in chronological order·—

The earliest practical writer on Chess is Lucena, whose treatise came to light only a few years since. It is entitled 'Arte breue, e introduccion muy necessaria para saber jugar al Axedres, con ciento y cincuente Juegos de partido.' Salamanca, 4to., about 1495.

His book was copied by Damiano, who published a treatise at Rome in 1512, entitled 'Libro da imparare giuocare a Scacchi,' &c., 4to. There is another edition, printed at Rome in 1524 *.

Ruy Lopez. 'Libro de la invencion liberal y arte de juego del Axedres, &c. En Alcara de Henares,' 1551, 4to.

Gianutio (Horatio). 'Libro nel quale si tratta della maniera di giuocar a' Scacchi, con alcuni sottilissimi partiti.' Turino, 1597. 4to.

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* It is a curious fact in literary history, that Damiano's work was in its turn copied without acknowledgment; in the quaint language of Bingham's translation of Ponziani, 'Of the eighty-eight parties by this author [Damiano] nine or ten are very ingenious, not so the others. We, nevertheless, must believe, that all alike excessively struck the fancy of D. Antonio Porto, who, with admirable frankness, caused them to be-reprinted under his own name, without adding the smallest particle to them himself; as may be seen by the two editions, one printed at Bologna, by Gio. Rossi in 1606, the other at Venice, by Peter Farri, in 1618.' p 62.

Salvio (Alessandro). 'Trattato dell' invenzione e dell arte liberale del giuoco degli Scacchi.' Nap. 1604, 1612, 1618; e diviso in lib. vj., per Gio. Dom. Montanaro, 1634. 'Discorso sopra il giuoco degli Scacchi con la sua Apologia contro il Carrera,' 1634, 1723. 4to.

———— 'Il Puttino, ossia il cavaliere errante sopra il giuoco de' Scacchi,' &c. Nap. 1634. 4to.

Selenus (Gustavus.) 'Das Schach oder Koenig-Spiel. Lips.,' 1616, folio. (This book was written by the duke of Brunswick.)

Greco (Gioachino). 'Trattato di nobilissimo e militare esercitio de' Scacchi.' (We do not know the date of this work, but that of the earliest French translation is 1615.)

Carrera (Pietro). 'Del giuoco degli Scacchi,' &c. Militelli, 1617. 4to.

Bertin (Capt.) 'The noble game of Chess.' London, 1735. 12mo.

Stamma (Philippe). 'Essai sur le jeu des Échecs,' &c. Paris, 1737. 12mo.

Philidor (A. D.) 'Analyse du jeu des Échecs,' &c. Londres, 1749. 8vo.

Rio (Ercole Del). 'Osservazioni pratiche sopra il giuoco degli Scacchi.' 4to. Modena, 1750. (This is the celebrated anonymous Modenese.)

Lolli (Giamb). 'Osservazioni teorico-pratiche sopra il giuoco degli Scacchi.' Bologna, 1763. Folio.

Cozio (il Conte Carlo). 'Il giuoco degli Scacchi. Torino, 1766. 2 vols., 8vo.

Ponziani (Domenico Canonico). 'Il giuoco incomparabile degli Scacchi,' &c. Modena, 1769. 4to. There is an English translation of this work by Bingham.

'Traité théorique et pratique du jeu des Echecs, par une société des amateurs.' Paris, 1775 and 1786.

'Les Stratagèmes des Echecs,' 2 tom. 16mo. Paris. An. X. There is an English translation of this work by Kenny.

Allgaier.. 'Neue theoretisch-practische Anweisung zum Schachspiele.' 8vo. Wien, 1811.

Koch (J. F. W.) 'Codex der Schachspielkunst.' 2 vols., 8vo. Magdeburg, 1813.

Sarratt (J. H.) 1. 'Treatise on the game of Chess.' 2 vols., 8vo. London, 1808.

2. 'Translation of the works of Damiano, Ruy Lopez, and Salvio, on the game of Chess.' 8vo. London, 1813.

3. 'Translation of the works of Gianutio and Gustavus Selenus.' 2 vols., 8vo. Lond., 1817.

4. 'New Treatise on the game of Chess,' upon a plan of progressive improvement hitherto unattempted. 2 vols., 8vo. Lond., 1821.

Trevangadacharya Shastree. 'Essays on Chess, adapted to the European mode of play,' &c. Bombay, 1814.

'A selection of fifty games, played by the automaton chess-player.' London, 1820. (Pawn and move are given by the automaton in all these games.)

Cochrane. 'A Treatise on the game of Chess; containing the games on odds, from the "Traité des Amateurs;" the games of the celebrated anonymous Modenese; a variety of games actually played; and a catalogue of writers on Chess.' Lond. 8vo. 1822.

Silberschmidt. 'Das Gambit, oder Angriff und Vertheidigung gegen Gambitzüge,' &c. Brunswick, 1829. 8vo.

Mauvillon. 1. 'Anweisung zur Erlernung des Schachspiels,' &c. Essen, 1827. 8vo.

2. 'Belehrende Unterhaltung für junge angehende Schachspieler,' &c. Essen, 1831 and 1832. 16mo.

Lewis (Wm.) 1. 'Oriental Chess, or Specimens of Hindostanee excellence in that celebrated game.' 2 vols. Lond., 1817.

2. 'Stamma on Chess,' with notes. 8vo. Lond., 1818.

3. 'Greco on Chess,' with notes. 8vo. Lond., 1819.

4. 'Sarratt on Chess,' with notes. 8vo. Lond., 1822.

5. 'Elements of the game of Chess.' 12mo. Lond. 1822.

6. 'Chess Problems.' 12mo. Lond., 1827.

7. 'The Games of the Match at Chess played by the London and the Edinburgh Chess Clubs, with numerous variations and remarks.' 8vo. Lond., 1828.

8. 'Remarks on the Report of the Committee of the Edinburgh Chess Club.' 8vo. Lond., 1829.

9. 'A Series of Progressive Lessons on the game of Chess.' 8vo. London, vol. i., 1831, vol. ii., 1832.

10. 'A Selection of Games at Chess, played at the Westminster Chess Club, between Monsieur L. C. de la Bourdonnais and an English amateur of first-rate skill, with remarks.' 8vo. London, 1835.

11. 'Chess for beginners.' London, 1835.

Mr. Lewis has likewise published a very valuable translation of Carrera.

'The Games of the Match at Chess, &c., as reported by the Committee of the Edinburgh Chess Club.' Edinburgh and London, 1829. 8vo.

Walker (George). 1. 'Variations on the Muzio Gambit.' London, 1831. 12mo.

2. 'A New Treatise on Chess.' London, 1832; second edition, 1833, small 8vo.

3. 'A New Translation of Philidor's Analysis.' London, 1832, royal 18mo.

4. 'A Selection of Games at Chess, actually played by Philidor and his contemporaries, now first published from the original MSS., with notes,' &c. London, 1835, small 8vo.

5. 'Chess made Easy.' London, 1836.

Walker (W. Greenwood.) 'A selection of games at Chess actually played in London, by the late Alexander Mc Donnell, Esq.,' &c. London, 1836. 12mo.

CHESTER, an antient and celebrated city of England, on the River Dee, near to where it falls into an æstuary of the Irish Channel.

In nothing is the impression of the Roman possession of this island more observable than in the names of so many considerable places, into which this word *Chester*, which is the Latin *Castrum* or *Castra*, enters; Manchester, Ribchester, Grantchester, &c. Sometimes it appears in the form of *Caster*, as Doncaster, Tadcaster. It is sometimes much contracted, as in Manceter, Exeter, Wroxeter. It occurs here without any prefix, but antiently this city was often called West Chester. There are other Chesters and Castors.

It might be inferred from the name alone that these were originally military stations. But Chester does not depend on etymology alone for proof of its Roman origin, or of its having been the station of a part of the Roman army. The distribution of the streets, the two main thoroughfares cutting one another at right angles in the centre of the city, is Roman. There is reason to conclude that the fortifications of the city are on a Roman basis. Some remains of Roman masonry have been discovered; and Chester has produced innumerable coins, fibulæ, inscribed tiles, inscribed stones and altars, the usual vestiges of the Romans. The most important discovery of this kind was made in 1653, when a votive altar to Jupiter Tanarus was dug up, which had been raised by an officer of the twentieth Legion called the Victorious. Other traces of this particular Legion have been found at Chester, confirming what we find in Antonine's Itinerary, that at *Deva* (which is evidently the Dee, meaning the station on the Dee, as Doncaster is in the same Itinerary mentioned as Danum, the Don, the river on which it is situated) the twentieth Legion had its station. The Welsh name of Chester has reference to the same fact, being, when rendered into English, the City of the Legion on the waters of the Dee.

Chester had, in the middle ages, several historical writers of its own, as Roger called De Cestria, Ralph Higden, and Henry Bradshaw. We pass over their traditionary stories of the antiquity and origin of their city as undeserving regard, and consider what has now been related as the sufficient and the true account of the origin of this city. We might, if our limits would allow, pursue the inquiry further, and ask *why* the Romans fixed upon this point as the permanent station of one of their legions, and at what period of their possession of Britain this was done. The Messrs. Lysons conceive that the original castrum was constructed by Ostorius Scapula soon after the defeat of Caractacus.

Chester was evidently the most considerable place in a large tract of country in the Roman times, and so continued when the Romans had withdrawn their forces. The possession of it was an object of importance to the Saxons and to the remains of the Britons. The two nations seem to have possessed it by turns, and it was certainly one of the last, if not the last, of the places which yielded to the Saxon power. In the Saxon Chronicle we are told that Ethelfrid, king of Northumbria, took it from the Britons in A.D. 607. After that date it was in the hands of the Britons, who held councils in it for political purposes. Finally, in A.D. 830, it fell under the power of Egbert.

From that period to the Conquest, 1066, Chester is often mentioned in the annals of the Saxon sovereignty, and its own annalists have delighted to record that King Edwin was one day rowed by six kings (no doubt small Welsh princes) on the waters of the Dee. Its situation as a frontier fortress against Wales necessarily gave it importance; but it had also a consequence as a place of security for the inhabitants of the coast when they were menaced with invasion from the Danes and Northmen.

The circumstance which we have just mentioned was the cause of one of the most important events in the history of Chester. On one occasion, when a descent from the Danes was apprehended, the body of Saint Werburgh, a Saxon saint, daughter of Wulphere king of Mercia, which had been preserved as a sacred relic, was removed for security to Chester. This was in A.D. 875. These relics remained at Chester. No doubt some kind of Christian community existed at Chester before this circumstance occurred: but from this time Saint Werburgh became the tutelar saint of Chester; a religious community was founded, among whom she was held in especial honour, and in whose church her relics were sumptuously enshrined. The house continued to flourish through a period of six centuries and a half, one of the wealthiest of the monastic establishments of England, its annual revenues exceeding 1000*l*., when at the Reformation it was dissolved with the other foundations of its class.

Chester had also in the Saxon times a peculiar local government, and peculiar municipal customs, of which there is a large and particular account in 'Domesday Book.' The number of the rated houses was 431. It had its trade by sea and its home trade; and there is reason to believe that associations of the members of particular trades, which have flourished longer at Chester than in most other places, had their origin in Saxon times, and that even some of the public processions and the sports with which the inhabitants of Chester have been from time immemorial entertained, may be continuations of Saxon usages. Chester had also in Saxon times a large *shire* attached to it, which in form has been aptly compared to an eagle's wing, the tip of it touching on Yorkshire. This was called Chester-shire (Cestrescyre), contracted into Cheshire. The bishop of Lichfield was also in remote times not unfrequently called bishop of Chester.

At the Conquest this shire was given by one sweeping grant (with the exception only of what belonged to the bishop) to Hugh of Avranche, commonly called Hugh Lupus, or Hugh Wolf, who had for his favourite device the Wolf's Head. Hugh was a near relation of the Conqueror, and possessed this portion of the conquered country with the Saxon title of Earl, but with some privileges which did not always accompany such concessions. Cheshire became what is called a County Palatine, having courts peculiar to itself and the custody of its own records. Hugh resided in the castle at Chester, and there he held his courts and parliaments, in which sat the superiors of the religious houses of the county, together with the eight great subinfeudatories, among whom he distributed the greater portion of his territory. The succeeding earls of his family, of whom there were six, maintained the same state. The series terminated in the reign of Henry III., and from that time the Earldom of Chester has been in the crown or in the hands of members of the royal house. Most of the large tenures created by the Conqueror reverted sooner or later to the crown by forfeiture or marriage.

The period from the Conquest to the reformation of religion, forms another great æra in the history of English cities. In that period Chester was often visited by the king, and was occasionally the scene of interesting public events. It has had a series of charters, by which valuable privileges were granted or confirmed, from the beginning to the close of that period, viz., from Hugh Lupus and some other of the succeeding earls of Chester, and when they were extinct, from the Kings Edward the First and Third, Richard the Second, and Henry the Seventh. As early as 1242 there is found a person with the title of mayor, who presided over a guild merchant or mercatorial. Chester was in those times a place of considerable trade. Beside the great monastery of Saint Werburgh, there was a religious community of women established within its walls: the black, the white, and the grey friars, had each an establishment in Chester: a college of the Holy Cross is mentioned, and hospitals of Saint Anne and of Saint John the Baptist, of which the latter escaped suppression at the Reformation, and continues to this day; besides numerous parish churches, all of which were founded before the close of the period of which we are speaking.

Chester had, during this period, among its inhabitants, some whose names are connected with the early literature of England; we have already mentioned three such persons, and it may be added, that Higden, the most celebrated of the three, whose æra was the reign of Edward III., is supposed to be the author of a set of mysteries, or religious dramas, which were exhibited by the several trades in Chester from time to time, and of which copies have descended to the present day.

Towards the close of the reign of King Henry VIII., two great changes took place at Chester. First, in the 34th of that reign, writs were first issued to it to send members to parliament; and second, it became the seat of one of the newly appointed bishops. The house of Saint Werburgh being dissolved, its church became the cathedral of the new see. A dean and six prebendaries were placed in it, Thomas Clark, the last abbot of Saint Werburgh, in Chester, being made the first dean. The revenue of the dissolved monastery furnished a provision for the prebendaries, dean, and bishop. The diocese assigned to him was the whole county of Chester, which had previously been under the superintendence of the bishop of Lichfield, and the county of Lancaster, with the archdeaconry of Richmond, part of the antient diocese of York. At the same period, 1544, a grammar school was founded, and Chester was appointed, about the same time, one of the sanctuary places.

From the period of the Reformation to the present time there are no very striking events in the history of Chester, nothing which in any eminent degree affected the condition or character of the place. It occasionally received royal visitants, and in the civil wars it had to endure a protracted siege. King Charles I. was for a time in the city, and from one of the towers, on the walls, is said to have personally witnessed the defeat of his army on Rowton Heath. The three earliest charters in the possession of the corporation were granted by Ranulph or Randle, earl of Chester, early in the thirteenth century. Charters were granted or renewed by several monarchs, and its corporation and parliamentary annals exhibit the usual amount of party struggles and disputed rights; so that the Reform Act, and the Municipal Corporation Reform Act, may be regarded as what more than any thing else in its more recent history will influence the future character and condition of the place. Previously to the passing of the Reform Act, the election of members of parliament was in the freemen, who were usually about 1200. The city was divided into twelve wards and nine parishes.

The modern history of the trade of Chester is rather the history of its decay, to which the prosperity of the port of Liverpool has in some degree contributed; but this decline is partly owing to the bad navigation of the Dee. A few gloves are manufactured here, and Chester has long had a reputation for the making of tobacco-pipes. Its fairs, of which there were two of very early date, and one by a charter of King Charles II., were long amongst the most celebrated of that species of mart, as long as the inland consumption was chiefly supplied in that way. King William established a mint at Chester, which had however no long continuance. A canal, which was cut in 1772, had no success till after many years the company united themselves to the proprietors of the Ellesmere canal. When the Act of Toleration gave liberty to the non-conforming Protestants to meet publicly for worship, they erected a spacious meeting-house in Chester, one of the earliest ministers in which was Matthew Henry, whose writings were long in great esteem in the non-conformist body. The modern Independents, the Baptists, and the Quakers, have each meeting-places in Chester; there are also a Roman Catholic and five Methodist chapels. The grammar-school of Chester, called the King's School, which is attached to the cathedral, is under the direction of the dean and chapter; there is also the marquis of Westminster's school, for 400 or 450 boys and girls, who are educated at the expense of the marquis; a diocesan school, and three infant schools. Chester has had many public benefactors, so that its charities are numerous. In 1700 a blue-coat school was founded, and in 1750 another for girls. The General Infirmary was opened in 1761. In 1763 an act of parliament was passed for the regulation of a house of industry; there is also a school of industry; and sunday-schools were established when first the idea was suggested.

Chester has always been the residence of many families of gentry. It has its theatre, its assembly, and its races. Several persons of literary eminence have resided here in recent times, as Dr. Haygarth and Mr. Falconer. In the seventeenth century Chester was the residence of a remarkable family named Holme. A taste for accumulating local and historical information appeared in four successive generations of this family, the individuals all bearing the name of Randal. The last Randal Holme being poor sold the whole collection to the earl of Oxford, who was then forming his great library. These manuscripts came with the rest of the Harleian collection to the British Museum, where they form 267 volumes, numbered in the catalogue 1920—2187; they abound in minute information, especially respecting Chester and the whole county.

The population of Chester, in 1774, was 14,713 persons; in the last census, 1831, it was 21,344. The number of houses inhabited was 4096; uninhabited, 388; building, 43. The number of families, 4628; of which 355 were chiefly employed in agriculture; 2665 in trade, manufactures, and handicraft; and 1608 not comprised in either of those classes: the number of marriages in 1830 was 396.

Chester is one of the very few places in England which have maintained in a tolerable state of completeness walls which were erected for their defence in remote ages; at no place are they so entire as at Chester. But now, instead of contributing to the defence of the inhabitants, they afford only an agreeable promenade, with pleasant views, at various points, of the surrounding country; they are nearly two miles in circuit. The walls and the rows are two most striking objects in Chester to a stranger. The rows are a species of wide foot-path, raised above the level of the street, at the height of the first story of a house, and covered over head by the third story of the house; it is as if the room in a series of houses was thrown open, or rather taken away, which would otherwise be what is usually called the front room of the first floor. The two great intersecting streets are, for the most part, constructed on this plan: Pennant supposes that this mode of construction may have existed from the Roman times. The corporate officers of Chester, previously to the late Act, were a mayor, recorder, two sheriffs, twenty-four aldermen, and forty common-councilmen.

(King's *Vale Royal;* Lysons's *Magna Britannia; the Chester Guide; the Stranger in Chester, &c.; Municipal Corporations' Reports.*)

CHESTER-LE-STREET. [DURHAM.]

CHESTERFIELD, a parish, municipal borough, and market-town in the hundred of Scarsdale, Derbyshire, 132 miles N. by W. from London. The parish of Chesterfield, which contains several chapelries, hamlets, and townships, has an area of 13,160 acres, with, in 1831, a population of 10,688, which is an increase of 1498 on the census of 1821. This is attributed, principally, to an increase of collieries and iron works. The population of the borough of Chesterfield in 1801, was 4267; in 1811, 4476; in 1821, 5077; in 1831, 5775. Two rivulets, the Hyper and Rother, run past the town.

Chesterfield is conjectured, from its name, to have been a Roman station. At the Norman survey it was an insignificant place. The town received various privileges from King John, but was not incorporated till the reign of Elizabeth. Under the Municipal Corporations' Act, it is governed by four aldermen and twelve councillors, but is not divided into wards. The limits of the borough are co-extensive with the township, which is about four miles in circumference. The town is lighted under an act passed in 1825. In and near the town there are silk, lace, and pipe manufactories, potteries, and iron founderies.

Chesterfield Church, erected during the thirteenth century, is a beautiful and spacious edifice. The spire is remarkable from being crooked. This crookedness, which was supposed to be merely apparent, has been ascertained to be real, by actual measurement. The bulging out of a portion of the middle of the spire causes the ball on the summit to deviate from the perpendicular six feet towards the south, and four feet four inches towards the west. The spire is 230 feet high. Its crookedness may be the result of some accident (perhaps the effect of lightning) which is not recorded.

There were in 1835 twenty-six daily and Sunday schools in the town of Chesterfield. A grammar or free-school, founded in the reign of Elizabeth, and formerly well attended, has been closed since 1832. It was under the management of the corporation. There are various public and benevolent institutions, and a literary and philosophical society in the town.

The Chesterfield Canal, which commences in the tideway of the Trent, after a course of forty-six miles, terminates at Chesterfield. This canal was planned by Brindley. It has sixty-five locks, and is carried through two tunnels, one of which is 2850 yards long. The North Midland Railway, between Derby and Leeds, will be carried past Chesterfield. (Woodhead's *Account of the Borough of Chesterfield for* 1835.)

CHESTERFIELD, PHILIP DORMER STANHOPE, fourth earl of, was born in London on the 22nd of September, 1694. He was educated by a private tutor, and at the age of 18 sent to Trinity College, Cambridge, where he studied the Greek and Roman writers with unusual diligence. He tells us that he narrowly escaped becoming a pedant, a character for which he had the greatest contempt in after life; and that he drank and smoked at college notwithstanding his aversion to wine and tobacco, because he thought such practices were *genteel*, and made him look like a man. In 1714 he left the University to make the usual grand tour of Europe. He passed the summer at the Hague, where his fashionable associates not only laughed him out of his pedantry, but initiated him into a love of play which never forsook him. Many years after he tells his son in one of his letters that at the Hague he thought gambling an accomplishment, and as he aimed at fashionable perfection he adopted cards and dice as a necessary step towards it. From the gamblers of the Hague he went to the fashionable ladies and titled courtezans of Paris, who, as he was accustomed to boast, completed his education and gave him his 'final polish.' He was at Venice, when the accession of George I. in 1715, induced him to return home with great speed, in order to be in time for a court place. Through the interest of his family connexions, he was made a gentleman of the bed-chamber to the Prince of Wales, afterwards George II. In the first parliament of the new reign he was returned for St. Germains in Cornwall, and as he was determined to attract attention, from the moment of his election he studied nothing and thought of nothing, for a whole month, but his maiden speech. Though he afterwards became an accomplished orator, his first effort was rather a failure, and betrayed a violence of manner not at all consistent with his smooth silken code. The speech was otherwise unfortunate, for it attracted attention to the fact that he was not quite of age, and consequently liable not only to expulsion from the Commons' house, but also to a fine of 500*l*. An opponent mentioned this to him privately as a good mode of silencing his zeal: Chesterfield took the hint, and withdrew for some months to Paris, where, as it was always suspected, he was engaged in some secret court-intrigue. He returned in 1716, and resuming his seat, spoke in favour of the Septennial Act. In the inveterate quarrel which broke out between George I. and his heir, he adhered to the Prince of Wales, nor could his uncle, General (afterwards Earl of) Stanhope, who was then at the height of favour, with plenty of places at his disposal, ever induce him to change sides. Being much with the heir apparent, he undertook the difficult task of transforming a German prince into a British king, and of making a fashionable and a most refined man (as he understood it) of the rough and homely George.

His first division in parliament against the ministry was on a motion for the repeal of the Schism Bills, where he decidedly took the illiberal side of the question, 'supposing,' as he lived to confess with shame, 'that it was impossible for the honestest man in the world to be saved out of the pale of the church; not considering that matters of belief do not depend upon the will; that it is as natural and as allowable that another man should differ in opinion from me, as that I should differ from him; and that if we are both sincere, we are both blameless, and should consequently have mutual indulgence for each other.'

In 1726 he was removed by the death of his father to the House of Lords, where, according to his biographer, Dr. Maty, his manner of speaking was much more admired than it had been in the Commons. He was constitutionally weak, and devoid of strong passions, and as a speaker had little faculty of touching the higher feelings of others, but he was brilliant, witty, and perspicuous—a great master of irony, and was allowed by all his contemporaries to be a very effective debater. On the accession of George II., whom, as prince, he had steadily served for thirteen years, Chesterfield expected a rich harvest of honours and places; but having mistaken the relative amount of the influence exercised on his master's mind by the queen and the mistress, he paid his court to Mrs. Howard (afterwards Lady Suffolk), and neglected Queen Caroline, who eventually proving to be more powerful than the mistress, checked his aspiring hopes. He was not alone in this error:—Lord Bolingbroke, Lord Bathurst, Swift, Pope, and many others of less fame, shared in it, and in the consequent disappointment. Pope's villa at Twickenham was the place of rendezvous, where the royal mistress used to receive the incense of Chesterfield and the rest who had hoped to rise through her favour. In 1728, the year after the accession, Lord Chesterfield accepted the embassy to Holland, where he gained the friendship of Simon Van Slingeland, a distinguished statesman and then Grand Pensionary, and assiduously cultivated his talent for diplomacy. To Slingeland he afterwards acknowledged the greatest obligation, calling him his 'friend, master, and guide,' and adding, 'for I was then quite new in business, and he instructed me, he loved me, he trusted me.' Chesterfield had the merit of averting a war from Hanover, for which service George II. made him High Steward of the Household and Knight of the Garter. Under the plea of ill health he obtained his recall from Holland in 1732, and returning to court, where his office of Steward gave him constant access, he again indulged the hope of rising. A curious anecdote is told by Horace Walpole, to account for the renewed displeasure and animosity of the queen, and for Chesterfield's sudden secession from the court party. (Walpole's *Reminiscences*.) No sooner had his Lordship shown his decided opposition to Sir Robert Walpole, than he was deprived of the High-Stewardship, and so badly received at court, that he soon ceased visiting there altogether. At the end of Sir Robert's ministry in 1742 Chesterfield went into opposition against the members of the new cabinet, with whom, when out of place, he had been accustomed to vote in the minority. On the coalition of parties known by the name of the 'broad-bottomed treaty,' he took office and was admitted into the cabinet, sorely against the inclination of the king, who considered him as a personal enemy. Chesterfield, while in opposition, had still further offended the king by repeatedly denouncing the union of the electorate of Hanover with the kingdom of England, and by proposing that they should be separated from each other, and allotted to different branches of the reigning family. At the beginning of 1745, the year of the Pretender's last war in Scotland, and a time of intrigue and difficulties, he was again dispatched as ambassador to Holland. In the course of the same year he was named while in Holland, Lord Lieutenant of Ireland, and immediately repaired to his post, where he distinguished himself, in a season of very great turbulence, by his tolerant spirit, and conciliating popular manners. His short government in Ireland was perhaps the most valuable part of his public life. George II., whose prejudices were removed or weakened, recalled him from Dublin in April, 1746, and appointed him Principal Secretary of State. In consequence of being obstructed in some measures which he considered important, and of his now really declining health, he resigned his office in January, 1748, much, it is said, to the regret of the king. He was kept from the House of Lords by his giddiness and deafness, but in 1751 he delivered an elegant speech in favour of adopting the New Style. His declining years, though now and then brightened by flashes of wit and merriment, were clouded by sickness and despondency. He died on the 24th of March, 1773, in the 79th year of his age. His natural son, to whom his well-known Letters were addressed, died five years before him.

By his wife, Melusina Schulemberg, Countess of Walsingham, and niece to George the First's mistress, the Duchess of Kendal, he had no issue. After much opposition from George II., who pretended to found his objection on Chesterfield's incessant gambling, this German lady married his Lordship in 1733. Chesterfield always had a certain taste for literature and a partiality for the society of literary men; at different times of his life he associated with Addison, Pope, Swift, Gay, Arbuthnot, Voltaire, Montesquieu, and Algarotti. He patronized Hammond, a poet of third-rate merit, but an unfortunate amiable man, and procured him a seat in parliament. In his intercourse with Samuel Johnson he gave himself lordly airs, and the sturdy doctor, thinking himself slighted, avenged himself in the celebrated letter which was prefixed to the first edition of his Dictionary. His Letters to his Son, which appeared the year after his death, were never intended for publication. They have been much censured for the loose morality which they are supposed to inculcate; but still it must be admitted that they show a great knowledge of the world, and much practical good sense, expressed in an easy, agreeable, and correct style. His Miscellanies, consisting of papers printed in 'Fog's Journal,' and 'Common Sense,' of some of his speeches and other state papers, and a selection from his Letters to his Friends, in French and English, together with a Biographical Memoir, written by his friend and admirer, Doctor Maty, were published in 2 vols., 4to., in 1777. A third volume, of doubtful authenticity, was added in 1778. Chesterfield also wrote Nos. 100 and 101 in the 'World,' in praise of Johnson's Dictionary, and sundry copies of very light verses which appeared in Dodsley's collection. (Dr. Maty's *Life;* Lord Orford's *Works*, vol. i., p. 533, and vol. iv., p. 277.)

CHESTNUT. [ÆSCULUS; CASTANEA.]

CHEVAL DE FRIZE, a square or octagonal beam of wood, from six to nine feet in length, and pierced by iron rods or wooden pickets six feet long, which are pointed at each end and shod with iron; the pickets are placed six inches asunder, and pass through two opposite faces of the beam in directions alternately at right angles to each other, the cheval resting on the ground at the lower extremities of the pickets. A series of these, disposed in lines and connected together by chains, is placed in the ditch, on the berme, at the entrances or behind the glacis of a field fort; or on the breach made in the rampart of a fortress, in order to impede the enemy at the time of making an attack.

Chevaux de frize, on account of their portability and the facility with which they can be put together or taken to pieces, were much esteemed formerly, and were employed in the open field as a protection against charges of cavalry; but they are now seldom used for this purpose, being easily deranged by the enemy's artillery.

When Badajos was besieged in 1812, chevaux de frize, formed by fixing sword blades in beams of wood, were planted by the defenders on the breaches in the Trinidad bastion and in the adjoining curtain, where they proved a fatal obstacle to the troops engaged in the memorable assault on that fortress.

CHEVIOT HILLS, THE, constitute the most eastern portion of the extensive mountain-range which begins on the west at Loch Ryan and traverses the whole breadth of South Scotland till it terminates on the boundary line between England and Scotland. Peel Fell, 55° 17′ N. lat., and 2° 35′ W. long., may be considered as the most western part of the Cheviot Hills. From this point the ridge runs N.E. for about 20 miles, and terminates in Cheviot Hill, the highest of its summits, which is 2658 feet above the sea. An elevated mountain tract, however, continues nearly due N. from this, separating the Breamish, which rises on the eastern declivities of the Cheviot Hill, from the Beaumont, which originates on its western side: this tract terminates at no great distance from the junction of these two rivers, which form the Till. To the E. of Cheviot Hill, but separated from the range by a valley, is Hedgehope 2325 feet above the sea. The highest parts of this range are covered with peat, and the lower acclivities with alluvial earth. The whole mountain-tract, especially towards the S., presents to the eye a great number of green hills, differing in form, and inclosing numerous deep, narrow, and sequestered valleys. The formation of the rocks is primitive, consisting of porphyry, especially east of Carter Fell. On Carter Fell, which is at a short distance from Peel Fell, limestone is quarried.

CHEVY CHACE, the name of an old English ballad, founded upon the history of a hunting encounter which took place in 1388 at Atterburn, upon the south of the Cheviot hills, between the martial families of Percy and Douglas. The older version of this ballad was first printed by Hearne, from a manuscript in the Ashmolean Museum at Oxford, and afterwards by Bishop Percy in the 'Reliques of ancient English Poetry.' It begins

'The Perse owt of Northomberlande.'

According to a communication made by the late Rev. J. J. Conybeare to the editors of the 'British Bibliographer,' there is now little doubt but that the author of this ballad was one Richard Sheale, who dwelt at Tamworth, whom Percy and Ritson both agreed to consider as the transcriber only of the Ashmolean copy. The style of this ballad is rugged and uncouth, and it is written in the very coarsest and broadest northern dialect. There seems the best reason for believing that its composition may be dated about or soon after 1540.

The more modern ballad of Chevy Chace, that of which Addison has criticised the beauties in the 'Spectator' (Nos. 70, 74), begins

> 'God prosper long our noble king.'

Bishop Percy ascribes this version to the time of Queen Elizabeth, and it was probably late in her reign when it was written, or Sir Philip Sydney would have had no occasion to lament that the ballad of Chevy Chace, in his time, was so 'evil-apparelled in the rugged garb of antiquity.'

Bishop Percy has printed both ballads in his 'Reliques,' edit. 1794, vol. i.: the old one at p. 1, the latter ballad, p. 270.

CHEYNE, GEORGE, was born in Scotland, in the year 1670. He was at first intended for the church, but after attending the lectures of Dr. Archibald Pitcairn, he determined to practise medicine. Having taken his doctor's degree, he came to London about 1700, and soon after published his 'Theory of Fevers,' in which he attempts to explain the doctrine of secretion on mechanical principles. His next work, 'On Fluxions,' was published in 1705, and procured his admission into the Royal Society. At a maturer age he called this a juvenile production, and acknowledged that it was justly censured by De Moivre, to whom and to Dr. Oliphant he makes an apology in the preface to his 'Essay on Health and Long Life,' for having treated their criticisms with rudeness. His 'Philosophical Principles of Natural Religion,' containing the elements of natural philosophy, and the evidence of natural religion to be deduced from them, was dedicated to the Earl of Roxburgh, for whose use it appears to have been written. An advertisement of the third edition makes mention of a second part, 'containing the nature of infinites, together with the philosophic principles of revealed religion;' but we do not know if this part was then first added.

Cheyne's natural disposition to corpulency was so increased by full living in London, that in a few years he became 'fat, short-breathed, lethargic, and listless.' His health gradually sank, and, after trying a variety of treatment with little benefit, he confined himself to milk, with 'seeds, bread, mealy roots, and fruit.' The experiment succeeded, and he was soon relieved of his most distressing symptoms. During his illness, being deserted by his 'bouncing, protesting, and undertaking' companions, who could not bear to see him in such misery and distress, he began to look to religion for consolation, and at last 'came to this firm and settled resolution in the main, viz., to neglect nothing to secure my eternal peace, more than if I had been certified I should die within the day; nor to mind any thing that my secular obligations and duties demanded of me, less than if I had been ensured to live fifty years more. This, though with infinite weakness and imperfection, has been much my settled intention in the main since.' (*The English Malady*, 2nd edit., p. 334.)

In 1722 he published an 'Essay on the true Nature and due Method of treating the Gout,' together with the virtues of the Bath waters, and the nature and cure of most chronic diseases. He had resided at Bath during the summers of several years, and attributed much of the benefit he had received to drinking the waters. In 1724 appeared his well-known 'Essay on Health and long Life,' in which he inculcates the necessity of a strict regimen, particularly in diet, both in preventing and curing diseases. It was dedicated to Sir Joseph Jekyll, Master of the Rolls, who had been under the author's care. In the preface he gives an account of his former works, which he censures where faulty, with great frankness, particularly when he had treated other writers with levity or disrespect. In 1733 he brought out his 'English Malady,' a treatise on the spleen and vapours, as well as hysteric and hypochondriacal diseases in general. This work, once very popular, contains a very minute account of the author's own case. It appears that on his recovery he gradually returned to a more generous diet. 'However, for near twenty years I continued sober, moderate, and plain in my diet, and in my greatest health drank not above a quart, or three pints at most, of wine any day (which I then absurdly thought necessary in my bulk and stowage, though certainly by far an over-dose), and that at dinner only, one half with my meat, with water, the other after, but none more that day, never tasting any supper, and at breakfast nothing but green tea, without any eatable; but by these means every dinner necessarily became a surfeit and a debauch; and in ten or twelve years I swelled to such an enormous size, that upon my last weighing I exceeded 32 stone. My breath became so short, that upon stepping into my chariot quickly, and with some effort, I was ready to faint away for want of breath, and my face turned black.' (*The English Malady*, 2nd edit., Lond., 1734, p. 342.)

He now returned to his low diet, and with the same success as before, though it required a longer time to re-establish his health. The proposal of a milk diet appears to have afforded much diversion to contemporary wits, some of whose gibes and sarcasms rather ruffled our author's complacency; but if it were worth while to refute epigrams, it would be easy to show that he was by no means a Pythagorean zealot: thus the very title of a chapter in his 'English Malady' is 'Of nervous cases, requiring a mixed or trimming regimen of diet, viz. of tender young animal food, and a little wine and water one day, and the other only milk, seeds, and vegetables.' Dr. Cheyne died at Bath, in 1742, at the age of 72.

CHIA'NA, VAL DI, a valley in Tuscany, in the province of Arezzo, running N. and S. 30 miles in length, from Arezzo to Chiusi, and between two chains of hills, of which the western divides it from the valley of the Ombrone, and the E. from the Thrasymene lake and the valley of the Tiber. The Chiana was once hardly anything but a vast marsh, and its air was pestilential, until the draining began under the Grand Duke Leopold I., which was finished under his son Ferdinand. By this operation above 36 square miles of ground are become now one of the most fertile districts of Tuscany. (Manetti, *Carte idrauliche sullo stato antico e moderno della Val di Chiana*; Fossombroni; Corsine, &c.) The waters of the N. and larger part of the Chiana now run N. into the Arno. In antient times they all flowed S. into the Tiber. [ARNO.]

CHIAROSCU'RO is a branch of painting, the object of which is to combine and arrange the light and dark parts of a picture to the best advantage. The term is derived from two Italian words, *chiaro*, light, and *oscuro*, dark, and includes the treatment of bright and dark colours or tints, as well as simple light and shade. It is by chiaroscuro that relief and depth, and what is termed the *effect* of a picture, are produced; by a judicious contrast of bright colours with dark, or a combination of the two, or by their gradual blending; by involving one part of the picture in shadow, while another part stands forth in full light; or by making the light gradually die away into the shadows. Leonardo da Vinci was the first who reduced the art of chiaroscuro to any thing like a system. It was afterwards practically improved by Correggio and by Titian, under whom it may be said to have attained perfection. It gives to Rubens all his richness and brilliancy, to Rembrandt his magical luminousness. It must however always remain, from its nature, difficult to teach or subject to rules. To acquire excellence in the use of chiaroscuro, the student should study the properties of light, and the mode in which it is diffused, collected, reflected, and separated into colours. He should refer to the works of the best masters, and observe the means which they have employed to imitate nature; and, above all, he should constantly watch and note down the effects of light and shade as exhibited in the objects around him under various modifications. The most powerful effects in painting will always be the nearest to nature; and the most pleasing will be those which are best selected out of the infinite variety which she presents for our choice.

CHIA'VARI, a province and town of the Sardinian States, in that part of the old Genoese territories called Riviera di Levante or E. coast. The province of Chiavari is bounded W. by that of Genoa, S. by the Mediterranean, N. by the province of Bobbio, E. and S.E. by that of La Spezia, and N.E. by the State of Parma. It is about 20 miles in length N.W. and S.E., and about 15 miles in its greatest breadth. The Apennines occupy the greater part of it; their summits divide it from the valley of the Trebbia, in the province of Bobbio, and from that of the Taro, in the State of Parma, the waters of which flow N. into the Po. The only rivers of the province are the mountain torrent of Rapallo, which runs into the Mediterranean, and the Vara, also a mountain stream, which flows E. into the Magra, which comes down from Pontremoli. The strip of land along the coast has a mild climate, in which the vine, olive, orange, and lemon thrive. The mountains abound with chestnut-trees. The inhabitants are chiefly employed on the sea.

Chiavari, a bustling place, with 9800 inhabitants, and a small harbour, is the residence of the intendente and of the courts of justice and commercial court: it has a college kept by the brothers Scholarum Piarum, besides the public elementary schools. Sestri di Levante has 7000 inhabitants; Rapallo is a pleasant town on the gulf of that name, with fine gardens and country-houses in the neighbourhood, and 9000 inhabitants; Santa Margherita, 6000; Lavagna, 5000; Varese, 5600; Borzonasca, 4700; and S. Stefano d'Aveto, 5700; the two last are inland among the Apennines. (*Calendario Sardo*, 1824.) The population of the whole province of Chiavari is about 91,000. (Serristori, *Saggio Statistico*.)

CHIAVENNA. [VALTELINA.]

CHICACOLE. [CIRCARS, NORTHERN.]

CHICHESTER, an antient walled city, the chief seat of a bishopric, to which it gives name, a parliamentary and municipal borough, and market-town, in the Rape of Chichester, western division of Sussex, 56 miles S.W. by S. from London, and about 6 miles from the sea-coast. It stands at the termination of a gentle descent from the South Down hills, on a slight rising ground sloping in all directions, in a low country, which is part of the plain that extends from the west side of Brighton to Portsmouth harbour, between the South Downs and the sea, and attains at Chichester its greatest width. The city within the walls, which are well preserved, is divided by two principal streets running north and south, and east and west, which intersect each other near the centre of the town; in this respect resembling Chester, and preserving the form of a Roman encampment. Beyond the walls the suburbs are prolonged in the direction of the principal streets. A small rivulet called [the Lavant, which is generally dry in summer, bounds the city on the east and south sides. The city and suburbs stand in eight parishes, besides an ecclesiastical precinct termed the Close, round the cathedral, and two extra-parochial pieces of land. The population of these in 1801 was 4744; in 1811, 6425; in 1821, 7362; in 1831, 8270. The number of inhabited houses in 1831 was 1514. These returns give 5·78 persons to a house in 1801, and 5·46 in 1831. There is no manufactory at present in Chichester. The cattle market, which is held every alternate Wednesday, is one of the largest in England held within the precincts of any town, and is always well supplied with cattle, horses, sheep, and pigs. There are several fairs in the town and the immediate vicinity at different stated times, but none are of great importance. Large quantities of corn are exported through the town for London and the west of England.

Chichester was undoubtedly a Roman station, probably Regnum. It is conjectured that Vespasian resided here, when in Britain, and that Claudius erected a temple in it, dedicated to Neptune and Minerva, of which an inscribed stone, dug up in 1731, is supposed to be a commemoration. The walls, which are nearly a mile and a half in circuit, were in all probability erected originally by the Romans. At the end of the principal streets there were formerly fortified gates, of which the eastern, the last standing (taken down in 1783), is said to have afforded decided proofs of Roman architecture. The present walls are supposed to have been re-constructed with the materials of the Roman walls, and a mound of earth (now planted in different parts with fine elm trees), which runs round the inside of the walls, is stated to be in the style in which the Romans constructed such works. But it is doubtful if there be any Roman remains now existing in the walls or buildings of the city.

The word Chichester is said to be a contraction of *Cissanceaster*, the city or castle of Cissa, an Anglo-Saxon chief, who, if credit can be given to the chronicles, repaired and partly rebuilt it, after it had been destroyed in a siege. At the Norman survey Chichester had only two hundred and thirty-eight houses, which were given to Roger de Montgomery, who was created the first earl of Chichester. This nobleman is believed to have been instrumental in procuring the removal of the seat of the bishopric of Sussex, or Selsea, from the peninsula of Selsea, where there was formerly a considerable town, to Chichester, which was one cause of the early prosperity of the place. The earliest charter extant is one by Stephen, confirming previously existing privileges and customs; which were further confirmed and extended by numerous charters from different kings. It is included in the list of towns of the Staple in the 27th Edward III., called Ordinatio Stapularum. Under the Municipal Corporations' Bill the city is divided into two wards, with six aldermen and eighteen councillors. It returned two members to Parliament from an early date. By the Reform Act the boundary of the parliamentary borough was enlarged considerably round the city.

A cathedral, built mostly of wood, was founded here in 1108. The present cathedral, which was erected during the 13th century, exhibits some specimens of Norman design, and also some examples of the first pointed style, when the Petworth or Sussex marble came into fashion. As a cathedral-church it is of an inferior class. but the spire, which is about a century later in date than the body of the building, is finely proportioned. The cathedral is built in the usual form of a cross; its extreme length from east to west is 407 feet; from north to south, 150 feet; the transept is 129 feet long, and 34 feet wide; the nave and aisles 97 feet wide; and the tower and spire 300 feet high. The north transept is now used as a parish church. In the interior there are nine monuments by Flaxman, one of them to the memory of William Collins, the poet, who was a native of Chichester. It also contains several antient monuments, which are curious, and some of more recent date that are not unworthy of notice. The best of the latter is in the form of a statue to the memory of Mr. Huskisson, who was for some time member for this city. It is the work of Carew, and was raised by subscription. At a short distance from the north-west angle of the cathedral is an insulated bell-tower, traditionally known as Ryman's tower, which is noted for its massive walls. The palace of the bishop of Chichester, whose diocese comprehends nearly the entire county of Sussex, is within the city. There is a neat antique chapel attached to the palace, which has been repaired by the late bishop, Dr. Maltby. Chichester stood a siege during the civil wars.

The average gross annual income of seven incumbents of the parishes of Chichester amounts to 664*l.*, but in six of the cases other preferments are held. (*Eccl. Ret.* 1835.) The various schools, daily and Sunday, amounted in 1835 to 29; and to these has recently been added an infant school. The schools of a distinct public character are—one Bell's school, one Lancaster ditto, both very flourishing, and educating a great number of boys; each of these has a girls' school belonging to it. The infant school is intended to accommodate about 250. A boarding-school was endowed in 1702 by Oliver Whitby, Esq., for 12 boys, but from an increase in its funds the number is now augmented to 28, who are boarded and educated. This school, which is under the direction of five trustees (who must be members of the church of England, and 'not parliament men'), is admirably managed; and the boys in the increased number are not only well taught, but are clothed. Such boys as behave properly receive a sum of money on leaving the school, to enable them to settle in business, or otherwise to promote their interests. The boys wear the antient blue dress of similar foundations. The revenue is about 1300*l.* per annum, and is yearly increasing. It is by the Foundation Charter restricted to members of the church of England. Another, termed a grammar-school, was founded in 1497 by bishop Story, the revenues of which are stated in the *Education Returns* to have been collusively administered. Scarcely any of the children of the citizens are educated at it, as it is exclusively a classical school. There is an antient foundation for the support of old and infirm poor persons, called St. Mary's Hospital. (*History of Chichester.*) Like so many of the antient charitable foundations, much too large a proportion of the funds of this hospital goes to the custos, or director, who is always one of the dignitaries of the cathedral, in the chapter of which lies the patronage of the charity.

The parochial churches in Chichester are remarkable for their smallness and the poverty of their appearance. During the present year, 1836, the largest parish (the Subdeanery) was divided, and a handsome Gothic church, capable of containing a thousand persons, erected without the walls. This church, which is surrounded with an extensive cemetery, is named St. Paul's.

The chief public buildings of Chichester are the guildhall, town or county-hall, council chamber, market-house, corn exchange, market cross, jail, theatre, infirmary, and the philosophical society's and mechanics' institutions. The town-hall is a rude inconvenient building, the remains of an antient monastery of Grey Friars. The council chamber, which is the official quarters of the corporation, is small, and far from ornamental; it is joined to an assembly room of large dimensions, in which most of the public meetings are held. The market-house is neat and commodious. The corn exchange is an elegant building, recently erected by subscription, and consisting of a splendid open show-room with stores for corn behind. The market cross, which stands at the intersection of the principal streets, is termed by Mr. Britton, 'the most enriched and beautiful example of this class of buildings in England.' Its form is an octagon, having a large central column, from which spring numerous bold ribs, beneath a vaulted roof; eight pier buttresses support the superincumbent panelled wall, parapet, pinnacles, and flying buttresses. There are three inscriptions on tablets, in niches, and clock-dials are inserted above them. The whole is surmounted by an open turret, of modern and inferior workmanship. The market-cross was erected by bishop Story towards the close of the fifteenth century; his arms are impaled with those of the reigning monarch on shields attached to the buttresses. The jail is small and inconvenient. The theatre is neat but small. The infirmary is a very elegant and beautiful building, situated on the northern slope outside the city, and surrounded with airing grounds for the patients. It was erected by subscription in 1826-7, and was opened for the reception of patients in October, 1827. It owes its establishment to the exertions of Dr. Forbes. It is one of the best planned and best regulated establishments in the kingdom, although of small extent; it contains about sixty beds, and is supported at an annual expense of about 1400*l.* The literary and philosophical society, which was established in 1831, and is very flourishing, has elegant and extensive premises in the South Street, with reading and exhibition rooms, and museum, which already contains a fine collection of birds and minerals, and many other articles of interest and value. Lectures are delivered regularly every winter before the members, now consisting of about 150, who pay an annual subscription of one guinea. The mechanics' institution was founded in 1829, and is also very flourishing; its present members amount to 450. In 1836 an elegant building for the purposes of the society was erected by subscription at the South Gate. Lectures before the members are regularly delivered during the winter, and are very well attended. This institution has no museum, but has an extensive well-selected library.

In 1817 an Act was passed for making a canal from Chichester harbour to the city, a distance of about a mile and a half, which forms a branch of the Portsmouth and London canal, by the way of Arundel. There is a quay on the harbour, to which vessels of 150 to 180 tons can come up at high tides. The canal has not been very profitable, as the dues are stated to equal the land carriage from the quay. The following statement shows the number of vessels with the tonnage ·—

FOREIGN.

Years.	Inwards.		Outwards.	
1830	6	410	3	120
1831	7	426	3	188
1832	5	300	2	113

COASTWISE.

	Inwards.		Outwards.	
1830	283	23,914	256	10,342
1831	398	25,730	288	12,555
1832	385	27,408	251	9,461

The gross receipt of Customs' revenue collected at Chichester in 1833 was 1034*l.*; in 1834, 1529*l.*

Chichester has a clean, neat, and comfortable appearance; the city is well built, lighted, watered, and drained; the principal streets are spacious, and contain many large houses.

There are annual horse races in the neighbourhood, at Goodwood Park, the seat of the Duke of Richmond, which attract numerous visitors. (Britton's *Picturesque Antiquities; Geography of the Society for Diffusion of Useful Knowledge; Boundary and Municipal Corporations Reports;* Hay's *Hist. of Chichester; Communication from Chichester.*)

CHICK PEA. [CICER.]

CHICKASAWS, an Indian tribe in the United States of America, inhabiting the northern portion of the State of Mississippi, on both sides of the upper branches of the rivers Tombigbee and Yazoo. They were formerly more numerous, but they have been considerably reduced by war and the small-pox. At present their number does not appear to exceed 3000. They speak a language similar to that of their southern neighbours, the Choctaws, and have made some progress in civilization; they cultivate corn, cotton, potatoes, and beet-root; and have herds of cattle, sheep, and swine. They live in comfortable cabins, and have erected a school at their own expense. A few missionaries are active in imparting religious instruction to them.

CHICKWEED, a common annual, with soft light green opposite ovate leaves, a brittle stem, and minute white petals, almost split into two parts. It and groundsel are two plants which are to be found in flower on any day in the year; botanists name it *Stellaria media.*

CHICORY is a perennial plant bearing a composite flower, which gives the name to the sub-family or section of the *chicoraceæ*, which belongs to the family *Compositæ.* It has a fusiform root like a carrot, from the crown of which large and succulent leaves spread out, with deeply indented edges. The whole plant is bitter and aromatic; and the leaves as well as the root have been used in medicine, in the form of a decoction, as a tonic bitter and diuretic. It is frequently used as a salad, especially when blanched. For this purpose, the roots are taken up in the end of autumn; they are then placed in sand or light mould, in a cellar from which the light is excluded, the leaves having been cut off previously within half an inch of the crown. Fresh slender leaves soon grow out of the root, and, being deprived of light, they are much more delicate and tender than those which grow in the open ground. The bitterness also is thus lessened, and they form a very pleasant winter salad, which, from the long, slender, and matted state of the leaves, the French call *barbe de capuçin* (monk's beard). It is pleasanter to the taste than common endive, and stimulates the stomach by its bitter and aromatic quality.

The luxuriant growth of the leaves of the chicory, and their speedy reproduction after they have been cut, suggested the more extensive cultivation of this plant as food for cattle and sheep, who are fond of the leaves. Mr. Cretté de Panuel, who cultivated it near Paris in a rich soil, produced extraordinary crops. The first year he cut it only twice, but afterwards four and five times in a year: it produced more green food than any other plant cultivated for this purpose. Arthur Young was so struck with it that he strongly recommended it to the notice of British agriculturists; and in the queries sent to various parts of the country by the Board of Agriculture, one was, whether chicory was cultivated in the district as green food for cattle. But notwithstanding its abundant produce, it has not been found so much superior to other green food as to make its cultivation general. Some accurate experiments on a large scale were made in France at the national farm of Rambouillet, to ascertain the value of chicory compared with lucerne and other green food. The chicory was declared inferior, giving a disagreeable taste to milk and butter when cows are kept upon it. For sheep it is very good, and a small portion mixed with their other food may probably be a preservative against the rot.

Chicory is now chiefly cultivated in Belgium and Germany, for the purpose of preparing from the root a powder which can be substituted for coffee. This has become a very considerable article of commerce. It was very lately introduced into Britain, and the consumption of it, and consequent demand, increased so rapidly, that the government thought proper to put a check on its importation by a duty of 20*l.* per ton on the dried root.

To have the roots in perfection, the seed should be sown, or rather drilled, in April, like that of the carrot. If sown sooner, they are apt to run to seed. The land should be rich, deep, and light. The plants should be thinned out to six inches in the rows, and most carefully weeded. In September the leaves should be finally gathered and the roots taken up, which may be done with a common potato-fork. They are then cleaned by scraping and washing, split where they are thickest, and cut across in pieces about two or three inches long. These pieces are dried by means of a slow oven or a kiln. Some nicety is required in drying, to prevent the root from being scorched and to keep the proper flavour. In this state it is sold to the merchants, packed in bags. It is afterwards cut or chopped into small pieces, and roasted exactly as coffee, ground in a mill, and packed in papers in pounds and half pounds for retail sale. When coffee, as well as all colonial produce, became too dear for the labouring classes in France and Germany, chicory was almost universally used as the best substitute, and the taste is by many thought so grateful, that they prefer the coffee with which a fourth or a fifth part of chicory has been mixed. Chicory is said to exhaust the soil, and to require fresh ground to prevent its degenerating. Unless the soil is rich and light, the roots will not come to a good size in one season, and old roots become tough and stringy. It is only the young roots that are fit to be prepared for commerce. They lose a great portion of their weight in drying. The best preparation of the land for chicory is grass or clover. The manure should be laid on before it is ploughed up in autumn, which will accelerate the decomposition of the roots. The land should be ploughed very deep in spring, and laid light; the surface harrowed fine, and the chicory seed drilled in rows twelve inches apart, and rolled. Liquid manure spread over the ground will much accelerate the growth of the plants, which must be thinned out like turnips or carrots to six or eight inches from plant to plant.

CHIEMSEE. [BAVARIA, p. 51.]

CHIHUAHUA. [MEXICO.]

CHILBLAIN, a local but peculiar inflammation of the skin, commonly appearing under one of three forms. The mildest form is attended with redness, swelling, and a sense of heat and itching, often quite intolerable. In the second or severer form the colour of the swollen part is of a deeper red, sometimes of a dark blue colour, and at other times even of a purple hue. In the third or the severest form, small vesicles rise on the surface of the reddened and swollen skin, which are soon converted into sores, from which a thin irritating matter discharges, the irritating nature of which it is very difficult to alter, or to bring the sores into a state of healthy suppuration.

That the inflammation of which this troublesome complaint is the consequence is of a peculiar kind, not very well understood, surgeons conclude because they find that it is not relieved by the applications which are most beneficial in ordinary inflammation.

The exciting cause of chilblain is always cold, and more especially cold applied after the part had been previously much heated. Hence those persons are most subject to the complaint who have contracted the bad habit of going immediately to the fire when they come home in winter with their fingers and toes very cold. Hence also the chief seats of the disease are those parts of the body which are most exposed to sudden alternations of heat and cold, as the nose, ears, lips, toes, heels, and fingers. Young persons are more subject to it than adults, females than males, and it seems most frequently to attack persons of a fair skin.

The painful itching, which is perhaps the most troublesome part of this complaint, is best relieved by active and long-continued friction with camphorated spirits of wine, or with a mixture of two parts of camphorated spirits with one of Goulard's extract. Some surgeons speak highly of the efficacy of one part of the tincture of cantharides to six of the common soap liniment as a lotion. But 'one of the best modes of curing chilblains of the milder kind is to rub them with snow or ice-cold water, or to bathe them in ice-water several times a day, keeping them immersed each time until the pain and itching abate. After the parts have been rubbed or bathed in this way, they should be well dried with a towel and covered with flannel or leather socks.'

The stimulating applications, only in a more diluted form, appear also to be the best remedies when vesications arise. In this case the application of heat to the part affected should be most carefully avoided. When the vesicles terminate in sores, they require stimulating dressings.

But prevention is better than cure, and the most effectual mode of guarding against the annoyance of this irritating and often exceedingly protracted disease is to accustom the skin to moderate friction, to avoid clothing the parts too warmly, to avoid still more carefully sudden and great alternations of heat and cold; and accordingly to take particular care not to go immediately into a warm room or near a fire out of the cold air; and to wash the parts frequently with cold water. (Cooper's *Surgical Dictionary*.)

CHILE, one of the new republics on the continent of South America, lies along the shores of the Pacific between 25° and 42° S. lat.; but the archipelago of Chiloë, which also belongs to it, extends about two degrees farther south. The republic of Chile considers the whole coast to the Strait of Magalhaens, and likewise a portion of Patagonia, as belonging to its territories; but as no settlements have been formed in these countries, we shall limit our description to the tract, between 25° and 42° N. lat., which extends from the chain of the Andes, forming its eastern boundary (between 69° and 71° W. long.), to the shores of the Pacific Ocean (between 71°, 70° and 74° W. long.)

Chile is bounded on the east by the republic of La Plata, from which it is divided by the Andes. On the north it borders on the desert of Atacama, which belongs to Bolivia. On the west it is washed by the Pacific; and on the south it is separated from the island of Chiloë by the Strait of Chacao, and bounded by the Bay of Ancud.

Its extent from north to south is about 1175 miles; its breadth varies between 100 and 200 miles; and its mean may be taken at 150 miles. This would give it a surface of 176,250 square miles, which does not differ much from the calculation of Humboldt, who assigns to it an area of 14,240 Spanish leagues (20 = 1 degree), or 170,880 square miles. It is therefore about 60,000 square miles larger than the British islands.

The Andes, which from the Strait of Magalhaens as far north as the Bay of Ancud press close on the shores of the Pacific, appear to turn east at the northern extremity of that bay, but soon resume their northern direction, in which with some slight bends to the east and west they continue along the boundary line of Chile. So far as we yet know, they constitute up to 35° S. lat. one single range, about 100 miles or more in width. Between 35° and 34° S. lat. they divide into two ranges, which unite again north of 34°, and inclose the elevated longitudinal valley of Tunyan, the most southern of those valleys by which the Andes are distinguished from all other mountain ranges. About 33° 20′ the chain divides again, and incloses the longitudinal valley of Uspallata, which extends northward to 30° S. lat.: the elevation of this valley at the post-house of Uspallata was found by Miers to be 5970 feet above the sea. It belongs to the state of La Plata. No part of the Chilian Andes has been measured, except three mountain passes; but some of the numerous peaks in the chain have been estimated to rise to 15,000 and 16,000 feet. This estimate is founded on the fact that in these latitudes the snow-line is found at about 14,000 feet above the sea. The summits, which are covered with perpetual snow, are the Peak of Aconcagua (south of 32°), the Peak of Tupungato (south of 33°), the Volcano Penqueñes (near 34°), the Peak of Descabezado (north of 36°), and the Volcano of Antuco (north of 37°). The mean height of the whole range seems to be lower south of 35° than north of it, though the summits in the whole range seem to attain nearly the same elevation. This portion of the Andes contains many volcanoes. They are extremely numerous to the south of 35°, where nearly twenty are known to exist, and it is supposed that many are still unknown. Between 35° and 30° only a few occur, and at great distances from one another. Still farther north no volcano is known to exist in the Andes, between that of Coquimbo (south of 30°), and that of Atacama (south of 21°).

Several mountain-passes traverse this range. The most frequented is that of Aconcagua, which passes over the range between the peaks of Aconcagua and Tupungato, traverses the valley of Uspallata, and unites Santiago de Chile with Mendoza in La Plata. Its highest point, called La Cumbre, is, according to the calculation of Pentland, 12,454 feet above the sea. The pass of the Portillo traverses the Andes south of the peak of Tupungato, passing through the northern part of the valley of Tunyan. It seems to be the same road that Dr. Gillies measured, whose highest elevation he found to be 14,365 feet above the sea. South of the southern extremity of the valley of Tunyan, near the volcano Penqueñes, is another pass, which, according to Dr. Gillies, rises to 13,210 feet. The Pass del Planchon traverses the range between the volcano of Peteroa and the peak of Descabezado, and is less elevated than the others, since vegetation extends to its summit. The pass of Antuco, which crosses the range near the foot of the volcano of that name, probably does not rise to a great height. As it traverses the country of the independent Indians, who occupy the Pampas of La Plata, it is not much used. Besides these passes there are others over the Andes, but all of them are impracticable for mules in winter (from June to September).

The districts of Chile north of the Rio Chuapa (31° 30′ S. lat.) resemble the coast of Peru, and the whole of that country may be considered as the western declivity of the Andes. Near the high range the country is still between 6000 and 8000 feet above the sea, and it lowers gradually to the west, till it terminates near the sea in an extensive plain, about twenty miles in breadth, and from sixty to eighty feet above the sea. The country between this plain and the chain of the Andes is very uneven, exhibiting numerous ridges of low hills, which in some parts, especially near the Andes, and near the plain along the shores, run parallel to the great chain and the Pacific; but in the intermediate country they continually change their direction. The surface of this country presents either bare rocks, or is covered with sand, and nearly without vegetation, except a few stunted shrubs, which generally occur in the narrow glens and ravines, with which it is sparingly intersected. A few rivers rising in the Andes run in deep beds through this country, but most of them have only water in the spring (September till December), when the snow is melting in the upper region of the Andes, and they are dry during eight or nine months of the year. Only three rivers, the Copiapò, Guasco, and Chuapa, have water all the year round. On their banks are the few cultivated spots, which are irrigated by water drawn from the rivers. But all the small level tracts along the watercourses are not fit for cultivation; the greater part of them are covered with incrustations of salt, which in some places are five or six inches thick, and occupy the whole surface, covering even the low grasses. The few spots which are cultivated produce only Indian corn, potatoes, a small quantity of wheat, and considerable quantities of fruits. Few countries of equal extent possess greater metallic wealth, especially gold, silver, and copper, but the extreme sterility of the country prevents the working of these mines, except when they are very rich. In climate these districts resemble Peru. It never rains, but sometimes a pretty strong dew falls in the morning, which refreshes the plants. This extreme dryness of the air is accompanied with a very moderate degree of heat, the thermometer in summer rarely attaining more than 70°; and in winter the temperature is sometimes so low, that the morning dew is changed into snow. This general description applies only to the country north of 30°, south of which line the cultivable spots are more extensive and more numerous, and the country is annually refreshed by a few showers of rain.

From the snow-capped peak of Aconcagua a mountain-ridge runs directly west, and terminates at a short distance from the sea. It is called Cuesta (ridge) de los Angeles, and attains a considerable height, which however greatly decreases as it proceeds westward. Another ridge, branching off from the Andes at the peak of Tupungato, runs first north-west, and is called Cuesta de la Dahesa: it then turns west, and may be said to terminate at the Campana de Quillota, a mountain which rises to about 2500 feet above the sea, from which it is about twelve miles distant. A much lower ridge extends farther west, terminating not far from the shore and the mouth of the Rio de Aconcagua. This westerly ridge, which is called Cuesta de Chacabuco, is traversed by the road which runs from the mountain-pass of the Cumbre, and attains in this place an elevation of 2896 feet above the sea. The country enclosed by the Cuesta de los Angeles, and those of La Dahesa and Chacabuco, is drained by the Rio de Aconcagua. This river rises on the north-west declivity of the peak of Tupungato, and runs more than one-third of its course in a narrow and elevated glen, nearly parallel to the chain of the Andes in a N.N.W. direction; it then gradually turns west, but the valley through which it flows is still narrow, till it has terminated another third of its course, when it enters the valley or plain of Aconcagua, a beautiful level tract, extending from E.S.E. to W.N.W. fifteen miles, with a breadth of thirteen where widest. This plain is about 2600 feet above the sea, but as the river has water enough to irrigate the whole, it is well cultivated, and perhaps the most populous portion of Chile. At its western extremity it lies nearly contiguous to the valley of Putuendo, which is smaller, but also fertile and well cultivated, and extends northward to the Cuesta de los Angeles. After the junction of the Rio de Aconcagua with the Rio Putuendo, the mountains again approach its bank, but soon retreat a little farther; and hence to the mouth of the river extends the valley of Quillota, which is not much inferior in fertility to the others, and is about three or four miles wide.

South of the Cuesta de Chacabuco the level country begins to occupy a much larger portion of the surface. The plain of Santiago, beginning at the foot of the range, extends south to the banks of the Rio Maypù. Towards the north it is from six to eight miles wide, but farther south it grows wider, and on the bank of the Maypù, from east to west, it is about twenty miles. Its soil is stony and dry, and it cannot be cultivated where it is not irrigated. Cultivation accordingly exists only in the neighbourhood of the rivers, and of the canal, by which the water of the Maypù has been brought upon it. Miers thought that not one-tenth of the plain was under cultivation, but in this respect there has doubtless been some improvement of late years. The country between the plain and the Andes is filled by mountains of various heights, with steep declivities, and nearly without vegetation: the valleys intersecting them are narrow, and covered with an immense number of greater or smaller stones, which have fallen down from the adjacent mountains. The country between the plain of Santiago and the Pacific is traversed by some ranges of hills, which rise to no great height above the adjacent plains, and are southern offsets from the Cuesta of Chacabuco. The plains between them are pretty level, and of moderate extent: the soil is dry and stony, without water and trees.

The Rio Maypù has its sources in the Andes, between the Peak of Tupungato and that of Cauquenes, and one-third of its course lies between the high offsets of the Andes in narrow valleys. Towards the plain of Santiago its valley widens. When the river has entered the plain, the canal of Maypù conducts a portion of its waters to the centre of the plain, while the river, continuing its western course, traverses its southern portion. After its junction with the Rio de Colina, which traverses the plain of Santiago, but has water only in the rainy season, the Maypù enters the valley of Melipilli, from four to six miles wide, which contains large tracts of well-cultivated land. The whole course of the Maypù is about 160 miles.

The country south of the Rio Maypù has a different character. Towards the Andes it is covered with the high lateral branches of that range, which enclose narrow and elevated valleys. But about two-thirds of the country rise in gentle undulations, and contain comparatively few steep and high hills. Here also the rains are by no means abundant, nor do they last for any length of time: agriculture therefore cannot be carried on without irrigation, and the tracts of ground under cultivation are not extensive. To this want of moisture the naked face of the country must be attributed. No trees of large size are found in Chile north of the Rio Cachapoal, but their number increases farther south, till on the banks of the Rio Maule the forests of high timber trees become very extensive. The Rio Maule rises in the Andes at the foot of the Peak of Descabezado, near 36°, and runs first nearly due west. When it has arrived at the more level country it turns north-west, and flowing in a diagonal line, falls into the sea about 34° 40′. It is the most northern of the navigable rivers of Chile. At high tides vessels, not drawing more than six feet water, may enter its mouth, and proceed some small distance up it. Flat river-barges may ascend at any season for twenty miles and upwards. These favourable circumstances, united to the fertility of the country on its banks, and the extensive forests of timber trees, will probably soon render this river of considerable importance. The country between the Rio Maule and the Rio Biobio is still better adapted to agriculture; but since the expulsion of the Spaniards it has been nearly deserted, on account of the frequent incursions of the neighbouring Indian tribes. This tract contains much more level ground than any other portion of Chile. The Andes here terminate by a steep descent, and without offsets; and at their foot begins, in the northern districts, an undulating country, intersected with small plains. In the southern districts the level country begins immediately at the foot of the range, and extends to a considerable distance from it. The Travesia (heath) of Yumbel, a plain sixty miles long, and nearly as wide, between the towns of Yumbel and Tucapel, is covered with sand and small pieces of volcanic matter; it is without trees, water, and vegetation, except at a few spots. Poeppig thinks it probable that it was once covered with water, and formed a lake. A chain of low hills divides it on the south from the plain of the Isla de Laxa, which is nearly as large, and contains only a few low hills. This plain, which is covered with grass, is of great fertility. The country between this plain and the sea is covered with high but gently-sloping hills, which are partly clothed with wood, and partly bare and sterile. Along the rivers, especially the Biobio, the soil is very fertile.

The Rio Biobio rises in the Andes near 38°, and runs in a W.N.W. course to the Pacific, which it enters N. of 37° N. lat., after a course of about 150 miles. In its upper course it is deep and rapid. It becomes navigable for canoes and rafts at Nascimiento, 40 miles from its mouth, which Captain B. Hall found two miles wide, though too shallow for large vessels. This river may be considered as the southern boundary-line of Chile. To the S. of it, the republic possesses only the fortress of Valdivia, and a few smaller fortresses along the S. bank of the river. These fortifications, which were erected by the Spaniards to prevent the incursions of the Araucanians, having fallen into decay during the war of independence, the Indians were enabled to overrun the southern districts of Chile, and to lay them waste Of late years the republican government has rebuilt them, and is now enabled to defend these countries against the Indians.

Though the country S. of the Biobio is included in the territories of the republic, it is, with the exception of a few small tracts, entirely in possession of the independent tribes, called Araucanos. This country, so far as it is known, is nearly covered with high trees, which frequently form impenetrable forests. The surface seems to be nearly a level up to the foot of the Andes, with the exception of a range of hills running N. and S., and the soil very fertile, as may be inferred from the great number of warriors that the Indians can send into the field. The Rio Callacalla (also named Rio de Valdivia) is by far the deepest of the rivers of Chile: sixty-gun ships can enter its mouth without great danger; but it is not known how far it is navigable. Some of the smaller rivers are also said not to have a bar at their entrance, and to form pretty safe harbours for vessels of middling size.

The climate of the central portion of Chile, of which alone we have more particular information, may be compared in some degree with that of Italy. The greatest heat occurs in the months of January and February, at which time the thermometer on the coast frequently rises to 85° during the day, and 70° to 75° during the night. The hottest part of the day is before ten o'clock in the morning, about which time wind rises in the S., which often blows with great violence. In the interior, even in the elevated valley of Aconcagua, the thermometer frequently rises to 90° and 95° in the shade; and as the southern wind is not strong here, the days are sultry, but at sun-set a delightful breeze sets in, which cools the air. The months of March and April are much more temperate, especially in the interior, and at the end of the latter months the rains generally set in. Rains fall only between May and August, and then the Andes are covered with snow, which generally lies for four or five months on the higher parts of the range. Snow and also some ice occur in the elevated valleys, but it soon melts, and the atmosphere is only chilly while the rain is falling. Snow never occurs along the sea. The number of rainy days in the northern districts is commonly fourteen, and seldom more than twenty throughout the year. This rain, which is very heavy, seldom falls for more than three days continuously. In the southern districts, where the number of rainy days is much greater, being on an average forty, the rain sometimes continues ten days without intermission. After the rainy season, in September the spring begins, which is frequently more chilly than the winter itself, and ice is sometimes observed even on the coast. Whenever an easterly wind brings down the cold air from the snow-covered Andes, the thermometer sinks in a short time 15° or 18°, but soon rises again. Summer begins towards the commencement of November, and then the sky, which, during the spring, is covered with clouds, is entirely free from them. The heat gradually increases, and in the northern districts vegetation begins to die away in December, but in the southern districts the country is always clothed with verdure, as the plants are occasionally refreshed by rain, and the dews are frequent and heavy. The mean temperature at the mouth of the Rio Aconcagua in July and August is 70°, and at Talcahuana, near Concepcion, one or two degrees less.

Chile is subject to strong periodical gales. In the beginning of the rainy season (May and June) the north and north-western winds prevail, and frequently blow with great violence. As all the harbours of this coast are open to that quarter, vessels abandon them, and weather the storm in the open sea. During eight or nine months the wind blows from the S., and frequently with great force, especially in autumn (from February to April). At the same time a current runs along the coast to the N., both which circumstances favour navigation northward, but the return to the S is rendered very tedious and difficult. Easterly winds are rare, except in September, when, as already observed, they suddenly lower the thermometer, and in February and March. In the latter season they blow only in the valleys of the Andes, and raise the thermometer from 77° to 80° even in valleys which are upwards of 5000 feet above the sea. They blow with such a force, that they throw down the strongest trees.

Probably no country is more subject to earthquakes than Chile; they occur, however, much more frequently along the coast than in the interior. In the northern districts slight shocks are felt almost every day, and occasionally several times in a day. Sometimes they destroy the towns and lay waste a great extent of country. In 1819 the town of Copiapò was levelled to the ground, and in 1822 the damage done in Valparaiso and the country about it was not much less. In the last earthquake the rocks inclosing the harbour of Quintero, which is some miles N. of the mouth of the Rio Aconcagua, were raised four or five feet above their former level.

The climate of Chile varies much in the different districts; but it is every where so healthy, that it is difficult to determine what kind of diseases are prevalent.

Intertropical plants do not succeed; for though the heat in the northern district is great, the extreme dryness of the air is unfavourable to the growth of plants which require a long time for coming to maturity. The sugar-cane was tried some years ago, but it has been abandoned. Agriculture is limited to the productions of Europe. Indian corn is grown every where, but not to a great amount. Wheat is the staple; it is raised all over the country, and gives in many places very abundant crops, especially S. of the Rio Maule, whence considerable quantities of flour are exported to the harbours along the western coast of S. America, where it enters into competition with the flour brought from the United States. Large quantities are from time to time shipped to Cook's Land or New South Wales. Barley is grown in the southern provinces to some extent, but very little N. of the Rio Maule; oats only on a few estates, and rye is not known. Leguminous vegetables are grown abundantly, especially different kinds of beans, and supply an article of exportation. Hemp is raised in the country N. of the Rio Maypù, and grows to an extraordinary height. Since it has been ascertained that the hemp of Chile is superior even to the Russian, the state favours this branch of agriculture by granting to its cultivators many advantages. Hemp is grown in no other country on the W. coast of S. America.

Vegetables are not much cultivated, except in the countries about the capital and the most frequented parts. Potatoes however are grown in great abundance in the northern districts. Capsicum is raised in the valley of Aconcagua, and forms a considerable article in the internal commerce of the country. The quinoa (Chenopodium quinoa) is peculiar to Chile, which, in the southern provinces, is raised in abundance, and somewhat resembles millet; a pleasant beverage is made of it. Melons and water-melons, as well as pumpkins, succeed very well in the northern provinces, where they are raised in great quantities, and attain a surprising size.

Figs, grapes, pomegranates, oranges, and peaches succeed best in the most northern districts, whence they are exported to the other parts of the state. Wine is made at different places, but not yet with any great success. The best is made near Concepcion. The olive-tree succeeds as well as in Spain, and its cultivation is rapidly increasing, but the oil is bad for want of a proper method of preparing it. Extensive forests of wild apple and pear trees occur along the foot of the Andes in the southern provinces. The fruits are hardly eatable, but cider is made of them. The forests, which cover so considerable a portion of the southern provinces, contain many fine timber-trees, which form one of the more important articles of export. In the Andes S. of the volcano of Antuco, many valleys are covered with forests of the Araucaria, whose fruits contain a great number of nuts twice as large as an almond, which are very palatable, and constitute the principal food of the Indian tribe of the Pehuenches. (Poeppig.)

Cattle are very abundant north of the Rio Maule, the declivities of the mountains and high hills affording copious pasture for four or five months, and some low tracts which are sown with lucerne, for the remainder of the year. Single proprietors sometimes possess from 10,000 to 20,000 head of cattle. Live stock, jerked beef, tallow, and hides, are large articles of export. Cheese is made on the banks of the Rio Maule and sent to Peru; and butter in the neighbourhood of the larger towns. Horses have greatly decreased in number during the last twenty years. They are of a middling size and strong; of late years horses and mules have been exported to Cook's Land and the Cape of Good Hope. Sheep are not numerous, and their wool is bad. Goats are kept by the lower classes, but are not numerous. Swine are found in abundance in the archipelago of Chiloë, whence hams are exported; on the continent they are less numerous Pork is salted in the harbours as provisions for the vessels. The island of Mocha, between Concepcion and Valdivia, is overrun with wild horses and pigs, both of which are used as fresh stock by the whaling and sealing ships in the Pacific.

Gold dust is found in the sand of nearly all the rivers which come down from the Andes, as in the Rio de Aconcagua, Rio Maule, and Biobio. Some twenty years ago many of the inhabitants on the banks of these streams were employed in washing the gold sand, but it is now only done in a few places. Some gold mines occur in the northern districts, where they are worked, but the produce is inconsiderable. Others are said to exist in the southern provinces, but none are worked. Silver is still more abundant, but the average is only from 9 to 10 marcs (one marc = 8 ounces) in the cargo, or 5000 lbs. of ore. In 1832 however very rich silver mines were discovered about sixty miles south of the town of Copiapò, where the ore was found so rich as frequently to contain 60 or 70 per cent. of pure metal. Their working has commenced with great activity, and all the other mines are nearly abandoned. Poeppig thinks that the produce of all the silver mines, even including the rich one discovered in that year, did not exceed 120,000 or 130,000 marcs. The copper mines are very numerous in the northern districts, especially about Illapel, Coquimbo, Copiapò, and Suasco; copper is also found farther south in the Andes, but is not worked. The copper of Copiapò is most valued. Miers estimated the quantity of copper exported in 1824 at 40,000 cwt.; in 1829 it rose to 60,000; the mean may be 50,000. A small portion comes to Europe, but by far the larger part goes to India and the United States. Ores of lead, tin, and iron, are said to exist, but they are not worked.

The coal formation extends under a considerable part of the southern provinces. The coal is at present bad, but it is hoped that it will improve in quality as the mines are sunk deeper. Salt does not exist in sufficient quantity. A good deal is collected in the lakes of Bucalemu, south of the mouth of the Rio Maypù, in which the salt water of the sea is subjected to evaporation. A great quantity of salt is imported from Peru and Patagonia. The latter is collected by the Indians, partly from lakes, and partly from the sides of mountains on the eastern sides of the Andes between 36° and 40° south latitude.

The population of Chile, north of the Rio Biobio, is entirely composed of descendants of Europeans. If there has been any mixture with the copper-coloured race, it must have been very small. There are no Indians north of the Biobio, except in the valleys of the Andes south of 34° S. lat. Negroes are few in number. The population is differently stated by travellers. Miers thought that it did not exceed 560,000, but the partial census of some provinces shows that he has much underrated it. Many who have seen the country are of opinion that 1,200,000 can hardly be too much. The most recent estimates carry it even to 1,400,000. The Indians who inhabit the country south of the Biobio are known by the name of Araucanians, and have obtained some celebrity by the high degree of civilization attributed to them by Molina [ARAUCANIANS], of which, however, modern travellers have been unable to find any traces. They appear to consist of several tribes, who speak different dialects of the same language, and are divided by the Chilenos into *Indios costinos*, or Indians inhabiting the coast, and into *Moluchos*, who inhabit the extensive wooded plains stretching along the foot of the Andes. It is the latter Indians who have resisted all attempts to conquer them, and have at last destroyed nearly all the settlements established south of the Biobio. These nations derive their principal subsistence from agriculture, cultivating Indian corn, potatoes, beans, and some other articles. In the valleys of the Andes between 34° and 37° S. lat. are the Pehuenches, who seem rather to be addicted to a wandering life. All these tribes still enjoy complete independence, and frequently ravage the southern districts between the Biobio and Maule in their incursions.

The country north of the Biobio is politically divided into six provinces, to which are added the province of Valdivia, comprehending the European settlements south of that river, and the province of Chiloë, which consists of the archipelago of that name.

I. The province of Coquimbo comprehends the most northern sterile portion of the republic; and has the Rio Chuapa for its boundary on the south. It exports gold, silver, and copper, and dried fruits. Its mines, which are the richest in Chile, are worked chiefly in the neighbourhood of the small towns of Coquimbo, Copiapò, Huasco, and Illapel. The capital is Ciudad de Serena, a small town with about 4000 inhabitants, situated somewhat more than six miles from the bay of Coquimbo.

II. The province of Aconcagua contains the valley of the Rio Aconcagua, and the countries north of it to the Rio Chuapa. It exports cattle and wheat, and has some rich mines of gold and copper. The capital, S. Felipe, or Villa Vieja de Aconcagua, contains above 10,000 souls. In the valley there are also Quillota, with 8000 inhabitants, and S. Rosa, or Villa Nueva de Aconcagua, of nearly equal size. Near Petorca there are rich mines of silver.

III. The province of Santiago comprehends the plains along the foot of the Andes on both sides of the Rio Maypù, and the hilly and in some places mountainous country between the plains and the Pacific. It contains few mines, and their produce is small. Its wealth consists in wheat and cattle. It contains the capital of the republic, Santiago, and the most frequented harbour, Valparaiso. Rancagua, towards its southern boundary, is a place of some importance.

IV. The province of Colchagua extends between the rivers Cachapoal and Maule, and comprehends a country partly level and partly hilly. It is of great fertility, and produces corn in abundance; cattle are also very numerous. It does not appear that there are any precious metals. In this province the immense forests begin which cover so considerable a portion of the south; farther north there are no forests. The capital, San Fernando, apparently one of the most considerable towns of the republic, is situated in a very fertile country. Talca is also a place of some note.

V. The province of Maule extends from the Rio Maule to the Rio Itata, and to its upper branch the Rio Ruble. It produces corn, wine, and tobacco, and is partly covered with lofty forest trees. It is probably the most fertile part of Chile, and consists mostly of an undulating country and some small plains. Copper abounds in some places; but cattle constitutes the principal wealth of the inhabitants. The chief town is Villa de Cauquenes, a small place situated in a well-cultivated plain.

VI. The province of Concepcion lies between the rivers Itata and Biobio, and comprehends the sandy plain of Yambel and the fertile plain of Isla de Laxa, with the hilly country extending between the plains and the sea. It is less fertile than Maule, a great part of its surface being occupied by the Travesia de Yambel and the sandy hills between it and the sea; but the remainder is very fertile, especially the plain of Laxa. Corn and timber are the principal exports. The capital is Concepcion. Chillan, in the interior, was formerly a place of some importance, but has been much reduced of late years by repeated invasions of the Indians.

VII. The province of Valdivia comprehends the countries between the Rio Biobio and the Bay of Ancud; but nearly all this tract is occupied by independent Indian tribes. Except the towns of Valdivia and Osorno, the European settlements are limited to a small number of fortifications along the banks of the Biobio, among which Nascimiento is the most important. Timber and a little corn are exported. The capital is Valdivia. Osorno, a small town lies in 40° 20′ S. lat.

VIII. The province of Chiloë. [CHILOE.]

Chile is probably the only American state formerly subject to Spain whose commerce has increased since the separation from the mother country. The importations in 1832 amounted, according to a rough estimate of the merchants of Valparaiso, to about 1,000,000*l*., and the exportation, including the transit commerce, did not fall much short of 1,500,000*l*. In Poeppig's 'Travels' the following table is given:

Countries and Harbours.	Articles of Import.	Articles of Export.
Bolivia: Cobija.	Bullion.	European and Indian goods; fruits.
Peru: Arica, Islai, Pisco, Lima, Lambayeque, and Paita.	Tobacco, sugar, cotton, rice, bullion, salt, spirits.	European and Indian goods; wheat, flour, wine, raisins; tallow, jerked beef, almonds, walnuts, timber.
Ecuador: Guayaquil.	Hats, sole-leather, cacao, bullion.	The same.
Central America: Realejo, S. Salvador, Guatemala.	Indigo, cigar-matches, dyeing wood, cochineal, saffron, balsams, hides, sugar, coffee, pearls.	European and Indian goods; wine, spirits, flour, fruits.
Mexico: Acapulco, S. Blas, Guaymas.	Bullion; sometimes sugar.	The same.
Manila.	Sugar, hats of palm-leaves, indigo.	Bullion.
China: Canton.	Silk goods; nankeens; tea, sugar, and some small articles.	Copper and bullion.
East Indies: Calcutta.	Sugar, coarse cotton goods.	Copper.
La Plata: Buenos Ayres.	European goods; produce of Brazil, sugar, maté.	Wheat, barley, beans, &c.
Brazil: Santos, Rio Janeiro.	Coarse cotton linen, called *tocuyos*.	Wheat, fruits, bullion.
United States: Baltimore, New York, Salem, Boston.	Tobacco, spermaceti candles, oil; European and Indian goods; sugar from Havanna and Brazil, &c.	Hides, copper, sealskins, bullion.
Spain: Cadiz and Gibraltar (by neutral vessels).	Wine, oil, quicksilver, paper, and some silk goods.	No direct exportation.
France: Bourdeaux, Hávre—rarely Marseilles or Nantes.	Wine, brandy, silk goods; linens, cloth, hardwares; paper, perfumes; books; calf-leather, goat-leather.	Bullion, hides, and sometimes copper.
England: Liverpool and London.	Cotton and woollen goods; iron, hardwares, and iron utensils; crockery, &c.	Bullion, hides, and copper.
Germany: Hambro', Bremen.	Linens, cloth, glass; iron utensils; silk and cotton goods, spirits.	Bullion.
Belgium: Antwerp.	Cloth, and English, German, and French manufactured goods.	Bullion, hides.

Somewhat more than one third of the whole commerce is said to be in the hands of the English, about one-third belongs to the North Americans and French, and the remainder to the other European and American nations. [VALPARAISO.]

The revenues of the republic, from 1825 to 1830, amounted to 1,736,800 Spanish dollars: in 1831 only to 1,509,000, and in 1832 to 1,634,633. In 1832 they were estimated at 1,685,000; but up to the year 1832 the expenses exceeded the revenue, and the interest on the English loan of 1,000,000*l.* has not been paid. The army consisted in 1832 of 3200 men, besides the militia, which was estimated at 20,000. The navy, which formerly consisted of 12 vessels, was reduced in 1832 to two small vessels.

When Francisco Pizarro had overthrown the empire of the Incas in Peru, he sent Almagro to subjugate Chile. With great loss of men, Almagro, passing over the Andes and through the desert of Atacama, entered the northern provinces without resistance, these districts having previously been dependent on the Peruvian empire. But farther south he met the more warlike tribes, and made no great progress. His successor, Valdivia, advanced to the Biobio, and founded the town of Santiago in 1541. For more than 200 years the Spaniards tried to establish their authority in the south, but without permanent success; and in 1771 they were obliged to abandon that country, with the exception of Valdivia, Osorno, and a few small fortresses on the banks of the Biobio.

The first disturbances tending to a separation from the Spanish dominion occurred in 1810, and went on increasing till the Chilenos were defeated in 1814 at Rancagua, by the Spanish general Osorio. In 1817 San Martin entered Chile with an army from La Plata, and liberated the country by the battles of Chacabuco (12th February, 1817) and Maypu (5th April, 1818). The new government has a republican form; the provinces, however, do not constitute separate states, but have a central legislature and executive. The executive power is in the hands of a supreme director. The congress is composed of a senate, consisting of twenty members at the utmost, and of a house of representatives, to which a deputy is sent for every 15,000 souls. Since the establishment of the constitution, the conflict of the political parties has been nearly continuous, and the country has not yet derived from this change those advantages which were anticipated. (Molina; Miers; Meyen; *Reise um die erde in* 1830—32; Poeppig, *Reise in Chile, Peru, und auf dem Amazonenstrome in* 1827—32.)

CHI'LIAD (from χιλιάς) is (or rather was) used to mean a thousand consecutive numbers. Thus from 1 to 1000 forms the first chiliad, from 1001 to 2000 the second, and so on.

CHILINA, a genus of testaceous mollusks, separated by Mr. Gray from *Auricula*, and including *Auricula Dombeiana* of Lamarck, and *Auricula fluviatilis* of Lesson. Locality, South America, in fresh-water streams, with most of the habits of the *Limneæ*.

CHILLIES. [CAPSICUM.]

CHILLINGWORTH, WILLIAM, was the son of William Chillingworth, mayor of Oxford, where he was born in October, 1602. In 1618 he was a scholar, and in 1628 a fellow, of Trinity College in that University. Some curious memoirs of him are preserved by Anth. Wood (*Athen. Oxon.* c. 20), who says 'he would often walk in the college grove, and dispute with any scholar he met, purposely to facilitate and make the way of *wrangling* common with him, which was a fashion used in those days, especially among the disputing theologists, or those who set themselves apart purposely for divinity.' The comparative merits of the English and Romish churches were at that time a subject of zealous and incessant disputation among the university students; and several learned Jesuits succeeded in making distinguished proselytes among the Protestant clergy and nobility. Chillingworth, being an able disputant, was singled out by the famous Jesuit Fisher, alias Johannes Perseus (*Biblioth. Soc. Jesu*), by whom he was convinced of the necessity for an infallible living 'Rule of Faith.' On this he at once adopted the Catholic system, wrote out his reasons for abjuring Protestantism, and joined the Jesuits in their college at Douay.

After the lapse of a few months, the arguments addressed to him by his godfather, Dr. Laud, then bishop of London, induced him to abandon Catholicism, and he returned to Oxford in 1631, where he passed about four years in reconsidering the Protestant tenets. The great work of Daillè on the Fathers, which then first appeared, is said to have finally determined him.

In 1635 he published his 'Religion of Protestants, a safe way to Salvation.' It excited great attention, and passed through two editions in less than five months. For an account of the circumstances which occasioned this work, and for a list of the publications connected with the controversy, see Kippis's *Biog. Brit.*, vol. iii., p. 511. The principle of Chillingworth is, that the volume of Divine Scriptures, ascertained to be such by the ordinary rules of historical and critical investigation, is to be considered the sole authority of Christians, to the utter exclusion of ecclesiastical tradition. His boldness in asserting the principle of private judgment was opposed as much by the Puritans as by the Catholics; and while the Jesuit Knott, alias Matthias Wilson (*Biblioth. Patrum Soc. Jesu*, p. 185), contended that he 'destroyed the nature of faith by resolving it into reason,' Dr. Cheynell 'prayed that God would give him new light to deny his carnal reason, and submit to faith.' These were two of the most determined of Chillingworth's antagonists. Cheynell was one of the assembly of divines who, in 1646, was sent to convert the University of Oxford. (See *Midsummer Moon, or Lunacy Rampant, being a Character of Master Cheynell*, 1648.) Chillingworth in the mean time, unable to reason his conscience into an approval of the 39 Articles, refused to accept any preferment in the church. His long letter on the subject to Dr. Sheldon (afterwards archbishop of Canterbury), a most interesting document, is given in his Life, by Des Maizeaux, p. 86, and in Kippis's *Biog. Brit.* Nothing can be stronger than the expressions of refusal to subscribe with mental reservation. 'If I subscribe,' says Chillingworth, 'I subscribe my own damnation—if I will not juggle with my conscience and play with God Almighty I must forbear—to say the 4th Commandment appertains to Christians is false—the damning sentences in Athanasius's creed are most false, and in a high degree presumptuous—I am firmly and immovably resolved that if I can have no preferment without subscription, I neither can nor will have any.' However, in a very short time he was completely persuaded by the arguments of Drs. Sheldon and Laud, that peace and union are the real object of subscription, not belief or assent —a doctrine held by Archbishop Sancroft and many other eminent divines. Accordingly he accepted the chancellorship of Salisbury with the prebend of Brixworth, Northamptonshire, annexed; and in the subscription-book of Salisbury cathedral are recorded the words, 'Ego Gulielmus

Chillingworth, omnibus hisce articulis, et singulis in iisdem contentis volens, et ex animo, subscribo; et consensum meum iisdem præbeo, Jul. 20th, 1638.' Chillingworth, in 1640, was deputed by the chapter of Salisbury as their proctor to the Convocation in London. He was attached very zealously to the royal party, and wrote a treatise (unpublished) on 'The Unlawfulness of resisting the lawful Prince, although most impious, tyrannical, and idolatrous.' Being present in the army of Charles I. at the siege of Gloucester, August, 1643, he acted as engineer, and devised the construction of engines, in imitation of the Roman *testudines cum pluteis*, to assault the rebels and take the city by storm. Having accompanied the king's forces under Lord Hopton to Arundel castle, he was there with his comrades taken prisoner by the parliament army under Sir William Waller; and falling ill he was thence conveyed to the Bishop's palace at Chichester, where he died and was buried in Jan. 1644. In his epitaph (*Gent. Mag.*, vol. lxiv., p. 697), on the mural monument in that cathedral, he is styled 'Propugnator invictissimus Ecclesiæ Anglicanæ.' A singular scene occurred at his funeral. Dr. Cheynell, then rector of Petworth, appeared at the grave, with the work of Chillingworth (*Relig. of Protest.*) in his hand, and after an admonitory oration on the dangerous tendency of its rationalism, he flung it into the grave, exclaiming, 'Get thee gone, thou cursed book, which hast seduced so many precious souls—get thee gone, thou corrupt rotten book, earth to earth, dust to dust, go rot with thy author!' He afterwards published 'Chillingworthi Novissima, or the Sicknesse, Heresy, Death and Burial of Wm. C., with a prophane catechism collected out of his works, by F. Cheynell, Fell. Mert. Coll. Ox.,' 1644 and 1725. In this singular production the object of the author's enmity is jeered at as 'this man of reason whose head was as full of scruples as it was of engines.' But the character and abilities of Chillingworth have been greatly and justly extolled by many of our most distinguished writers. 'The incomparable Chillingworth,' says Dr. Tillotson, 'is the glory of his age and nation.' 'If you would have your son to reason well,' says Locke (*on Educat.*), 'let him read Chillingworth;' again (*on Study*), 'For attaining right reasoning I propose the constant reading of Chillingworth: for this purpose he deserves to be read over and over again.' Anth. Wood says that, 'having spent all his youth in disputation, he was a most subtle and quick disputant, and would often put the king's professor to a push.' Hobbes observes that 'he was like a lusty fighting fellow driving his enemies before him, and often giving his own party smart back blows.' 'Those,' says Mosheim, 'who desire to know the doctrines of the Church of England, must read especially Chillingworth's admirable book, The Religion of Protestants.' Gibbon observes that Chillingworth most ably maintains the principle that the protestant's sole judge is the Bible, and its sole interpreter, private judgment. Dr. Reid considers him 'the best reasoner and most acute logician of his age;' but Anth. Wood's opinion is not outdone by any, for he declares that 'Chillingworth had such extraordinary clear reason that if the great Turk or the Devil could be converted, *he* was able to do it.' 'His great excellency consisted,' says Dr. Barlow, 'in his acquired logic, the syllogisms of Aristotle and Crakenthorp having been a principal part of his studies.' The result of this proficiency in 'wrangling' is stated by his intimate friend Lord Clarendon, who says (*Hist. Rebell.*) that 'Chillingworth had contracted such an irresolution and habit of doubting, that at last he was confident of nothing.' This fact is adduced by Dugald Stewart (*Philos.* vol. ii., p. 279) as an instance of the ruinous effects of the scholastic logic. It is said by Clarendon that 'Chillingworth was a man of little stature,' and that it was 'an age in which many great and wonderful men were of that size.' The 10th and best ed. of *The Relig. of Protest.* is that in fol., 1742, with sermons, &c. and a life of the author by Dr. Birch. An edition of Chillingworth's whole works has been recently published in 1 vol., 8vo. For evidence that Chillingworth was not a Trinitarian, see Whitaker's 'Origin of Arianism,' p. 482, 492. A complete list of his miscellaneous controversial works is given in Kippis's *Biog. Brit.*, vol. iii., p. 515, and in the *Life of Chillingworth*, by Des Maizeaux, 8vo., 1725.

CHILOE, an island situated on the western coast of South America, between 41° 48′ and 43° 50′ S. lat., and 73° 20′ and 74° 30′ W. long. It is the most northern of that series of larger and smaller islands which skirt the western coast of South America from Cape Horn northwards. It is divided from the continent by a wide strait, called the Gulf of Ancud and at its northern extremity by the much narrower strait of Chacao. It extends from north to south about 120 miles, and from east to west sixty, where widest; but its eastern coast being deeply indented, the average width probably does not exceed forty miles. This gives an area of 4800 square miles. It is therefore nearly 900 square miles larger than Corsica, about 1000 square miles less than Yorkshire, or about double the area of Devonshire. The whole island is one mass of rock, which in no part rises to a great height, and is covered with earth and clothed with wood, chiefly consisting of a species of bastard cedar, very durable, and affording excellent timber, which is exported in great quantities to Chile and Peru. In the island itself it is used for building vessels. The northern and eastern coasts, which are much indented, have many excellent harbours, among which the best are Chacao, S. Carlos, Dalcahue, and Castro, in all of which vessels of any size may anchor with the greatest safety. On the west coast is the Lagoon of Cucao, which is upwards of twenty miles in length, and connected with the sea. Though frost and snow are hardly known, the climate of the island is chilly. The air is so damp that fogs occur almost daily during the rainy season, which lasts ten months; yet the climate is healthy. The domestic animals are cattle, horses, sheep, and swine. Some hides are exported, and also nearly 8000 hams annually, of excellent quality. These with about 260,000 planks constitute all the articles that are sent out. Sometimes grain is exported. The soil being of excellent quality produces rich crops of wheat and barley, and great quantities of potatoes. A good deal of butter is made, but it does not yet form an article of commerce. Fish, as well as oysters and other shell-fish, are very abundant, and in some parts are the chief food of the inhabitants.

The interior of the country is not known, the inhabitants living all along the sea-shore, or only at a little distance from it. The northern and eastern coasts are settled by Europeans, but at the southern extremity only Indians in small numbers are found. The people are in appearance more like northern Europeans than Spaniards, being athletic and robust, and having a fair complexion and light flaxen hair The principal towns are S. Carlos, on the strait of Chacao, a small town with about 2000 inhabitants, and Castro, which is somewhat larger. The Gulf of Ancud contains a great number of smaller islands, of which about thirty-two are inhabited. The most remarkable are Quinchau, Lemuy, Calbuco, and Llaicha. On Lemuy very good ponchos are made from the wool of the country.

All these islands form together the Chiloë archipelago. They constitute the most southern of the provinces of Chile. This province includes also the small fortress of Maullin, which is situated on the mainland near the western entrance of the strait of Chacao, and is the most southern European settlement in America.

The province of Chiloë contained in 1832 a population of 43,382, and 31 schools, in which 1271 boys received instruction. It sends three representatives and two senators to the congress. (Poeppig's *Travels in Chili, Peru, &c.*, in German.)

CHILO′GNATHA, according to Latreille, a family of insects of the order of *Myriopoda*. Technical characters:—Body generally cylindrical, and consisting of numerous crustaceous rings or segments; the head is furnished with two short seven-jointed antennæ, and two mandibles; the horny substance of the mandibles does not continue uninterruptedly from the base to the apex, but is divided in the middle, so that the upper part is, as it were, hinged to the lower by a tough membrane; they are covered above by the fore part of the head, which forms a kind of upper lip, and beneath by an under lip; this last part is divided externally into four portions by three sutures; the two central portions are narrower than the outer ones, and spring from a plate of a semicircular shape; the apex of the under-lip is furnished with several large tubercles. The first segment of the body, or that next the head, is considerably larger than the following segments. The legs are short, very numerous, and terminated by a simple hook, the anterior segments of the body are, some of them, unprovided with legs, and others have a single pair each; the remaining segments (with the exception of the two or three last), commencing from the fourth, fifth, or sixth from the head, are each furnished with two pairs of legs.

The sexual organs of the male are situated behind the seventh pair of legs, and those of the female behind the second pair.

The respiratory orifices are situated on the sternal part of each segment of the body; they communicate internally with double series of pneumatic sacs which extend the whole length of the body, and from which the tracheal branches spring, and spread over the other organs; these sacs are not connected with each other, as is usually the case, by a principal trachea.

A series of pores on each side of the body have been mistaken for the stigmata, but their orifices give vent to an acid liquid secretion which has a very disagreeable odour, and probably serves as a means of defence.

The chilognathæ crawl slowly and appear to glide over the ground; and when touched they will roll themselves up spirally. They feed upon decaying animal and vegetable substances, and constitute the genus Iulus of Linnæus. [Iulus.]

CHILOMANAS. [Phytozoaria.]

CHILO'PODA, according to Latreille, a family of insects of the order *Myriopoda*. This family is synonymous with the order Syngnatha, Leach, and the genus Scolopendra of Linnæus. The characters are—antennæ thick at the base, and gradually growing slender towards the apex, composed of fourteen or more joints; the mouth consists of two mandibles, which are furnished with a palpiform process, and provided at the apex with numerous little denticulations; covering these is an upper lip and an under lip; the latter is composed of four distinct portions, of which the two outer parts are the largest, and transversely jointed: above this part (viewing the head from beneath) are two palpi, which resemble legs in being terminated by a pointed claw: covering this underlip, there is a second lip, an organ furnished with two lateral processes, each of which is terminated by a large bent claw, which is said to be perforated beneath by a hole through which a poisonous liquid is ejected.

The body is depressed, composed of numerous segments, which are covered above and beneath with plates of a horny substance, and each segment is generally furnished with a pair of legs; the last pair are thrown back. The sexual organs are placed at the posterior extremity of the body. The organs of respiration consist wholly or partly of tubular tracheæ. The stigmata are placed on the sides of the body.

These insects are carnivorous, and crawl about by night. Most of them are very active in their movements, and some emit a phosphoric light. They conceal themselves under stones and fallen trees, and are all found in rotten wood. In hot climates some of the species grow to an immense size (especially those of the genus Scolopendra, as it is now restricted), and, owing to their venomous bite, are much dreaded by the inhabitants of those parts.

The animals commonly known by the name of centipedes belong to this family. [Scolopendra.]

CHILTERN HUNDREDS. A portion of the high land of Buckinghamshire is known by the name of the Chiltern hills. 'Formerly these hills abounded in timber, especially beech, and afforded shelter to numerous banditti. To put these down, and to protect the inhabitants of the neighbouring parts from their depredations, an officer was appointed under the crown, called the steward of the Chiltern Hundreds;' (*Geography of Great Britain*, by the Society for the Diffusion of Useful Knowledge.) The duties have long since ceased, but the nominal office is retained to serve a particular purpose. A member of the House of Commons, not in any respect disqualified, cannot resign his seat. A member therefore who wishes to resign, accomplishes his object by accepting the stewardship of the Chiltern Hundreds, which being held to be a place of honour and profit under the crown vacates the seat. This nominal place is in the gift of the chancellor of the exchequer.

CHIMÆ'RA, a genus of cartilaginous fishes allied to the sturgeon and shark sections. [Sturionidæ.]

CHIMA'PHILA CORYMBO'SA (Pursh), the Pyrola umbellata of Linnæus, corymbose *Wintergreen*, a small evergreen woody plant, common in the pine-forests of the north of Europe, also found in Asia, and in North America, to the Indian inhabitants of which its virtues have been long known. The leaves possess diuretic properties joined to a tonic power, and they impart strength and comfort to the stomach while they increase the action of the kidneys. Applied externally, they cause redness and vesication of the skin. Chemical analysis shows them to consist of tannin, resin, and an acrid extractive. The taste is at first sweet, afterwards bitter. Their tonic and diuretic properties render them valuable remedial agents in dropsies, especially such as follow acute diseases. They have also been given advantageously in intermittent, and even typhus, fever. Dr. Chapman ascribes a diaphoretic power to them. Infusion, decoction, and extract are the forms in which they have been given: decoction is preferable, of which some ounces may be given repeatedly during the day. (See *Trans. of Medico-Chirurg. Society*, vol. v.)

CHIMAY. [Hainault.]

CHIMBORA'ZO, a mountain mass, forming one of the higher summits of the Andes. It is situated between 1° and 2° S. lat., and between 79° and 80° W. long., in the republic of Ecuador, nearly at an equal distance from the towns of Quito and Guayaquil. It is on the western of the two parallel ranges, which here constitute the highest portion of the whole chain. Its summit, as determined by Humboldt, rises nearly 21,600 feet above the level of the sea. The snow-line in the neighbourhood of the equator being about 15,750 feet, the summit of the mountain is 5850 feet, or more than one-fourth of its height elevated above it. Since the visit of the French mathematicians to Peru to measure a degree of the meridian, Chimborazo has been considered the highest summit in America, and generally on the globe. But towards the close of the last century it was ascertained that some of the summits of the Himalaya mountains rose to a greater height; and within the last ten years it has been proved that the highest portion of the Andes does not lie near the equator, but between 14° and 17° S. lat., where at least four summits rise higher than Chimborazo: the highest of them, the Nevado di Sorato, rises to 25,250 feet, or nearly 4000 feet higher than Chimborazo. (Humboldt; Pentland, in *London Geographical Journal*, vol. v.)

CHIMES, a set of bells tuned to the modern musical scale, and struck by hammers acted on by a pinned cylinder or barrel, which revolves by means of clock-work. The term is also applied to the music, the tune, produced by mechanical means from the bells in a steeple, tower, or common clock.

Chimes differ from Carillons (as the last word is commonly understood in England), inasmuch as the bells of the former are acted on by clock-work, those of the latter by keys struck by the hand. But the French apply the term *carillon* to the tune played, and, generally, to the series of bells, whether sounded by machinery or by hand; though the most accurate writers distinguish the latter kind as *le carillon à clavier*. The *carillons à clavier* comprise three octaves of bells, sounded by means of keys, similar to the pedals of an organ, which the performer strikes forcibly with hands clenched and sideways, the little fingers being guarded by a thick covering of leather. These keyed-carillons are found in many towns of Holland and the Netherlands. At Ghent they are remarkable; but the best specimen is at Amsterdam, where the *carilloneur* (M. Pothoff, formerly an organist in that city) used to display an extraordinary command of the instrument, on which he executed pieces in three parts—the base by means of pedals—with a rapidity rarely exceeded by judicious performers on the organ.

CHIMNEY. [House.]

CHIMNEY-SWEEPER, a person whose trade it is to cleanse foul chimneys from soot. The actual sweepers are boys, formerly of very tender age, who are taught to climb the flues, and who, from the cruelties often practised upon them by their masters, have, for the last half century, become objects of particular care with the legislature. The first and chief act by which regulations concerning them were enforced was the 28th Geo. III., c. 48. It has been since followed by Act 4 & 5 Will. IV., for the better regulation of Chimney-sweepers and their Apprentices, and for the safer Construction of Chimneys and Flues, passed 25th July, 1834. From that date no child who is under ten years of age can be apprenticed to a chimney-sweeper. The law is so tender with regard to these generally friendless children, that it has appointed a particular form of indenture for them. About the beginning of the present century, a number of public-spirited individuals joined in offering considerable premiums to any one who would invent a method of cleansing chimneys by mechanical means, so as to supersede the necessity of climbing-boys. Various inventions were in consequence produced, of which the most successful was that by Mr. George Smart. The principal parts of the machine are a brush, some hollow tubes which fasten into each other by means of brass sockets, and a band for connecting the whole together. The unskilful use of the machine, however, and the antiquated and peculiar construction of a great many of the chimneys of the metropolis, have prevented the universal adoption of what had received the significant appellation of 'the last chimney-sweeper. Till the passing of the last Act, the little chimney-sweeper used to announce his vocation as he traversed the streets of London by crying 'Sweep.'

CHIMONA'NTHUS, a Japanese genus of Calycanthaceous plants, whose species or varieties are called in the gardens Japan allspice. They are deciduous plants, with opposite pale-green, sharp-pointed, rather rough leaves, of an ovate-lanceolate figure. About the end of November these fall from the bushes, and are succeeded by the flowers, which appear at Christmas-time upon the naked branches. They consist of an inferior calyx, formed of a considerable number of roundish scale-like sepals, the outermost of which are pale brown, the innermost semi-transparent, with some tinge of yellow. The petals are yellowish ovate leaves, staind with chocolate red veins, and surrounding a small number of stamens. The fruit is a bright brown leathery calyx-tube, enclosing three or four oblong bright-brown polished nuts. There is probably no plant more deliciously fragrant than this, the orange and violet not excepted; the plant is quite hardy if protected a little by a wall or by palings. Three varieties are known in the gardens; the common kind with small pale-yellow flowers; the *grandiflorus* with large bright-yellow flowers; and another with flowers resembling those of the first, except in being very much smaller. The last is not worth cultivating; both the former should be found in every garden, however small; nothing can be more elegant as room ornaments than handsful of their round flowers placed on little porcelain trays.

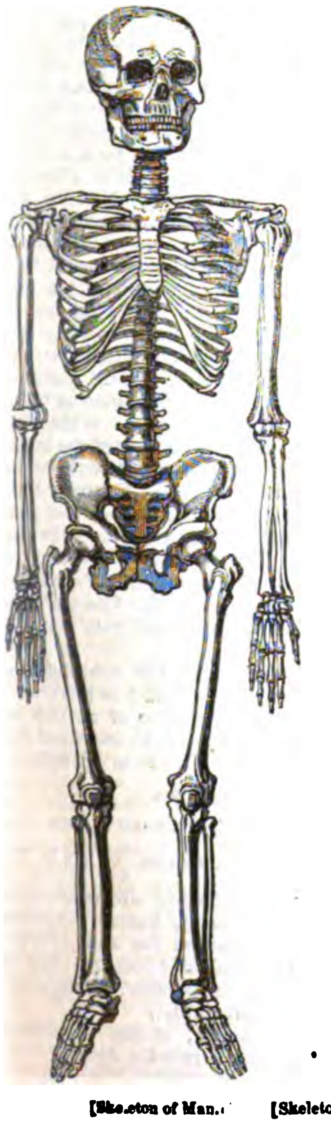
CHIMPANZEE, the name by which one of those forms which approach nearest to man is most generally known. The term has been applied to the *Simia Satyrus* of Linnæus, the *oriental orang*, but zoologists are now agreed in its proper application to the *Black* or *African Orang* or *Pygmy*. (*Troglodytes niger* of Geoffroy, *Simia Troglodytes* of Blumenbach.) Linnæus placed the form under the genus Homo, with the specific name *Troglodytes*, next to *Homo Sapiens*, arranging, as we have seen above, the Asiatic orang under the *Simiæ*; but he seems to have confounded the two species of orangs, which differ very considerably; for he refers to the figure given by Bontius which was intended for the Asiatic, and yet he gives, quoting Pliny, the borders of Ethiopia as its habitat, as well as Java, Amboyna, Ternate, and Mount Ophir in Malacca. That the Chimpanzee, though much of its organization bears a striking resemblance to that of man, is separated from him by a wide interval, the accurate investigations of modern anatomists sufficiently prove. Tyson, Camper, Blumenbach, Cuvier, Lawrence, and Owen, have set that question at rest, though Bory de St. Vincent struggled hard to retain man and the orangs as members of the same zoological family. Before we refer to the arguments of the last-named zoologist, it will be necessary to apprize the reader that, to say nothing of the difference of organization in other parts of the body and foot, the heel-bone (*os calcis*) of man does not project backwards so far in proportion as that of the Chimpanzee, and Lawrence notes this as an infallible human characteristic; '*ex calce* hominem.' Bory de St. Vincent, and those who support the theory of gradual development of animal form, endeavour to show that the position of the great toe, upon which its conversion into an opposable organ, or thumb, and the consequent transmutation of the foot into a hand, principally depends, is a character subject to modification; and, after a somewhat sweeping assumption, that it is the only difference of organization between the orangs and man, points the whole strength of his argument against its value as a zoological character; and, by a rather retrograde process of reasoning, endeavours to support his views by giving an instance where man, under certain circumstances, obtains a prehensile power of foot. Calling in aid the *Resiniers* of the landes of Aquitaine, he exhibits them as having acquired a power of opposing the great toe to the others, a faculty supposed to have been arrived at by their scansorial habits in obtaining the tiving, by gathering the resin of *Pinus maritima*. 'But, as Owen well observes, 'supposing the extent of motion of the great toe to be sufficiently increased by constant habits of climbing, or in connexion with a congenital defect of the upper extremities, yet it does not appear that the *os calcis*, or the other bones of the foot, have lost any of those proportions which so unerringly distinguish man from the ape.' M. Bory, however, in his zealous endeavours to lower the arrogance which makes man unwilling to fraternize with apes and monkeys, is carried so far as to give vent to this naïve question. 'En effet, quatre mains ne vaudraient elles pas mieux que deux comme élémens de perfectibilité?' 'In fact, are not four hands of more value than two as elements of perfectibility?' Now let us look at this fallacy, for a fallacy it is. There might be a little, and a very little after all, in the query, if any one of the four hands of the *Quadrumana*, or all of them put together, approached the hand of man as an instrument of action,—an instrument whereby, though born the most helpless of animals and without clothing or any natural protection, he has made himself master of all, and compelled the apparently most impracticable natural productions to minister not only to his wants, but to his most luxurious imaginations. Let any one who is at all conversant with animal mechanics look at the hand of a chimpanzee, and compare it with his own; or let any one observe the chimpanzee using his apology for a thumb, and then cast his eyes on the merest hodman at his work, and he will soon see where the advantage lies. And this is not all. 'To give due force to this proposition,' says Owen in his excellent paper 'On the Osteology of the Chimpanzee and Orang Utan,' 'the four hands of the ape ought to be independent of any share in stationary support or progression; now, it is scarcely necessary to observe, that the perfection of the hands of man results, in a great measure, from the free use he is enabled to make of them in consequence of the organization of the lower members as exclusive instruments for sustaining and moving the body. It has, however, been suggested that the *hallux* (thumb) of the orang might acquire increased length and strength during the efforts of successive generations to maintain the erect position; but if we look a little further into the anatomy of the orangs, a difficulty presents itself unforeseen by Lamarck. The muscle called *flexor longus pollicis pedis* terminates, in the human subject, in a *single* tendon, and its force is concentrated on the great toe, the principal point of resistance in raising the body upon the heel. In the orang, however, the analogous muscle terminates in *three* tendons, which are inserted separately and exclusively in the three middle toes, obviously to enable these to grasp with greater force the boughs of trees, &c. It is surely asking too much to require us to believe that, in the course of time, under any circumstances, these three tendons should become consolidated into one, and that one become implanted into a toe, to which none of the three separate tendons were before attached. The myology of the orangs, to which I may hereafter endeavour to direct more attention than it has yet received, affords many arguments equally unanswerable against the possibility of their transmutation into a higher race of beings.' From the same author we take the following summary comparison of the *chimpanzee* and *orang utan* with each other, and with *man*.

The *chimpanzee* differs osteologically from the *orang*: 1. In having the cranium flatter and broader in proportion to the face. 2. In having the supraciliary ridges more developed, and in the absence of the interparietal and sagittal crests. 3. In the junction of the temporal with the frontal bones. 4. In the greater proportional breadth of the interorbital space. 5. In the more central position and less oblique plane of the occipital foramen. 6. In having but one anterior condyloid foramen on each side, while the orang has two. 7. In having generally but one suborbital foramen on each side, while the orang has three or more. 8. In the persistence of the cranial sutures. 9. In the earlier obliteration of the maxillo-intermaxillary sutures. 10. In the smaller proportional size of the incisive and canine teeth, and consequent smaller development of the jaws, especially of the intermaxillary bones. 11. In the smaller proportional size of the cervical, and larger proportional size of the lumbar vertebræ. 12. In the additional dorsal vertebra corresponding to the additional pair of ribs 13. In the more complete composition of the sternum which consists of a single and not double series of bones, as in the orang. 14. In the greater sigmoid curve of the clavicle, which in the orang is nearly straight. 15. In the less proportional breadth of the *scapula*, and the more lateral aspect of the glenoid cavity. 16. In the less proportional breadth and greater length of the *sacrum*. 17. In the less proportional breadth of the *ilium*, and greater expansion of the *ischium*. 18. In the comparative shortness of the upper extremities, more especially of the fore-arm and hand. 19. In the non-division of the pisiform bone of the wrist. 20. In the greater proportional length of the *femur* and *tibia*, and the less proportional length of the foot. 21. In the presence of a *ligamentum teres*, and consequent depression in the head of the *femur*. 22. In the greater proportional size of the *tarsus* as compared with the *phalanges* of the toes. 23. In having constantly two *phalanges* in the *hallux* or great toe with a nail, while the ungueal *phalanx* and nail are often wanting in the *hallux* of the orang, especially in that of the female.

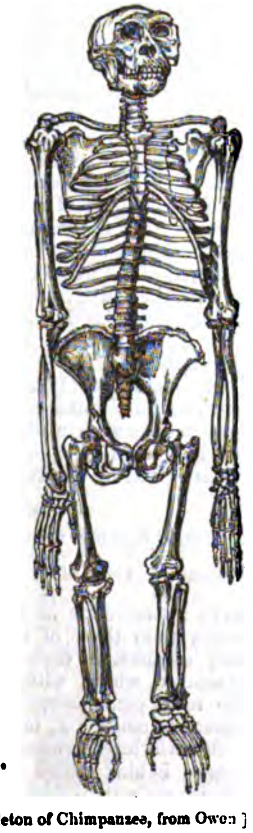
The *Chimpanzee* approximates more nearly to the human structure in those deviations which are numbered 4, 5, 6, 7, 8, 9, 10, 12, 13, 17, 18, 19, 20, 21, 22, 23.

The *Orang* has a nearer resemblance to *Man* · 1. In the junction of the sphenoid with the parietal bones. 2. In having 12 pairs of ribs. 3. In the form of the *scapula*, especially in its greater breadth.

Mr. Owen well observes, that it is a result of the preceding comparison, that the *Chimpanzee* ought to rank above the *Orang* in a descending series, and not below it as in the *Règne Animal* of Cuvier. Linnæus, as we have seen, gave the *Chimpanzee* that superiority of rank, but erred as much on the other side by placing it under the genus *Homo*, for both the *Chimpanzee* and *Orang*, according to Owen, differ in structure from the human subject. 1. In the *diastema*, or interval between the *cuspidati* and incisors in the upper jaw, and between the *cuspidati* and *bicuspides* of the lower jaw. 2. In the greater magnitude of the intermaxillary bones, indicated in the adult by the distance of the *foramina incisiva* from the incisive teeth, both of which differences result from the greater proportional development and different forms of the *cuspidati* and incisors. These, as the author observes, are differences of generic value. 3. In the more backward position and oblique plane of the occipital *foramen*. 4. In the smaller proportional size of the occipital condyles. 5. In the larger proportional size of the petrous bones. 6. In the greater proportional development of the jaws. 7. In the flatness of the nasal bone, which is rarely divided in the mesial line, while in *Man* the nasal bones are as rarely consolidated into one. 8. In the presence of the ant-auditory process of the temporal bone, and the absence of the mastoid and styloid processes. 9. In the absence of the process of the ethmoid, called *crista galli*. 10. In the shortness and comparative weakness of the lumbar region of the spinal column, which is also composed of four instead of five *vertebræ*. 11. In the narrowness and proportional length of the *sacrum*. 12. In the flatness of the *ilia*, and the larger development and outward curvature of the *ischia*. 13. In the position of the *pelvis* in relation to the spine. 14. In the larger proportional development of the chest. 15. In the greater length of the upper extremities. 16. In the wider interval between the *ulna* and *radius*. 17. In the shortness and weakness of the thumb, and narrowness of the hand in relation to its length. 18. In the shortness of the lower extremities. 19. In the greater proportional length and narrowness of the foot. 20. In the small size of the *os calcis*. 21. In the shortness and opposable condition of the *hallux*.

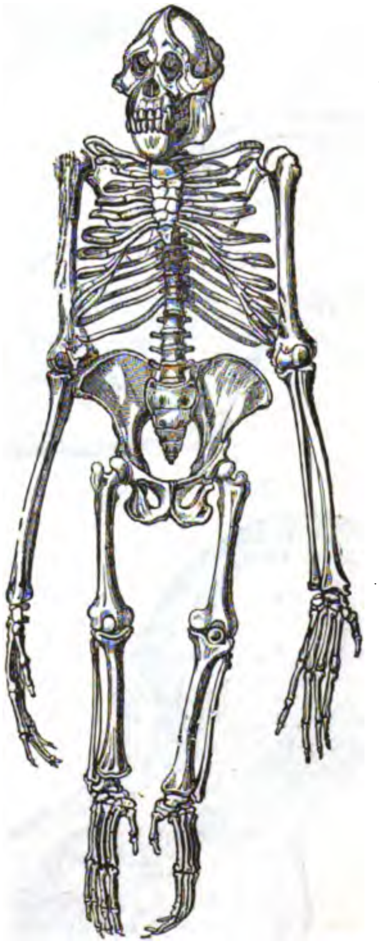


[Skeleton of Man.]



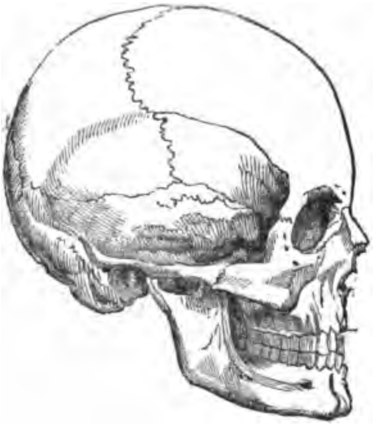
[Skeleton of Chimpanzee, from Owen.]

'These differences,' adds Mr. Owen, 'result from original formation, and are not liable to be weakened in any material degree, either on the one hand by a degradation of the human species, or, on the other hand, by the highest cultivation of which the anthropoïd *apes* are susceptible.'

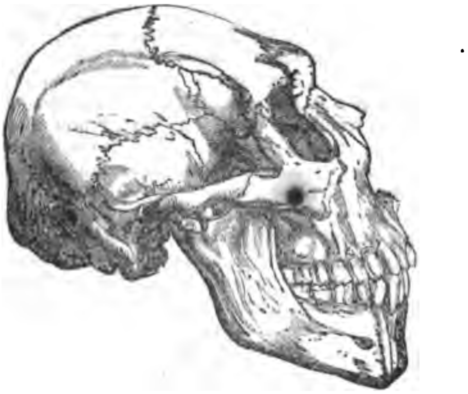


[Skeleton of Orang Utan, from Owen.]

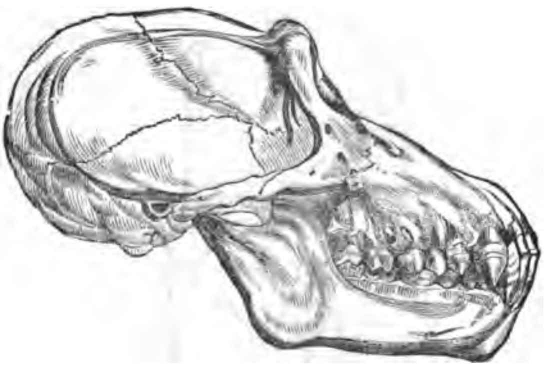
In following out this osteological comparison it becomes necessary, for the assistance of the student, to give a sketch of the cranial development in man, and in the anthropoïd apes, so that he may have under his eye the comparative form of each.



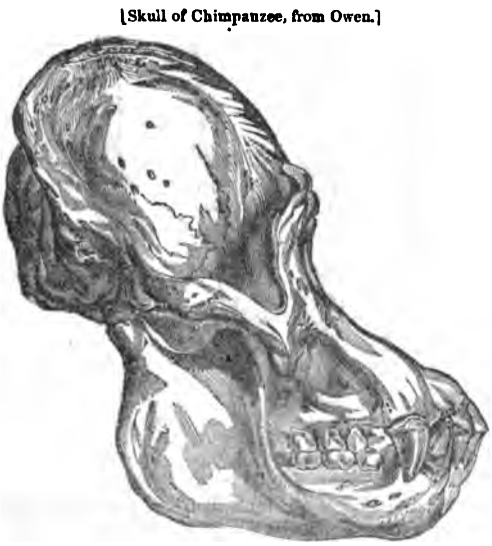
[Well-developed Human Skull.]



[Skull of Human Idiot, from Owen.]



[Skull of Chimpanzee, from Owen.]



[Skull of Orang Utan, from Owen.]

The following summing-up is so much better than anything we could present to the reader, that we give it in Mr. Owen's words.

'Certain modifications in the form of the human *pelvis* have been observed to accompany the different forms of the *cranium* which characterize the different races of mankind but there is nothing in the form of the *pelvis* of the Australian or Negro which tends to diminish the wide hiatus that separates the *bimanous* from the *quadrumanous* type of structure in regard to this part of the skeleton. Observation has not yet shown that the *pelvis* of the *Orang*, in a state of captivity, undergoes any change approximating it towards the peculiar form which the same part presents in the human subject. The idea that the iliac bones would become expanded and curved forwards, from the pressure of the superincumbent *viscera*, consequent on habitual attempts at progression on the lower extremities, is merely speculative. Those features of the *cranium* of the *Orangs* which stamp the character of the irrational brute most strongly upon their frame, are, however, of a kind, and the result of a law originally impressed upon the species, which cannot be supposed to be modified under any circumstances, or during any lapse of time; for what external influence operating upon and around the animal can possibly modify in its offspring the forms, or alter the size, of the deeply-seated germs of the permanent teeth? They exist before the animal is born; and let him improve his thinking faculties as he may, they must, in obedience to an irresistible law, pass through the phases of their development, and induce those remarkable changes in the maxillary portion of the skull which give to the adult *Orangs* a more bestial form and expression of head than many of the inferior *simiæ* present. It is true that in the human subject the *cranium* varies in its relative proportions to the face in different tribes, according to the degree of civilization and cerebral development which they attain;, and that in the more debased Æthiopian varieties, and Papuans, the skull makes some approximation to the *quadrumanous* proportions: but in these cases, as well as when the *cranium* is distorted by artificial means or by congenital malformation, it is always accompanied by a form of the jaws, and by a disposition and proportions of the teeth, which afford unfailing and impassable generic distinctions between *Man* and the *Ape*. To place this proposition in the most unexceptionable light, I have selected the *cranium* of a human idiot, in whom nature may be said to have performed for us the experiment of arresting the development of the brain almost exactly at the size which it attains in the *Chimpanzee*, and where the intellectual faculties were scarcely more developed; yet no anatomist would hesitate in at once referring this *cranium* to the human species. A detailed comparison with the *cranium* of the *Chimpanzee* or *Orang* shows that all those characters are *retained* in the idiot's skull which constitute the differential features of the human structure. The cranial cavity extends downwards below the level of the glenoid articulatory surfaces. The nasal bones are two in number, and prominent. The jaws and teeth exhibit the *bimanous* characters as strongly as in the most elevated of the human race. The *cuspidati* do not project beyond the contiguous teeth, and consequently there are no interruptions in the dental series, as in the *Orangs*, where they are required to lodge the disproportionate crowns of the canine teeth.'

M. Geoffroy St. Hilaire characterized the subgenus *Troglodytes* from immature *Chimpanzees;* and as Mr. Owen's observations were made upon the skeleton of an adult individual, and he has consequently altered the zoological characters given by Geoffroy, we follow Mr. Owen's definition.

Subgenus Troglodytes.

Dental formula, the same as in the human subject; viz., incisors $\frac{4}{4}$, canines $\frac{2}{2}$, bicuspids $\frac{4}{4}$, molars $\frac{6}{6}$. (N.B The teeth approximate in their proportionate size much more nearly than those of the Orang to the human teeth; but they manifest in their relative position the absence of the character, which, with one anomalous exception—that of the fossil genus *anoplotherium*—is peculiar, among mammifers, to man; viz., unbroken proximity.)

Muzzle long, truncated anteriorly; strong supraciliary ridges, behind which the forehead recedes directly backwards; no cranial ridges.

Facial angle 35°, excluding the supraciliary ridges

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Auricles, large.

Thirteen pairs of *ribs;* bones of the sternum in a single row.

Arms reaching below the knee-joint.

Feet wide; hallux extending to the second joint of the adjoining toe.

Canines large, overpassing each other; the *apices* lodged in intervals of the opposite teeth.

Intermaxillary bones anchylosed to the maxillaries during the first or deciduous dentition.

Example. The *Chimpanzee, Black Orang*, or *Pygmy* (*Troglodytes niger* of Geoffroy, *Simia Troglodytes* of Blumenbach). In the young state the animal has been named *Jocko.*

Description. The following is from the pen of Dr. Traill, of Liverpool: and from minute examination of the individual lately exhibited at the garden of the Zoological Society, in the Regent's Park, London, we can vouch for its accuracy. Dr. Traill's specimen was a young female, about thirty inches high, and was brought home by Captain Payne. 'The skin appears of a yellowish-white colour, and is thinly covered with long black hair on the front; but it is considerably more hairy behind. The hair on the head is rather thin, and is thickest on the forehead, where it divides about an inch above the orbital process of the frontal bone, and, running a little backwards, falls down before the ears, forming whiskers on the cheeks. Here the hair measures nearly two inches long; but that on the occiput is not above an inch in length. There are a few stiff black hairs on the eyebrows, and a scanty eyelash. A few whitish hairs are scattered on the lips, especially on the under one. The rest of the face is naked, and has whitish and wrinkled skin. There is scarcely any hair on the neck, but, commencing at the nape, it becomes somewhat bushy on the back. The abdomen is nearly naked. The hair on the back of the head, and the whole trunk, front of the lower extremities, back of the legs, and upper part of the superior extremities, is directed downwards, while that on the back of the thigh and fore arms is pointed upwards, appearances well represented in Tyson's figure. The longest hair is just at the elbows. There is none on the fingers or palms of either extremity. The ears are remarkably prominent, thin and naked, bearing a considerable resemblance in shape to the human, though broader at the top. The projection of the process above the eyes is very conspicuous, but has not been sufficiently marked in any engraving or drawing which has fallen under my observation. The nose is quite flat, or rather appears only as a wrinkle of the skin, with a slight depression along its centre. The nostrils are patulous, and open upwards, which would be inconvenient did the animal usually assume the erect posture. The projection of the jaws is excessive, and though much less so than in the baboon, yet the profile of the face is concave. It may be remarked however that the projection of the lower jaw is caricatured in the first and second figures of Camper's second plate. The mouth is wide, the lips rather thin, and destitute of that recurvation of the edges which adds so much to the expression of the human countenance. The spread of the shoulders is distinctly marked, but the width of the lower part of the chest is proportionally greater, when compared to the upper, than in man. From the lower ribs the diameter of the abdomen decreases rapidly to the loins, where the animal is peculiarly slender; a circumstance in which it approaches the other *Simiæ.* The pelvis appears long and narrow, another approximation to the rest of the genus. With regard to the limbs, the chief difference between our specimen and Dr. Tyson's figure consists in the excessive length of the arms, which in this animal descend below the knees, by the whole length of the phalanges of the fingers, which are above three inches in length. The same observation applies to almost every figure of this animal which I have seen. The proportions in the work of Camper approach nearest, in the present instance, in this particular. The hand differs from the human in having the thumb by far the smallest of the fingers. The foot is more properly a hand appended to a tarsus. The thumb of this extremity is very long, powerful, and capable of great extension. The legs are certainly furnished with calves; but they scarcely resemble the human in form, because they are continued of equal thickness nearly to the heel. When this animal is erect, the knees appear considerably bent, as is the case with the other *Simiæ*, and it stands with the limbs more apart than man.'

Geographical distribution. Africa is the only part of the world known to be the residence of the Chimpanzee, which, it should be remembered, has been confirmed, as Cuvier observes, by almost all zoologists. The specimen described by Dr. Traill was procured in the isle of Princes, in the gulf of Guinea, from a native trader, who had carried it thither from the banks of the Gaboon. The individual exhibited in the Egyptian Hall, Piccadilly, in 1831, had been obtained by a trading vessel on the river Gambia, and that exhibited at the garden of the Zoological Society was brought from the Gambia coast. Cuvier gives Guinea and Congo as its localities. The subject of Mr. Owen's paper was shot by a European at Sierra Leone.

Habits. The habits of the Chimpanzee in a state of nature are but imperfectly known. Cuvier states that the Chimpanzees live in troops, construct themselves huts of leaves, arm themselves with sticks and stones, and employ these weapons to drive man and the elephant from their dwellings. He also repeats the story of their pursuit of the negresses and carrying them off into the woods. This report is, as we shall presently see, still credited in the country where they are found. Speaking of Captain Payne, Dr Traill, in his interesting paper in the Wernerian Transactions, says, 'The natives of Gaboon informed him that this species attains the height of five or six feet; that it is a formidable antagonist to the elephant; and that several of them will not scruple to attack the lion and other beasts of prey, with clubs and stones. It is dangerous for solitary individuals to travel through the woods haunted by the orang, and instances were related to Captain Payne of negro girls being carried off by this animal, who have sometimes escaped to human society after having been for years detained by their ravishers in a frightful captivity. These reports confirm the narratives of the early voyagers, who have often been suspected of exaggeration, and similar facts have been recently stated, very circumstantially, by gentlemen who have lived in western Africa.'

In a state of captivity its manners have been the theme of many a tale, and much admiration; and as most of the individuals described have died very young, conjecture has been busy as to the progress the animal might make if its education were continued to the adult state. 'Deductions,' says Mr. Owen in his paper above referred to, 'in favour of the anthropomorphous character of the orangs have been derived from observation of the living habits of young orangs; but these cannot be regarded as affording a type of the nature of the adults, since it is well known that the docility and gentle manners of the young ape rapidly give way to an unteachable obstinacy and untameable ferocity in the adult; at least of those species to which, as I shall afterwards show, the full-grown orangs have the nearest resemblance in the form of the head.'

Captain Payne thus describes the manners of the animal which formed the subject of Dr. Traill's paper. 'When our animal came on board,' says Captain Payne, 'it shook hands with some of the sailors, but refused its hand, with marks of anger, to others, without any apparent cause. It speedily however became familiar with the crew, except one boy, to whom it never was reconciled. When the seamen's mess was brought on deck, it was a constant attendant; would go round and embrace each person, while it uttered loud yells, and then seat itself among them to share the repast.' It sometimes expressed its anger by a barking noise like a dog; at others it would cry like a froward child and scratch itself most vehemently. When any favourite morsel was given to it, sweetmeats more especially, it expressed its satisfaction by a sound like 'hem,' in a grave tone. The variety of its tones seems to have been small. It was active and cheerful in warm latitudes, but languor came on as it left the torrid zone; and on approaching our shores, it manifested a desire for a warm covering, and would roll itself carefully up in a blanket when it went to rest. It generally progressed on all fours, and Captain Payne particularly observed that it never placed the palms of the hands of its anterior extremities on the ground, but, closing its fists, rested on the knuckles. This mode of progression noticed by Tyson was confirmed to Dr. Traill by a young naval officer who had been for a considerable time employed in the rivers of western Africa, and had opportunities of observing the habits of this species. Captain Payne's animal did not seem fond of the erect posture, which it rarely affected, though it could run nimbly on two feet for a short distance. In this case it appeared to aid the motion of its legs by grasping the thighs with its hands. It had great strength in the four fingers of its superior extremity; for it would often swing by them on a rope upwards of an hour without intermission. When first procured, it was so thickly covered with hair, that the skin of the trunk and limbs was scarcely visible, until the long black hair was blown aside. It ate readily every sort of vegetable food; but at first did not appear to relish flesh, though it seemed to have pleasure in sucking the legbone of a fowl. At that time it did not relish wine, but afterwards seemed to like it, though it never could endure ardent spirits. It once stole a bottle of wine, which it uncorked with its teeth, and began to drink. It showed a predilection for coffee; and was immoderately fond of sweet articles of food. It learned to feed itself with a spoon, to drink out of a glass, and showed a general disposition to imitate the actions of men. It was attracted by bright metals, seemed to take a pride in clothing, and often put a cocked hat on its head. It was dirty in its habits, and never was known to wash itself. It was afraid of fire-arms; and on the whole appeared a timid animal. It lived with Captain Payne seventeen weeks, two of which were spent in Cork and Liverpool. At the former place it was exhibited for the benefit of the soup-kitchen for a few days, but seems to have been there neglected. On coming to Liverpool it languished a few days, moaned heavily, was oppressed in its breathing, and died with convulsive motions of the limbs. Such is Dr. Traill's account.

We also refer to the observations on the habits, &c., of a male chimpanzee (*Troglodytes niger*, Geoff.), then living in the menagerie of the Zoological Society of London, by Mr. Broderip, which were read at a meeting on the 27th of October, 1835[*].

The animal that was the subject of Mr. Broderip's remarks died in the spring of the following year; and on the 12th of April, 1836, Mr. Owen detailed the morbid appearances observed on its dissection[*]

[Troglodytes niger.]

Before we conclude this article, it may be necessary to hint at the probable height of the adult chimpanzee. The natives of Gaboon, as we have seen, informed Captain Payne that the species attained the height of five or six feet. Bingley, in his 'Animal Biography,' says, 'Allemand, the Dutch professor of natural history, had received many vague and unsatisfactory accounts respecting an animal of this kind, and was induced to write to Mr. May, a captain in the Dutch naval service stationed at Surinam. This gentlema found him exactly similar to one which he had broug from Guinea, except in size. He was nearly five feet an a half high, and very strong and powerful. Mr. May ha seen him take up his master, a stout man, by the middl and fling him from him for a pace or two; and one day seized a soldier, who happened to pass carelessly near th tree to which he was chained, and, if his master had n been present, he would actually have carried the man in the tree.' It is further stated that the age of this anima when Mr. May saw it, was about twenty-one years. In th following year it died, but was said to have increased height during the interval. The mother of that exhibite in the menagerie of the Zoological Society was reported have stood four feet six inches in height: but Mr. Owe gives three feet ten inches as the length of the body the adult chimpanzee (skeleton), from the *vertex* to th base of the *os calcis*, and four feet as the height of th adult at the end of his subgeneric character.

CHINA is an extensive country in Eastern Asia, const tuting the principal portion of the Chinese empire. It situated on the borders of the Pacific, and extends fro 20° N. lat., or, if the island of Hainan is included, from 1 to 41° N. lat., and if the tract of land projecting on th north-west towards the centre of Asia be added, to 46° N lat. Its eastern extremity, where it borders on Corea, is cu by 124° E. long., and its western, where it borders on th Birman empire, by 98° E. long.; but if the projecting trac be added, it reaches to 85° E. long. Its greatest length from the harbour of Amoy, opposite the island of Formosa taken in a north-western direction to the farthest extremit of the projecting tract, can hardly fall short of 2000 miles If, however, this latter tract is excluded, the length o China from the Peninsula opposite the island of Hainan t the great wall due north of Peking is about 1400 miles: its breadth varies between 900 and 1300 miles. If its averag length is taken at 17 degrees of lat., or about 1180 miles and its average breadth at the same number of miles, th area of China is 1,292,400 square miles, a computatio which does not differ much from that of Sir George Staunton, who assigns to it 1,297,999 square miles, or an area more than eleven times as large as that of the British Islands. The north-western projecting tract is not include in both calculations.

China is surrounded by countries dependent upon it, except at its south-western and southern side, where it borders on the Birman empire, the kingdom of Siam, and that o Cochin China, of which the last only seems to be nominally dependent on China. On the west of it extend Tibet and the country of Kho-kho-nor, or Ching-Hai. The projecting tract is mostly surrounded by Eastern Turkistan, lately called Grand Tartaria, and by Mongolia. Mongolia occupies also the greatest part of its northern boundary, except in the extreme east, where it is bounded by Manchuria or Ching-King and by Corea. Its eastern side is washed by the Pacific, which forms a deep gulf between China and Corea, called the Hoango-Hai or Yellow Sea; it assumes the name of Tung-Hai or Eastern Sea, between Corea and the island of Formosa, and that of Nan-Hay or Southern Sea, between Formosa and Hainan.

Its coast being about 2440 miles, there is only one mile of coast for every 532 square miles. Where China borders on Corea its coast is high and bold, and full of rocky islets. This coast continues on both sides of the Peninsula of Leao-tung, or about 240 miles. It is followed by a sandy coast, which in most places is so low that it cannot be seen at a short distance from the shore: this coast extends from the innermost corner of the bay of Leao-tung for about 360 miles to the neighbourhood of the Straits of Meao-toa, which form the entrance of the bay of Pe-tsche-li. The coast of the Peninsula of Chan-tung is rocky, and commonly bold, but not high, except in a few places. It extends from the Straits of Meao-toa to Cape Macartney, and hence to 35° N. lat., about 350 miles. The shores, as far as the Chusan Islands (30° 30′ N. lat.), are low and sandy, indeed in many places very swampy, and extend from 420 to 450 miles. From the Chusan Islands to the bay of Canton the coast is rocky, bold, and high, except in the recesses of the numerous bays and harbours. At some places it rises to a considerable height, and is besides lined with numerous cliffs and rocky islets, in all its extent of about 800 miles. The western shores of the bay of Canton, for about 30 miles, are formed by a great number of low sandy islands. From the bay of Canton to the peninsula of Lui-cheou, about 120 miles, the coast is again rocky and bold, but it does not appear to be high. The shores of the peninsula itself are about 100 miles long, sandy, flat, and low; the remainder of the coast of China, which is washed by the Gulf of Tonkin (about 100 miles), is not well known.

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[*] Proceedings of the Zoological Society of London, 1835, 1836.

A considerable portion of China is covered with mountains. Its western boundary extends to the chains which constitute the eastern edge of the high table-land of Eastern Asia [Asia and Bayan Khara]; but only the most eastern of these ranges lies within the boundary of China. It may be considered as beginning in the most southern bend of the Yang-tse-kiang, between 101° and 103° E. long., and as extending hence in a N.N.E. direction, and terminating in the great northern bend of the Hoang-ho, between 107° and 111° E. long. This mountain-range, which is called Siue-ling (Snow-range), or Yung-ling, contains a considerable number of snow-capped summits. The snowy mountains are numerous between 30° and 36° N. lat., and more especially between 32° and 34°. But even south of the great southern bend of the Yang-tse-kiang, and at a short distance from its banks, are some snow-covered summits, whence Ritter rightly concludes, that the river breaks through the southern portion of the range. The four mountain-chains, which traverse China from west to east, may be considered as offsets of this range. South of the snowy mountains, which are situated on the south of the great bend of the Yang-tse-kiang, is the hilly table-land of Yunnan. It is of considerable extent, and at a great elevation above the sea, if we may judge from its temperature in summer. From the eastern edge of this table-land two mountain-ranges branch off, the Yu-ling and the Nan-ling. The Yu-ling, the most southern of these ranges, branches off from the table-land in 24° N. lat. and 102° E. long., and runs nearly east to the neighbourhood of the bay of Canton, dividing the river Ta Si-kiang from the sea. It does not seem to approach the shores of the sea in any point, nor to rise to a great height. The Nan-ling (or southern range) which constitutes the most extensive mountain-system in China, branches off from the northern edge of the table-land of Yun-nan, where the snowy mountains are situated (26° N. lat. and 103° E. long.), and runs eastwards, passing about 150 miles to the north of Canton as far as 116° E. long.; it then inclines to the north-east, in which direction it continues with a slight bend to the west to its termination on the sea near the harbour of Ning-po, opposite the islands of Chusan. Several summits of this range rise above the snow-line, west of 110° E. long., where also it extends to a great width. An aboriginal nation, the Mioa-tsee, have maintained their independence in its fastnesses. A lateral range, which separates the Yang-tse-kiang from its tributary the Yuen-kiang, and extends north-east to the centre of China, is also said to contain some summits which rise above the snow-line. East of 110° no snow-capped mountains occur, though some rise to a great elevation; but even here the range preserves its steep and rugged character. Its numerous branches, running towards the Formosa Strait and the Tung-Hai, are also steep and craggy, but those extending northward are of inconsiderable elevation. Three mountain-passes are known to traverse the Nan-ling. The most frequented is to the north of Canton, where the range is called Mei-ling (the chain of the wild plum-trees, according to Klaproth), and hence the pass is called Mei-ling pass. By this pass goods are transported from Canton into the interior of China. Goods are brought in boats on the river Pe-kiang to the town of Nan-yong-foo. Between this town and that of Nan-gan-foo is the pass where goods are carried on the backs of men, for about 24 miles over rocky mountains. This is the only place, between Canton and Peking, where no water communication exists; for at Nan-gan-foo the goods are again shipped and descend the Kan-kiang and afterwards the Yang-tse-kiang till they come to the great canal. The elevation of the Mei-ling mountain-pass is estimated by Staunton to be 8000 feet above the sea. The second pass which is known occurs near 28° N. lat. and 118° E. long. between Kien-ning-foo on the east and Kian-tchang-foo on the west of the range, and though the mountains are very steep and rugged it is much frequented; 18,000 porters are continually employed for the transport of goods. The third road, which is a little farther north, connects the town of Kien-ning-foo with the town of Kin-tcheou-foo, which lies on the west of the range. Though difficult to pass it is much used.

The two other mountain-ranges, the Tapa-ling and the Pe-ling, are immediately connected with the Yun-ling, the Tapa-ling branching off south of 33° N. lat. and Pe-ling about 35°. The Tapa-ling runs south of east nearly in a straight line, and terminates near 112° E. long. north-east of the town of Koei-tcheou-foo. It divides the valley of the Han-kiang from that of the Yang-tse-kiang, and rises to a great height; several of its summits exceed the snow-line, as, for instance, the Kianku Shan, with which it terminates. The Pe-ling, which runs nearly parallel to the Tapa-ling, separates the valley of the Han-kiang from that of the Hoai-ho, or Wei-ho, an affluent of the Hoang-ho, and consequently the two great river-systems of China from one another. It continues in its eastern direction to 113° E. long., and this portion of the range is high, rugged, and steep. At 113° it declines to the south-east, diminishing considerably in elevation and ruggedness. Having attained 32° N. lat. it turns again to the east, and soon subsides into a chain of hills, which terminates on the western shores of the lake Tsiao-hoo, a considerable distance east of Nanking. The western part this range contains several snowy mountains though fewer than the Tapa-ling. The obstacles opposed by these two chains to the communication between the provinces which they traverse have been overcome by an artificial road, much more extensive than those which traverse the Alps. Beginning at the antient capital of Singan-foo on the banks of the Hoai-ho it runs in the valley of that river west past Fong-tsiang-foo to a place named Pao-ki-hiang. Near this place begins the mountain-road which is conducted over deep clefts by long bridges, and is often deep cut through high mountains. It then descends from the Pe-ling to the valley of the Han-kaing, which it crosses about 20 miles west of the town of Hang-tchong-foo. It then traverses the Tapa-ling, on the south of which it terminates on one of the branches of the Kialing-kiang at Tchao-hoa, north of Kian-tcheou-foo. This artificial mountain-road is said to be 420 lis or nearly 150 miles long. Its continuation leads through a less mountainous country, traverses the town of Poa-king-foo, and terminates at the antient capital of Tching-tu-foo.

These ranges traverse that part of China which lies south of the Hoang-ho. But even the western, and greater portion of the countries north of that river is almost entirely covered with high and rugged mountains. These mountains belong partly to the northern portion of the Yun-ling, which joins the Hoang-ho at its great bend, and partly are ramifications of the Inshan, a range which extends round the bend of the river on the west and north, and whose offsets enter China between that bend and the town of Peking in several ridges.

The whole surface of China may be divided into the mountainous country, the hilly country, and the great plain. The mountainous country comprehends more than half of the whole, and the meridian of 112° may be considered its eastern boundary, but to the north of the Hoang-ho it extends as far as 114°. All this immense tract of country is covered by mountains and valleys. The mountains are commonly too steep and rugged to admit much cultivation, but a great part of them is covered with high trees. Towards the north they are mostly bare, but contain immense beds of coal. The valleys are often narrow, but being watered by numerous streams, their fertile soil maintains a numerous population. This general description, however, applies properly, in all its extent, only to the districts north of the Tapa-ling and south of the Nan-ling, for in those between these two ranges the mountains are less steep, and their sides are commonly cultivated to a considerable height. The valleys, too, are much wider, and the level land sometimes extends to plains of considerable width, as, for instance, the plain of Tching-tu-foo, which is perhaps 20 miles in every direction.

Among the mountainous districts must be included the tract of land which lies between the Nan-ling and the sea; but, with the exception of the immediate neighbourhood of the range, it rather resembles the countries between the Nan-ling and Tapa-ling than those farther north, its valleys being generally wide, and sometimes expanding into plains, as, for instance, the plain of Canton. A considerable portion of the sides of the mountains is also fit for cultivation. If this tract is added to the other mountainous country, it may be said, that rather more than two-thirds of the surface of China are of this character.

The hilly country lies to the east of 112° E. long., and between this meridian and the eastern part of the Nan-ling, and extends north to the banks of the Yang-tse-kiang. The hills, though in many places steep, generally rise with a gentle ascent; and, as they do not attain a great elevation, their sides are cultivated, and planted with rice on the terrace system. Their tops are covered with forest trees, generally of the pine kind, which are carefully planted. The levels between the hills are sometimes narrowed into valleys, in other places they expand into plains. They have generally abundance of water in their rivers, and there are some lakes, of which the largest are the Tung-ting near the confluence of the Yuen-kiang with the Yang-tse-kiang, and the Po-yang, not far from the mouth of the Kan-kiang. The greatest portion of the surface is in a very high state of cultivation.

The great plain occupies the north-eastern part of China. It extends in length 700 miles from the Great Wall, north of Peking, to the confluence of the rivers Yang-tse-kiang and Kan-kiang (30° N. lat.). The Yang-tse-kiang may be considered as its southern boundary, as far down as Ngan-king, whence to the sea it is formed by a line drawn from Ngan-king to the sea, through Hang-tcheou-foo. The western boundary-line may be marked by a line drawn from King-tcheou-foo, a town situated on the Yang-tse-kiang, to Hoai-king-foo, on the Hoang-ho, and hence to the Great Wall, about 50 miles north-west of Peking. The breadth of the plain is various. North of 35° N. lat., where it partly extends to the shores of the Hoang-hai, and partly borders on the western side of the mountain range of Chang-tung, which occupies the peninsula of that name, its width varies between 150 and 250 miles. If we suppose the average breadth to be 200 miles, this portion of the plain covers an area of 70,000 square miles. Between 35° and 34° N. lat. the plain enlarges, and in the parallel of the Hoang-ho it extends more than 300 miles east and west. It grows still wider to the south, and reaches nearly 500 miles inland in the parallel of the embouchure of the Yang-tse-kiang. If we suppose the mean breadth of this portion of the plain to be 400 miles, it occupies a surface of 140,000 square miles. The whole plain, containing 210,000 square miles, is seven times as large as that of Lombardy, with which it may be compared in many respects.

The northern part of the plain has a dry sandy soil, impregnated in many parts with saline matter, and destitute of trees, but it produces millet and wheat in abundance. South of 35° N. lat. the whole tract along the coast is very low and swampy, being partly covered with numerous lakes and lagunes, and intersected by numerous water-courses, both artificial and natural. It produces a great quantity of rice. Farther inland the soil is more firm and dry, and of great fertility, which is increased by the abundance of water drawn from the rivers and small lakes. It produces rice, cotton, wheat, and tobacco. The southern districts bordering on the banks of the Yang-tse-kiang differ from the other in not being a flat level, but having a surface slightly undulating, on which even a range of hills rises, as the eastern prolongation of the Pe-ling. It is not, however, less fertile than the other districts. Among its most valuable branches of agriculture is tea, which is extensively cultivated on these low hills (between 30° and 32° N. lat.)

The eastern portion of this plain is traversed by the Great or Imperial Canal, which begins on the south at the town of Hang-tcheou-foo (30° N. lat.), and extends to the town of Lin-tchin-cheou, where it falls into the river Eu-ho or Wei-ho. Its length considerably exceeds 500 miles in a straight line, and probably its whole length may be 700. Some portions of it have been made merely for the purpose of internal navigation, but in others the design of draining and irrigating the adjacent country has been connected with it; hence it differs widely from all the canals made in Europe. Its breadth is considerably greater, and its waters are in few places altogether without a current. At a few points it is cut through rocks; it often traverses lakes and swamps of considerable extent, running on an artificial elevation, sometimes 20 feet above the surface of the country. Its flood-gates, bridges, the vessels which navigate it, and the number of towns and villages lining its banks, excite the admiration of all travellers. By this canal, and the navigable rivers, Yang-tse-kiang and Kan-kiang on the south, and the rivers Eu-ho and Pei-ho in the north, goods may be transported by water from the foot of the Mei-king pass to the town of Tong-tcheou-foo, a few miles distant from Peking. That portion of the canal which lies south of the Hoang-ho was made in the seventh century, or soon after, but the more northern part in the thirteenth, by Kublai Khan and his successors, when the Tartar dynasty had removed the imperial residence from Nanking to Peking.

The fertility of its soil and the advantages resulting from the internal navigation afforded by the Great Canal and its numerous branches, have rendered this plain the most populous spot on the earth. According to the census of 1813, the provinces which it comprises contained a population of 177 millions, namely, Pe-tshe-li 28, Chantung 29, Honan 23, An-hoei, or Ngan-hoi, 34, Kiang-su 37, and Che-kiang 26. Here then, as Ritter observes, lives a population more than two-thirds of the whole population of Europe. To protect this rich plain the Great Wall was erected, which incloses China on the northern boundary, and extends over mountains and rivers for about 1400 miles. This great work was constructed rather more than 2000 years since, or about 200 years before the Christian æra, by the first universal monarch of China, as a defence against the nomadic tribes of Tartars, who have never ceased to infest the country to the south, as long as it has been subject to a separate dominion. The main substance of the wall is earth or rubbish, retained on each side by a thick casing of stone and brick, and terraced by a platform of square tiles. It bounds the whole north of China, extending along the frontiers of three provinces, a distance of nearly 19° of longitude. From its eastern extremity there is an extensive stockade of wooden piles, enclosing the country of Mougden, and which in some European maps has been erroneously represented as a continuation of the solid barrier. The total height of the wall, as observed by an engineer officer in Lord Macartney's embassy, is 20 feet, on a basis of stone projecting 2 feet under the brick-work, and about the same in height. The thickness of the whole wall at the base is 25 feet, diminishing to 23 at the platform. The towers are 40 feet square at the base, diminishing to 30 at the top, and about 37 feet in height. The thinness of the parapet of the wall, being only 18 inches, justifies the conclusion that it was not intended to resist cannon; and it appears certain that the use of fire-arms is comparatively modern in China, however antient the invention of gunpowder.

Numerous rivers drain and water China, but by far the greater number flow into the Hoang-ho and Yang-tse-kiang, which are among the greatest rivers of the globe. Among the rivers which do not belong to the systems of those two great rivers, two require notice here, the Pei-ho and the Ta-si-kiang. The Pei-ho or White River rises on the mountains north-west of Peking, near the Great Wall, and flows in a south-eastern direction to the town of Tong-tcheou-foo, a few miles east of Peking, where it becomes navigable for large river-boats. Continuing in the same direction, it unites with the Eu-ho, a much larger river than the Pei-ho itself, which rises near the banks of the Hoang-ho, and running in a north-east direction is connected with the Great Canal at the town of Lin-tchin-tcheou: the remainder of its course may be considered as the continuation of the canal. The tides come up nearly to the place where the Eu-ho meets the Pei-ho, a distance of more than eighty miles. Hence to the sea the Pei-ho runs nearly due east, and at its mouth has a bar which at low tides has only two or three feet water upon it; but at high tides, which here rise five or six feet, the bar does not prevent the flat-bottomed Chinese junks from entering the river. There is perhaps no river in the world which is navigated by so many vessels as the Pei-ho.

The Ta-si-kiang, or the river of Canton, rises east of the town of Yunnan (103° E. long.), and runs the first half of its course in a narrow valley between high mountains, and the other half in a wide, fertile, and well-cultivated one: towards its mouth it drains the plain of Canton, and receives the Pe-kiang. The general direction of its course is from west to east, and it seems to be navigated to a considerable distance.

Climate.—In regard to the climate of China, a distinguishing feature is the unusual excess in which heat and cold prevail in some parts of the empire at opposite seasons of the year; as well as the low average of the thermometer in comparison with the latitude. Although Peking is nearly a degree to the south of Naples, the latitude of the former place being 39° 54′, of the latter, 40° 50′, the mean temperature of Peking is only 54° of Fahrenheit, while that of Naples is 63°. But as the thermometer at the Chinese capital sinks much lower during the winter than at Naples, so in summer it rises somewhat higher. The rivers are said to be frozen for three or four months together, from December to March; while, during the last embassy in September, 1816, a heat of between 90° and 100° was experienced in the shade. It is well known that Naples and other countries in the extreme south of Europe are strangers to such a degree of long-continued cold, and are not often visited by such heats. Europe, observes Humboldt, may be considered altogether as the western part of a great continent, and therefore subject to all the influence which causes the western sides of continents to be warmer than the eastern; and at the same time more temperate, or less subject to excesses of both heat and cold, but principally the latter. The mean annual temperature of Canton and Macao, which lie nearly under the tropic, is what commonly prevails in the 30th parallel; and it is surprising to contrast their meteorological averages with those of Calcutta, which stands very nearly in the same latitude *. The total fall of rain varies greatly from one year to another; the average annual quantity is about 70 inches, but it has been known to reach 90 inches and upwards. Vegetation is checked in the interval from November to February, not less by the dryness than by the coldness of the atmosphere: the three winter months being known sometimes to elapse with scarcely a drop of rain. The north-east monsoon, which commences at Canton and in the adjacent seas to the southward and eastward in September, blows strongest from December to February, and begins to yield to the opposite monsoon in March or April. About that period the southerly winds come charged with the moisture which they have acquired in their passage over the sea through warm latitudes; and this moisture is suddenly condensed into thick fogs as it comes in contact with the coast of China, which has been cooled down to a low temperature by the long-continued northerly winds. The latent heat given out by the rapid distillation of this steam into fluid, produces the sudden advance of temperature which takes place about March; and its effect is immediately perceptible in the stimulus given, by this union of warmth with moisture, to vegetation of all kinds. With the progressive increase of heat and evaporation commence those rains which tend so greatly to mitigate the effects of the sun's rays in tropical climates. In the month of May the fall of rain has been known to exceed twenty inches, being more than a fourth of all the year, and this keeps down the temperature to the moderate average of about 75°, while in Calcutta there is no portion of the year more dreaded than May. At length the increasing altitude of the sun, which becomes just vertical at Canton about the solstice, and the accumulated heat of the earth, bring on the burning months of July, August, and September, which are the most oppressive and exhausting of the whole year. The extreme rarefaction of the atmosphere now begins to operate as one of the causes tending to the production of those terrible hurricanes, or rushes of wind, called typhoons, which are justly dreaded by the inhabitants of the south of China; but which chiefly devastate the coasts of Hainân, and do not extend much to the north of Canton. The principal circumstances to be observed concerning these hurricanes are, the state of the barometer previous to and during the storm, the influence of the moon, and the localities in which they prevail. The barometer falls slowly for many hours, often a whole day before the commencement, the mercury sometimes descending nearly to 27 inches during the progress of the gale; while its rising is a sure sign of subsidence. Another sign of the approaching storm is the long and heavy swell which rolls in upon the sea-beech, without any apparent cause, for some time before the hurricane begins; but which may perhaps be explained by so much of the usual pressure of the atmosphere (equal to two inches, or a fifteenth part of the mercurial column) being removed from the surface of the water; a circumstance which may likewise partly account for the overwhelming seas which are so much dreaded by ships encountering the typhoons. In addition to the prognostics already noticed, the storms are preceded by a thick muddy appearance of the atmosphere, and a show of unusual disquiet among the sea-fowl. They seldom last forty-eight hours, and their duration is commonly confined to twenty-four, or less.

Natural History.—As regards the natural history of China, there is no subject on which Europe is less indebted to the Romish missionaries. The Jesuits, while employed in constructing their excellent map of the empire, which of course required that they should have free access to every part, lost an opportunity, which may perhaps never again occur, for investigating and describing its natural productions. The studies of zoology, botany, and mineralogy, it must however be observed, were then far short of their present state of advancement. We must here confine ourselves to a general statement of the most remarkable productions of China in the animal, vegetable, and mineral kingdoms, as they have been made known to us by later researches; observing, that in a country whose interior is so little accessible to Europeans, there must be a great deal that remains to be known and described. The animals, as well as vegetables of China, belong principally to the temperate zone; since the low average of the thermometer (which, as far south as Canton, is little above 70°), and the cold winters, are unfriendly to the existence of numerous tropical tribes which are found in corresponding latitudes of India. Animals being, for obvious reasons, more generally diffused over continents than plants, it follows that the number of cases in which the zoological productions of China have been found peculiar to that country are rare in comparison with the botanical ones. The larger and more ferocious descriptions of carnivorous quadrupeds are not common in a country so well peopled and cultivated. In the forests of Yunnân, to the south-west, the Bengal tiger is said to exist, and the animal is well known to the Chinese; but at Canton, so nearly in the latitude of Calcutta, it is quite a stranger. Lions are almost a fabulous animal with them. The woods of the south abound in a small but fierce description of wild cat, which is fattened in cages for the table. The domestic dog of China is uniformly one variety, about the size of a moderate spaniel, of a pale yellow and occasionally a black colour, and a coarse bristly hair on the back; sharp upright ears and peaked head, not unlike a fox's, with a tail curled over the rump. Bears are common in the hilly wooded parts of Chansy, west of Peking. Of the common ruminant animals, the Chinese possess several varieties of deer, particularly a spotted kind kept about their residences. Gerbillon describes a species of antelope abounding on the borders of Mongol Tartary, but called by the Chinese *huâng-yâng*, 'yellow goat.' The sheep of China are the large-tailed kind; and, as the people never use milk, cows are rare and of a peculiarly small kind. The buffalo used in ploughing is also very small, with a skin of slate colour, thinly covered with hairs. Dromedaries are much used as beasts of burthen between Peking and Tartary; but in China Proper the reasons which cause human labour to supplant every other have prevented their being adopted. Chinese horses are not numerous, and of a poor and stunted breed, being very ill fed and kept. Asses and mules are common in the north of the empire; the mules are generally of a good size, and said to bear a higher price than horses, as being capable of more labour on less food. Of pachydermatous animals, the domestic pig of China is well known in England, and has been freely introduced into our farm-yards. The wild boar may be found in the half-reclaimed countries on the western borders, but not in Central China, nor on the east coast, where tillage and population have reached their present height. Of the other wild pachydermatous tribes, the elephant is not at present an inhabitant of China, unless it be in Yun-nân, nor is he used for purposes of either peace or war. The one-horned rhinoceros is found in the forests of the extreme west and south. Of rodent animals, the common rat attains to an unusual size, and is well known to be eaten by the lowest orders of the Chinese. Mr. Gray has described a glirine animal discovered by Mr. Reeves, being nearly allied to the bamboo rat of Sumatra, as a new genus, 'in teeth and general appearance; most nearly allied to *spalax*, from which it differs in its tail of moderate length, its exposed eyes and ears, and the more complex character of its molar teeth.'

The ornithology of China is distinguished by some splendid varieties of gallinaceous birds, as the gold and silver pheasants, to which has been lately added the *Reeves's pheasant*, the longest tail-feathers of which approach the extraordinary dimensions of six feet. Another description

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* In the winter of 1835 a fall of snow occurred at Canton, two and a half inches in depth.

is called the *medallion* pheasant, from a beautiful membrane of resplendent feathers which is displayed or contracted according as the animal is affected. China abounds in wild fowl of all kinds, and particularly in immense flocks of geese, observable during winter near Canton. The *yuen-yang*, a teal of splendid plumage, has been called the 'mandarin duck,' and is remarkable for the attachment between the male and female. The fishing corvorant, employed on the shallow lakes of the country in capturing fish, has been described as a brown pelican with white throat; body whitish beneath, spotted with brown; tail rounded; irides blue, and bill yellow. Among the miscellaneous birds of China may be enumerated quails which are often trained to fight; the common ringdove, of which great numbers breed in the woods about Canton; and the peculiar crow of the country, marked with white about the neck.

Of reptiles, it is remarkable that the largest kinds of saurians, as the crocodile and alligator, are unknown even as far south as Canton, probably in consequence of the vast population and traffic that exists on the rivers. Great numbers of the small lizard tribes are visible during the hot months, some of them infesting trees and shrubs, while others inhabit holes in rocks or old walls. Several freshwater tortoises have been lately sent home, and two new genera of batrachians, or the frog kind, are described by Mr. Gray. Notwithstanding its situation under the tropic, Canton is little infested by the venomous kinds of serpents; the species most dreaded is a smallish slender snake, between two and three feet in length, called by the Chinese 'the black and white,' from being surrounded from head to tail with alternate rings of those colours.

Of fishes, a large collection of Chinese specimens has been lodged by Mr. Reeves in the British Museum. The golden carp is one of the most distinguished kinds, and has long been bred in Europe from the original specimens which were carried by the Dutch first to Java and thence to Holland. Of edible sea fish, the best kinds near Canton are a sort of rock-cod, and a flat fish called *Tsâng-yu* by the Chinese, and 'pomfret' by Europeans. Soles are good and plentiful, but the fish most valued by native epicures is the sturgeon.

Among insects, the locust commits great ravages occasionally in particular districts, and rewards are given for its destruction. Some of the most poisonous tribes, as scorpions, are not met with at Canton; but the centipede, which the Chinese call by exactly the same name of pĕ-tso, 'hundred feet,' is common. A monstrous spider has been seen, inhabiting trees, and attaining to a size and strength that enable it to devour small birds entangled in its webs. Dr. Abel notices the *Scarabæus molossus*, the *Cerămbyx farinosus*, and the mole-cricket of a large size. At a mountain lying eastward of Canton, called Lo-fow-shan, there are butterflies of a gigantic size and very brilliant colours, a selection of which are sent annually to Peking. The pĕ-lă-shoo, or wax-tree, affords nourishment to an insect which is supposed to belong to the Coccus tribe, but which has never yet been correctly ascertained.

At the head of Chinese botany may properly be placed the tea-plant. The specimens from the black and green tea countries differ slightly in the leaf, the latter being a thinner leaf, rather lighter in colour, and longer in shape, than the other; though the Chinese themselves acknowledge that either black or green tea may be prepared from any tea-plant. The *Camellia* bears the same name in China with the tea-shrub, and possesses most of its botanical characters; they in fact constitute two genera very closely allied. The *Laurus camphora*, one of the most remarkable productions of China as well as Japan, is a fine timber-tree, growing in the southern provinces to the height of fifty feet. From the seeds of the *Dryandra cordata* the Chinese extract a varnish for boats, and for the coarser implements of domestic use. The fine japan varnish, however, is obtained from the *Tsiĕ-shoo*, or lacker-shrubs, a species of *Rhus*, from which the varnish distils like gum. The Chinese procure their tallow from the *Croton sebiferum*, the seed of which, as soon as it is ripe, opens and divides into three parts, discovering as many kernels within the capsule, each attached by a separate foot-stalk, and covered with the vegetable grease of a snowy whiteness. The plant from which the pithy substance vulgarly called 'rice-paper' is prepared, seems to be a leguminous species growing in marshes, and found in some parts of India. The square pieces purchased in China are obtained from the stem, which, not being above an inch or two in diameter, is cut in a circular manner, and the cylinder in this manner rolled out and flattened. The *Smilax*, or China root of commerce, commonly known as a sudorific, may be seen growing near Canton. That valuable medicine rhubarb is cultivated to the northward, in the cold and mountainous province of Shensy. The Chinese cassia, an inferior cinnamon, is grown in Kuâng-sy, and largely exported in European ships.

Among the most remarkable fruits of China are three distinct species of orange, as different as one sort of fruit can be from another of the same genus. The first is the 'China orange' of Europe; the second is of a pale yellow colour, but very sweet, and with a highly aromatic rind: the third, and perhaps best sort, has a deep crimson rind when ripe, quite detached from the fruit, the lobes of which are almost loose, and surrounded with a kind of net-work of fibres. Another description of *citrus*, of the lemon kind, by the exercise of some horticultural ingenuity, is made to run entirely into rind, the whole terminating at the head in long narrow processes like fingers, whence it has obtained the appellation of Fŏ-show, 'the hand of Fŏ.' Among the peculiar fruits of China, the *Lichi* has been naturalized in Bengal. Another of the Dimocarpus sort, called *Loong-yen*, or 'dragon's eye,' is much smaller, and has a smoother skin. The *Loquat* is a fine fruit (when well ripened) of the *Mespilus* kind. The *Wampee*, as it is called at Canton, has been compared to the gooseberry, which it resembles only in size; its fruit, which grows in bunches on a good sized tree, has a yellow skin, inclosing a rather acid pulp that surrounds two or three seeds of a green colour. At the head of cultivated flowers the Chinese place the *Nelumbium*, in consideration of both its beauty and utility. The seeds, in form and size like an acorn without its cup, resemble nuts in flavour: the roots are sliced and eaten as fruit. Another highly esteemed flower is the *Olea fragrans*, allied to the olive of Europe, and remarkable for the fine scent of its blossoms. The famous *Mow-tân*, or Tree-peony, flourishes only in the north of the empire. A flower much cultivated is the *Chrysanthemum Indicum*, valued for the variety and richness of its colours, and now common in this country. The *Choo-lân* (Chloranthus inconspicuus) is used in scenting the tea that bears its name.

The variety of surface through the wide extent of the empire affords a rich fund of minerals and metals. There can exist no doubt of the abundant supply of coal throughout China, nor of its general use, which we find from Marco Polo was known to them before its adoption in Europe. Lime they possess in all its combinations. The dark grey marble used at Canton is coarse, and unsusceptible of a fine polish; the shops contain large quantities of striated gypsum or alabaster. At the head of minerals the Chinese place their famous *yu* stone, which is nephrite, or jade. As the country abounds in the primitive rocks, it is consequently rich in metals. Gold is obtained in the native state from the sands of the rivers in Yun-nân, near the frontiers of the Burmese country, well known for its richness in that metal; in Yun-nân also silver mines are worked. Ordinary copper comes from Yun-nân and Kuei-chow, and an abundance of malachite, or green copper-ore, is obtained near the great lake in Hoo-kuâng. The famous pĕ-tung, or white copper, which takes a polish not unlike silver, comes from Yun-nân: a considerable quantity of quicksilver is obtained in Kuei-chow; and there is a rich mine of tutenague or zinc in Hoo-pĕ.

Government.—The government of China is in principle an absolute despotism, and the succession depends on the will and nomination of the reigning emperor. The authority of a father over his family is well known to be the exemplar or type of political rule in the country. It is the object of the first of the 'Four Books' of Confucius to inculcate, that from the knowledge and government of oneself must proceed the proper economy and government of a family; and from the government of a family, that of a province and of a kingdom. The emperor is called the father of the empire; the viceroy of the province over which he presides; and the mandarin, or magistrate, of the city which he governs; and the father of every family is the absolute ruler of his own household. 'There is nothing more remarkable,' observes Mr. Davis, 'in their ritual, and in their criminal code, than the exact parallel which is studiously kept up between the relations in which every person stands to his own parent, and to the emperor. For similar offences against both he suffers similar punishments; and at the death of both he mourns the same time, and goes the same period unshaven; and both possess nearly the same power over his person. Thus he is bred up to civil obedience *tenero ab ungui*, with every chance of proving a quiet subject at least. Such institutions certainly do not denote the existence of much liberty; but if peaceful obedience and universal order be the sole objects in view, they argue on the part of the governors some knowledge of human nature, and an adaptation of the means to the end.' The emperor is head of the state religion, and, as high-priest of the empire, can alone, with his immediate representatives, sacrifice in the government temples. No hierarchy is maintained at the public expense, nor any priesthood attached to the Confucian or state religion, as the sovereign and his great officers perform that part. The two separate religious orders of Fo (Budha) and Taou, which are only tolerated, and not maintained, by the government, derive support entirely from their own funds, or from voluntary private contributions.

With respect to the machinery of civil government, the emperor's principal ministers form the 'interior council-chamber,' and the chief councillors are four in number, two Tartars and two Chinese; the former always taking precedence. Below these are a number of assessors, who form the chief council of state. The body whence these chief ministers are generally selected, is the Hân-lin, a sort of imperial college, or National Institute. The details of government business are distributed among six boards or tribunals, viz., 1. The board of civil appointment, which takes cognizance of the conduct and administration of all civil officers; 2. The board of revenues, which regulates all fiscal matters; 3. The board of rites and ceremonies; 4. The military board; 5. The supreme tribunal of criminal jurisdiction; 6. The board of public works. A very peculiar feature of the government is observable in the Too-chă-yuen, or office of censors, the members of which are generally styled Yushe. There are two presidents, a Tartar and a Chinese, and the members consist in all, of about forty or fifty, several of whom are sent to various parts of the empire, as imperial inspectors, or perhaps, more properly speaking, spies. By the antient custom of the empire, they are privileged to present any remonstrance to the sovereign without danger of losing their lives; but they are frequently degraded if their advice is unwelcome. The provinces are placed under the principal charge, either, singly, of a Foo-yuen, or governor, or two provinces together are made subject to a Tsoong-to, or general governor, who has a Foo-yuen under him for each single province. Canton and its adjoining province are together subject to the Tsoong-to, commonly called by Europeans the Viceroy. In each separate province there is a chief criminal judge and a treasurer, the latter having usually cognizance of civil suits, but his special business is the charge of the territorial revenue. With this, he first of all defrays the civil and military expenses of his province. and whatever surplus remains is remitted by him to Peking, in silver or in produce. The total surplus of all the provinces remitted to the capital is about 11 or 12 millions sterling annually, which has very erroneously been taken for the whole revenue of the empire. The subordinate cities and districts of each province in the three ranks of Foo, Chow, and Hien, are under the charge of their respective magistrates, who take their rank and titles from the cities they govern. The total number of civil magistrates through China is estimated at 14,000. At Canton the amount and importance of the European trade has given rise to the special appointment of the Haekuân, or commissioner of customs, called by Europeans Hoppo, who ranks as third in the province, but has no territorial jurisdiction beyond the trade. No individual in China can hold a magistracy in his own province; and each public officer is changed about once in three years, to prevent growing connexions with those under his government. A son, a brother, or any other very near relation, cannot hold office under a corresponding relative. The various degrees of civil and military offices are partly distinguished by the colour of the ball which they wear at the apex or point of their conical caps. These are red, light blue, dark blue, crystal, white-stone, and gilt. Each ball is accompanied by its corresponding badge, which is a piece of silk embroidery, about a foot square, with the representation of a bird, or other device, on the breast and back of the ceremonial habit; together with a collar or necklace of very large beads, down to the waist.

The whole amount of military throughout the empire including the militia of each district, has been estimated at 700,000, of which the largest portion are fixed to their native districts, and cultivate the land, or follow some other pursuit. The whole are under the direction of the military tribunal, or board, at Peking. The trusty Tartar troops are ranged under the eight standards, each of them comprising 10,000 men, and making a total of 80,000 for a standing army. Very few mounted soldiers were seen by either of our embassies, and whatever may be their actual amount, they are said to be nearly all Tartars. A great difference seems to exist between the pay of Tartars and Chinese. One of the former, being a foot-soldier, receives about five-pence a day, with an allowance of rice; one of the latter, only four-pence, without the rice. The principal arms of the cavalry are bows and arrows, the bow being of elastic wood and horn combined, with a string of silk. Their swords are generally ill made, and their matchlocks are considered by them as inferior weapons to the bow and arrow. Some are provided with shields, composed of rattans turned spirally round a centre.

The residence of the emperor and his court for some hundreds years past has been removed from Nanking to Peking, a city whose population has been stated at double that of London; but various reasons conduce to render this altogether improbable. Notwithstanding the great extent of the area enclosed within the walls, there are so many open spaces of great extent, that it is difficult, taking the lowness of the one-storied buildings into consideration, to imagine how such an immense number can exist within its precincts. A large portion of the Northern or Tartarian city is occupied by the enclosure which contains the palace and pleasure grounds of the emperor; the remainder is studded over at intervals with official or religious buildings, all of them surrounded by large open courts; and the Chinese city to the south has some very extensive spaces occupied by immensely-spreading public buildings, with grounds attached. There are, besides, large sheets of water, and gardens devoted to the growth of vegetables for the city. The streets of Canton and of most of the cities are extremely narrow, admitting only three or four foot passengers abreast; but the principal thoroughfares of Peking, connecting its different gates, are fully one hundred feet in width. These are unpaved, probably in consequence of the difficulty and expense of procuring stone in the flat that surrounds the city In rainy weather the principal ways are said to be in a dreadful state, from the want of proper drains, and in consequence of the perfect level of the ground not allowing the water to run off.

Population.—The population of the empire has naturally been a subject of investigation with those persons who had the best opportunities of pushing the inquiry with success. A number of natural, social, and political causes no doubt combine to explain the very dense population which the country unquestionably contains. The advantages which China possesses from nature have been improved to the utmost by its industrious inhabitants: agriculture, the source of food, has been honoured and encouraged beyond every other species of industry. There is no meadow cultivation whatever; nothing is raised by labour for the food of cattle, but all for man, since the very small number of horses, oxen, or sheep maintain themselves as they can on pastures unsusceptible of cultivation; and in no other country is so much food derived from the waters. The political causes which tend to swell the population of China are numerous and powerful. Among these are the paternal rights, which continue during life, and render a son, even in that over-peopled country, an important acquisition. The laws of the empire grant life sometimes even to a condemned homicide, if the want of another son or grandson render his existence necessary to the support of a parent. The other cause, which renders male children so desirable, is the sentiment regarding sacrifices at the tombs and in the temples of ancestors. In default of male children there is a legalized mode of adoption by which the line is perpetuated and the family prevented from becoming extinct. Even the tendency of slavery to check population is counteracted by a law which makes the owners of domestic slaves, who do not procure husbands for their females, liable to prosecution; but the perpetuation of families does not tend more to the density of the population than the manner in which those families live and are maintained. It is a universal system of clubbing on the most economical plan, and the claims of kindred being universally admitted and enforced, the property of families is made to maintain the greatest number possible. Another political cause is the obstacle that exists, both in law and prejudice, to emigration. Besides the statute in the penal code, which punishes this offence according 'to the law against communicating with rebels and enemies,' the abandonment of his native place, and of the tombs of his ancestors, is always abhorrent to the mind of a Chinese. To the above list of causes tending to produce the excessive population of China, must be added the uninterrupted peace which has been enjoyed by that country since the complete establishment of the Manchow dynasty, a period now considerably exceeding a century.

Under the circumstances above briefly enumerated, there is less difficulty in admitting the extraordinary amount of population which has been given from various authorities, involving, however, statements occasionally so contradictory that it seems not altogether easy to come to any satisfactory result as to the actual number. Grosier made the population in 1743 amount to 198 or 200 millions. There is nothing incredible in this, considering that the area of China Proper is eleven times that of the British Islands. But on comparing it with the 333 millions of Lord Macartney's authority, just fifty years afterwards, an increase of considerably more than half within that period seems very large. When the census was taken by Kien-loong, a little before Lord Macartney's embassy, that emperor issued a proclamation addressed to the whole of his subjects, calling on all ranks and conditions of men to economize the gifts of heaven, and by industry to increase the quantity; for, observing the increase of population since the period of the conquest, he looks forward with deep concern to the future, when the numbers of the people shall have exceeded the means of subsistence. According to this highest authority then, a very great increase had really taken place; but when we come to the particulars, they seem to stagger all belief. The emperor goes on to say, that in the 49th year of Kâng-hy, the second sovereign of his family (and under the old system of the poll-tax), the population of the empire was rated at about 23,312,000; and that by the late census, according to returns from all the provinces, it amounted to 307,467,200. Unless some way can be found of reconciling such an account with bare possibility, it seems unworthy of serious acceptance. But we must remember that a great portion of the country was actually *unsubdued* in the reign of Kâng-hy. The southern parts of the empire held out obstinately against the Tartars, and some of them were long governed by independent Chinese rulers. These then for the time must have been excluded from a census of the subjects of the Manchow dynasty. Again we must call to mind that the census so remarkable for its small amount under Kâng-hy was with reference to a poll-tax, and to military service, two objects which were of all others the least calculated, during an unsettled and half-subdued state of the country, to ensure a correct or full return. The Manchow conquest is said, by the combined effects of war and flight, to have reduced the population of China to less than half its amount under the Ming race; but the conquest has since been followed by almost unexampled peace and prosperity during a period considerably exceeding a century. A census, said, on the authority of a Chinese statistical work, to have been taken in 1812, goes beyond the amount given to Lord Macartney, and makes the population reach the number of 360,279,897. Our faith in this must of course be determined by the degree of credit to be attached to the Chinese census. The account is said to be made up from the returns received in detail from every village in the empire, in which the houses are provided with what is called a *mun-pae*, or 'door-tables,' on which are inscribed all the individuals of a family. The lists are transmitted through several channels before they reach Peking, and may therefore occasionally, if not always, be liable to falsification by those who wish to flatter the emperor with the idea of increase. Taking the area of China at 1,200,000 square miles, in round numbers, we should have the latest estimate, 300 inhabitants on a square mile, which is more than England or Holland possesses.

Revenues.—The revenues of China are derived principally from a land-tax, and the monopoly of salt, to which are to be added something for customs and transit-duties. At the Manchow conquest a capitation or poll-tax was imposed, but this was soon taken off again; and the second emperor of the dynasty ordained that the land-tax, which under the Chinese had been taken from the cultivators, should ever after be taken from the land-owners. The subject of the Chinese revenues seems never before to have been very clearly understood. From the produce of taxation in each province, the treasurer of that province deducts the civil and military expenses, and all outlays, whether for public works or otherwise, remitting the surplus to Peking either in money or kind. This surplus has been the only point clearly ascertained, and it has been very erroneously mistaken for the gross amount of the revenue. The difficulty of ascertaining the real expense that attends the administration of the empire arises from a considerable portion of the taxes being levied in commodities instead of money, as grain, salt, silks, and stores of different sorts. A portion of the allowances of public servants, especially at Peking, as well as of the stipends of imperial relatives, is paid in the shape of rations and supplies. Du Halde states the total revenue of the empire, including the provinces, at 'about 200 millions of taels (or upwards of 60 millions sterling), of which only 12 millions sterling are transmitted to Peking.' The accuracy of the latter amount seems pretty nearly confirmed by what appeared in a Peking gazette of 1833. A Tartar officer therein states, 'that the whole receipts at Peking do not exceed 40 millions of taels, which is 12 or 13 millions sterling:' again, it appears from a statement translated by Dr. Morrison, that the surplus from land-tax, transmitted to Peking by two provinces, was 5 millions of taels, which, taken as an average for eighteen provinces, would give 45 millions; but one or two of them supply much below that average, and the true total may therefore be 40 millions, as above.

Laws.—We possess a translation of the Tartar-Chinese penal code, from Sir George Staunton, and of this specimen of legislation a very advantageous comparison with other Asiatic systems has been made by an able critic in the 'Edinburgh Review.' 'When (says he) we turn from the ravings of the Zendavesta, or the Puranas, to the tone of sense and of business of this Chinese collection, we seem to be passing from darkness to light; from the drivellings of dotage to the exercise of an improved understanding; and redundant and minute as these laws are, in many particulars, we scarcely know any European code that is at once so copious and so consistent, or that is nearly so free from intricacy, bigotry, and fiction. In everything relating to political freedom or individual independence, it is, indeed, wofully defective; but for the repression of disorder, and the gentle coercion of a vast population, it appears to us to be, in general, equally mild and efficacious.' If we estimate Chinese legislation by its result, we shall find it (as Sir George Staunton observes) wholly inconsistent with the hypothesis of a very bad government, or a very vicious state of society. Mr. Ellis, who had long been in Persia and India, pronounced China 'superior to the other countries of Asia, both in the art of government and the general aspect of society;' and adds, 'that the laws are more generally known, and more equally administered; that those examples of oppression, accompanied with infliction of barbarous punishment, which offend the eye and distress the feelings of the most hurried traveller in other Asiatic countries, are scarcely to be met with in China; that the proportion which the middling orders bear to the other classes of the community appeared to be considerable; that, compared with Turkey, Persia, and other parts of India, an impression was produced highly favourable to the comparative situation of the lower orders.' It is a popular maxim with the Chinese, that to violate the law is the same crime in the emperor as in a subject. 'This plainly intimates (observes Mr. Davis) that there are certain sanctions which the people in general look upon as superior to the will of the sovereign himself: these are contained in their sacred books, whose principle is literally, *salus populi suprema lex;* and however much this principle may at times be violated under the pressure of a foreign Tartar dominion, it nevertheless continues to be recognised, and must doubtless exercise more or less influence on the conduct of the government.'

Moral Character, &c.—The moral character of the Chinese people is a compound of bad and good traits, which, as usual, may be traced to the influence of their political and social system. The late Dr. Morrison seems to have formed a fair estimate of a nation with whom he was better acquainted than most Europeans. 'In China (he observes) there is much to blame, but something to learn; and moral instruction is ranked above physical.' The consequence is, that industry, tranquillity, and content, are unusually prevalent in the bulk of the population. Notwithstanding his power is absolute, the emperor himself always endeavours to prove that his conduct is based in reason and benevolence, the truth of the argument being, of course, a distinct affair. From the habits in which they are brought up, the people are more ready to reason with each other than to resort to violence. The advantageous features of their character, as mildness, docility, industry, peaceableness, subordination, and respect for the aged, are accompanied by the vices of insincerity and falsehood, with their consequences, mutual distrust and jealousy. Lying and deceit, being generally the refuge of the weak and timid, have always been held among us as disgraceful vices, while the Chinese, at any time, do not attach the same degree of disgrace to deceit, and least of all when it is practised towards a European. It would however be as unreasonable to infer the character of the whole nation from the unfavourable aspect in which it appears at Canton, a trading seaport, as to form an estimate of our national character in England from an experience equally limited and disadvantageous. It has, in fact, been considered as a matter for surprise, that the Chinese at Canton should be no worse than we find them: they are well acquainted with the maxim of their government, by which it professes 'to rule barbarians like beasts, and not like native subjects;' and they are continually supplied by the local authorities with every motive to behave towards strangers as if they were a degraded order of beings. Their conduct to Europeans therefore is different from their conduct among themselves.

In their physical characteristics, the Chinese have been recognised as superior to many other Asiatics. A finer shaped and more powerful race of men exist nowhere than the coolies or porters of Canton; and as sailors, they have been found stronger and more efficient than natives of India on board of English ships, but it has always been both difficult and expensive to employ them. Though the Chinese are allied to the Mongols in the general cast of their features, the harsher points of the latter are softened down in the former considerably: in the thickness of the lips, the Chinese in some degree approaches, but by no means equals, the Negro, nor is that feature at all so prominent as in the latter; the nose is flattened, and the nostril expanded in the Chinese, but not to the same extent as in the African: there is the same lank, black, and shining hair in the case of the Chinese as in that of the North American Indians; the same obliquity of the eyes and eyebrows, turned upwards at the outer extremities, and a corresponding thinness and tufty growth of beard. The Chinese too is distinguished by a nearly total absence of hair from the surface of the body. In the smallness of the hands and feet, and of the bones of the body, compared with Europeans, he resembles the generality of Asiatics. The features of the people in the South have perhaps less of the harsh angularity of the Tartar countenance than at Peking. Among those who are not exposed to the climate the complexion is fully as fair as that of the Portuguese; but the sun has a powerful effect on their skins, and that upper portion of a man's person which is habitually exposed in the summer above his loose trowsers is often so different from the remainder, that when stripped he looks like the lower half of a European joined on to the upper moiety of an Asiatic. Up to the age of twenty, or a little more, they are often very good looking; but soon after that time the prominent cheek-bones generally give a harshness to the features as the roundness of youth wears off. With the progress of age the old men in most cases become very ugly, and the old women, if possible, still more so.

China is now politically divided into provinces, of which seven extend entirely or partly over the great plain, two comprehend the hilly districts, two others the mountainous country along the sea, and the others the mountainous country in the interior.

1. Pe-tche-li extends over the most northern and less fertile portion of the plain, but is well cultivated, and produces, besides vegetables for the supply of the capital, large quantities of millet and wheat. In it is situated PEKING, the capital of the whole empire; the capital of the province is Pao-ting-foo, a very large and populous town in which the governor resides.

2. Chang-tung comprehends a part of the plain and the peninsula of Chang-tung, on which an isolated mountain range rises to a moderate height. It produces wheat, millet, and cotton. Its capital is Tsi-nan-foo, a large and populous town. Lin-tchin-tcheou, at the confluence of the canal with the river Eu-ho, is the deposit of goods which are carried from the southern provinces to Peking, and a very large place.

3. Kiang-su, which with the following province once formed that of Kiang-nan, comprehends the low and swampy country on both sides of the Great Canal. It chiefly produces rice and pulse, and has extensive fisheries. Besides the capital, NANKING, it contains many large towns on the banks of the canal, among which the most remarkable are Yang-tcheou-foo, which is at a short distance from the Yang-tse-kiang, and carries on an active trade; and Su-tcheou-foo, which to an extensive commerce unites great industry in manufacturing silk and cotton goods. Its principal port is Shang-hae.

4. Ngan-hoei or An-hoi, on both sides of the Yang-tse-kiang, produces, besides grain and rice, some silk. In its south-eastern districts are extensive plantations of tea, and also some mines of gold, silver, and copper. The capital is Ngan-king-foo, on the Yang-tse-kiang.

5. Ho-nan is chiefly in the plain, but its western districts are traversed by the Pe-ling mountain-range and its branches. It is rich in grain and cotton, and is supposed to contain some mines. In its south-eastern districts tea is cultivated. The capital, Khai-fong-foo, is not far from the banks of the Hoang-ho; but the most populous town appears to be Ho-nan-foo, on a river which falls into the Hoang-ho, in a richly-cultivated valley.

6. Hoo-pĕ comprehends part of the undulating portion of the plain, and the wide valleys of the Han-kiang and Yang-tse-kiang, with some mountainous districts. It lies in the centre of China, and formerly constituted, with the more southern province of Hoo-nan, one province called Hou-quang. Its fertility is very great: its products are grain, cotton, silk, and tea, which are cultivated on its north-eastern border. Its capital, Wu-tchang-foo, situated on the Yang-tse-kiang, opposite its junction with the Han-kiang, is one of the largest of the inland towns of China, and carries on an extensive commerce. King-tcheou-foo, farther to the west, likewise on the banks of the Yang-tse-kiang, has also a very extensive trade.

7. Che-kiang comprehends the south-eastern corner of the plain, and the northern portion of the mountainous country extending along the sea. It produces more green tea than other provinces, and also silk, rice, grain and pulse, in abundance. Its capital is Hang-tcheou-foo, on the banks of the Tsien-tong-kiang, at the southern termination of the Great Canal, in a very pleasant situation. According to Staunton, its population was thought to be not much less than that of Peking, and the missionaries estimated it at one million. None of the houses exceed two stories in height: the streets are well paved. It has extensive manufactures of silk and cotton goods, especially in flowered and embroidered satins, and a very active commerce, as well by means of the canal as by the river, which is navigable for large vessels up to the town. The principal port of this province is Ning-po.

8. Kiang-si extends over the eastern portion of the hilly country, along the western side of the Nan-ling range, and produces in its well-cultivated valleys and plain, grain, rice, silk, cotton, indigo, and sugar. It has some plantations of tea. The capital, Nan-tchang-foo, on the Kan-kiang, not far from the place where it falls into the lake Poyang, is a large town, and carries on a great trade. In the hilly country which begins at some distance from the lake of Poyang on the east, is the borough of King-te-ching, which is said to contain one million of inhabitants, who are occupied exclusively in the fabrication of china-ware; which is here made in the greatest perfection. The number of furnaces is said to amount to five hundred. Kan-tcheou-foo, on the Kan-kiang, not far from its source and the Mei-ling Pass, is a large town, in which Indian ink and varnish are made on an extensive scale.

9. Hoo-nan, or the southern part of the antient province of Hoo-quang, contains the remainder of the hilly country. Its productions are like those of Kiang-si. It is said to be rich in minerals. The capital, Tchang-cha-foo, on the Heng-kiang, is a large commercial town. Yo-tcheou-foo, on the channel connecting the large lake of Tung-ting with the Yang-tse-kiang, also carries on a very active trade.

10. Fo-kian, or Fochan, extends over the mountainous country on the shores of the sea opposite the island of Formosa. Some of the summits of the Nan-ling range here rise to a great height, but do not attain the perpetual snow-line. The higher parts of some of the mountain-ridges are bare; others are covered with trees, but in its extensive and fine valleys all the commercial productions of China are met with, except perhaps varnish. Its plantations of tea are extensive, and the greatest quantity of black tea is grown here. The inhabitants of this province are noted for their industry, and still more for their spirit of enterprise and their love of emigration. The numerous settlements of Chinese in the islands of India and the countries without the Ganges have been formed by them, and are continually increasing by new adventurers from Fo-kian. The capital is Fu-tcheou-foo, on the river Mingho, over which a bridge is built of thirty-three arches of fine white stone. The largest Chinese vessels can come up almost to the wall of the city, the maritime commerce of which is very considerable, and its population greater than that of Canton. Tsuen-tcheou-foo, between Fu-cheou-foo and Amoy, is likewise a large town. A great number of vessels sail hence to the neighbouring countries. It has a bridge built over an arm of the sea, on 300 piers of black stone. Here is also the harbour of Amoy, which was formerly visited by Europeans. [Amoy.]

11. Quang-tun, or Canton, extends over the whole southern coast from 117° E. long. to the very boundary of Cochin-China, and is likewise mountainous, but its mountains are not so high as those in Fo-kian. It has a great number of fine and wide valleys, and the plain about Canton is of considerable extent: it produces all the commercial commodities of China, except tea and varnish. The number of its harbours is considerable, but Canton is alone visited by Europeans. This town is the capital of the province. [Canton.] Fochan, lying south-west of Canton, at a distance of about 20 miles, is said to contain a population of one million of souls, and to have numerous manufactures of silk, cotton, china-ware, and colours.

12. Quang-si, extending on both sides of the Ta-si-kiang, is covered with mountains: the valleys, which are generally narrow, occupy a small portion of its surface. The mountains belonging to the Nan-ling range, enclosing the northern side of the province, rise to a great height, and some summits above the perpetual snow-line. The forests on the declivities of the hills are extensive. Its productions are rice, silk, and timber, and it is supposed to contain gold and other metals. A mountainous district, towards the northern boundary of this province, is inhabited by the Tchang-Colas, an aboriginal and independent tribe, differing from the Chinese in language and manners. The capital of the province, Kuei-ling-foo, lies in a narrow but fine valley.

13. Kuei-tcheow, to the north of Quang-si, is one of the most mountainous provinces of China, being traversed in all its length by the highest portion of the Nan-ling range, several summits of which are always covered with snow. In these mountains live the Seng Miao-tsee, an aboriginal tribe, who differ in language and manners from the Chinese, and often make war on them. Many fortresses have been erected in the narrow parts of the valleys to stop their incursions. Its productions are timber and metals, gold, silver, &c., but especially copper and quicksilver. The capital is Kuei-yang-foo, a comparatively small town, its circuit being not much more than two miles.

14. Yun-nan, the most south-western province, bordering on Cochin-China, Siam, and the Birman empire, forms an extensive but uneven table-land, studded here and there with high mountains, especially towards the north, where there are several snow-capped summits. The mountains towards the south, on the boundary line of the Birman empire and Siam, are inhabited by a tribe of mountaineers, called Lolos, or Lowas, who are only nominally dependent on the Chinese. Its commercial wealth consists of the produce of its mines, gold, silver, copper, &c., and of its forests, which contain timber trees, and several kinds of rare wood. The capital, Yun-nan-foo, situated on the least mountainous part of the table-land, is a considerable place, and carries on an active trade with the Birman empire. A much-frequented road, running mostly on the banks of the Yang-tse-kiang, connects this town with the interior provinces of China, and another passes hence, west to Yang-tchang-foo, another considerable town, perhaps larger than Yun-nan. From this place the road continues to the Irawaddi river, and to Bhanmo, in the Birman empire. A considerable trade is carried on by this route. [Birman Empire.]

15. Se-tchu-an, the largest of the provinces, is nearly everywhere enclosed by high mountain-chains, and its interior is traversed by lower ranges. Its valleys are commonly wide, and often expand into plains. The soil is rich, and produces every kind of grain, as well as rice and sugar, in abundance; but its commercial riches consist principally of silk, timber, and different kinds of metals. Its capital, Tching-too-foo, situated on an island formed by the Min-kiang, in an extensive and richly-cultivated plain, is a place of considerable trade, and very populous. Koci-tcheou-foo, on the banks of the Yang-tse-kiang, is one of the most commercial places in the interior of China, and very populous.

16. Shen-si is more covered with rugged mountains than Se-tchu-an, and contains a much smaller portion of cultivable land; yet the wide valleys through which the Wei-ho and Han-hiang run are very fertile, and produce abundance of wheat, millet, and pulse, but little rice. The capital is Si-ngan-foo, on the Wei-ho, once the metropolis of the whole empire, a town so large that it is compared with Peking itself; it is strongly fortified, and carries on a considerable trade.

17. Shan-si is still more mountainous than Shen-si; it has one wide and fertile valley along the banks of the Fen-ho, or Fien-ho, which is well cultivated, and studded with villages and towns. It exports wheat, millet, raisins, iron, and coal. The capital is Tai-yuen-foo, a large place, with considerable manufactures in silk and carpets, and some trade. Tai-tong-foo is one of the principal fortified places near the Great Wall.

18. Kan-si, the most north-western province of China, consists of the western portion of Chen-si, to which has been added a comparatively narrow tract of land, which extends far westward to the centre of Asia. This tract has been added with the view of separating the warlike and wandering tribes, which inhabit the table-lands to the north and west of China, from one another, and of preventing their incursions into China. The eastern part of this province is studded with high and many snow-capped mountains, and the western extends over the stony and sandy deserts of Central Asia; the whole is a poor country, and thinly inhabited. The capital is Lan-tcheou, a small place, on the banks of the Hoang-ho, which however carries on a brisk trade with the tribes inhabiting the table-lands to the north and west of it.

To these eighteen provinces may be added the province of Leao-tong, or Mougden, which extends along the northern shores of the Hoango-Hai, or Yellow Sea. It constituted formerly a part of Manchuria, but after the present dynasty had ascended the throne of China, this portion was separated from it, and considered as the domain of the imperial family. It is divided from China by the eastern extremity of the Great Wall, and from Mongolia by a stockade of wooden piles, which extends to the mountains which separate it from Corea. This country is covered with high mountains, except on the banks of the Leao-ho, where there is a plain of considerable extent, and pretty well cultivated. Here is the capital, Mukden, or Mougden, now called Fung-thian-foo, a place of moderate extent, in which are the tombs of the Manchow dynasty. Towards the boundary of Corea is Fon-Hoan, traversed by the only road which connects Corea with China, and on which some trade is carried on.

History.—Without attempting to deny to the historical records of the Chinese empire a very high degree of antiquity it is now pretty generally admitted, on the testimony of the most respectable native historians, that this point has been considerably exaggerated. In reference to the earliest traditions of their history, a native commentator observes, 'it is impossible to give entire credit to the account of these remote ages.' The persons styled Fohy, Shin-noong, and their immediate successors, must be ranged rather under the head of mythology than of history; resembling those demi-gods and heroes of Grecian fable who rescued mankind from primeval barbarism. The fabulous part of Chinese history commences with Puân-koo, who is represented in a dress of leaves, and concerning whom every thing is wild and obscure. He is said to have been followed by a number of persons with fanciful names, who, in the style of the Hindoo chronology, reigned for thousands of years, until the appearance of Fohy, who is said to have invented the arts of music and numbers, and taught his subjects to live in a civilized state. At length came Yaou and Shun, who are stated to have been the patterns of all Chinese emperors. To the age of Shun they refer their tradition of an extensive flooding of the lands, which by some has been identified with the Mosaic deluge. It was for his merit in draining the country, or drawing off the waters of the great inundation, in which he was employed eight years, that 'Yu the Great' was chosen by Shun for his successor. He commenced the period called Hea, upwards of 2100 years before Christ; and the whole of the long space of time included under Hea and Shang is full of the marvellous: until Woo-wong was called upon to depose a tyrannical emperor, the last of the Shang, about 1100 years B.C. With him began the period of Chow, which may be considered as the commencement of authentic history, and during which CONFUCIUS himself lived. Though it might be going too far to condemn all that precedes that period as absolutely fabulous, it is still so much mixed up with fable as hardly to deserve the name of history. The race of Chow filled the long period of 800 years, during which China appears to have been divided into a number of petty independent states, engaged in perpetual disputes with each other. The king of Tsin had long been growing powerful at the expense of the other states: he fought against six nations, and at length compelled them all to acknowledge his authority. The chief government began now to assume the aspect of an empire, which comprehended that half of modern China lying to the north of the great river Kiang, but which was doomed, after the lapse of some centuries, to be split again into several parts. The first emperor of the Tsin dynasty rendered himself famous by the erection of the Great Wall, which has now stood for 2000 years; as well as by ordering all the books of the learned (including the writings of Confucius), to be cast into the flames. About the year 201 B.C., the race of Tsin was succeeded by that of Hân, which filled one of the most celebrated periods of Chinese history. It was now that the Tartars became the cause of endless disquiet to their more civilized and peaceful neighbours, who were frequently obliged to buy them off with tribute. The period of the Jan-kuo, or 'Three States,' into which the country was divided towards the close of Hân, about A.D. 184, is a favourite subject of the historical plays and romances of the Chinese. The leader of one of these 'Three States,' having at length obtained the sovereignty, established the capital in his own country Honân, and commenced a new dynasty. In consequence of the distractions which had arisen from women and eunuchs interfering in affairs of government during the period of the 'Three States,' a kind of salic law was passed, that 'queens should not reign, nor assist in public matters,' and accordingly we meet with no female sovereigns in their history. On the conclusion of this race of monarchs, in A.D. 416, China became divided into two principal kingdoms, Nanking being the capital of the southern one, and Honân of the northern. For about 200 years afterwards, five successive races (Woo-tae) rapidly followed each other, and the salutary rule of hereditary succession being constantly violated by the strongest, the whole history of the interval is a mere record of contests and crimes. At length, in A.D. 585, the north and south of modern China were united for the first time into one empire, the capital of which was fixed at Honân. The last of the five contending races was soon after deposed by Ly-yuen, who in A.D. 622 founded the dynasty of Tâng. There is reason to believe that certain Christians of the Nestorian church first came to China about this time. It is recorded that foreigners arrived, having fair hair and blue eyes. According to the Jesuits, whom Du Halde has quoted, a stone monument was found by them in Shen-sy, with the cross, an abstract of the Christian law, and the names of seventy-two preachers in Syriac characters, bearing the date of A.D. 640. The dynasty of Tâng was put an end to by a powerful leader in the year 897, and the whole country was thrown into a state of war and confusion, with several aspirants to the sovereignty. This period, which lasted about fifty-three years, is principally distinguished by the incursions of the Tartar people at the eastern extremity of the Great Wall, who, being encouraged by the unsettled and divided state of the country, gave great trouble by their inroads. After a succession of civil wars, Tae-tsoo, the first emperor of the Soong dynasty, was raised to the throne by the military leaders, A.D. 950. The art of printing having been just previously invented (about 500 years before it was known to us), the multiplication of books became a principal cause of the literary character of the age of Soong. The Chinese however being much less warlike than learned, the eastern Tartars advanced apace; they took possession of a part of northern China, and threatened the whole country. They were destined soon to be checked, not by the Chinese, but by the Mongols, who inabhited the countries which extend from the north-western provinces of China to Tibet and Samarcand. They had already conquered India, and being now called in against the Kin or eastern Tartars, they soon subdued both them and the enervated Chinese, whom they had been invited to protect. The Mongols might be said to be masters of the northern part of modern China from the middle of the thirteenth century. Kublai Khan, finding himself possessed of the provinces bordering on the Wall, with Peking for his capital, sent his army against the last sovereign of the Soong dynasty, then a child. Little or no resistance was offered to the Tartars, who exercised great cruelty on the vanquished. The remains of the Chinese court betook themselves to the sea near Canton, and perished with the emperor, A.D. 1281. Notwithstanding the great qualities of Kublai Khan, which were calculated to lay the foundation of a permanent dominion, his successors of the Yuen race, as they are called, by their rapid degeneracy caused the empire to pass out of the hands of the Mongol race in a little more than eighty years' time. Enervated by the climate and vices of the south, they quickly lost the courage and hardihood which had put the country in possession of their ancestors; and Shun-ty, the ninth emperor in succession, was compelled to resign the empire to a Chinese. The new sovereign, who commenced the native dynasty of Ming, A.D. 1366, selected Nanking as his capital, erecting Peking into a principality for one of his younger sons, Yoong-lo. When this prince succeeded as third emperor of his family, the capital was finally transferred (A.D. 1408) to Peking; a principal reason perhaps being the necessity of keeping in check the Eastern Tartars, who had been joined by some of the refugees among the expelled Mongols. From this union sprung the Manchows, who were destined at length to expel the Chinese dynasty, and establish a permanent Tartar dominion. In the year 1618, Wan-liĕ, the thirteenth emperor of the Chinese dynasty, being on the throne, a war commenced with these Manchows: and the empire passed in 1644 to Shunchy, the first of the Ta-tsing race, of whom the sixth emperor is now reigning. Such is the brief summary of the principal revolutions in the history of this antient empire, which for nearly two centuries past has been governed by a foreign race, who had the sagacity to adopt the political and social system of a nation which so greatly out-numbered themselves.

Arts, &c.—Whatever may be the actual antiquity of the Chinese people, no doubt seems now to exist of their having been the authors of what are justly considered in Europe as three of the most important inventions or discoveries of modern times: the art of printing, the composition of gunpowder, and the magnetic compass. To these may be added two very remarkable manufactories, of which they were unquestionably the first inventors, those of silk and of porcelain. There cannot be the least doubt of the art of printing having been practised in China during the tenth century of our æra. The precise mode in which they operate is certainly different from ours, but the main principle, that of multiplying and cheapening books, by saving the time and labour of transcription, is altogether the same. The invention of powder, as compounded of 'sulphur, saltpetre, and willow-charcoal,' is carried back by the Chinese to a very remote date; but its particular application to fire-arms seems to have been European. The Chinese name has no reference whatever to guns, and simply implies *fire-drug*, which seems to show that the composition was applied by them merely to fire-works (in which they excel at present) and other harmless or useful purposes, long before their unwarlike spirit could have suggested the use of guns to themselves, or they could have borrowed the notion from Europe. With regard to the compass, the attractive power of the loadstone had been known to them from remote antiquity, but its property of communicating polarity to iron is for the first time explicitly noticed in a Chinese dictionary finished in A.D. 121. Under the head of 'Loadstone' appears this definition: 'A stone with which a direction can be given to the needle.' The same word (*chin*) is used by them to express the magnetic and the common working-needle, as among ourselves. Père Gaubil, in his History of the Tâng dynasty, states that he found, in a work written one hundred years later than the above, the use of the compass distinctly recorded. It is curious to contrast inventions of such high utility and importance with the very small progress which the Chinese have made in the sciences, as astronomy, geography, and mathematics, for which they were not ashamed to be indebted to the European missionaries. With regard to the fine arts, or those which minister rather to the pleasures than to the wants of mankind, it becomes necessary to make some allowances for the peculiarities of national taste. The arts of drawing and painting do not rank so high among the Chinese as among ourselves in Europe, and having therefore met with less encouragement they may be expected to have made less progress. In drawings where perspective is not very strictly required, as in representations of birds, insects, fruits, and flowers, they are eminently successful, and nothing can exceed the splendour and variety of their colours. In regard to the Chinese music, their instruments are mostly tuned in unison, and they have little or no idea of accompaniment. They have certain characters to express the name of every note in their very limited scale, and these they use in writing down their airs; but whether this mode of notation is indigenous, or whether they obtained it from the Jesuits, in imitation of the European method, is doubtful. It is indeed stated that the Emperor Kâng-hy was much surprised when Père Pereira pricked down the Chinese tunes as they were played, and repeated them afterwards. Their instruments are numerous, consisting of different species of lutes and guitars; flutes and other wind-instruments; an harmonicon of wires, touched with two slender slips of bamboo; bells and pieces of sonorous metal; drums, and a sort of clarionette which emits as nearly as possible the tones of the Scottish bagpipe.

Literature and Language.—The antiquity of Chinese literature is proportionate to that of their language, and has been of course greatly promoted and increased by the early invention of the art of printing, which they have now possessed for 900 years. Specimens of this literature in various departments have been afforded to Europe by the labours of Staunton, Davis, Morrison, Klaproth, and Rémusat, who followed up the earlier investigations of the Jesuits at Peking, and have enabled us to form a judgment regarding the merits of compositions, which for a long period were considered to be inaccessible, from the difficulties of the language in which they were written. In legislation, we possess a translation of the Penal Code of the empire; in politics and morals, the sacred books of Confucius and his followers; and, in Philology and Belles Lettres, we have a copious and well-executed dictionary of the language; several translations or abstracts of histories; the Dramas of the 'Heir in Old Age,' the 'Sorrows of Hân,' 'Le Cercle de Craie;' an elaborate treatise concerning their poetry; and the excellent novel or romance of the 'Fortunate Union.' The mastery which has thus been obtained of the language of China by several Europeans, among whom our own countrymen hold a conspicuous place, seems to prove that the rumoured difficulties attendant on its acquisition, from the alleged number and variety of the characters, are the mere exaggerations of ignorance. We may close this article with giving some account of so singular and original a language from Davis's work on China.

It appears that the theory of a universal medium for the communication of ideas, as conceived by Bishop Wilkins, has been realized by the Chinese. While the letters of our alphabet are mere symbols of sounds, the Chinese characters or written words are symbols of ideas, and alike intelligible to the people of Cochin-China, Japan, Loo-choo, and Corea, with those of China itself. As the best practical illustration of a written character, common to several nations who cannot understand each other's speech, Mr. Davis adduces the Arabic numerals common to all Europe. An Englishman, who could not understand what an Italian meant if he said *venti-due*, would comprehend him immediately if he wrote down 22. This advantage, which belongs to our numerals only, pertains to the whole language of the Chinese. The uniformity however in the written character does not prevent the existence of great diversities in the oral languages of the neighbouring countries and China, and even of the separate provinces of the latter country. These diversities are precisely analogous to the different pronunciation given to the same numeral characters in the various countries of Europe. To adduce the foregoing example, the number 22, which an Italian calls *venti-due*, a Frenchman pronounces *vingt-deux*, and an Englishman *twenty-two*, though all three write them just alike. It is in this manner that the universality of the Chinese language extends only to the written character, and that the natives of the two extremities of the empire, who read the same books, and understand each other perfectly on paper, are all but mutually unintelligible in speech. The roots, or original characters of the Chinese, are only 214 in number, and might indeed be reduced to a much smaller amount by a little dissection and analysis. These are combined with each other to form other words, or express other ideas, very much in the same way that the individual Arabic numerals are combined to express the infinite varieties of numbers. By a species of analogy they may be called the alphabet of the language; with the difference that exists between an alphabet of ideas, and an alphabet of sounds. To assert that there are so many thousand characters in the Chinese, is much the same thing as to say that there are so many thousand words in Johnson's Dictionary; nor is a knowledge of the whole at all more necessary for every practical purpose than it is to get all Johnson's Dictionary by heart, in order to read English. Prémare observes, 'that there is nobody who might not read and write Chinese, after he had once acquired a good knowledge of 4000 or 5000 characters or words.' The roots already mentioned serve, like our alphabet, for the arrangement of the words in the large Chinese Dictionary, a national work compiled by the most learned persons in the empire, more than a century since, by order of the enlightened monarch Kâng-hy. So ingenious and lucid is the arrangement, that to a practised person there is little more difficulty in turning to a word than, among ourselves, in consulting Johnson. From the principle on which the written language has been constructed, there has accrued to it a remarkable property noticed by the late professor Rémusat, in his paper 'On the State of the Natural Sciences among the People of Eastern Asia.' As the 214 roots, or radical characters, whose combinations with each other form the whole language, singly express or represent the principal objects or ideas that men have occasion to communicate in the infancy of their knowledge, they comprise within their number the heads of genera and classes in nature, and thus afford the elements and means of a philosophical system of arrangement. As their knowledge increased, a fortunate instinct (M. Rémusat observes) guided the framers of the written language, and led them, instead of forming characters altogether new, to express new objects by the ingenious combination of those elementary symbols which they already possessed. Among the roots, for instance, we find *horse, dog, metal*, the addition to which, of some other significant symbol, expressive of some peculiar property or characteristic, serves to designate the different species comprised under their principal genera.

In this manner, as M. Rémusat remarks, each natural object becomes provided with a binary denomination, inasmuch as the complex character is necessarily formed of two parts; one for the class, order, or genus: the other for the species or variety. Thus they express horse,—horse-ass—horse-mule; dog—dog-wolf—dog-fox; metal—metal-silver—metal-iron, &c. &c.—the elementary or generic words, horse, dog, metal, being those under which the compounds are arranged in the Dictionary. Much consideration is attached by the Chinese to the graphic beauty of their written characters. The advantage of simplicity constitutes the merit of our alphabetic writing: but that of variety and picturesque effect must fairly be claimed by the Chinese; as well as the peculiar characteristics of a universal medium of communication. The two most usual forms of their character are the printed and the written, besides which, there are the seal, or engraved form, and one or two others. The printed form (analogous to our Roman type) lays claim only to clearness and accuracy; but the written combines correctness with elegance. It may suffice to observe generally, that the grammar of the language is extremely limited. In the absence of all inflexion, of which their characters are utterly incapable, the relation of words to each other in a sentence can only be marked by their position. The verb, for instance, must always precede its object, and follow its agent. The plural number is denoted by the affix of mun to nouns—jin-mun, men; t'ha-mun, they; or by repeating the noun, as jin-jin, men. Either of these is rendered unnecessary when a specific number is prefixed, as san jin, three men. The genitive or possessive case is commonly marked by an affix, che, succeeding the noun like our 's, as T'hien che gen, 'heaven's favour—shoo che ken, 'the tree's root.' The comparison of adjectives is marked by affixes, as haou, good'—keng haou, 'more good'—ting haou, 'most good.' The tenses of verbs are denoted by auxiliaries, or expletives, as t'ha yew tso, 'he has done.' The cases of nouns and pronouns are determined by prepositions, as tsoong t'hien, 'from heaven.' The collocation of words in a sentence must of course be a matter of more consequence in Chinese than in those languages where the relations of different words to each other are marked by the distinctions of number, gender, case, and person, as shown by declension and conjugation. The *Notitia Linguæ Sinicæ* of the Jesuit Prémare may be recommended as the best Chinese Grammar ever written.

As before the arrival of the Europeans China was frequently divided into two or three states, the northern portion of it was called by the adjacent nations of Central Asia *Cathay*, and under this name it became known to the Russians and Mongols, whilst the inhabitants of India called the southern part *Chin*, under which name the Portuguese and other Europeans became acquainted with it. In the seventeenth century, and not before, it was ascertained that Cathay was China, and that the great town of Cambalù was identical with Peking. (Du Halde; Staunton; Lindsay; Davis's *China;* Ritter's *Asia.*)

CHINA-WARE. [PORCELAIN.]

CHINCHILLIDÆ (Zoology), a small natural family of Rodent (gnawing) animals, to which the attention of English naturalists was first called by Mr. Bennett, from whose writings the principal part of this article is compiled.

Order. RODENTIA.

Tribe. Herbivora. F. Cuvier.

Molar teeth without true roots, growing throughout life by means of a persistent pulp.

Family. *Chinchillidæ.* Bennett.

Upper incisors simple; molars, $\frac{4-4}{4-4}$, consisting of two or three tænial or riband-like bony lamellæ or plates, parallel with each other, entirely surrounded with a vitreous substance; the crowns exactly opposite to each other and flattened by attrition. The posterior limbs nearly twice as long as the anterior. The tail produced with long and somewhat bristly hairs above and at the tip. The *chinchillidæ* are gregarious and subterranean in their habits, and mild in disposition.

Genera. Lagotis.

Dental formula: incisors, $\frac{2}{2}$, molars, $\frac{4-4}{4-4}=20$. The incisors are sharpened, and each molar consists of three complete oblique plates. *Skull* arched posteriorly and above; the superior cellules of the tympanum inconspicuous. All the feet four-toed, the great toe being entirely absent; nails long and subfalcular. Ears very long. Tail long. Fur soft, but caducous.

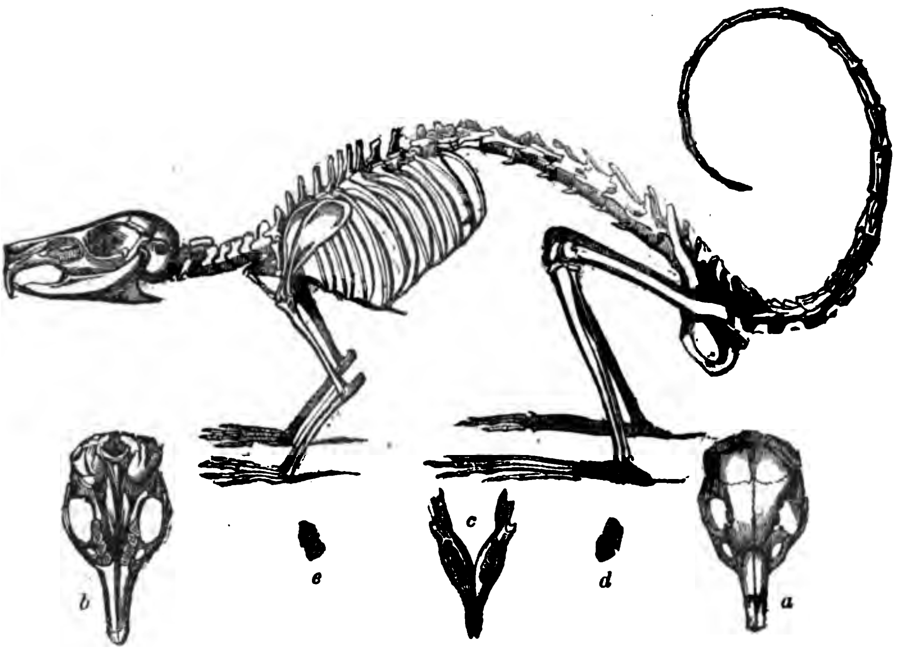
Example. *Lagotis Cuvieri.* Size, and much of the general form of the rabbit. Posterior limbs twice the length of the anterior: tail about equal in length to the body, excluding the head. Whiskers very numerous, closely set, jet black, ten or twelve of the longest on each side being exceedingly thick and rigid, and seven inches long. Ears nearly like a long parallelogram, rounded at the tip, three inches long and one broad, with the margins rolled in below, so sparingly furnished with short scattered hairs as to appear almost naked. Fore feet like the hinder, with four toes only, there being no vestige of a thumb; claws small, slightly sharpened, and entirely concealed by long and somewhat bristly hairs; those of the hinder feet similar in shape and rather larger, but that of the inner toe flattened, curved inwards, and exposed, the immediately adjoining hairs giving place to a tuft of about eight rows of short, stiff, horny, curved bristles, approaching nearly in rigidity to the comb-like appendage found in almost the same situation in the *Ctenomys Massonii* of Gray. A similar structure occurs in the *chinchilla.* The fur is beautifully soft, downy, and of considerable length, but so loosely attached to the skin that it readily falls off, unless handled with care. It is dusky at the base, and to within a short distance of the tip, where, for an extent of from one to three lines, it is dirty white, more or less tinged with yellowish brown. A few long black hairs, most numerous posteriorly, protrude through it. The general tone of colour is a mottled greyish ash. On the sides of the neck and body, where the tips of the fur merge more into yellowish-brown than on the back, and where they are also of greater length, as well as on the haunches and beneath, the latter tinge appears rather more predominant. There is little of the dusky colour visible on the under surface. The hairs of the tail below are extremely short, closely depressed, and of a brownish black; on its sides they are of two kinds, black and white; and this is also the case with the very long, rigid, and erectile hairs which form a crest along its upper surface. The very long, bristly hairs, which project in a tuft at the tip, are wholly black.

Mr. Bennett believes this species to be the *viscacha* of all the writers from Pedro de Cieça downwards, including Acosta, Garcilasso, Peter de Laet, Nieremberg, Feuillée, Ulloa, Vidauré, Molina, Schmidtmeyer, and Stevenson, who have stated that animal to be an inhabitant of the western or Peruvian acclivities of the Andes. M. de Blainville, Desmarest, and Lesson, are among the modern zoologists who have noticed the viscacha; Lesson, in his Manual, apparently confounding the eastern and western species, gives it as the *lepus viscaccia* of Gmelin, places it among the hares, and quotes Desmarest, as expressing his opinion in his 'Mammalogie,' that it ought to be the type of a new genus, under which the *chinchilla* might be perhaps arranged.

Cuvier, in the last edition of the 'Règne Animal,' says that the viscacha, as described by D'Azara, and according to the figures which he had seen and which were communicated to him by Mr. Brookes and Major Hamilton Smith, can scarcely be any other than a large species of chinchilla, with hair less long and soft; and he says that it is the animal described under the name of *Gerboise géante* (Giant Jerboa) by M. de Blainville in Desmarest's 'Mammalogie, and in the 'Nouv. Dict. d'Hist. Nat.,' and represented in the English translation of the 'Règne Animal' under that of *Marmot Diana.* Cuvier seems to be here speaking o. the *Lagostomus* of Brookes, the other viscacha (of which we shall presently treat), and the *Dipus maximus* (*Gerboise géante*) of De Blainville, to include which and the chinchilla, M.M. Isidore Geoffroy St. Hilaire and Dessalines D'Orbigny had proposed in the 'Annales des Sciences Naturelles,' for November, 1830, the creation of a new genus—*Callomys.*

Mr. Bennett, in the concluding part of the first volume of the 'Transactions of the Zoological Society of London,' has recorded a second species, *Lagotis pallipes.* The fur of this, he observes, is perhaps even softer to the touch than that of *Lagotis Cuvieri;* a feel which is probably owing to its being less dense, on account of the comparative shortness of the hairs composing it; the fur of *Lagotis Cuvieri* imparting to the hand the sensation of fullness and consequent firmness, while that of *Lagotis pallipes* is yielding with its softness. The hairs in both species, especially those which form the mass of the fur, are wavy for the great part of their length, their tips only being straight; those of the middle of the sides measure, when their natural waves are not interfered with, three-quarters of an inch in *Lagotis pallipes,* and an inch and a quarter in *Lagotis Cuvieri.* In neither of these species, however, is the quality of the fur at all comparable to that of *Chinchilla lanigera.*

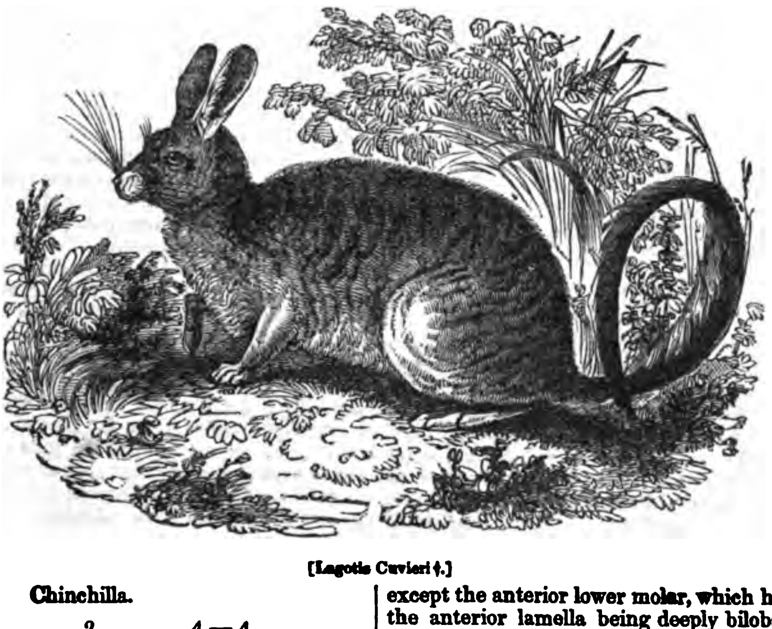
We have already observed that Mr. Bennett is of opinion that this species is the Peruvian viscacha of the authors above alluded to. The following is the English version (1709) of the passage in Pedro de Cieça's 'Chronica del Peru' (1554), descriptive of the habits of that animal:—'There is another sort of creature they call viscacha, about the bigness and resembling a hare, but that it has a long tail like a fox. These breed in stony places and among rocks, and many of them are shot with guns and crossbows, and taken by the Indians in gins (with the lasso), they being good to eat after hanging to tender; and of their hair or wool the Indians make large mantles, cloaks, or blankets, as soft as silk, and very valuable.' Ulloa's account (*Noticias Americanas,* 1772) is, in the opinion of Mr. Bennett (whose translation we adopt), the best history that has been given of its habits and manners. 'Taking the place of the rabbit, which is wanting in Peru, there is another kind of animal called viscacha, which is not found in Quito. In form, and in the colour of its fur, it is similar to the rabbit, but differs from it in having a long tail furnished with tufted hair (like that of the squirrel), which is very thin towards



[Skeleton of Lagotis Cuvieri *.]

a, skull seen from above; *b*, the same seen from below; *c*, lower jaw seen from above; *d*, crowns of the two anterior molar teeth of the lower jaw enlarged; *e*, crowns of the two posterior molar teeth of the upper jaw enlarged.

the root, but thick and long as it approaches the tip. It does not carry its tail turned over the head like the squirrel, but stretched out, as it were, in a horizontal direction; its joints are slender and scaly. These animals conceal themselves in holes of the rocks, in which they make their retreats, not forming burrows in the earth like rabbits. There they congregate in considerable numbers, and are mostly seen in a sitting posture, but not eating; they feed on the herbs and shrubs that grow among the rocks, and are very active. Their means of escape do not consist in the velocity of their flight, but in the promptitude with which they run to the shelter of their holes. This they commonly do when wounded; for which reason the mode of killing them is by shooting them in the head; as if they receive the charge in any other part, although much injured, they do not fail to go and die in the interior of their burrows. They have this peculiarity, that as soon as they die their hair falls off, and on this account, although it is softer and somewhat longer and finer than that of the rabbit, the skin cannot be made use of for common purposes. The flesh is white but not well flavoured, being especially distasteful at certain seasons, when it is altogether repugnant to the palate.' The author (supposed by some to be the Abbé Vidauré) of an anonymous Italian work on the natural history of Chile, extracts from which are given in the 'Journal de Physique' for 1779, has evidently confounded the eastern and western species; and his account, as Mr. Bennett well observes, is in several particulars apocryphal. Molina speaks of the employment of its wool among the antient Peruvians, adding, that the Chilians of the present day (his work was originally published in 1782, and reprinted with additions in 1810) use it in the manufacture of hats. Its burrows, according to the report of eye-witnesses, have two flats, communicating by a spiral staircase; in the lower it deposits its food, while it lives in the upper, which it seldom quits, except at night. It collects round the mouth of its burrow whatever has been left behind or lost by travellers: and its flesh, which is white and tender, is preferred to that of the rabbit or hare. But this account is liable to the same objections as that in the 'Journal de Physique.'



[Lagotis Cuvieri †.]

Chinchilla.

Dental formula: incisors, $\frac{2}{2}$, molars, $\frac{4-4}{4-4} = 20$, the molars generally consisting of three complete oblique plates, except the anterior lower molar, which has but two lamellæ, the anterior lamella being deeply bilobated. Skull posteriorly retuso-truncated, above depressedly flattened; cellules of the tympanum conspicuously inflated. Anterior feet five-toed · posterior feet four-toed, the nails small and subfalcular The ears ample. The tail rather long. In addition to *Chinchilla lanigera*, which we select as an example, Mr. Bennett gives a second species, *Chinchilla aurea*, *Callomys aureus* of Isid. Geoff. St. Hilaire.

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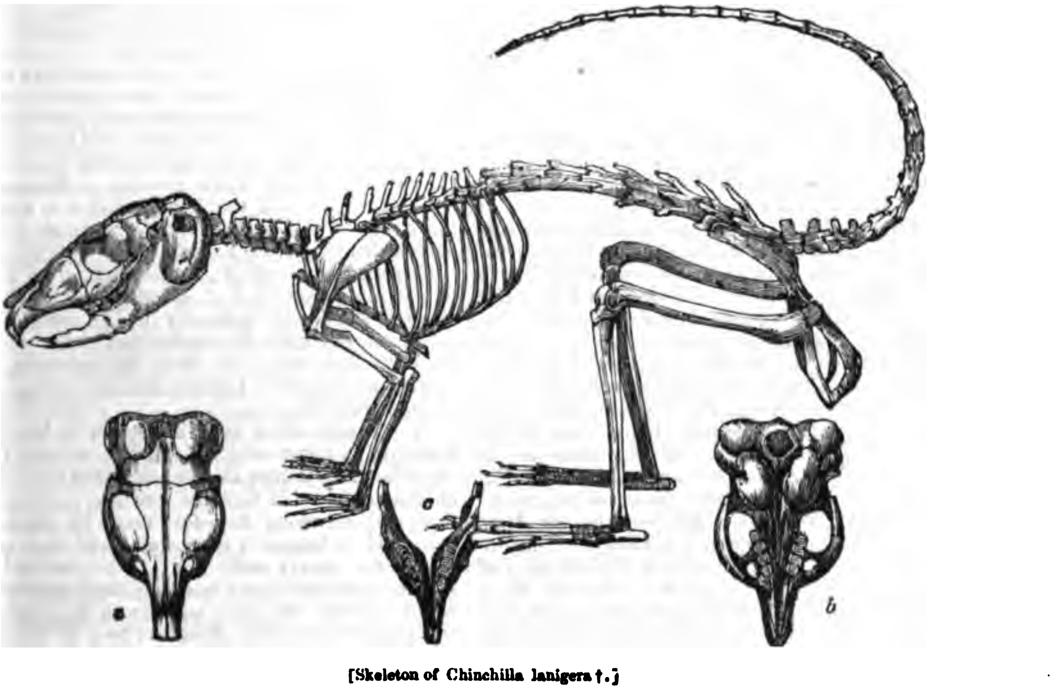
* From Mr. Bennett's figure. 'Zool. Trans.,' vol. i., part i.

† From Mr. Bennett's figure.

The length of the body of *Chinchilla lanigera* is about nine inches, and that of the tail nearly five. Its proportions are close-set, and its limbs comparatively short, the posterior being considerably longer than the anterior. The fur is long, thick, close. woolly, somewhat crisped, and entangled together, greyish, or ash-coloured above, and paler beneath. The form of the head resembles that of the rabbit; the eyes are full, large and black; and the ears broad, naked, rounded at the tips, and nearly as long as the head. The moustaches are plentiful and very long, the longest being twice the length of the head, some of them black and others white. Four short toes, with a distinct rudiment of a thumb, terminate the anterior feet; and the posterior are furnished with the same number, three of them long, the middle more produced than the two lateral ones, and the fourth, external to the others, very short and placed far behind. On all these toes the claws are short, and nearly hidden by tufts of bristly hairs. The tail is about half the length of the body, of equal thickness throughout, and covered with long bushy hairs; it is usually kept turned upwards towards the back, but not reverted as in the squirrels.' Such is the minute description of Mr. Bennett, who, in 1820, described the animal as the type of a distinct genus under its common name. Mr. Gray, in August, 1830, also described and gave an interesting account of its domesticated habits obtained from Mr. Hennah *.

Organization.—Mr. Yarrell, in February, 1831, gave to the Zoological Society of London the following account of the skeleton and parts of the *viscera* of one which died in the menagerie of the Society, premising that at the time of examination all the *viscera* had been preserved some months in a weak solution of spirit. 'The lungs are composed of three small lobes on each side. The heart is flattened in form from behind forwards, measuring $\frac{6}{10}$ths of an inch across its base, and but $\frac{4}{10}$ths in depth; the want of apex gives it a round and muscular appearance. The liver exhibits two large and equally sized lobes, and two smaller lobes. The stomach, a single cavity, measures from the entrance of the *œsophagus* round the great curve to the pyloric contraction five inches $_{10}$ths, the greatest breadth 2 inches $\frac{2}{10}$ths, the depth, 1 inch $\frac{4}{10}$ths; the spleen is small and elongated. The length of the small intestines from the *pylorus* to the end of the *ilium*, 3 feet 10 inches; the *cæcum* and first portion of the *colon* are of large size; made up of three half circular convolutions, one central, with one of smaller dimensions on each outer side, containing numerous cells and divisions, strengthened by muscular bands and *septa*, the whole length of *cæcum*, *colon*, and *rectum*, measures 4 feet 10 inches. With the exception of the *cæcum* and commencement of the *colon*, which are voluminous, all the intestines are of very small calibre. The kidneys vary somewhat in shape; one measures $\frac{6}{10}$ths of an inch in length, and $\frac{3}{10}$ths in breadth; that on the opposite side is much more spherical. The specimen is female, and the uterine *cornua* measure each 3½ inches in length.'

'Of the skeleton when mounted, the whole length, from the nose to the end of the tail, is 13 inches $\frac{6}{10}$ths; the upper surface of the *cranium* from the *occiput* to the inter-orbital space is triangular and flat, the width at the occiput 1 inch $\frac{1}{10}$th; of the inter-orbital space, $\frac{4}{10}$ths, the whole length of the head, 2 inches $\frac{8}{10}$ths; the mastoid processes and auditory cells of very large size; the external *meatus* also large, oval, directed upwards and backwards; the *zygoma* narrow and slender posteriorly, but deep and stronger at its junction with the malar bone, which has an ascending bony division between the orbits and temporal *fossæ*, the nasal bones narrow, convex, and of parallel diameter; the lower jaw is curved, broad, and strong; the course of the incisor teeth is visible, and the alveolar cavities of the molar teeth are well defined externally; the coronoid processes are wanting, apparently as if broken off during the preparation of the skeleton, but have obviously been of very small size; the condyle elongated from before backwards; the plate deep, and the posterior angle of considerable length. The exposed portion of the incisors measures $\frac{4}{10}$ths of an inch in length; the molar teeth are all made-up of three parallel portions, or bony *laminæ*, each portion invested with a thin coat of enamel, and closely united; the base of a molar tooth presenting six lines of enamel and three cavities; the anterior third of the first molar tooth on each side, above and below, is smaller than the other two portions, and gives to these teeth a triangular shaped crown; the posterior third portion of the last molar tooth on each side above, is nearly round, and gives an increase of surface to these also; in the molar teeth of the lower jaw the fold of enamel between the first and second portions of the bony *laminæ* of each tooth does not reach quite to the outer edge, and the two portions of bone appear therefore to be only partially separated. The direction of the parallel *laminæ* of all the molar teeth is not at right angles with the line of the maxillary bones, but inclining obliquely from without backwards. The length, from the *atlas* to the end of the tail, is 11 inches $\frac{4}{10}$ths; cervical



[Skeleton of Chinchilla lanigera †.]

a, skull seen from above; the same seen from below; *c*, lower jaw seen from above.

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* Spicilegia Zoologica.

† From Mr. Bennett's figure.

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vertebræ, 7; dorsal, 13; lumbar, 6; sacral 2, and caudal, 23. The *scapulæ* are small, measuring 1 inch from the external angle to the articulation with the *humerus*, the spine is but little elevated, the *acromion* ample, the clavicles perfect; length of the *humerus*, 1 inch $\frac{4}{10}$ths; the bone strong and furnished with an elongated crest descending from the head; from the *olecranon* to the carpal articulation, 1 inch $\frac{5}{10}$ths; the *ulna* and *radius* firmly anchylosed throughout the distal half of their length; thence to the longest of the five toes $\frac{4}{10}$ths of an inch. The ribs, 13 pairs. The bones of the *pelvis* slender and elongated; from the crest of the *ilium*, which is but little produced, to the inferior edge of the *ischium* is 1 inch $\frac{8}{10}$ths; the *ossa pubis* slight in structure, advancing but little; the *symphysis* elongated, and the *obturator foramen* of large size. The *femur* is straight, strong, and smooth, and measures 1 inch $\frac{8}{10}$ths; the *tibia* 2 inches $\frac{3}{10}$ths; the *fibula* is complete, and forms the external *malleolus*; from the *os calcis* to the end of the longest toe, 2 inches $\frac{1}{10}$th; the toes, four in number, of which the outer one is the shortest, the third from the outside, the longest; the second and fourth equal'

Yarrell remarks that in some previously published observations, he had stated that the *Chinchilla* appeared to be closely allied to Mr. Brookes's *Lagostomus*, but that the more complicated structure of the teeth, and the existence of an additional toe on each of the feet, require for the *Chinchilla* the generic distinction claimed for it by Mr. Bennett and Mr. Gray. He adds that the resemblance of the skeleton to that of the *Jerboa* is also remarkable, particularly in the form of the head, in the excessive development of the auditory cavities, and the small size of the anterior extremities compared with the hind legs; and that the true characters of the Chinchilla 'seem even now to be unknown to the French authors above referred to [*], who appear to be acquainted with its skin alone, and never to have examined either its teeth, or the number of its toes. In these respects it deviates from the characters of their proposed genus (*Callomys*); a genus which cannot be adopted, inasmuch as it is composed of heterogeneous materials, and as the two types included in it have both previously been described and designated as distinct groups.'

We now go back to Mr. Bennett's interesting account, in 'The Gardens and Menagerie of the Zoological Society delineated [†],' of this animal, which that author observes, notwithstanding the extensive trade carried on in its skins, 'might have been regarded until the last year almost as an unknown animal.'

The earliest account cited by Mr. Bennett is an English translation (London, 1604) of Father Joseph Acosta's 'Natural and Moral History of the East and West Indies,' published at Barcelona, in Spanish, in 1591. 'The Chinchilles is another kind of small beasts, like squirrels; they have a woonderfull smoothe and soft skinne, which they (the natives) weare as a healthfull thing to comfort the stomacke, and those parts that have neede of a moderate heate.' Sir John Hawkins, in his 'Voyage into the South Sea, A.D. 1593,' (London, small folio, 1622, reprinted in 'Purchas his Pilgrims,') says, 'Amongst others they have little beastes, like unto a squirrell, but that he is grey; his skinne is the most delicate, soft, and curious furre that I have seene, and of much estimation (as is reason) in Peru; few of them come into Spaine, because difficult to be come by, for that the princes and nobles laie wait for them; they call this beast Chinchilla, and of them they have great abundance.' Alonso de Ovalle, in his 'Historical Relation of the Kingdom of Chili' (Rome, 1646), calls them squirrels. 'The squirrels (Ardas) which are found only in the valley of Guasco, are ash-coloured, and their skins are in great esteem for the fineness and softness of the fur.' An anonymous Italian author, supposed by some bibliographers—erroneously, as Mr. Bennett thinks—to be the Abbé Vidauré, who published at Bologna, in 1776, a 'Compendium of the Geographical, Natural, and Civil History of the Kingdom of Chili,' speaks of the Arda (Spanish for a squirrel) as a species of rat, or campagnol, of the size of a cat, found only in the province of Copaipo, moderately docile, and covered with ash-coloured wool, as close and delicate as the finest cotton. Buffon, and that too, after quoting Feuillée's excellent description, confounded it with the *Chinche*, the most stinking of beasts. D'Azara corrected this error, but falls into another himself, in regarding the chinche of Feuillée and Buffon as his Yagouaré. Molina (Natural History of Chili—Italian, Bologna, 1782) describes the Chinchilla as a species of Linnæan *Mus*, under the name of *Mus laniger*. Gmelin adopted the appellation, but M. Geoffroy St. Hilaire considered that it ought to be regarded as one of his *Hamsters*. Zoologists generally took up this opinion, and Molina, in a second edition of his essay (1810), seems to have entertained it. 'The Chinchilla,' says Molina, 'is another species of field-rat, in great estimation for the extreme fineness of its wool, if a rich fur as delicate as the silken webs of the garden spiders may be so termed. It is of an ash-grey, and sufficiently long for spinning. The little animal which produces it is six inches long from the nose to the root of the tail, with small pointed ears, a short muzzle, teeth like the house rat, and a tail of moderate length, clothed with a delicate fur. It lives in burrows underground, in the open country of the northern provinces of Chili, and is very fond of being in company with others of its species. It feeds upon the roots of various bulbous plants which grow abundantly in those parts; and produces twice a year five or six young ones. It is so docile and mild in temper that, if taken into the hands, it neither bites nor tries to escape; but seems to take a pleasure in being caressed. If placed in the bosom it remains there as still and quiet as if it were in its own nest. This extraordinary placidity may possibly be rather due to its pusillanimity, which renders it extremely timid. As it is in itself peculiarly cleanly, there can be no fear of its soiling the clothes of those who handle it, or of its communicating any bad smell to them, for it is entirely free from that ill odour which characterizes the other species of rats. For this reason it might well be kept in the houses with no annoyance, and at a trifling expense, which would be abundantly repaid by the profits on its wool. The antient Peruvians, who were far more industrious than the modern, made of this wool coverlets for beds and valuable stuffs. There is found in the same northern provinces another little animal with fine wool, called the Hardilla, which is variously described by those who have seen it; but as I have never observed it myself, I cannot determine to what genus it belongs.' Upon this, Mr. Bennett, whose translation we have given, remarks that there can be little doubt that this animal is identical with the Chinchilla, the latter being frequently spoken of by the name of Arda, the same with Harda, the diminutive of which is Hardilla. Schmidtmeyer ('Travels into Chile over the Andes,' London, 4to, 1824) thus describes the animal. 'The Chinchilla is a woolly field-mouse, which lives underground, and chiefly feeds on wild onions. Its fine fur is well known in Europe; that which comes from Upper Peru is rougher and larger than the Chinchilla of Chile, but not always so beautiful in its colour. Great numbers of these animals are caught in the neighbourhood of Coquimbo and Copiapo, generally by boys with dogs, and sold to traders who bring them to Santiago and Valparaiso, from whence they are exported. The Peruvian skins are either brought to Buenos-Ayres from the eastern parts of the Andes, or sent to Lima. The extensive use of this fur has lately occasioned a very considerable destruction of the animals.'

Captain Beechey, R.N., on his return from his expedition to the north-west coast of America, presented a living specimen to the Zoological Society; and an entire skin, rendered particularly valuable in consequence of its having the skull preserved in it, was at the same time brought home by Mr. Collie, the surgeon of Captain Beechey's ship, and deposited in the British Museum.

'To the account of its habits given by Molina,' says Mr. Bennett, 'we can only add, that it usually sits upon its haunches, and is even able to raise itself up and stand upon its hinder feet. It feeds in a sitting posture, grasping its food, and conveying it to its mouth by means of its fore paws. In its temper it is generally mild and tractable, but it will not always suffer itself to be handled without resistance, and sometimes bites the hand which attempts to fondle it when not in a humour to be played with. Although a native of the Alpine valleys of Chili, and consequently subjected in its own country to the effects of a low temperature of the atmosphere, against which its thick coat affords an admirable protection, it was thought necessary to keep it, during the winter, in a moderately warm room, and a piece of flannel was even introduced into its sleeping apartment for its greater comfort. But this indulgence was most pertinaciously rejected, and as often as the flannel was replaced, so often was it dragged by the little animal into the outer compartment of its cage, where it amused itself with pulling it about, rolling it up, and shaking it with its feet and teeth. In other respects it exhibits but little playfulness, and gives few signs of activity; seldom disturbing its usual quietude by any sudden or extraordinary gambols, but occasionally displaying strong symptoms of alarm when startled by any unusual occurrence. A second individual of this interesting species has lately been added to the collection by the kindness of Lady Knighton, in whose possession it had remained twelve months previously to her presenting it to the Society. This specimen is larger in size, and rougher in its fur than the one above described; its colour is also less uniformly grey, deriving a somewhat mottled appearance from the numerous small blackish spots which are scattered over the back and sides. It is possible that this may be the Peruvian variety, mentioned in the extract from 'Schmidtmeyer's Travels,' as furnishing a less delicate and valuable fur than the Chilian animal. It is equally good tempered and mild in its disposition, and, probably, in consequence of having been exhibited in a public collection, is much more tame and playful. In its late abode it was frequently suffered to run about the room, when it would show off its agility by leaping to the height of the table. Its food consisted principally of dry herbage, such as hay and clover, on which it appears to have thriven greatly. That of the Society's original specimen has hitherto been chiefly grain of various kinds, and succulent roots. When the new-comer was first introduced into Bruton Street, it was placed in the same cage with the other specimen; but the latter appeared by no means disposed to submit to the presence of the intruder; a ferocious kind of scuffling fight immediately ensued between them, and the latter would unquestionably have fallen a victim had it not been rescued from its impending fate: since that time they have inhabited separate cages, placed side by side; and although the open wires would admit of some little familiarity taking place between them, no advances have as yet been made on either side. Such an isolated fact can, of course, have little weight in opposition to the testimony of Molina, that the Chinchilla is fond of company. It is nevertheless a remarkable circumstance, and deserves to be mentioned in illustration of the habits of these animals.'

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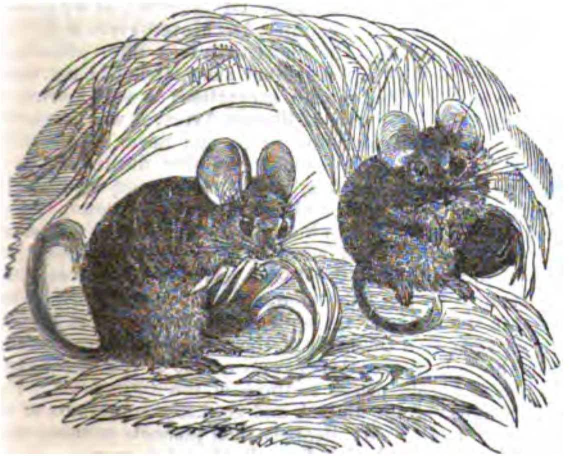
[*] M.M. Isidore Geoffroy St. Hilaire and Dessalines D'Orbigny.

[†] Vol. 1, 1830.

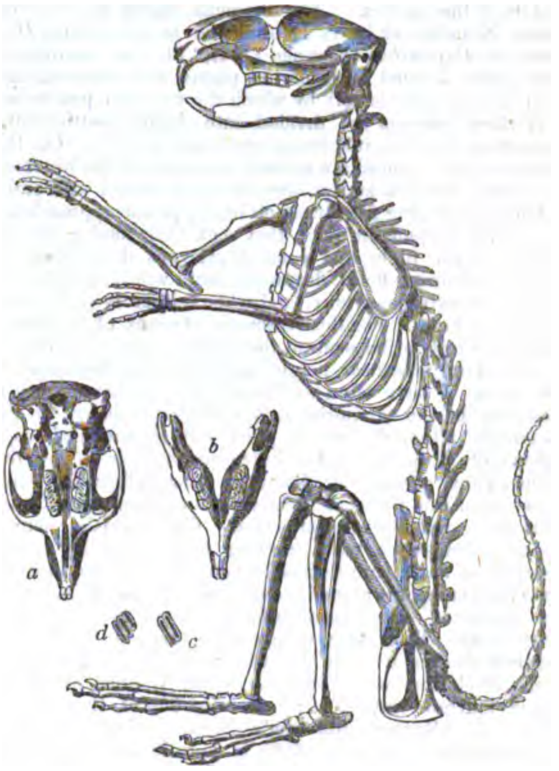
Utility, &c.—The fur is a considerable article of commerce. In muffs, tippets, linings to cloaks and pelisses, and trimmings for the same, it is sold extensively, and at a comparatively high price. There is now (August, 1836) a living specimen in the Garden of the Zoological Society, in the Regent's Park.



[Chinchilla Lanigera[*].]

LAGOSTOMUS.

Dental formula, incisors, $\frac{2}{2}$, molars, $\frac{4-4}{4-4} = 20$. The incisors sharpened. The molars each consisting of two complete oblique lamellæ, the upper posterior one being trilamellar. Anterior feet four-toed, the thumb being altogether deficient, the nails small and falcular. Posterior feet three-toed, the nails produced, straight, and robust. Ears moderate. Tail moderate. Example. *Lagostomus trichodactylus*, Brookes.



[Skeleton of Lagostomus trichodactylus[*].]

a, upper jaw; *b*, lower jaw; *c*, crown of the second molar tooth of the left side of the lower jaw; *d*, crown of the last molar tooth of the right side of the upper jaw.

In 1814 there was a living specimen of this animal at Exeter Change, where it was observed by M. de Blainville and M. F. Cuvier. The former described it in the 'Nouveau Dictionnaire d'Histoire Naturelle,' and the latter in the 'Dictionnaire des Sciences Naturelles,' under the name of *Dipus maximus*, Blainv., erroneously referring it to the Jerboas, and not suspecting its identity with the Eastern Viscacha, or Biscacho, an identity overlooked also by Mr. Brookes[†], who obtained the specimen after its death, and prepared from it a stuffed skin and skeleton, which, on the breaking up of his museum, passed, according to Mr. Bennett's belief, into the hands of M. Temminck, who purchased them for the Leyden Museum. It had been figured, while living, in Mr. Griffith's 'Translation of the Règne Animal,' under the name of *Marmot Diana*, as before observed. MM. D'Orbigny, fils, and M. Isidore Geoffroy St. Hilaire, published in the 'Annales des Sciences' for November, 1830, a paper 'on the Viscacha and the Chinchilla, regarded as the types of a genus named *Callomys*, together with the description of a new species.' But M. Isidore Geoffroy has since seen reason to abandon his opinion of the generic identity of the two animals. In August, 1831, M. Lesson gave, in the 'Bulletin des Sciences Naturelles,' an extract from his 'Illustrations de Zoologie,' containing a new description of the Viscacha, under its original name of *Lagostomus trichodactylus*, which M. Kuhn had previously restored to the animal. The 'Illustrations' give a figure of the animal, and representations of its feet and of its muzzle.

Mr. Bennett is clearly of opinion that it is the Viscacha, described by so many travellers as colonizing the vast plains eastward of the great chain of the Andes. Dobrizhoffer, Jolis, D'Azara, Proctor, Head, Miers, and Haigh, all mention it. Capt. (now Sir Francis Head) gives a picture of these animals, sitting solemnly at the entrance of their burrows, quite in his peculiar style. Biscacho is the name he assigns to them, and, according to his account, the Bissachueras, or Biscacho burrows, which perforate the plains, are terrible traps for the unwary horsemen.

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[*] Goldfuss has figured it in his 'Naturhistorische Atlas,' under the name of *Lagostomus laniger* of Wagler, referring as a synonym to *Eriomys Chinchilla* of the Frankfort Museum.

[*] From Mr. Brookes's figure in the 16th vol. of the 'Linnæan Transactions.'

[†] 'Linn. Trans.,' vol. xvi., p. 95.

Habits.—We select the accounts of two foreign travellers (whose works are not in the hands of every one) of the habits of this species. 'The Biscacha, called by the Abipones Nehelàterek,' says Dobrizhoffer in his curious *Historia de Abiponibus* (Viennæ, 1784), 'digs its burrows in the more elevated parts of the plains with so much art, that no aperture is left by which the rain can penetrate; and these burrows are divided into distinct settlements, numerous families inhabiting the same locality. On the surface of the ground are several entrances to the burrows, at which, towards sunset, they are seen seated in crowds, diligently listening for the sound of any person approaching. If everything remains quiet, they seek their food in the obscurity of the night, and commit grievous devastation on the neighbouring fields, devouring both wheat and Indian corn with extreme avidity, and when either is to be had, despising grass. For this reason the stations of the Biscachas are rarely to be seen in the desert plains, but indicate with certainty the near neighbourhood of the Spanish settlements. I have often wondered never to have seen the Biscacha in the territories either of the Abipones, or the Guaranis, although well supplied with all kinds of crops. They daily heap up, at the entrances of their burrow, dry bones, chips of wood, or whatever other refuse they may meet with, but for what purposes they collect such things it is impossible even to conjecture. The Spanish colonists amuse themselves with hunting them; pouring many buckets of water into their subterraneous retreats, until, to avoid drowning, the animals come forth into the plain, where, no means of escape being afforded them, they are killed with sticks. Their flesh, unless when very old, is not considered despicable even by the Spaniards.' The Abbé Jolis dwelt for twelve years in South America, and made three journeys into the remote districts of the interior. His work, 'Saggio sulla Storia Naturale della Provincia del Granchaco' (Faenza, 1789), is so little known, and his description, in some particulars, differs so much from that of Dobrizhoffer, that we give Mr. Bennett's translation of it. 'The Biscachas live in society, in burrows, under ground, which they form for themselves, excavating in all directions to the extent of a mile in circumference, with various exits and separate retreats, in which the old live distinct from the younger. The soil in which these are usually made is that which is hard and barren, and destitute of everything, but with bushes (boscaglie) at no great distance, and pasture of tender grass, roots, and the bark of trees. They collect around their retreats bones, dried leaves, and whatever they find in the neighbourhood: if anything is missing in their districts, it is to be found with certainty piled up in these situations the following day. As they are animals that avoid the light, having little power of vision, they are not to be seen in the day-time, unless at dawn, or towards evening after sunset. The night, and especially when the moon shines, is the proper time for seeking their food. Those among the Biscachas which are called Chinchillas, and which may be said to belong to the first species, inhabit only the mountains and cold situations; in size they are like a rabbit, and are clothed with a fine long fur. Their agility is surprising; they are seen leaping from rock to rock as if they had the faculty of flight. The others, indicated above, inhabit the level country, in warm situations..... Fierce and courageous, they defend themselves with all their might against the dogs, and sometimes even attack the legs of the hunters. I shall speak in my travels, as a fitter place, of the three curious modes in which they are driven out of their retreats; that is to say, with water, with fire, and by rubbing sticks together.'

But neither of those authors mentions the somewhat anomalous companions with which the Biscachos are associated, and we select, from the travels of Proctor, Head, Miers, and Haigh, the account of the first-named traveller, which, as Mr. Bennett observes, gives nearly all the particulars which are to be found in the rest. 'The whole country, from Buenos Ayres to San Luis de la Punta, is more or less burrowed by an animal between a rabbit and a badger, called the *biscacho*, which renders travelling dangerous, particularly by night, their holes being so large and deep, that a horse is almost sure to fall if he steps into one of them. The *biscacho* never ventures far from its retreat, and is seldom seen till the evening, when it comes out to feed, and hundreds may be observed sporting round their holes, and making a noise very similar to the grunting of pigs. Their flesh is much liked by the people, and they are remarkably fat, and on that account, when caught at any distance from their holes, are easily run down; they will however defend themselves from a dog a considerable time. The holes of these animals are also inhabited by vast numbers of small owls, which sit, during the day, gazing at the passing travellers, and making a very ludicrous appearance. The parts of the road most frequented by the *biscacho* are generally overrun by a species of small wild melon, bitter to the taste; whether it thrives particularly on the manure of the animal, or whether the *biscacho* chooses his hole nearer this running plant, does not seem to have been ascertained.'

In March, 1833, Dr. Meyen sent to the Imperial Academy Naturæ Curiosorum, the second part of a series of zoological observations, made during a voyage round the world, containing a revision of this family, for which he adopts from Wiegmann the name of *Lagostomi*, and to which he refers six genera; viz., *Pedetes*, *Lagostomus*, *Eriomys*, *Chinchilla*, *Galex*, and *Lagidium;* and he enumerates three distinct species of *Lagostomus*. His paper was published towards the end of 1833, in the 'Nova Acta Acad. Cæs. Nat. Cur.' His views differ widely from those of Mr. Bennett, which however we have retained, under the conviction that they are well founded, or, at least, unshaken by the observations of Dr. Meyen. As however confusion may arise from the discrepancy, we think it due to give Mr. Bennett's remarks on the paper in the last volume of the 'Zoological Journal.' 'As regards the South African genus *Pedetes*, Ill. (or *Helamys* of M. F. Cuvier),' says Mr. Bennett, 'I can by no means concur with the German zoologists who have proposed to associate it with the South American family of *Chinchillidæ*, although, as I have already stated in my paper in the Zoological Society's Transactions, p. 62, it seems in many of its characters to approach *Lagostomus*. I am still uncertain as to its true position, which I continue to think we are not yet furnished with sufficient materials to determine; but I am convinced that its relation to the *Chinchillidæ* is not one of near affinity.' 'The differences in the relative proportion of the limbs, in the elongated claws of its anterior extremities, in the character of its fur, and above all, in the structure of its teeth, forbid, as I have there stated, a close approximation.'

'The genus *Lagidium* of Dr. Meyen is synonymous with my *Lagotis;* and the species named by him *Lagidium Peruvianum* appears to be identical with *Lagotis Cuvieri*. The ascertainment of its habitat on the elevated plateaux of Peru confirms the accuracy of my decision, unassisted by any evidence as to locality, regarding its identity with the *Viscacha* of Peruvian travellers. Of its habits, as witnessed by himself in its native country, Dr. Meyen gives some interesting particulars. He states that it is most abundant just below the limits of perpetual snow, and does not form those extensive subterranean excavations so well known as the work of the *Viscacha* of Buenos Ayres; it was moreover invariably found among the rocks, and never on the level ground. On several occasions it was shot during the day, but was seen most frequently at sunset, being excessively abundant, although pursued with avidity on account of the good flavour of its flesh, which, however, is not so tender as that of the hare. The fabrication of stuffs from its wool, so general in the time of the Incas, has now entirely ceased; and such stuffs are only to be met with among the rarities found in the tombs of the antient inhabitants. Dr. Meyen further adds, that the skins of these Viscachas are brought to us through Buenos Ayres as an article of commerce, but are not so highly prized as those of the *Chinchilla*. He gives a figure of the animal, and good representations of its skull and teeth.' Mr. Bennett then proceeds to show that Dr. Meyen, as he had before observed, enumerates three species.

Of *Lagostomus*, the two first of these represent the animals respectively figured by the late Mr. Brookes and by M. Lesson, under the name of *Lagostomus trichodactylus*, which Dr. Meyen considers as distinct on account of the differences observable between the two figures. These consist in the small and curved claws of the hinder foot in the former, contrasted with the large size and nearly straight direction of the same organs in the latter; in the habit; and in the shape of the tail. The misapprehension may serve to show how dangerous it is to rely on figures only in the discrimination of species. As regards the first presumed distinction, Mr. Bennett has observed (p. 57 of his paper), that 'in this particular the figures given by Mr. Brookes are defective, as exhibiting the claws far smaller and more curved than is natural.' A reference to the descriptions of M. F. Cuvier and M. de Blainville, both taken from Mr. Brookes's specimen while living, will confirm the accuracy of this observation; the latter in particular (Desm. *Mammal.* No. 508), describing the middle toe of the hinder foot as furnished with a very strong claw. On the second point, the habit, it need only be observed, that both figures were taken from stuffed skins by artists who had never seen the living animal; and who could consequently give only their own conjectural ideas of its natural appearance when in a living state. On the third, it may be observed, that some obscurity is to be feared, M. de Blainville having described the animal while living as having its tail truncate and mutilated, and Mr. Brookes's skin and skeleton being both provided with perfect tails. A fine skin, now in the possession of the Zoological Society, agrees in all essential particulars with the animal figured by M. Lesson; and as far as Mr. Bennett's recollection goes, with that which once formed a part of Mr. Brookes's Museum. The figure given by the latter should only be considered as correct in so far as it is borne out by the descriptions of MM. F. Cuvier and De Blainville, which should be referred to in connexion with it.

The third species of *Lagostomus*, enumerated by Dr. Meyen, is the *Eriomys Chinchilla* of Dr. Lichtenstein, figured and described in the 'Darstellung neuer oder wenig bekannter Säugethiere,' a work unknown to Mr. Bennett when his paper was published; and Mr. Bennett acknowledges that the figure there given so closely resembles the true *Chinchilla lanigera* in all its prominent features, that he should not have hesitated to refer it to that animal, had it not been accompanied by separate representations of the feet, which offer only four toes on the anterior, and three on the posterior extremities. Dr. Meyen, however, quotes as a synonym *Callomys laniger* of M. Isidore Geoffroy and the younger D'Orbigny; and Mr. Bennett, therefore, observes, that there can be little doubt that they overlooked the small and almost rudimental inner toe both of the fore and hind feet; the identity of this animal with the *Chinchilla lanigera* of Dr. Rousseau being unquestioned by the Parisian zoologists, who have ample opportunities of comparing them, and M. Geoffroy himself having subsequently admitted the generic distinction of the *Chinchilla* (his *Callomys laniger*) from his genus *Callomys*, the true *Lagostomus*. The *Chinchilla* of Mr. Gray, the fourth genus of the family, according to Dr. Meyen, being beyond question the only *Chinchilla* yet noticed by English zoologists, and consequently identical with that figured in Mr. Griffith's edition of Cuvier's Animal Kingdom; and Mr. Bennett's Chinchilla. The author last named sees no reason for doubting that the *Eriomys* of Vander Hoeven, Dr. Meyen's fifth genus, is founded on the same species.

Galex, Dr. Meyen's sixth genus, is founded on a skull discovered at the entrance of a burrow belonging, according to Mr. Bennett, in all probability to a yet undescribed species of the family *Chinchillidæ;* as the character of the animal inhabiting the burrow, which was only seen at a distance, appeared closely to resemble a true *Chinchilla*. The skull and teeth, however, observes Mr. Bennett, according to the figures, belong to the *Caviïdæ*, with none of the known genera of which do they altogether agree, although they approach most nearly to *Kerodon*.

Mr. Bennett concludes by stating that Dr. Meyen's *Dendrobius Degus* is his (Mr. Bennett's) *Octodon Cumingii*, described in March, 1832; and he observes that Molina's description of his *Sciurus Degus* differed so greatly from the animals from which Mr. Bennett's description was taken, and which were living in the garden at the Regent's Park, in September, 1834, that he hesitated to quote that name as a synonym, adding that he is not quite sure whether Dr. Meyen states of his own knowledge or on Molina's authority, that his (Dr. Meyen's) animal is called *Degus* by the natives of Chile. If the former, the synonym, he remarks, can be of course no longer doubtful.

As dates are of consequence in an investigation of this nature, the following note to Mr. Bennett's paper on *Lagotis pallipes* is given:—'Dr. Meyen's paper was communicated to the Imperial Academy in March, 1833: mine was communicated to the Zoological Society in May of the same year. But the genus *Lagotis* had been characterized by me, so far as its external characters could be ascertained from the living specimen, at a meeting of the Committee of Science and Correspondence, in June, 1832; and the name then given was affixed, throughout the life of the animal, to the cage in which the Society's animal was kept.'

CHINESE ARCHITECTURE. The architecture of the Chinese may be considered unique in its style. Their buildings differ also in construction from those of Europe and the rest of Asia. The peculiar character of Chinese architecture is displayed in their royal palaces, their temples, bridges, triumphal arches, and also in their houses and sepulchres. The materials employed are wood, of which that most in use is the nan-mon, a kind of cedar: stone, marble, bricks, bamboo, and glazed or porcelain tiles are also employed. The construction of houses is directed by a public functionary, whom we may not inaptly designate a district surveyor. Every one is obliged to build his house according to his rank, and for every house a certain size and details are fixed. The ordinary habitations have one floor, and we may presume the houses of the common people in the towns to be crowded, and badly ventilated, since the police force the people to sleep in the open air during the dog-days, lest they should be suffocated. The houses called heon, that is of many floors, were once very much the fashion, and some were built about 211 feet high. Wooden columns, so placed as to support the roof, are common, and are from eight to ten diameters in height. They are fixed on stone or marble bases, but have no capitals; an architrave of wood placed on the top of them runs through the wall of the house, and a beam which is carried through the upper part of the column, and passes through the wall also, is connected with the architrave on the outside of the house. The roofs, which are slightly constructed of bamboo, are often double, and resemble one roof rising out of the other: they turn up at the eaves, at the angles of which are hung grotesque figures of dragons, &c. The columns and beams are often made of precious woods, and are inlaid with ivory, copper, and mother-of-pearl. Not the least singular appearance in a Chinese house is the door, which is often a complete circle; the window frames and sashes are formed of small pannels of various forms moulded out of clay, and neatly joined together. The sills of doors are of stone. The wood of the nan-mon is said to last more than a thousand years. Stone and marble, though in abundance, are more rarely used than wood, brick, and tile. The palaces of the kings are built on large masses of alabaster as a foundation. The palace of Pekin is on an immense scale, 2513 feet by 3235 feet. It is spoken of by the missionaries as presenting a very imposing appearance. The palace, which is divided into a number of courts, is composed of towers, galleries, porticos, halls, and immense buildings: each court is more superb than the other as you approach towards the last court, the residence of the king, which is the richest of all. In Pekin, and in the environs, there are said to be 10,000 temples: those which are within the walls of the palace are beautiful, and some are magnificent.

Almost all the temples differ in their plan. That of Honang presents as you enter, first, a very extensive court with three rows of trees which lead to an open vestibule, the ascent to which is by a step; this vestibule leads to another, in which are four colossal seated figures, formed of stucco; this last vestibule leads into another great court surrounded with colonnades and rooms behind them for the priests. The court contains three square temples, equidistant, and set upon a plinth along the centre of the court; they are two stories high, and surrounded with columns both above and below, and filled with idols. The priests perform their religious ceremonies in these buildings. At the four corners of the court are other smaller and somewhat similar edifices but without columns, in which the chief priests reside. Under the colonnades and between the rooms of the ordinary priests, there are four chambers occupied by idols. Two smaller courts are placed on each side of the centre of the large court; these are surrounded by the kitchens, refectory, and hospitals; all the buildings are covered with green varnished tiles.

The towers which we call pagodas are very common in China. The most celebrated is at Nankin, and is commonly called the Porcelain Tower. The plan is octagonal, with a diameter of 40 French feet, each face being 15 French feet wide; it has nine stories. There are others of round, square, and hexagonal forms, built of stone, brick, porcelain, and wood: each story has a roof and an elaborate balcony railing; at the angles of the roof beds are hung. The pagoda at Kew is a poor representation of a pagoda, having neither the colours nor brilliant decorarations of the Chinese. It was built by Sir William Chambers.

Triumphal arches, erected to the honour of women as well as men, are very common; and there is a great rage for them in China. In the smaller towns they are built of wood, and the workmanship of many is very coarse. At Ming-po the triumphal arches have three gates, two small and one large, the larger one being in the centre. The door-posts are of stone. The entablature consists of three or four faces, and the architrave is morticed and tenoned, although it is of stone. Mouldings are seldom used in these faces, except in the highest or the highest but one; instead of a cornice there is a projecting roof which crowns the whole. The ornaments of some of these arches consist of men, birds, and flowers, and the ground is cut away so that the day-light is seen behind: the three openings are also arched. Most towns have extensive walls, high enough to hide the buildings, except the pagodas or towers, and wide enough to ride on horseback. The walls of Pekin, which are built of brick, are 42 feet 6 inches high, and they have small square towers at every 200 feet. In some places there are long inclined planes for the cavalry to ascend. The isolated castle of Tien-sing-foo, at the confluence of the Pei-ho and Eu-ho rivers, is of a square form and built of slate-coloured bricks; the walls are ramped or inclined inwards; the basement is of stone, and the entrance, which is arched with stones, is at some height from the ground, with a square window on each side. The top of the castle has battlements, and below them is a large torus-moulding on a level with the terrace; just above the torus are small semicircular arches to let the rain run off the terrace. The parapets between the battlements are each pierced with two small holes, and a small guard-house with the roof having the usual turned-up eaves is built on the top of the terrace.

The Chinese varnish their columns, colour their roofs, and plaster their walls with stained substances of brilliant colours. Ornaments in China are little more than mere flat cuttings out, like the laced railwork of their balconies. The Chinese roofs, which for their form are unique, are considered by some to have been derived from the tents of this people in their nomadic state.

The tombs and monuments of China exhibit a variety of architectural designs, often resembling the familiar forms of their buildings; even the double roof is carved on some mausoleums. The common people have only a cone of earth with trees on the summit, not unlike the barrows in Wiltshire. Several forms of tombs are given in Alexander's 'Costume of China.' The forms are round, square, hexagonal, and octagonal, and the form of the coffin is also imitated.

Chinese architecture does not appear to be founded on the best principles. As in all semibarbarous nations, outward show is the great object, and thus the brightest coloured houses are thought the most beautiful.

For a general account of Chinese bridges, see BRIDGE; and for the Great Wall see CHINA, p. 74. (Alexander's *Costume of China*, and his drawings in the museum of the East India House; Sir William Chambers's *Architecture; Il Costume Antico e Moderno*, plates; the *Encyclopédie Methodique* contains a very long article on China.)

CHINGLEPUT, a tract of country forming part of the grants obtained by the East India Company in 1750 and 1763, from the Nabob of Arcot, and known in the annals of the Indian government as the Company's Jaghire. This tract is bounded on the N. by Nellore district; on the W. by the districts of northern and southern Arcot; on the S. by the southern division of Arcot; and on the E. by the bay of Bengal; it therefore forms part of the province of the Carnatic, and is included in the presidency of Madras.

The soil of the Chingleput district is generally bad; detached rocks of granite are continually met with in the fields, and interfere with the processes of cultivation. The district was invaded by Hyder Ali in 1768 and 1780; in the latter of these invasions the country was so ravaged that many parts were wholly depopulated, and for some years after presented to the view of the traveller only the ruins of houses and temples, and the bones of people who had been massacred. Shortly after this invasion the inhabitants of the less desolated parts experienced a famine which caused so considerable an emigration that nearly the whole country was deserted. In 1794 the district was formed into a collectorate under Mr. Place, and a gradual improvement took place, so that in 1823, according to returns made by the collector to the Madras government, the population amounted to 363,129 persons, of whom 190,243 were males, and 172,886 females. The principal towns in the collectorate are Chingleput and Conjeveram. Chingleput is situated in 12° 46′ N. lat., and 80° 2′ E. lon., on a stream which at a short distance west from the town falls into the Palaur. The town is distant 38 miles S.S.W. from Madras; it is irregularly built, and the houses are of mean appearance. The fort is of considerable extent, and has been of great strength; of late years it has been allowed to go into decay, and is garrisoned by a few invalids. In 1751 it was taken by the French under Dupleix, and in the following year was retaken by a small detachment under captain, afterwards lord Clive.

Conjeveram, called by the natives Kunji, is situated in a fertile valley watered by the small river Wegawutty, in 12° 49′ N. lat., and 79° 48′ E. long. The town is built in a straggling manner, and resembles a series of villages interspersed with extensive gardens and plantations. The streets, which are wide and regularly laid out, are planted on each side with cocoa-nut trees and bastard cedars. The houses are only one story high; they have mud walls and are roofed with tiles. Each house is built in the form of a square, with a small court in the centre. The buildings extend for between five and six miles; round the whole is a hedge of the Agave Americana, which has been found useful as a defence against irregular troops. A considerable part of the inhabitants are weavers, and employ themselves in making red handkerchiefs, turbans, and cloths adapted for the dresses of the natives. Conjeveram is also the residence of numerous Brahmins belonging to temples dedicated to Siva and Vishnu, which are much frequented. The pagoda of Siva is a large building said to contain 1000 pillars, many of them elaborately sculptured. The pagoda dedicated to Vishnu Conjee is not so large, but is more highly venerated. It was from this building that the town obtained its name of Conjeveram. There are many other pagodas, dedicated to various Brahminical deities. There are large tanks near to the different pagodas; for one of these, lying on the west side of the great pagoda, it is said the gods collected water from three millions of rivers. Every Brahmin who visits the place for the first time must perform his ablutions in this tank, and spend money in charity; the sums thus raised being in fact applied to the support of the Brahmins belonging to the temple.

(Mill's *History of British India*; Buchanan's *Journey through Mysore, Canara, and Malabar*; Heyne's *Historical and Statistical Tracts on India*; *Report of Committee of Commons on Affairs of India* 1832.)

CHIO'NEA (Dalman), a genus of Dipterous insects belonging to the section *Tipulariæ terricolæ*.

Only one species is yet discovered of this genus, but this is remarkable both in its structure and habits. It is less than half an inch in length; the head is of a brownish-yellow colour; the thorax and abdomen are ashy-brown; the latter is of an oval form and rather hairy; the legs are very long, rather thick and covered with hairs, not unlike the legs of a spider, and of a yellowish colour. It is perfectly destitute of wings, and is found upon the snow in the woods of Sweden throughout the winter. The generic characters are:—Body apterous; joints of the palpi nearly equal; antennæ setaceous, ten-jointed, and covered with fine hairs at the extremity; the abdomen of the male terminated by a forcep-like appendage composed of two horizontal jointed processes, and that of the female is terminated by a boring instrument, or ovipositor, consisting of two valvules, placed one upon the other, of which the upper one is the longer, and composed of two plates.

Upon turning to the article Boreus, it will be found that there is another insect which, though it belongs to a different order (*Neuroptera*), resembles this species in its habits of appearing during the winter, and crawling upon the snow, as well as in being apterous, a character which is of rare occurrence in either tribe.

CHIOS, called by the modern Greeks, Khio, and by the Italians, Scio, is an island of Asiatic Greece, near the W. coast of Asia Minor. It faces the peninsula of Clazomenæ and Erythræ, which is formed by the gulf of Smyrna on the N., and that of Samos on the S. Chios lies at the entrance of the Gulf of Smyrna, and is separated from the main land by a channel about 8 miles wide. Its length from N. to S. is about 30 miles, and its greatest breadth about 10. It is mountainous, especially in the N. part, the principal summit of which, called Mount Pelinæus, consists of a long line of bare rocks. Strabo reckoned 400 stadia from the N. extremity of Chios to the nearest point of Lesbos. The oldest settlers, according to tradition once current in the island, were Pelasgi from Thessaly. Chios was afterwards one of the twelve Ionian states founded by the European colonists from Greece; the population that settled there was not pure Ionian, but mixed. (Strab. 633. Herod. i., 142.) The dialect of the inhabitants is said by Herodotus to have been the same as that of the people of Erythræ. In the great sea-fight between the Ionian Greeks and the Persians, (B.C. 494) which resulted in the entire defeat of the Greeks, the people of Chios furnished 100 ships, and fought bravely. After the battle the Persians took possession of the island, which suffered in nearly the same way that it has again suffered in our own time: the cities and temples were burnt, and all the handsome young females carried off.

The principal towns of the island in antient times were Chios, Posidium, Phanæ, which had a good port and a temple of Apollo, Notium, Elæus, and Leuconium. Ion, the dramatic writer, the historian Theopompus, and the sophist Theocritus, were natives of this island. Chios was also one of the places that claimed Homer as a native.

After the close of the Persian war, B.C. 480, the island passed successively under the dominion of the Athenians, the Macedonians, the Romans, and the Byzantines. The Genoese took it in 1346, and it was governed for a long time by the Genoese family of Giustiniani. Solyman the Great took it in 1566. In 1694 it was taken by the Venetians, but was soon after retaken by the Turks, by whom it was treated with especial favour, being allotted as a kind of dowry to the Sultana mother, who sent her officers to collect the mastic gum which is found in great abundance in the S. district of the island, and which constitutes a valuable commodity, being much used at Constantinople, and especially by the ladies of the seraglio for chewing. Under the protection of the Sultana mother, the people of Chios were safe from the vexations of the pashas and other arbitrary chiefs; they had their own magistrates, and lived in comparative freedom and security. The island accordingly prospered, and Tournefort, Dr. Chandler, Olivier, and other travellers, agree in representing it as a garden inhabited by a happy people. Its inhabitants amounted to more than 100,000, of whom nearly 30,000 lived at Khio, the capital, a handsome town built in the Italian style, with a castle raised by the Genoese, on the E. coast of the island. Khio is at the foot of Pelinæus, and occupies the site of the antient town of Chios. It had a college with fourteen professors, in which between 400 and 500 youths of the various Greek islands received their education, a printing-office, and a good library. The establishment was supported by voluntary contributions of the Chiote merchants, many of whom were wealthy, and carried on an extensive commerce with Italy and other countries.

Chandler speaks with rapture of the beauty and the simple graceful manners of the young females of Chios, at the time of his visit. When the Greek insurrection broke out, the Chiotes, a peaceful race, and far from the theatre of war, remained quiet, until a party of turbulent Samiotes and other Greeks from Candia, half partizans, half pirates, landed upon the island in 1822, and excited or rather obliged the people to join the insurrection. The sequel is well known. The capudan pasha came with a large force, the Samiotes escaped by sea, the poor Chiotes made hardly any resistance, but were slaughtered by thousands, their wives and children were carried away and sold as slaves, and the town was burnt. A traveller who visited the island in 1828 describes the melancholy appearance of that once thriving and beautiful place. 'We walked through long streets that contained nothing but the ragged skeletons of houses, and heaps of fallen masonry; grass, weeds, and nettles were growing in the crevices of the marble halls, in the ruined churches, in the but lately busy streets; and to give an idea of the utter desolation of this once populous town, we started a covey of partridges in the Strada dei primati, or principal street. In the town and the villages of the island there were at that moment about 15,000 Greeks who had escaped from the slaughter and had returned under the assurance of protection of the new Pasha Jussuf, the scanty remnant of a population of 100,000.' (Macfarlane's *Constantinople in* 1828.)

The wine of Chios is celebrated as among the best in the Levant, and it had the same reputation in the time of Strabo. The island produces also cotton and silk, besides fruit in abundance. A great number of tame partridges are bred on the island. Marble quarries are mentioned by Strabo as being worked; and Chandler speaks of a marble quarry near the town of Khio.

CHIPPENHAM, a parish, parliamentary, and municipal borough, and market town, in the hundred of Chippenham, Wiltshire, on the Bristol Avon, 86 miles west from London. The parish contains about 6900 acres, being upwards of six miles in length from east to west, and varying in breadth from one to two miles. The parliamentary borough, which returns two members, was extended under the Reform Act, and includes the parishes of Chippenham, Hardenhuish, and Langley Burrell, and an extra-parochial district which was formerly the forest of Chippenham. The population of the parish in 1821 was 3506; in 1831, 4333: of the extended borough, in 1831, 5270. The population of the town is estimated at about 1700. Under the Corporations Reform Act, the municipal borough has four aldermen and twelve councillors, but is not divided into wards.

Chippenham is an ancient town, but it was not incorporated till the reign of Mary. Its name is derived from its market, for which it has been long famous. The Avon is not navigable for several miles below Chippenham; but a branch of the Wilts and Berks canal is brought into the town from a distance of about two miles, by which a considerable trade, principally in coals, is carried on. A great traffic also arises from the town lying on the London and Bristol and Bath road. The great western railway will pass within a quarter of a mile of the market-place.

The market has recently been changed from Saturday to Friday, and a handsome building, called the Market-House, (over which is an extensive room, used for public meetings), has been erected by Joseph Neeld, Esq., at present (1836) one of the members for the borough. There is a monthly market for the sale of cattle and cheese: four annual fairs, for cattle and horses, are also held; and during the present year (1836) wool fairs have been established.

The town has recently been lighted with gas and paved, under an Act obtained in 1834. With the exception of some very dilapidated buildings in the centre of the town, the houses are generally well built, either with freestone or brick.

There are two manufactories, one for woollens, and the other for silks, at present at work: the latter is of recent establishment, but the former has been for many years the staple fabric of the town: the number of manufactories in that branch was formerly considerable, but for several years their number declined, and has been now reduced to one.

A savings' bank was established in 1822, which, on the 20th of November, 1835, held the sum of 22,521*l*. A literary and scientific institution has recently been set on foot.

A court of requests, for the recovery of debts not exceeding 40*s*., is held here every six weeks; its jurisdiction extends over the hundreds of Chippenham, Damerham North, and Calne. The living of Chippenham is a vicarage, with the rectory of Tytherton Lucas annexed, in the gift of Christ Church, Oxford. In addition to the church, (a venerable Gothic edifice, almost in the centre of the town), Chippenham contains four chapels, not connected with the establishment.

A bridge over the Avon, and certain causeways in the neighbourhood, are kept in repair by the corporation, who some years since widened the bridge at a considerable expense; it is well paved and lighted.

A free school, for the education of twelve poor children, is (with other charities) under the management of the corporation; the stipend allowed to the master by the foundation is 5*l.* 15*s.* per annum, with a residence. There is a daily and Sunday school for poor children (which is well attended), in connexion with the National School Society, and there are also Sunday schools in connexion with the various dissenting chapels. A trifling endowment for a Sunday school for the instruction of girls in the principles of the church of England was left in the year 1724, by the Rev. Robert Cock, vicar of the parish, who, by his will, gave the whole of his property to trustees for that purpose. A monument is erected to his memory in the chancel of the church. There are several other charities.

Some mineral springs have been found in the vicinity of Chippenham.

The antient abbeys of Stanley and Lacock are within three miles of Chippenham; the former is converted into a farm-house, but the latter has fallen into the hands of the Talbot family, who have preserved, and made it their family seat.

The antient forest of Chippenham and Pewsham is destroyed, although the latter place is still provincially called 'the Forest,' and the roads leading from it to the town retain the names of Wood Lane and Timber Street.

A union, under the Poor Law Amendment Act, has been formed of Chippenham and twenty-eight surrounding parishes, comprising a population, according to the census of 1831, of 19,265 persons, and an area of 56,371 acres. (*Communication from Chippenham*, &c.)

CHIPPEWAYS. [Crees.]

CHIROCEPHALUS. [Branchiopoda.]

CHIRONECTES. [Lophiadæ.]

CHIRO'NOMUS, a genus of Dipterous insects of the family *Tipulidæ*. This genus was established by Meigen, and is principally distinguished by the following characters:—Fourth joint of the palpus longer than the rest; antennæ thirteen-jointed, in the male, and furnished with long hairs; the antennæ of the female are six-jointed, and the hairs are short; the anterior legs are inserted at some distance from the others, and the anterior tarsi are generally very long; the wings when closed lie parallel and they have three posterior cells; the body is long, slender and hairy.

Mr. Stephens, in his catalogue of British insects, enumerates upwards of eighty species of this genus: they are all of small size, frequent marshy situations, and very much resemble gnats. The worm known to anglers by the name of blood-worm is the larva of one of the species of this genus—the *Chironomus plumosus*. This worm is about half an inch in length; the body consists of numerous segments, and is furnished at the tail with several appendages which constitute the breathing apparatus. It is seen during the summer months on the mud near the edges of ponds and ditches; when thus seen however it is only shifting from one place to another, its natural locality being in the mud, where it may generally be found in great numbers, living for the most part under water. This larva is much sought after and devoured by birds and fishes; but during this last summer (1836) we discovered that it had a very formidable enemy in an insect of its own order. A fly, which closely resembled the house-fly, was observed in great abundance on the mud which had just been left by the retiring water, and we found them assembled in little groups of five or six, in the act of extracting the blood-worms from their holes, using the proboscis for this purpose; but no sooner was the worm fairly dislodged than a battle ensued, for each apparently wished to have the worm to itself; those that kept possession sucked out the fluids from the worm.

The pupa is of a brownish colour; the body is cylindrical, the head, thorax, wings, and legs are inclosed in separate sheaths, and, with the exception of the two fore-legs, lie in a close and compact mass; the fore-legs, covered by their sheaths, project from each side of the thorax. In this as well as in the larva state, the animal lives in the water. The breathing apparatus consists of two appendages, one on each side of the thorax, and each is composed of five branches which spring from a common centre.

When the insect is ready to quit its pupa case, it gains the surface of the water, and there remains suspended for some little time* with the disc of the thorax slightly protruded; this part bursts down the middle, and the insect, which is hairy, and hence does not easily wet, places its feet upon the surface of the water, where it floats (if the weather be calm) with the greatest safety. We observed, upon taking one upon our finger, that the wings are at first opaque and white, and filled with a fluid; but in a minute this fluid was expelled, and the sides of the wings collapsed and became transparent. The fluid thus ejected we perceived on our finger beneath the insect, but could not ascertain from what part of the wing or body it made its escape.

The perfect insect is of a pale ash colour, and is a little larger than the common gnat, which it resembles. This, as well as others of the genus, is remarkable for its habit of carrying the two fore-legs in a horizontal position: they project in front, and might be mistaken for antennæ; these latter organs however are very beautiful, and in the males resemble litle plumes.

CHI'ROTES, a genus of Saurians separated by Cuvier, and, according to him, resembling the *Chalcides* in their verticillated scales, and the *Amphisbænæ* still more, in the obtuse form of their head; but distinguished from the first by their want of posterior feet, and from the last by their possession of anterior limbs. The same author adds, in a note to the last edition of the 'Règne Animal,' that the genera which terminate this order of Saurians are interposed in various manners between the ordinary Saurians and the genera which are placed at the head of the order Ophidians to such a point, that many naturalists are now of opinion that the two orders ought no longer to be separated, or rather that one order should be established, comprising on the one part the Saurians, with the exception of the *Crocodilidæ*, and on the other the Ophidians of the family *Anguidæ*; but he observes that there exist, among the fossil forms of the antient calcareous beds, two very extraordinary genera (*Ichthyosaurus* and *Plesiosaurus*), which, with the head and trunk of a Saurian, have feet attached to short limbs and formed of a multitude of small articulations conjoined so as to form a kind of paddle or fin, like the anterior paddles or fin-feet of whales. These ought, he adds, to form a very distinct family. In their osteology they approach the Saurians, properly so called, much nearer than the crocodiles, with which Fitzinger associates them in his family *Loricata*, though in the fossils there is no trace either of scales or of the tongue, the two parts on which the characters of the *Loricata* rest.

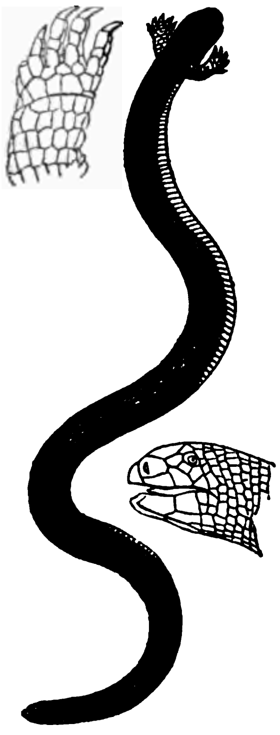
These Bimanous reptiles, as Cuvier terms them, include, according to him, but one species, which is a native of Mexico. This is the *Bimane cannelé* (*Chirotes canaliculatus*) of Cuvier, *Bipède cannelé* of Lacépède, *Chamæsaura propus* of Schneider, and *Lacerta lumbricoïdes* of Shaw. The animal has two short feet with four toes on each (and the vestige of a fifth) sufficiently organized internally, and attached by means of *scapulæ*, *clavicles* and a small *sternum*; but the head, the vertebræ, and, in short, all the rest of the skeleton resemble that of the *Amphisbænæ*.

Chirotes canaliculatus is about the size of a human little finger, and from eight to ten inches long (French). It is of a flesh-colour and covered with about 220 demi-rings on the back, and as many under the belly, which meet, in alternating, on the side. The tongue is but little extensile and is terminated by two small horny points. The eye is very minute. The tympanum is covered with skin and invisible externally. Above the vent are two lines of pores.

* Discussions have arisen on the means which this animal possesses of suspending itself at the surface of the water without motion, its specific gravity being supposed to be greater than water.

Messrs. Kirby and Spence account for it by a kind of propelling power which the centre of the thorax possesses, and state that this part being thus protruded and drying, the attraction of the air to the dry portion of the thorax is sufficient to overcome the slight difference in the specific gravity between the animal and the element; but it is further stated that if a drop of water fall upon the insect at this time it will immediately sink.

We have kept these insects in a glass jar for the purpose of observing their habits, and are very much inclined to doubt that the specific gravity of the pupa is greater than that of the water at the time just previous to the transformation from pupa to the imago state. Indeed at this time it appeared that they could not keep *from* the surface, unless they were in motion. Whenever we approached the jar, being at the top, they immediately descended by a quick zigzag movement of the body; but upon our remaining quiet for a moment they ceased all motion and rose to the surface again. We imagine that at this time the animal within having become partially disengaged from the pupa case, the space between the two is filled with air, that this would be sufficient to overcome the difference of specific gravity between the animal and the water, and that there would most probably be more air in the region of the thorax than elsewhere; and hence this part is protruded from the water, Cuvier says that he only detected one large lung and the vestige of a small one, as in the majority of serpents.



[Chirotes canaliculatus.]

CHI'RUS, a genus of fishes of the section *Acanthopterygii*, and family *Gobioides*. The species of this genus have the body considerably elongated, furnished with ciliated scales, and the mouth not deeply cleft; the teeth are small and conical, but the most remarkable character consists in the body being furnished with several longitudinal lines of pores, similar to the ordinary lateral line. Some of the species have appendages over the eyes, as observed in the *Blennies;* their ventral fins have each five soft rays: the spines of the dorsal fin are slender, and this fin extends nearly the whole length of the back.

Cuvier says that it is with hesitation that he places this genus with the family above-mentioned, and that it will probably one day form the type of a separate family. All the species as yet discovered inhabit the seas of Kamtschatka—they are included in the genus *Labrax* by Pallas, who describes several of the species in the 'Memoirs of the Academy of St. Petersburgh,' vol. ii., 1810.

CHISMOBRANCHIA'TA (Zoology), De' Blainville's second order of his second sub-class, *Paracephalophora Monoica*. The following is his definition of the order. ***Organs of respiration*** aquatic, branchial or pectinated, situated at the anterior part of the back, in a large cavity communicating with the ambient fluid by a wide oblique anterior slit. ***Mouth*** toothless, but provided with a long lingual riband-like organ. ***Shell*** either none, or internal, or external, very much depressed, with a very large entire aperture, and without any pillar (*columella*).

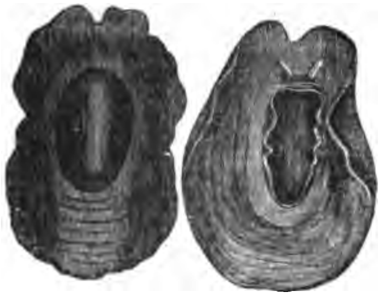
This definition is incorrect, in so far as it states that in some instances there is no shell; for *Coriocella*, the only genus described by De Blainville as being without any shell, has a horny one, as Cuvier observes, though it is very delicate and flexible, and nearly membranous. Cuvier, who places three of the genera, *Sigaretus*, *Coriocella*, and *Cryptostoma*, under his *Capuloides*, a family of his order *Gasteropoda pectinibranchiata*, observes that De Blainville places the greater part of the *Capuloides* under his non-symmetrical *Hermaphrodite Paracephalophora*, or *Calyptracians;* but that they appear to him (Cuvier) to be all Diœcious.

The geographical distribution of this order, which, according to De Blainville, is marine and probably herbivorous, is wide.

Genera.—Coriocella.

Body elliptical, very much depressed, having the borders of the mantle very delicate, notched in front, and spreading out very largely on all sides. ***Foot*** oval, very small. ***Head*** scarcely distinct; two *tentacula*, hidden under the shield, of some size, but short and contractile. ***Eyes*** at the external base of the *tentacula*. ***Back*** somewhat rounded, and according to De Blainville—but this, as we have already seen, is an error—without any shell, external or internal.

Example.—*Coriocella nigra*, Blainv. The only species of the genus, and described by De Blainville from a specimen in his collection. Locality, Seas of the Isle of France. Cuvier places this and the two following genera under his *Gasteropoda pectinibranchiata*.



[Coriocella nigra.]

Sigaretus.

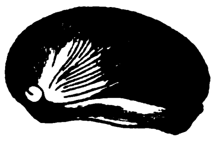
Shell more or less thick, flattened, with an ample and round aperture and but little spire, the whorls of which increase very suddenly; and enveloped during life in a spongy shield, which considerably encompasses its borders as well as the foot, and which is the true mantle. In front of this mantle there is a notch and a demi-canal, which serve to conduct the water into the branchial cavity. The tentacula are conical, and the eyes are placed at their external base. The male organ, according to Cuvier, is very large.

De Blainville thus subdivides the genus:

a. Species with a very delicate and smooth shell.

Example.—*Sigaretus convexus.*

[Sigaretus convexus, seen from below.]



[Sigaretus convexus, side view.]

b. Species with a thick and solid shell.

Example.—*Sigaretus haliotoideus.*

[Sigaretus haliotoideus.]

De Blainville observes that only a few living species of this genus are known. Mr. G. B. Sowerby, admitting that he has but a slight acquaintance with it, judges it to belong to the same family with Lamarck's *Bullæa Aplysia*, and *Dolabella*, though Lamarck has placed it among his *Macrostomata*, near to *Haliotis*, evidently on account of its general form and its dilated aperture. G. B. Sowerby further observes, that he knows not why Lamarck has arranged *Nerita cancellata* of Chemnitz with *Sigaretus* rather than with *Natica*, and remarks that much confusion seems to reign in Lamarck's synonymy of his *Sigaretus haliotoideus*, inasmuch as he quotes figures of several very distinct shells for it.

Sigaretus has been found at depths varying from five to fifteen fathoms on sandy bottoms.

Fossil Sigareti.

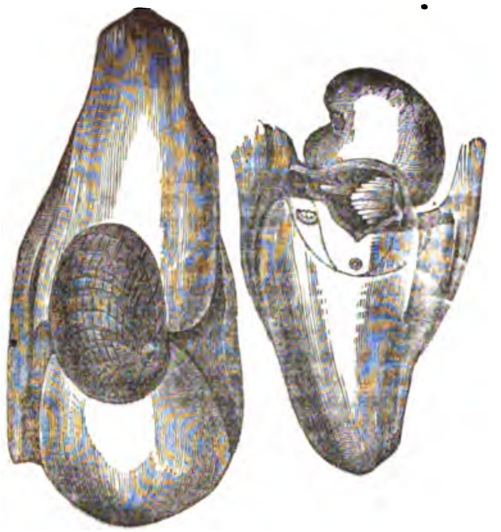
Defrance enumerates three fossil species, one from the

Plaisantin, one from Grignon, and another from the environs of Bourdeaux. G. B. Sowerby says that the fossil species are few and rare, and that they occur in the London clay at Barton, and in the contemporaneous formations in France and Italy. The species in the Calcaire grossier at Grignon, he adds, has a small umbilicus. Deshayes in his 'Tables' gives eleven living species, and four fossil (tertiary); one, *Sigaretus depressus*, living in the seas of the Molucca islands. The fossils occur in the Pliocene, Miocene, and Eocene periods of Lyell.

Cryptostoma.

Shell very like that of Sigaretus, carried with the head and abdomen, which it covers, upon a foot four times its size, cut almost squarely behind, and which produces anteriorly a fleshy and oblong part, which makes nearly one-half of the mass. The animal itself has a flat head, two tentacula, and a large pectinated branchia on the *plafond* of its dorsal cavity. The male organ is placed under the right tentaculum.

Example.—*Cryptostoma Leachii.*



[Cryptostoma Leachii.]

De Blainville, who separated the genus, says that he knows two species, both from India, and adds, that perhaps some species of Lamarck's *Sigaretus* belong to them. G. B. Sowerby, who identifies *Cryptostoma* with *Sigaretus*, states that as far as the differences in the shells themselves warrant it, his opinion is decidedly against the separation of De Blainville's *Cryptostoma* from the latter genus; and adds, that he does not think the animals sufficiently different to render the propriety of separating them very clear. He afterwards says, 'Upon examination of the specimens in the British Museum, we are convinced that De Blainville's *Cryptostoma Leachii* is the same as one of the two shells which Adanson calls *Sigaret;* his *Crypt. breviculum* is probably the other; but this we cannot ascertain, because the shell has been taken away from the specimen in the British Museum. We have no doubt, however, that the *Crypt. breviculum* of De Blainville is a female specimen of Cuvier's *Sigaretus*, given by him to Dr. Leach. It is to be regretted that Cuvier has not given any description of the shell of his *Sigaretus*, so that it is impossible to ascertain whether or not it be identical with either of Adanson's shells; it is perhaps needless to add, that unless it can be identified with one of them, it ought not to be considered as a *Sigaretus*. Its animal is certainly very different from that of *Cryptostoma Leachii*, which we believe to be identical with one of Adanson's.' Cuvier, in the last edition of the 'Règne Animal,' retains De Blainville's genus *Cryptostoma*, and places it next to *Coriocella*. He adds in a note, that besides the species in the British Museum (*Cryptostoma Leachii*, Blainv.), he possesses another (*Cryptostoma Carolinum*, Cuv.), sent from Carolina by M. L'Herminier. The genus does not appear in Deshayes's list.

Oxynöe.

Body gastropod, with a large dorsal shell, anterior, bulliform, and with a simple spire. *Foot* narrow. *Branchiæ* marginal, striated transversely. *Mantle* widened into two lateral wings. *Tentacula* two, not retractile.

Example.—*Oxynöe olivacea*. De Blainville, who seems to consider this genus somewhat apocryphal, observes that he only knows it from the little that Rafinesque, who described it in the 'Journal de Physique,' says of it; and adds, that he only places it in the position given to it, because M. Rafinesque states that it only differs from *Sigaretus*, because the shell is external; adding that, nevertheless, if the *branchiæ* are disposed, as Rafinesque describes them, the difference must be much greater. Rang, who speaks with approbation of this remark by De Blainville, places it under his unclassed genera. Cuvier does not notice it.

The next genus in De Blainville's arrangement is *Stomatella*, but as he places *Stomatia* with the sea-ears, and as we agree with G. B. Sowerby that *Stomatia* and *Stomatella* do not differ sufficiently for generic distinction, the reader will find their description under HALIOTIDÆ.

Velutina.

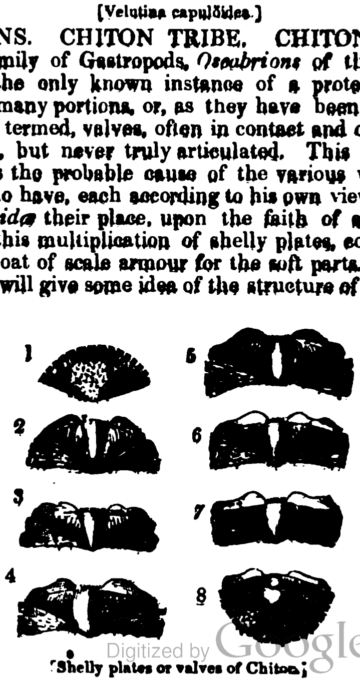
Animal oval, sufficiently protuberant (bombé), hardly spiral; border of the mantle simple anteriorly, and double for the whole of its circumference; the internal lip thickest and tentacular. *Foot* thick. *Tentacula* large, obconical, distant, with a small frontal veil between them. *Eyes* black, sessile at the external side of the base of the tentacula. *Mouth* large, at the extremity of a sort of muzzle. *Respiratory cavity* large, without any trace of a tube, and containing two unequal pectinated *branchiæ;* orifice of the ovary at the base of the male organ, situated at the root of the right tentaculum. Muscular attachment of a horseshoe shape, very slight behind and open before.

Shell, external with an epidermis, patelliform, with a small lateral spire, and without a columella. Aperture large, the edges almost continuous, and sharp: the right border united to the left by a lamellar calcareous deposit.

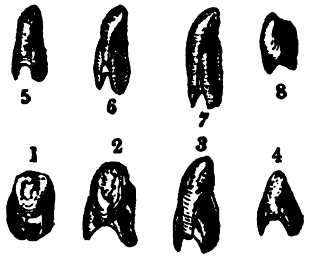
Example.—*Velutina capuloidea*, *Helix lævigata*, Linn. De Blainville observes that he established this genus from an individual provided with its shell, which he owed to the generosity of Defrance. He adds that he knows but one species from the coast of England, which is very probably the same of which Müller speaks under the name of *Bulla velutina*, and which Lamarck erroneously regarded as the analogue of his *Sigaretus haliotoideus;* and that Mr. Gray has also proposed the genus under the same name.

[Velutina capuloides.]

CHITONS. CHITON TRIBE. CHITONIDÆ. A natural family of Gastropods, *Oscabrions* of the French, affording the only known instance of a protecting shell formed of many portions, or, as they have been somewhat incorrectly termed, valves, often in contact and overlapping each other, but never truly articulated. This anomalous structure is the probable cause of the various wanderings of those who have, each according to his own view, assigned the *Chitonidæ* their place, upon the faith of a too great value for this multiplication of shelly plates, composing a shield, or coat of scale armour for the soft parts. The following cut will give some idea of the structure of this shelly covering.



[Shelly plates or valves of Chiton.]



[Shelly plates, or valves of Chitonellus.]

These plates are bound together by a coriaceous border, which, as we shall presently see, is either plain, or beset with bristles, spines, &c.

The early naturalists took these shells for the peculiar armour of certain serpents, a conclusion to which they were doubtless helped by the love of the marvellous, so strongly shown in the accounts of the older travellers. By degrees the true condition of these mollusks became better known; and the opposite opinions of Linnæus and Adanson divided the naturalists of their age. The former arranged these shells among his multivalves, a class entirely artificial, and like all artificial classifications comprising the most heterogeneous forms. Adanson, on the contrary, took nature for his guide, and carefully observing the animal itself, while he regarded the shell as of comparatively small importance, placed *Patella* and *Chiton* side by side in his method. But the Linnæan school long reigned paramount; and Adanson's labours were comparatively forgotten, when Cuvier began to reform the crude state in which he found the *Mollusca*, and Lamarck and others aided in the work. Cuvier, who made anatomical investigation the basis of his opinions, at once pronounced in favour of Adanson. Lamarck afterwards adopted the same conclusion, but not till he had previously placed the Chitons at the end of the Acephalous Mollusks, between *Fistulana* and *Balanus*. Poli, in his magnificent work on the *Testacea utriusque Siciliæ*, in giving the anatomy of a Mediterranean species, became a valuable ally; for, although he still retained Linné's class of Multivalves, and although in his anatomical details he said nothing of the nervous system, a branch of animal organization essentially necessary to be known for assigning an animal its true place, he demonstrated enough clearly to show that *Chiton* bore no relation to the other Multivalves of Linnæus. M. de Blainville, however, resting upon the generative faculty of the *Chitons*, proposed, in opposition to these views of Cuvier and Lamarck, which had been adopted by almost all zoologists, to form a subtype of Mollusks under the name of *Malentozoaria*, in which each of the Linnæan genera, *Lepas* and *Chiton* constitute a class; the first, the *Lepadians* or *Lepadicea*, the second, the *Polyplaxiphores* or *Polyplaxiphora*. These almost singular views of De Blainville have not prevailed among zoologists; and Cuvier, in the last edition of the 'Règne Animal,' arranges the Chitons at the side of the *Patellæ*, forming from these two genera, his small family of *Cyclobranchians*.

Deshayes, in the article *Oscabrion*, in the 'Encyclopédie Méthodique,' enters at large into the organization of the Chitons, and discusses with much learning and acuteness the conflicting opinions of Cuvier and De Blainville.

The following is a summary of Deshayes's observations.[*]

Digestive organs. No projecting *head*, in which the Chitons resemble the *Phyllidians*. No *tentacula*, which are replaced by a kind of veil which surrounds the mouth. *Eyes*, as in many other Mollusks, the *Pteropoda*, for example, wanting. *Mouth* and *Œsophagus*, furnished with a very long tongue rolled spirally, and armed with horny teeth, a good figure of which is given by Poli. Stomach, intestine, and liver, like those of the other gastropods. Vent at the posterior extremity of the body, as in the Phyllidians, *Doris*, &c.[†]

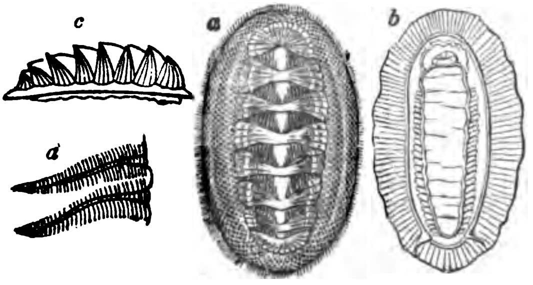
Respiratory and Circulating Organs. The *branchiæ* of the Chitons consist of a range of small triangular leaflets placed, as in *Patella* and *Phyllidia*, in the furrow which separates the foot from the mantle. The *heart* is situated posteriorly[*] in the mesial and dorsal line: it is symmetrical, and composed of a single ventricle and two auricles.

Organs of Generation. According to De Blainville, an ovary only, which, instead of having, as in the other mollusks, a single exit, has two external issues, one to the right, the other to the left. Deshayes observes upon this, that though he has made minute anatomical investigations, he has found it impossible to find the second issue of the organs of generation, but he acknowledges that the species which he dissected were small[†].

Nervous System. Proved by Cuvier not to differ from that of other mollusks properly so called. It consists of what may be termed a complete œsophagian ring, and of various branches, which are given off divergingly towards the several organs.

Locomotive Organs. The oval foot, more or less wide, according to the species, extends the whole length of the animal.

Shell. Eight narrow, transverse, calcareous pieces, overlapping each other, and strongly implanted on each side in a thick and fibrous border of the mantle, which surrounds the whole body, and is sometimes, as we have observed, naked, but more generally covered with small scales, spines, or hairs. These pieces are not immoveable, as the animal can roll itself up or stretch itself out again for the purpose of progression or adhesion. To work this machinery, there are three muscles given off from the first piece to the second, three others given off from the second to the third, and so on throughout, so as to make the mechanism of this scale armour complete. One of these muscles occupies the mesial and dorsal line, the other two are lateral and oblique. The growth of the shell is analogous to that of the other mollusks.



[Animal of Chiton Squamosus.]

a, the animal and shell seen from above; *b*, the animal seen from below; *c* side view of the shell and animal in a creeping or adhering state; *d* portion of branchiæ magnified.

The chitons then resemble the other mollusks. 1st., in the general form of the body; 2nd., in the organ of locomotion; 3rd., in the nature, form, and position of the branchiæ; 4th., in the heart, and in the distribution of the circulating vessels; 5th., in the mouth and its veil; 6th., in the tongue and the rest of the digestive organs; 7th., in the position of the vent; and 8th., last, but not least, in the nervous system.

What, then, are the differences? 1st, the form of the shell composed of eight pieces instead of one; 2nd, the mantle, which is more fleshy and fibrous than in the other mollusks; 3rd, the myology; 4th, the double issue of the organs of generation, allowing this difference to be established, whereas it is doubted. With regard to the absence of eyes, that defect exists in a considerable number of mollusks.

Hence Deshayes concludes, and the conclusion appears to us to be just, that the chitons are true mollusks, and that their place is not far distant from the *Patellæ*.

Geographical distribution. The species are numerous, and there are few rocky shores without some of them. As a general rule, the largest are found in warm climates, but there are exceptions; for instance, *Chiton setiger* and *Chiton Bowenii*, King, are found on the shores of Tierra del Fuego, and in the straits of Magalhaens: the former of these species grows to the length of two inches and three-eighths, and the breadth of one inch and three-eighths, and the latter to the length of three inches and two-eighths, and the breadth of one inch and a half. No mention is made of them in the 'Supplement to Captain (now Sir Edward) Parry's Voyage' (1819—20), nor in the 'Supplement to Captain (now Sir John) Ross's Voyage' (1829—1833). The British species are small.

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[*] Last edition of Lamarck, vol. vii., p. 487.

[†] The stomach is membranous, and the intestine is very long and much folded. The vent is situated under the posterior extremity

[*] Upon the rectum.

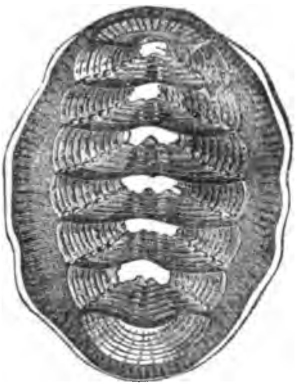
[†] Cuvier says that the ovary is situated above the other viscera, and that it would seem to open at the sides by two oviducts.

Locality. Rocky shores where it adheres, and also on stones and other submarine bodies. Found at depths varying from the surface to twenty-five fathoms.

Most zoologists are agreed that there are no differences sufficiently strongly marked to make a generic distinction between *Chiton* and *Chitonellus;* and, indeed, the gradations from the one to the other are so imperceptible, that there is no point where the line can be satisfactorily drawn. In the most completely-developed form of *Chiton* the shelly secretion greatly preponderates; in *Chitonellus* that secretion is comparatively small, and the great development is in the border of the mantle, which, in some instances, almost hides the comparatively-minute shelly pieces.

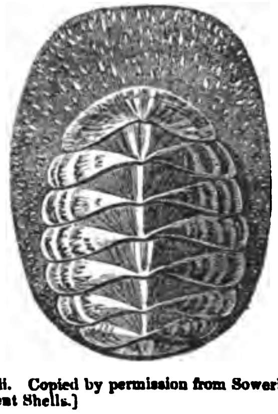
a. Species with the mantle border or marginal ligament, coriaceous and naked. Examples, *Chiton Chilensis*, Frembley, and *Chiton Blainvillii*, Broderip.

Chiton Chilensis. Shell oblong-ovate, opaque, thick, dark brown, smooth, dull; inside white, with pink markings on the first, second, and last valves. Valves with longitudinal *striæ*, crossed by irregular concentric ridges. Anterior and posterior valves semilunate, slightly punctated; second valve subcarinated, the front margin obtusely angled, lateral margins arcuate, and the posterior with a prominent beak, on each side of which diverges a rather elevated granulated ridge; the next five valves alike, bow-shaped, with a granulate ridge on each side. Border smooth, coriaceous, tough, thick, darker coloured than the shell, semipellucid, broad at the sides and narrow at the extremities. Locality, Valparaiso, in crevices of rocks and under stones. (Frembley.)



[Chiton Chileusis.]

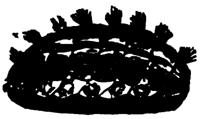
Chiton Blainvillii. In this species the shape of the coriaceous border itself is not only very remarkable, but it is here and there fringed, though not with hair. M. Deshayes has placed this under his section of those species which have the border of the mantle fringed with hair or spines, probably from not having seen a good specimen. *Shell* roundish, anterior valve obscurely rayed, the posterior one very small and abrupt; the others concentrically lineated, the whole being rosy, variegated with white brown, and greenish and, internally, white. The mantle-border orange-red, very narrow posteriorly, and enormously produced anteriorly, rounded and fringed here and there, especially on its anterior margin, with some short coriaceous processes Locality, Inner Lobos Island, coast of Peru.



[Chiton Blainvillii. Copied by permission from Sowerby's 'Illustrations of Conchology.'—Recent Shells.]

β. Mantle-border smooth, but with tufts of hair at the lateral extremities of each plate. Example, *Chiton Fascicularis*, Linnæus.

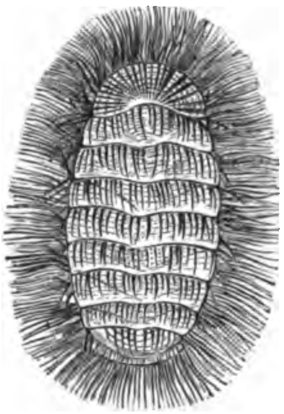
Shell apparently smooth, but when examined with a glass, proving to be rough like shagreen, except on the elevated dorsal ridge; margin surrounded with tufts of whitish hair, one at the junction of each valve, and two in the front, making eighteen in number. Colour brown or dark cinereous; length five-eighths of an inch; breadth rather more than two-eighths. Locality, British southern coasts. Montagu, who gives this description, says, that on the coast of Barbary it is not unfrequently an inch long.



[Chiton fascicularis.]

γ. Mantle-border hairy. Example, *Chiton Peruvianus*, Lamarck.

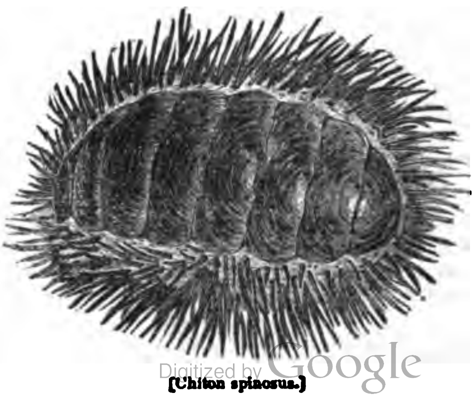
Shell oblong-ovate, opaque, dirty yellowish green, or yellowish brown, inside white. Valves thin, slightly elevated; posterior compartments of the dorsal valves a little raised and striated, with minute granulated striæ, and in like manner the other parts of the shell; under each valve is inserted a series of short black hairs, which lie on the back of the shell. Border narrow, coriaceous, thickly set with coarse black hairs. Length two inches, breadth one and a half. Found under stones at low water on the shores of Valparaiso Bay. There is a variety with the anterior valves much narrower than the posterior. (Frembley.)



[Chiton Peruvianus.]

δ. Mantle-border beset with spines. Example, *Chiton spinosus*, Bruguière; and *Chiton spiniferus*, Frembley.

Chiton spinosus. Shell brownish black, valves opaque,

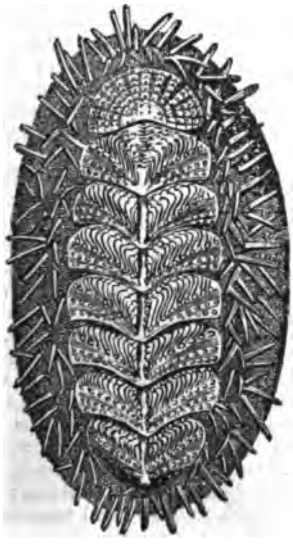


[Chiton spinosus.]

moderate, with the sides granulated, the anterior valves entirely granulated. Mantle-border wide, and beset with long aculeated blackish spines, very much resembling those of certain *Echini*. Locality, South Seas, according to Péron. Length three inches.

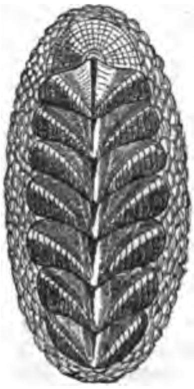
N.B. Lamarck describes the valves as smooth, and the specimen figured by Sowerby in his Genera has them nearly so. This may be the consequence of age and corrosion, for in a comparatively young specimen the sculpture of the valves is that above described. The species is very rare at present.

Chiton spiniferus. This is the *Chiton aculeatus* of Barnes, a name which had been preoccupied by Linnæus for another species, and the *Chiton tuberculiferus* of Sowerby in the 'Tankerville Catalogue;' but the latter name was given from an old specimen with broken spines, and has been rejected as inapplicable. Shell opaque, oblong ovate, reddish-brown, glossy; inside reddish-white. The posterior angles of the valves do not cover the anterior ones. Anterior valve with generally nine rows of raised dots diverging from the apex, but the number perhaps varies with the age of the shell. Second valve rather acutely beaked and carinated, longer than the five following, which are striated and shaped alike; these all rise into a rather acute beak, are carinated, each side of the carina being divided into two distinct portions, the anterior one the largest, and bearing broad, irregular, longitudinal striæ; a prominent row of raised dots, extending from the apex to the anterior angles of the valves, separates the compartments; the posterior portion glossy, with fine concentric striæ; the posterior margins with tooth-like granulations. Last valve striated, like the anterior compartments of the others, and rising into a rather prominent beak, leaning towards the posterior margin; from under the beak are raised dots, disposed in a similar manner to those on the anterior valve. Border coriaceous, thick, broad, rough, greenish or orange-coloured, and in the younger specimens thickly studded with blunt spines; but in the old shells the spines are short and scanty, and generally covered with corallines; the inner edge of the border, inserting itself under the posterior angles of the valves, has the appearance of being deeply separated. (Frembley.) This species grows to the length of five or six inches, but has then generally lost all its external beauty. We have seen many individuals in all the stages of growth, and have invariably found the spines of the aged ones covered with that calcareous matter which is so frequently found adhering to shells and submarine bodies, but we have never detected anything organic about that which was attached to the spines of this species. Locality, Chili and Valparaiso, where Mr. Frembley found several specimens in very exposed situations; so much so, that collecting them was attended with much difficulty, and not unfrequently with danger, from the violence of the sea breaking on the rocks to which they attach themselves very strongly. They are generally covered with sea-weed.


[Chiton spiniferus.]

ε. Mantle-border scaly. Example, *Chiton Coquimbensis* Frembley.

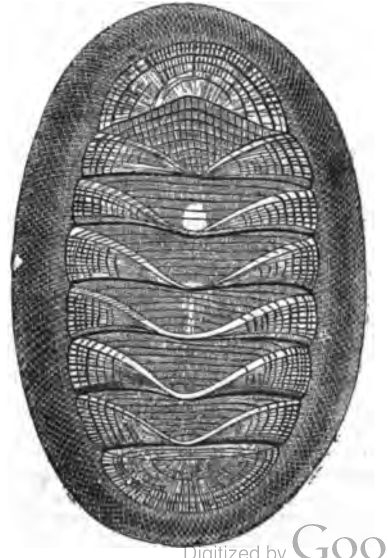
Shell ovate, narrow, opaque, greenish-brown, shining; inside blackish: the anterior valves with numerous undulated, concentric ridges; the next rather acutely keeled; the five following alike: carina broad and smooth, on each side of which is a similar ridge diverging from the beaks, and forming with the carina a sagittate figure, and connected with it by several strongly marked ridges: from under the beaks, to the anterior angles of the valves, extend sharp, moniliform ridges, each side of which is coarsely striated longitudinally. Border thick, moderately broad, and covered with coarse, seed-like scales, which are attached laterally. Length three inches, breadth one and a half (Frembley). The description was taken from a young shell; for as the shell advances in age, the middle of the valves, which are very solid, becomes eroded and covered with adhesions, *Balani*, *Patellæ*, &c. Mr. Frembley says, that the only part of the coast where he found this species was the south side of Coquimbo Bay: their habits, he adds, are very similar to those of *Ch. spiniferus* with the exception that they seem more gregarious.


[Chiton Coquimbensis.]

ζ. Mantle-border granulous.

Example. *Chiton magnificus*, Deshayes.

Shell opaque, ovate, olivaceous, dull, dotted with lighter coloured spots: inside glaucous. The anterior valve with regular radiating striæ, crossed by concentric ridges; posterior margin nearly straight. Dorsal valves obtusely beaked, divided laterally into two compartments; the anterior having regular longitudinal striæ, crossed with others very minute and concentric; from under the beaks diverge to the lateral margins of the valves coarse and more irregular striæ, which raise the posterior compartment above the other. The posterior valve has a well-defined apex, leaning towards the posterior margin. Border thin, moderately broad, and covered with fine shining bead-like gra-


[Chiton Magnificus.]

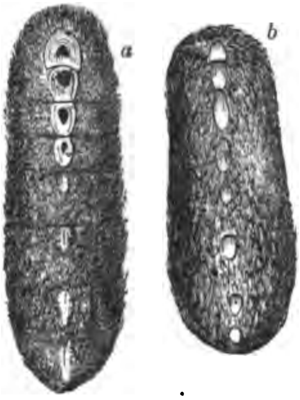
nulations, of the same colour as the shells, divided into two distinct portions, the upper of which is composed of finer beads than the lower, and which are placed transversely (Frembley). This is the *Chiton olivaceus* of Frembley, and *Chiton latus* of Sowerby (Tankerville Collection), which latter may be perhaps considered a variety, remarkable for its breadth. Deshayes had previously given to the species the name here assigned to it. The species grows to the length of four or five inches: we have seen one that reached four inches and a half when dead. There is another variety narrower than the ordinary individuals, and Mr. Frembley observes that, among the very young shells, some of them have their borders of a lighter colour than their shells, and spotted with black: this not being a constant character in all the young specimens, Mr. Frembley thinks they may be regarded as a variety. Locality, Chili.

*

Species with the border highly developed, and the valves very small. (*Chitonellus.*)

These are more or less cylindrical, and vermiform, the valves being very small, and in some species almost entirely hidden under the skin of the border, giving the animal an almost naked appearance.

Examples. *Chitonellus lævis*, and *Chitonellus larvæformis**.



a, Chitonellus lævis; *b*, Chitonellus larvæformis.

Fossil Chitons.

G. B. Sowerby states that the fossil species are rare; and that detached valves are sometimes found in the calcareous sand of the neighbourhood of Paris and in the English crag. Deshayes in his tables (Lyell) gives but one fossil species (tertiary): in the 7th vol. of his edition of Lamarck (1836), he says that up to that time (jusqu'à présent) but one fossil species was known; and that was discovered at Grignon by M. Defrance. Since, he adds, the genus has been found in the transition rocks (le terrain de transition) in the neighbourhood of Tournay; and he states that the knowledge of this curious and interesting fact is due to the researches of M. Duchastel and M. Puzos.

The student should refer to the great work of Poli (Testacea utriusque Siciliæ), the Memoir of Cuvier in the Annales du Muséum, the article *Oscabrion* (by De Blainville) in the Dictionnaire des Sciences Naturelles, and in his Malacologie; and that by Deshayes in the Encyclopédie Méthodique. He should also consult the writings of Broderip, Bruguière, Frembley, Gray, King, Lamarck, Linnæus, Montagu, Pennant, Quoy and Gaimard, Rang, Sowerby, and Wood.

CHITONELLUS. [Chiton.]

CHITTAGONG, a district in the south-east part of the province of Bengal, bounded on the north by Tiperah district, on the east by the Burmese empire, on the south by the province of Aracan, and on the west by the bay of Bengal. This district lies between 21° and 23° north lat., and between 91° and 93° east long.; its length from north to south is about 120 miles, and its greatest breadth 50 miles, but the eastern boundary has never been accurately defined, and the average breadth is supposed to be not greater than 25 miles. According to an estimate made in 1784, the district was computed to contain 2987 square miles, about two-thirds of which were unproductive hilly country. The level lands lie near to the sea; the interior is generally hilly, and covered with jungle, the rapid growth of which is favoured by the moistness of the climate. The rainy season sets in earlier than in most other parts of the province of Bengal, and continues later, sometimes till the middle of November. The country is watered by numerous streams, one half of which flow towards the bay of Bengal, and the rest into the Irawaddy. The most considerable of these streams is the Kamaphuli, or Chittagong river, which, at its mouth, forms a secure harbour, but so embayed, that during the continuance of the south-west monsoon it is generally difficult for vessels to put to sea. The channel of this river at the capital, Islamabad, is about a mile broad; but a little higher up its width does not exceed 200 yards, although the tide continues to flow strongly up the river. The source of this river is in Ava, whence it flows south-west to the district of Chittagong, which it enters by the Mugh mountains, where many waterfalls occur.

The river Nauf, which forms the southern boundary of the district, is about 70 miles south of Islamabad; it is not navigable: the banks of this river are, for the most part, covered with thick jungle, and exhibit only a few spots cleared for cultivation, and a few miserable dwellings of huntsmen, who catch and tame elephants, which are sent from Chittagong to every part of Hindustan. In the valley of the Kamaphuli are some rich tracts of land, cultivated by Bengalese, which yield plantains, ginger, betel-leaf, sugar-cane, cotton, indigo, and tobacco. The land is parcelled out into very small divisions, having formerly been assigned for the support of the military stationed in the district, to prevent the incursions of the Mughs of Aracan. When this military establishment ceased to be necessary the farms became zamindaries, and have been so considered in the administration of the country. Between the hills are several well-watered plains and valleys, of small extent, which are cultivated partly by Hindus of Bengal, and partly by Mughs of Aracan, who migrated into the district upon the conquest of their country by the Burmese in 1783. The majority of the Mughs who thus settled in Chittagong are traders and mechanics, only a small proportion having become cultivators. Exclusive of the Mugh settlers, the inhabitants of Chittagong were estimated, in 1801, at 1,200,000; but this number is probably excessive, considering the physical circumstances of the country The Mohammedan inhabitants exceed the Hindus in number in the proportion of three to two.

It is supposed that Chittagong was once a frontier province, belonging to the independent kingdom of Tripura, and that during the conflicts between the Buddhists and Brahmins, it was governed sometimes by chiefs of one and sometimes of the other religion. During the wars between the Moguls and Afghans, the district was held by the Buddhists of Aracan, and yet at the beginning of the present century the population contained scarcely a single Buddhist. In 1582 this district was enumerated by Abul Fazl among the dominions of the Mogul sovereigns, yet it does not appear to have been actually in their possession until 1666. Nearly a century later (1760), Chittagong was ceded to the East India Company, by Jaffier Ali Khan. In 1826, when Aracan was taken from the Burmese, the political superintendence of Chittagong was included within the government of Aracan, and has so continued to the present time.

(*Ayin-i-Akbari*; Rennell's *Memoir*; Hamilton's *East India Gazetteer*; *Report of Committee of House of Commons* (1832) *on affairs of India*.)

CHITTOOR, a town and small pollam or district on the western side of the Carnatic, in 13° 15′ N. lat., and 79° 10′ E. long., eighty-two miles west from Madras. The situation is naturally strong, being between two ranges of hills, one of which bounds the Balaghaut, and the other forms an irregular sweep of various elevation, and approaches within a few miles of the sea at a short distance from Madras. This tract was acquired from the Nabob of the Carnatic in 1801, and an assessment of the lands was made in the following year; but it was not until 1804, that the British obtained complete and quiet possession through the expulsion of the Poligars, or small tributary chiefs by whom the lands were held, and who had never been thoroughly subdued by the Mohammedans. (Hamilton's *East India Gazetteer*.)

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* Cuvier, in the last edition of the Règne Animal, has the following note to Chiton (Les Oscabrions). 'Les Oscabrelles (*Chitonellus*) de Lamarck et toutes les espèces de *Chiton* des auteurs doivent rester sous ce genre dont M. de Blainville a cru devoir faire une classe à part, qu'il nomme *Polyplaxiphores*, supposant qu'elle conduit aux animaux articulés.

CHIVALRY has commonly been represented as a great institution, invented in the eleventh century, for a grand moral purpose—that of struggling against the deplorable condition of society at that period—of protecting the weak against the strong, and redressing individual injuries. So prevalent and so deeply-rooted has been this notion of the origin of Chivalry, that we find it set forth even in the new *Histoire des Français* of M. de Sismondi, a writer usually so clear-sighted and so little a slave to the routine of his predecessors. But a closely attentive as well as philosophical analysis of the history of European society, in the middle ages, proves this theory, or rather this supposition, to be deceitful. It shows us that Chivalry was not, in the eleventh century, an innovation, an institution brought about by a special exigency which it was expressly adapted to meet. It arose much more simply, more naturally, and more silently; it was but the development of material facts long before existing—the spontaneous result of the Germanic manners and the feudal relations. It took its birth in the interior of the feudal mansions, without any set purpose beyond that of declaring, first, the admission of the young man to the rank and occupation of the warrior; secondly, the tie which bound him to his feudal superior—his lord, who conferred upon him the arms of knighthood.

Of this we find an irrefragable proof in the history of the term *miles* itself, which was constantly used in the latinity of the middle ages to designate the chevalier, or knight. Towards the end of the Roman empire, the verb *militare* signified simply to serve, to discharge some service towards a superior, whether the service itself were of a military or a civil nature. The service originally denoted by this expression, indeed, was, no doubt, the military service exclusively; but the use of the term had in course of time been extended until it embraced every subordinate office and function. After the Germanic invasions of the declining Roman empire, we find it frequently employed in speaking of the household of the barbarian kings, and the offices which their companions held about their persons. Soon, by a natural retrogression, in conformity with the new turn given to the social state, the term *miles* resumed its almost exclusively warlike character, and denoted the companion, faithful to the service of his superior. It thus became synonymous with *vassus*, or *vassallus*, and indicated that a certain man held of another a beneficium, or fee, and was attached to him by that consideration; in short, from the ninth to the twelfth century, the word *miles* denoted, not the chevalier, or knight, as ordinarily conceived of, and as M. de Sismondi himself has described him, but simply the companion, the vassal, of a feudal superior.

Here we see the true and necessary origin of chivalry. But in the course of its development, when once the feudal society had acquired some degree of stability and self-confidence, the usages, the feelings, the circumstances of every kind, which attended the young man's admission among the vassal warriors, came under two influences which soon gave them a fresh direction, and impressed them with a novel character. Religion and imagination, poetry and the church, laid hold on chivalry, and used it as a powerful means of attaining the object they had in view, of meeting the moral wants which it was their business to provide for. So early as the ninth century we find some religious ceremonies associated with the Germanic practices on these occasions. A succinct account of the reception of a chevalier, as practised in the twelfth century, will show what progress this combination had made, and how powerfully the church had laid its grasp on every particular of that solemn act of the feudal life.

The young man, the squire, aspiring to knighthood, was first of all stripped of his garments and put into a bath, the symbol of purification. On his coming out of the bath, they clad him in a white tunic, the symbol of purity, a red robe, emblematic of the blood which he was to shed in the cause of the faith, and a black doublet, in token of the dissolution which awaited him as well as all mankind. Thus purified and clothed, the novice kept a rigorous fast for twenty-four hours. When evening came, he entered the church, and passed the night in prayer, sometimes alone, sometimes with a priest and with sponsors who prayed in company with him. The next morning, his first act was confession; after which the priest administered to him the communion; and after communion he heard a mass of the Holy Ghost, and commonly a sermon on the duties of a chevalier, and the new course of life on which he was about to enter. When the sermon was over, the novice advanced towards the altar, with the sword of knighthood suspended from his neck: the priest took it off, blessed it, and attached it to his neck again. The novice then went and knelt before the lord who was to knight him. 'To what end,' the lord then asked him, 'do you desire to enter into this order? If it is that you may be rich, repose yourself, and be honoured without doing honour to knighthood, then you are unworthy of it, and would be to the knighthood you should receive, what the simoniacal clergyman is to the prelacy.' And on the young man's answering that he promised well to discharge the duties of a knight, the lord granted his request.

Then did knights in attendance, and sometimes ladies, approach the novice, and array him in his novel garb, putting on first the spurs, next the hauberk or coat of mail, then the cuirass or breast-plate, then the brassarts or arm-pieces, and the gauntlets, and lastly girding on the sword. Then, he was *dubbed*, to use the modern English expression derived from the French *adoubé*, which, according to Ducange, signified *adopted*. The lord rose from his seat, went up to him and gave him the *accolade*, that is, three strokes with the flat of his sword upon the shoulder or the nape of the neck, and sometimes a blow with the palm of his hand upon the cheek, saying, 'In the name of God, Saint Michael, and Saint George, I make thee a knight;' and sometimes adding, 'Be thou brave, bold, and loyal.' The young man being thus knighted, they handed him his helmet, and brought him a horse upon which he sprang, usually without the aid of the stirrup, and caracoled within the church, brandishing his lance and flourishing his sword. Then quitting the church, he went and exhibited himself in like manner in public, beneath the castle walls, before the populace, whom he found eagerly awaiting their share of the spectacle.

It is easy to recognize in all this the influence of the priesthood, studious to associate religion with every circumstance of a solemnity so important in the warrior's life. Not only have the Christian sacraments their place in the ceremonial, but several of the observances more peculiarly chivalric are assimilated as much as possible to the administration of a sacrament. Such was the share taken by the ecclesiastical order in what may be called the exterior material part of the reception of a knight. And when we look into the moral character of chivalry, when we examine the series of oaths required of the knights at various periods from the eleventh to the fourteenth century, and mark the ideas and the feelings with which it was sought to imbue them, we find the clerical influence no less distinctly apparent. Certain it is, that in the obligations thus imposed upon the chevalier, we find a moral development extremely foreign to the state of lay society at that period. Moral notions so exalted—often so delicately scrupulous—above all, so humane, and so constantly impressed with the religious character, evidently emanated from the clergy. They alone then viewed the duties and relations of men in such a light; and their influence, it must be owned, was constantly employed in directing towards the fulfilment of those duties, and the improvement of those relations, the ideas and the usages to which chivalry had given birth. Whatever evils resulted from the unscrupulous and improvident use which the Roman church made of this direct influence over the power of the sword, in promoting so many crusades against the infidel and the schismatic, it undeniably made use of the chivalric institutions which feudalism had brought forth, in labouring to introduce internal peace in society, and a stricter and more comprehensive morality into individual conduct.

In proportion as this endeavour succeeded, and as chivalry more and more appeared under a character at once warlike, religious, and moral, at once conformable and superior to the actual manners, it seized upon and inflamed the imaginations of men; and in like manner as it had intimately bound itself up with their belief, so it also became the ideal standard of their aspirations, and the source of their most exalted pleasures. Poetry, in short, laid hold on chivalry, as religion had already done. As early as the eleventh century, the chivalric ceremonies, duties, and adventures, formed the mine to which the poets resorted for the means of charming the people: of at once gratifying and stimulating that craving of the imagination, that thirst for incidents more varied and more stirring, for emotions purer and more elevated, than real life affords. For it should be observed that in the earlier stages of society poetry is not merely a national pastime; it is also a means of progress, exalting and developing man's moral nature. The poetical remains that have descended to us from that age show, that the poet imposed upon the chevalier the fulfilment of the same duties, and the practice of the same virtues, as were inculcated in the more solemn exhortations of the priest.

It is an oft-repeated observation, that all this was mere poetry, a fine chimæra, bearing no resemblance whatever to the reality. And indeed, when we consider the state of manners in those three centuries, and the incidents of daily occurrence that filled the lives of men, the contrast between the duties and the actions of the chevaliers is truly shocking. The period before us is undoubtedly one of the most grossly brutal in the history of European society, one in which we find the greatest amount of crime and violence, in which the public peace was most incessantly disturbed, in which the most dissolute manners prevailed. To any one attending only to the positive and practical state of society, all this poetry and morality of chivalry looks like sheer falsehood. Yet it is undeniable that the chivalric morality and poetry existed simultaneously with these disorders, with this barbarism, with all this deplorable social state. The monuments are before us: the contrast, we repeat, is shocking, but it is real.

This very contrast, however, forms the great distinctive characteristic of the middle ages. When we look into other social systems, as the Greek and Roman, when we examine, for instance, the early stage of Greek society, its heroic age, of which the poems that bear the name of Homer present a faithful mirror, we there find nothing resembling the contradiction that strikes us in the middle ages. The practice and the theory of manners are there nearly accordant. We do not find men having ideas much purer, nobler, and more generous than their daily acts. Homer's heroes seem quite unconscious of their own brutality, ferocity, selfishness, and covetousness; their moral science is no better than their conduct; their principles are on a level with their acts. We find it to have been the same with all other social systems in their vigorous and turbulent youth. But in Europe, on the contrary, in the middle ages, while the deeds are habitually detestable, while crimes and disorders of every description abound, yet we find dwelling in the minds and imaginations of men nobler instincts and more exalted aspirations. Their notions of virtue are much more developed; their ideas of justice incomparably better than what is practised around them, than what they practise themselves. A brighter ideal of morality hovers, as it were, above that rude and stormy social state, attracting the view and commanding the respect of men whose lives are little conformable to it. Christianity must undoubtedly be ranked among the principal causes of this fact: for its great characteristic is, its labouring to inspire men with a high moral ambition, to keep constantly before their eyes a standard infinitely superior to human reality, and stimulate them to attain it. But whatever be the cause, the fact is indubitable. We find it everywhere in the middle ages, in the popular poetry as well as in the exhortations of the priests. The moral conceptions of men rose far above the practice of their lives. Nor let it be thought, because those conceptions did not govern their actions, because their practice so strangely belied their theory, that the influence of the theory was absolutely null. The habitual judgment of men upon human actions is not without its effect. It has been justly remarked, that a bad action is better than a bad principle: a bad action may remain isolated and solitary; but a bad principle is constantly fructifying: for, after all, it is the mind that governs; and a man acts from reflection much oftener than he is himself aware of. In the ages of chivalry, we repeat, the principles were infinitely better than the acts. For instance, at no period perhaps has the intercourse between the sexes been more licentious; yet never was purity of manners more strongly enjoined or more feelingly described. Nor was it a theme for poetic eulogy alone. We find from a multitude of testimonies that the public thought in this particular as the poet spoke, that the prevailing moral notions were pure and noble amidst all the rudeness and licentiousness of conduct.

This, then, was the grand moral characteristic of chivalry, which entitles it to an important place in the history of modern civilization. If, on the other hand, we regard it not in a moral but in a social point of view, not as an idea, but as an institution, it merits but slight consideration; for though it had a great and stirring part in the world's affairs, yet, as already shown, it did not constitute an actual specific institution at all. The feudal lords, the possessors of fiefs, were alone chevaliers; they alone, with few exceptions, had the right to become so. The knights formed no separate class of society with distinct functions and duties Thus chivalry, properly so called, being inseparably bound up with feudality, could not survive its extinction; and accordingly, so early as the fourteenth century, when compared with its condition in the twelfth, we find it to be rapidly declining.

It had, however, given birth to the religious orders, as the Templars, the Knights of St. John, and the Teutonic knights; and it was beginning to produce the courtly orders—those of garters and ribbons—the knighthood of mere rank and parade. It was destined to tincture yet a long while the manners, the language, and the literature of European society. But the true chivalry, that to which alone the name can strictly be applied, flourished and fell with feudalism.

CHIVES, a small species of allium called ampeloprasum. Its bulbs have the usual garlic odour of the genus, and are used in soups and stews: they are but little cultivated.

CHLÆ'NIUS, a genus of coleopterous insects, of the family *Harpalidæ*, and section *Patellimmanes* (Dejean.)

The species of this genus are all of tolerably large size, very elegant in form, and generally adorned with various hues of green, the colours being rich, but not glossy, owing to the upper parts being more or less covered with a very delicate pubescence, which produces a silk-like appearance. Very many of the species have the legs and antennæ of a pale yellow colour, and the outer margin of the wing-cases of the same tint, and some have the elytra adorned with large yellow spots.

The genus Chlænius constitutes a very large group of the Harpalidæ, which, according to our views, embraces the genera *Epomis* and *Dinodes*, we will therefore briefly notice the distinguishing characters of these three groups.

All three of the genera agree in having the tarsi of the anterior pair of legs dilated in the males, and a bifid tooth in the middle of the emargination of the mentum; but they differ chiefly in the form of the terminal joint of the palpi, and the difference may be thus expressed:—

Terminal joint of the palpi.

Elongated and truncated at the apex,	*Chlænius.*
Elongated and distinctly securiform *,	*Epomis.*
Short and slightly securiform,	*Dinodes.*

As regards the form of these insects, the body is generally more or less oval, and very slightly convex: the thorax is almost always considerably narrower than the elytra, broad towards the anterior part, and diminishing in width towards the posterior. The head is rather long, the eyes project considerably, and are rather remote from the base of the head; the portion of the head before the eyes is rather pointed.

The species are found under stones, weeds, and almost any rubbish which will afford them shelter; sometimes under the loose bark of old trees, near the root, but they must be sought after in the vicinity of water.

Of the genus Chlænius M. Le Comte Dejean enumerates one hundred and fifteen species, a great portion of which are European; many are from Africa, the East Indies, and North America, but South America and Australia appear to be almost destitute of these insects.

In England eight species have been discovered; of these however two only have been found in any abundance *Chlænius vestitus* (*Carabus marginatus*, Lin.) is very common in the south of England, and is found under stones by the edges of ponds where gravel abounds. It is nearly half an inch in length, black beneath, and of a rich green colour above: the elytra are distinctly striated, very finely punctured, and covered with a delicate pubescence of a golden hue: their outer margin is of a pale yellow colour: this tint is confined to a narrow line towards the base of the elytra, but forms a broad patch at the apex; the head and thorax are rather glossy; the latter is finely punctured throughout, and has the margin slightly tinted with yellow; the legs, antennæ, and palpi are yellowish-white when the insect is alive.

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* Securiform (*securiformis*). 'When the last joint of the feeler is triangular, and the preceding joint is connected with the vertex of the triangle.' Kirby and Spence's *Introduction to Entomology*, vol. iv., p. 380

Of the genus *Epomis* M. Dejean enumerates six species, one of which is said to have been found in England, but it is here decidedly very rare, since only three specimens are recorded. It is about three-quarters of an inch in length; the head and thorax are of an obscure brassy-green colour and slightly punctured; the elytra are black, with the outer margin pale yellow; the legs and antennæ are also yellow.

This species is not uncommon in France and Italy.

The genus *Dinodes* only embraces four species. *D. rufipes* is about half an inch in length, of a rich blue colour above, and finely punctured throughout: the legs and base of the antennæ are of a reddish-yellow colour.

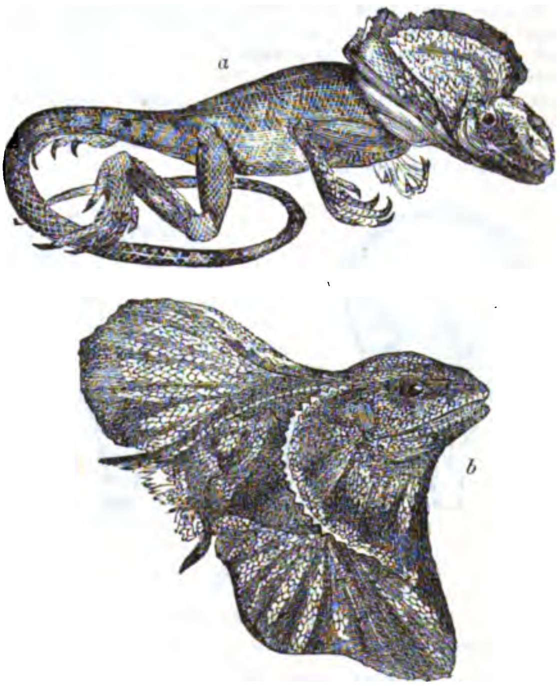
The thorax in this genus (taking *D. rufipes* as the type) is broader and more rounded than in the genera Chlænius and Epomis. The species described is found in France and Italy.

CHLAMYDOSAURUS, a genus of Saurians, founded by Mr. Gray, upon a specimen brought home by Captain Phillip Parker King, R.N., F.R.S., &c., on his return from his survey of the intertropical and western coasts of Australia, performed between the years 1818 and 1822. The following is Mr. Gray's description:—

Animal scaly; the head depressed; the nostrils placed on the side, midway between the eyes and the end of the head; the drum of the ear naked; the front teeth conical, awl-shaped (eight in the upper, and four in the lower jaw), the hinder ones longest; the side or cheek teeth compressed, short, forming a single ridge, gradually longer behind; tongue short, fleshy, with an oval smooth disk at each side of the lower part of its front part; neck rather long, furnished on each side with a large plaited frill, supported above by a crescent-shaped cartilage, arising from the upper hinder part of the ear, and, in the middle, by an elongation of the side fork of the bone of the tongue; body compressed, legs rather long, especially the hinder ones; destitute of femoral pores; feet four, with five toes, the first having two, the second three, the third four, the fourth five, and the little finger and toe three joints; claws compressed, hooked; tail long, nearly round, scaly. Example, *Chlamydosaurus Kingii*. The colour is yellowish-brown, variegated with black. The head is depressed, with the sides erect, leaving a blunt ridge on the upper part wherein the eyes are placed. The ridge over the eyes is covered with larger scales than those over the head. The eyes are rather small, with a fleshy ridge above them, and the eyelids are covered with minute scales, and surrounded by a delicate serrated ridge of small upright ones. The lips are surrounded by a row of oblong four-sided scales, arranged lengthways, the front scale of the upper lip being the largest. The chin is covered with narrow mid-ribbed scales, with a five-sided one in the centre, and several of larger size just over the front of the fork of the lower jaw. The nostrils are surrounded by a rather large orbicular scale, situated nearly mid-way between the eye and the end of the upper jaw, the tubes pointing forwards. The side of the face has a very obscure ridge extending from the angle of the mouth to the under part of the ear. The neck is covered with small scales. The frill arises from the hinder part of the head, just over the front of the ears, is attached to the sides of the neck, and extends down to the front part of the chest, supported above by a lunate cartilage arising from the hinder dorsal part of the ear, and in the centre by a bone which extends about half its length. Each frill has four plaits which converge on the under part of the chin, and fold it up on the side, and a fifth where the two are united in the centre of the lower part of the neck. The front part of its upper edge is elegantly serrated, but the hinder or lower part is quite entire: the outer surface is covered with carinated scales, those in the centre being the largest. The inner surface is quite smooth. The scales of the back are oval, and nearly smooth; those of the lower part of the body and upper part of the legs have a short mid-rib, and those of the sides and joints of the limbs are minute. The tail is twice as long as the body, roundish, covered with scales which have each a sharp mid-rib, and towards the termination, which is blunt, form six rows, so as to render that organ obscurely hexagonal. The toes are long, very unequal, compressed, and scaly. The claws are hooked, and horn-coloured.

Dimensions. Length of the tail, twelve inches; of the body, five; of the head, five and a-half. Breadth of the head over the eyes, one inch. Length of the thigh, one inch nine-tenths; of the foot and sole, two inches two-tenths; of the outer edge of the frill, ten inches.

Locality and *Habits.* We owe the discovery of this extraordinary Saurian to Mr. Allan Cunningham, who accompanied Capt. King's expedition as his Majesty's botanical collector for Kew Gardens, and to whom naturalists in general are so much indebted for the zeal displayed by him in favour of natural history, and for the liberality with which he has communicated the results of his labours. He found the specimen from which the description was taken on the branch of a tree in Careening Bay, at the bottom of Port Nelson, and sent it to Sir Everard Home, by whom it was deposited in the Museum of the Royal College of Surgeons. The following is the account of the capture in Mr. Cunningham's Journal:—'I secured a lizard of extraordinary appearance, which had perched itself upon the stem of a small decayed tree; it had a curious crenated membrane, like a ruff or tippet round its neck, covering its shoulders, and when expanded, which it was enabled to do by means of transverse slender cartilages, it spreads five inches in the form of an open umbrella. I regret that my eagerness to secure so interesting an animal did not admit of sufficient time to allow the lizard by its alarm or irritability to show how far it depended upon, or what use it made of, this extraordinary membrane when its life was threatened. Its head was rather large, and eyes, whilst living, rather prominent; its tongue, although bifid, was short and thick, and appeared to be tubular.' According to Captain King, the colour of the tongue and inside of the mouth was yellow. Mr. Gray is of opinion that this genus is nearly allied to the *Agamæ*. [Agama, Zoology.] We give a representation of the dead animal from the figure in the Appendix to Captain King's 'Voyage,' where the animal and its capture are described; and, below it, a representation of the living head, as it is seen in the illustrations to the 'Suites à Buffon.'

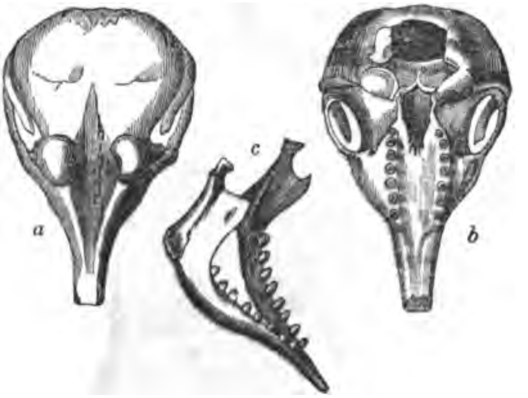


[Chlamydosaurus Kingii.]

a, the animal in the Museum of the College of Surgeons; *b*, representation of the living head.

CHLAMY'PHORUS (Zoology), Dr. Harlan's name for a genus of quadrupeds, of the order *Edentata*, first described by him in the 'Annals of the New York Lyceum of Natural History,' vol. i., from a specimen presented to the Philadelphia Museum, on the 18th December, 1824, by Mr. William Closeberry, according to whom it is the *Pichiciago* of the Indians in Mendoza (its native place), on the east of the Cordilleras, in lat. 33° 25′, and long. 69° 47′. It had been obtained on the spot in a living state, but lived in confinement only a few days. The viscera and the greater portion of the skeleton had been removed before the animal came into Dr. Harlan's possession. In March, 1828, the council of the Zoological Society of London, influenced by the recommendation of Mr. Vigors, placed in the hands of Mr. Yarrell a specimen of this rare and new animal, and the latter able zoologist so executed the trust reposed in him, as to produce a perfect skeleton, without injuring the skin, which was mounted by Mr. Leadbeater. When Mr. Yarrell returned the specimen to the Society, he accompanied it with a valuable paper on the osteology of the animal, from which we are enabled to supply the information which the absence of materials prevented Dr. Harlan from giving.

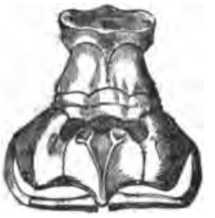
Osteology. The form of the head presents the figure of an irregular cone, the base of which is turned toward the spine; the cranium does not exhibit any sutures; the cavity capacious; the frontal bone supporting two rounded processes projecting upwards and somewhat outwards; the space between them occupied by a substance resembling in appearance adipose matter, from which issued a fluid-like oil. From the anterior part of the base of these two rounded processes, a narrow ridge of bone extends forwards on each side converging towards the nose. The nasal bones elongated, the orifice opening downwards. No incisor nor canine teeth in either jaw; molars $\frac{8}{8}$, cylindrical, separate, encircled with enamel, but none on the crowns; the first tooth on each side in the lower jaw, having no opponent, is the longest, the remaining seven opposed to the first seven of the upper jaw, and taking angular impressions on their surfaces by contact; the direction and depth of the alveolar cavities of the upper jaw distinctly marked on the outside by parallel ridges; in the lower jaw the alveolar cavities are pierced the whole depth. The anterior portion of the lower jaw is elongated; the inferior edge concave the first half of its length, then convex; the plate broad, rising at right angles with the line of the teeth; the condyloid process longer than the coronoid, the condyle itself elongated transversely. The external meatus auditorius is extended in the form of a semicircular cylindrical tube of bone, curving round the base of the zygoma, and passing forwards terminates in an aperture immediately behind the eye. The orbits and temporal fossæ united; the zygomatic arch is slender posteriorly, but becomes much stronger towards the front, expanding downwards, and furnished with an acute descending process. The occipital foramen is of great size.



[Skull of *Chlamyphorus* truncatus.]

a, skull seen from above; *b*, the same seen from below; *c*, lower jaw.

The cervical vertebræ seven, the first large, the articulating surface broad; the 2nd, 3rd, and 4th, very firmly ossified together, pierced with foramina for the passage of the cervical vessels; the 5th united to the 4th on the under surface only; the 6th and 7th slender and separate, allowing the head great freedom of motion upwards; the whole of the last six grooved on the under surface, in the line of the passage of the œsophagus. Dorsal vertebræ eleven, the spinous process of the first slender, three-eighths of an inch long, the others diminish gradually in length, but increase in size; all directed backwards. The first rib is very broad, and from the 2nd to the 8th, the ribs of the *Chlamyphorus*, like those of birds, are firmly united to the sternum without the intervention of an elongated cartilage; and, again like those of birds, are also supplied with a false joint, at the distance of about two-thirds of their length from the spine to the sternum. The 9th, 10th and 11th, being false ribs, are united in the usual way to each other, and to the 8th, by elongations of cartilage from their extremities. The portions of ribs intervening between the false joints and the sternum are in the 6th, 7th, and 8th ribs, consolidated, broad, flattened portions of bone, which form the boundary of the anterior and lateral parietes of the thorax. The first bone of the sternum is broad and flat, the superior surface regularly concave, the inferior irregularly convex. Upon the anterior edge of the sternum are two prominences, to which are attached the extremities of each clavicle. From each of these articulations a slightly elevated ridge proceeds backwards along the inferior surface of the sternum, converging towards the centre, where they become united, and form a prominent crest. The lateral edges of this first bone of the sternum are articulated at its anterior extremity to the first and broadest rib; from this part the bone suddenly becomes narrowed posteriorly, and terminates in a concave articular surface to which the second bone of the sternum is attached. Judging from the imperfect remains of the second bone, of which the upper part only was distinguishable, it would appear that its form was oblong, the superior surface concave. The remaining portion of the sternum was too much mutilated to admit further description.



[Cervical vertebræ, first bone of the sternum, with parts of the first and second ribs, seen from below.]

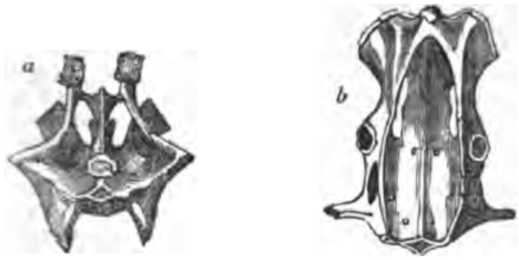
Lumbar vertebræ three, the spinous processes short and flattened; the two last dorsal vertebræ, as well as the lumbar, furnished with long oblique processes directed forwards, upwards, and outwards; the transverse processes of the first two lumbar vertebræ considerably elongated, the last possessing a rudiment only.

The whole of the sacrum and innominata is so peculiar and unique in character, that it is scarcely possible to give any correct idea of this part, without the assistance of accurate representations. The superior part of the ilium is flattened, the upper part bent to form an arched plane of bone, the concavity of which faces downwards and outwards; the crista of great length from before backwards. The inferior portion of the ilium is much stronger, inclining outwards, from its junction with the sacrum to the acetabulum.

The transverse and spinous processes of the sacrum are represented by three slender plates of bone, which, approximating as they pass backwards, are united to form a septum, extending down the median line of the sacrum to the tail. A channel is formed on each side of this septum by a thin flat plate of bone, which, arising from the posterior and superior part of the ischium on each side, is bent over the back part of the sacrum, and fixed to an arched and prominent plate of bone, which is extended from this septum outwards, to form a junction with it. The channels thus produced are bounded below by the sacrum, on the inner sides by the septum, on the outer sides by the ascending plates of bone just described, and above by the junction of both. From this union a short osseous stem issues horizontally on each side, and expands into a flattened circular plate of bone, to the rough surface of which, as well as to the tuberosity of the ischium below, portions of the truncated exterior of the animal are firmly attached.

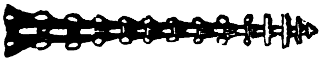
The under surface of the sacrum is broad and flattened, and marked by an indistinct central ridge. The pelvis is open in front, the ossa pubis on each side do not incline inwards, but descend at right angles from the horizontal surface of the sacrum. In the circumstance of the pelvis being open, there is a second resemblance to the bony structure in birds.

The caudal vertebræ are fourteen in number; the transverse processes of the last four are elongated, to support the thin dilated lateral edges of the paddle or spatular extremity of the tail. Large muscles are imbedded in the two cavities formed on the upper surface of the sacrum by its septum and the two lateral elevated portions of the schema before described; and there are antagonist muscles



a, the pelvis seen from behind; b, the same seen from below.

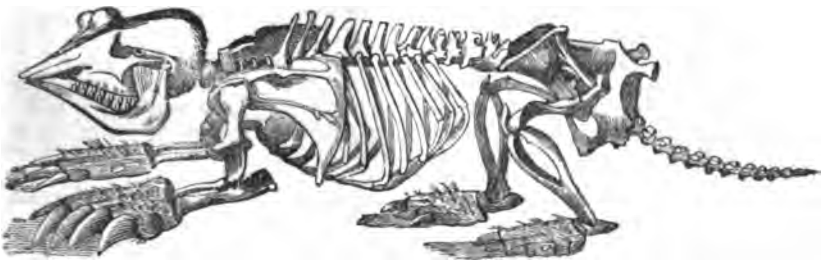
of equal size on the under surface. The tendons of these muscles were inserted on the upper and under parts of the caudal vertebræ, giving great power to the tail, which is probably exercised in removing backwards the loose earth accumulated under the belly of this burrowing animal by the action of the fore legs, and for which purpose the expanded and flattened extremity seems well calculated.



[Vertebræ of the tail.]

The scapula has its superior margin straight, ending in a notch of great size; the base rounded; the inferior margin concave, and the posterior inferior angle considerably elongated; the coracoid process but little produced, the spine elevated, the acromion very long, passing forwards, downwards, and inwards, over the head of the humerus, to be articulated to a long and slender, but perfect clavicle. There is a second spine of smaller size, parallel to, but beneath the true spine. The humerus is three-fourths of an inch in length, large, and broad; the deltoid crest prominent; between which and the external condyle a deep groove is formed for the lodgment of muscles, &c.; both condyles very much elongated transversely; the inner condyle perforated above; the edge rising from the external condyle acute. The radius small, and seven-sixteenths of an inch in length; the ulna flattened, concave upwards, the olecranon nearly as long as the ulna, horizontally flattened also, and presenting a superior concave surface, ending in a curve pointing downwards. The feet furnished with sesamoid bones for the insertion of the tendons of the flexor muscles.

The femur, thirteen-sixteenths of an inch long, large and strong; the length of the neck considerable; the great trochanter elongated backwards beyond the line of the articulation of the head of the femur with the acetabulum, and ending in a tuberosity; the lesser trochanter directed downwards; a third trochanter projecting from the outer side of the shaft of the femur somewhat above the middle; the condyles moderately elongated transversely, the outer having a crest directed backwards. The tibia and fibula fifteen-sixteenths of an inch, flattened, concave inwards, firmly anchylosed at each extremity, and arched in opposite directions, giving an appearance of great size and strength to the leg. The os calcis elongated backwards, flat, and ending in a curve slightly inclined upwards. Hind feet plantigrade.



[Skeleton of Chlamyphorus truncatus, with the exception of the feet, which are covered with the integuments.]

Mr. Yarrell observed the following points of resemblance between the skeleton of *Chlamyphorus* and that of other quadrupeds:—1. Beaver (*Castor Fiber*), in the form and substance of some of the bones of the limbs, in the flattened and dilated extremity of the tail, and the elongation of the transverse processes of the lower caudal vertebræ, but no further. 2. Mole (*Talpa Europæa*), in the shortness and great strength of the legs, and in the articulation of the claws to the first phalanges of the toes; but in the form of the bones of the anterior extremity, as well as in the compressed claws, it is perfectly different, nor do the articulations of the bones, nor the arrangement of the muscles, allow any of the lateral motion so conspicuous in the mole. The hinder extremities of *Chlamyphorus* are also much more powerful. 3. Sloth (*Bradypus tridactylus*), in the form of the teeth, and in the acute descending process of the zygoma, but not otherwise. 4. Armadilloes (*Dasypi*), in the coat of mail, in the peculiar ossification of the cervical vertebræ, in possessing the sesamoid bones of the feet, and in the general form of the bones, except those of the pelvis; they differ however in the form and appendages of the head and in the tail. 5. *Orycteropus Capensis* and *Myrmecophaga jubata*, in some of the bones. 6. *Echidna* and *Ornithorhynchus*, in the form of the first bone of the sternum, and in the bony articulations as well as the dilated connecting plates of the true and false ribs. 7 and 8. *Ruminantia* and *Pachydermata*, in the form of the lower jaw, and in other points equally obvious. The unique points in its structure appear to be the form of the head and the open pelvis.

Dr. Buckland (Bridgewater Treatise) considers *Chlamyphorus* one of the nearest approximations to *Megatherium*, particularly in regard to its coat of mail, and in the adaptation of the animal for digging.

According to Dr. Harlan, the total length of the entire animal is five inches two-eighths. The *shell* which covers the body is of a consistence somewhat more dense and inflexible than sole leather of equal thickness, and is composed of a series of plates of a square, rhomboidal, or cubical form, each row separated by an epidermal or membranous production, which is reflected above and beneath, over the plates: the rows include from fifteen to twenty-two plates, the shell being broadest at its posterior half, extending about one-half round the body. This covering is loose throughout, excepting along the spine of the back and top of the head, being attached to the back immediately above the spine by a loose cuticular production, and by the two remarkable bony processes on the top of the *os frontis*, by means of two large plates, which are nearly incorporated with the bone beneath; but for this attachment the covering would be very easily detached. The number of rows of plates on the back, counting from the vertex, where they commence, is twenty-four; at the twenty-fourth the shell curves suddenly downwards, so as to form a right angle with the body: this truncated surface is composed of plates, nearly similar to those of the back; they are disposed in semicircular rows, five in number the lower margin, somewhat elliptical, presents a notch in its centre, in which is attached the free portion of tail, which makes an abrupt curvature, and runs beneath the belly parallel to the axis of the body, the extremity of the tail being depressed, so as to form a paddle; the rest of the tail compressed. The superior semicircular margin of the truncated surface, together with the lateral margins of the shell, are beautifully fringed with silky hair.

Head.—Posterior half, broad, anterior half, before the eyes, tapering; the occiput is covered by the five first rows of the back plates with which they are continuous; the occiput not distinguishable externally. The anterior half of the top of the head is covered, first, by a row of large plates, five in number, which are firmly attached to the bone beneath, particularly the two outer; secondly, by a smaller row, six in number, anterior to which, that is to say, the top of the snout is covered with smaller plates irregularly disposed.

Mr. Yarrell observes that when separating the skin from the muscles of the back, the fibres (described by Dr. Harlan) by which the outer coat was attached in the line of the vertebræ were found to be adherent to the muscles immediately investing the spinous processes, and each of them, Mr. Yarrell supposes, probably affords a nidus for vessels nourishing the external covering; but these attachments did not extend below the dorsal vertebræ. Proceeding from thence forwards, the great size of the muscles of the scapulæ and neck was apparent, filling up the whole space, the back and upper portion of the head forming one continued line. The thick plate of scales covering the frontal portion of the head was without difficulty separated from the surfaces of the singular bony processes of the os frontis; the projecting cartilaginous portion of the nose was removed with the skin, and the tendons of several muscles giving motion to the snout were cut through.

The hinder portion of the body still remained to be separated from the skin, and this was found to be a matter of some difficulty. The posterior and inferior portions of the sacrum on each side were firmly united by distinct attachments, differing in form, to certain scales of the truncated extremity of the outer covering.

The necessity of preserving this outer covering entire rendered a division of these portions of bone necessary, and from the particular form of the part, this was attended with some hazard, but was ultimately accomplished without injury, the bones being cut through as near to, and as parallel with, the inner surface of the plates, as their confined situation would admit. The covering of the tail was separated from the vertebræ as far as the flattened extremity, where the greater elongation of the transverse processes of the last four vertebræ, and the tenuity of this flattened portion, made further separation difficult. The tail was then divided between the tenth and eleventh vertebræ, and both parts of the animal entirely separated.

On the inner surface of the removed skin were two long, broad, and thin muscles, extending the whole length of the back; each muscle was divided, as it approached the shoulder, into two portions; the outer one was attached to the superior and greater spine of the scapular bone, the inner and longer slip proceeded forwards, and was inserted into the transverse occipital ridge. The posterior extremity of each muscle was attached to the superior edge of the spine of the ilium.

External Ear.—This, according to Dr. Harlan, consists of a circular, somewhat patulous opening, directly posterior to the eye, surrounded with an elevated margin, and communicating with a bony canal.

Eye.—Minute, totally black; and, like the ear, nearly hidden by long silky hair.

Mouth.—Gape small.

Nose.—Furnished with an enlarged cartilage, as in the hog; the anterior nares opening downwards at the inferior border.

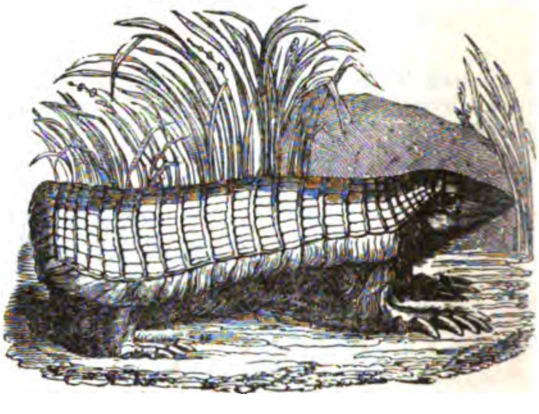
The whole surface of the body is, it appears from the same author, and the correctness of his description is proved by an inspection of the stuffed specimen, covered with fine silk-like hair, longer and finer than that of the mole, but not so thick set. The anterior of the chest is large, full, and strong; the anterior extremities short, clumsy, and powerful; the hair is continued for some distance on the palm—the phalanges of the hand united; five powerful nails rising gradually one above the other; the external shortest and broadest; the whole so arranged as to form a sharp cutting instrument, rather scooped, very convenient for progression under ground, and such as must very much impede motion on the surface. Hind legs weak and short; feet long and narrow; the sole resembles considerably the human foot, having a well defined heel, which rests flat upon the ground, and being arched in the middle, toes separate, nails strong.

In the specimen dissected by Mr. Yarrell, the abdomen and thorax had been opened throughout their whole length, and the viscera from both cavities had been entirely removed. Adhering to the skin lining the truncated portion of the animal, were two sacs which had been lodged in cavities on each outer side of the sacrum, immediately under the superior projection, made evident by the corresponding depression in the investing muscle of that part. These globular bags were lined with a secreting surface, but having suffered some mutilation in removal, the mode by which the secretion passed, or its particular use, could not be ascertained. Mr. Yarrell thinks that they are probably analogous to the well-known anal glands of various other quadrupeds.

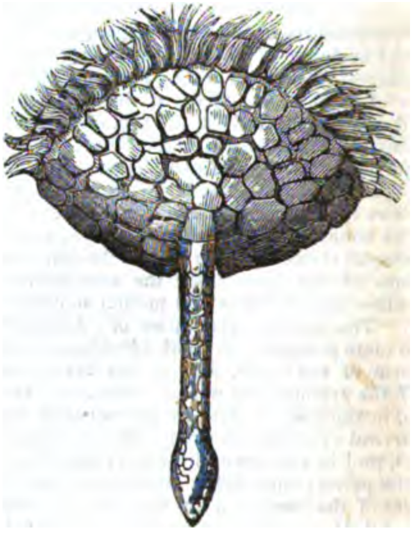
Sexual Organs.—The sex, in the specimen dissected by Mr. Yarrell, was evident from the penis remaining attached to one edge of the divided abdominal muscles; and, lying quite loose in the cavity of the abdomen, was found one of the testes, but whether its original situation had been internal or external to the parietes, could not be ascertained. The penis itself was large compared to the size of the animal, and one inch and one-eighth in length. The confined situation of the female sexual organ, in Mr. Yarrell's opinion, probably renders such a provision necessary, the truncated portion of the coat of mail covering the whole of the posterior extremity.

We must refer the reader for further particulars to the papers of Dr. Harlan and Mr. Yarrell, both of which are to be found in the 'Zoological Journal' (vols. ii. and iii.)

Habits. According to Mr. Closeberry the habits of *chlamyphorus* resemble those of the mole, as it lives for the most part under ground. He adds that the animal is reputed to carry its young beneath the scaly cloak with which it is covered, and that the tail possessed little or no motion. The carrying the young in the manner described may be considered apocryphal till further evidence is obtained*



[Chlamyphorus truncatus.]



[Truncated extremity and tail.]

CHLAMYS. [CHRYSOMELIDÆ.]

CHLEN'ACEÆ, a natural order of polypetalous exogens, by some accounted an ally of Malvaceæ, but more correctly referred to the vicinity of Cistaceæ, from which, and all those associated with them in the Gynobasic group, they differ in having an involucrum to each calyx, or to each pair of calices: they are handsome trees or shrubs, but of no known use; their leaves are alternate and undivided, their stipules deciduous, and their flowers in panicles or racemes, always showy, and often red. The whole of them are wild in Madagascar.

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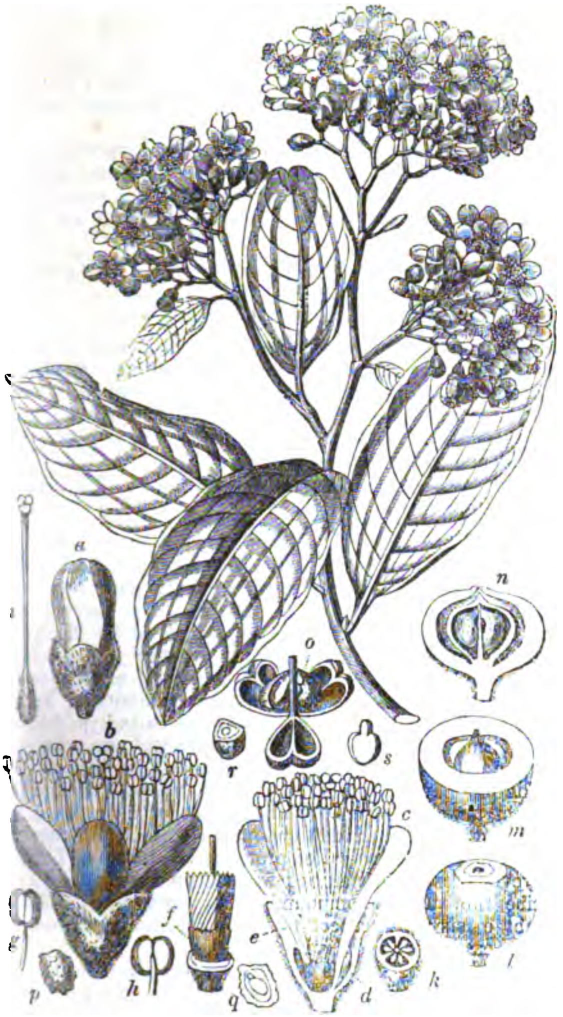
* The osteological figures are taken from Mr. Yarrell's Memoir.



[Sarcolæna multiflora.]

a, flower-bud; b, flower; c, vertical section of flower; d, the calyx. e, the involucrum; f, base of the flower, showing the spiral tube formed by the union of the filaments; g, h, back and front views of anthers; i, pistil; k, transverse section of ovary; l, fruit; m, transverse section of fruit; n, vertical section of fruit; o, pericarp, splitting and discharging its seed; p, seed; q, vertical section of seed; r, transverse do.; s, embryo.

CHLOEIA. [DORSIBRANCHIATA.]

CHLORAL, a liquid prepared by Liebig with chlorine and alcohol, from the first syllables of which words its name is derived. To form it, a current of dry chlorine gas is passed into anhydrous alcohol, at first kept cool, but afterwards sufficiently heated to expel the hydrochloric acid formed. During the action of these substances one portion of the chlorine unites with the hydrogen of the alcohol to form hydrochloric acid, and another portion with its oxygen and carbon to constitute chloral. When the operation has been long continued, a liquid of the consistence of a syrup is procured, which afterwards becomes solid; it is a hydrate of chloral containing some undecomposed alcohol and a portion of hydrochloric acid. It is then to be shaken with concentrated sulphuric acid, which combines with the water, and the chloral rises in a fluid state to the surface; this is to be mixed with lime, and by distillation the chloral is obtained free from hydrochloric acid.

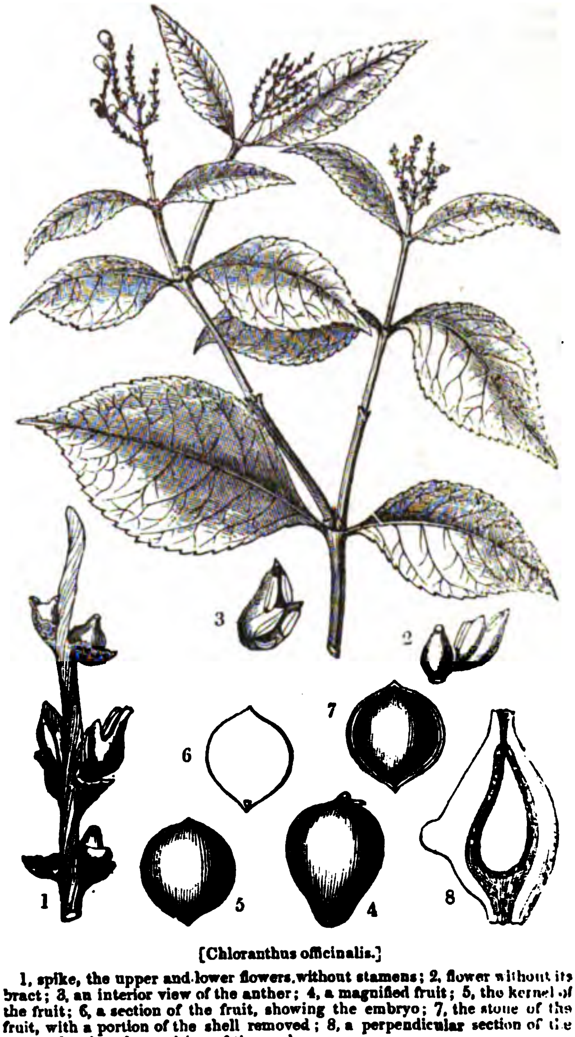
Chloral is a colourless transparent oily-looking fluid; its smell is pungent, and its taste but slight; its specific gravity is 1·502; at about 200° Fahrenheit it boils, and the vapour condenses unchanged. Water when warmed dissolves chloral, but when mixed with a small quantity of it, they combine, when agitated, into a solid crystalline hydrate. It combines with bromine, iodine, and sulphur; when its vapour is passed over lime heated to 212°, it is decomposed, oxide of carbon is evolved, and chloride of calcium, mixed with a little charcoal, remains; by solution of potash or soda it is also decomposed, and a chloride of carbon is formed.

Chloral consists of

Six equivalents	of chlorine	36 × 6 =	216
Four „	oxygen	8 × 4 =	32
Nine „	carbon	6 × 9 =	54
			302

CHLORANTHA'CEÆ, a natural order of achlamydeous exogens, allied to the Peppers, and, like them, having an aromatic fragrant odour; they are known from the orders associated with them by their jointed stems and opposite leaves, with intermediate stipules. Their flowers grow in naked spikes, and consist of an ovary next the axis of inflorescence, and a fleshy anther on the outside. Chloranthus officinalis is reckoned a stimulant of the highest order.

(See Blume, *Flora Javæ*, and Lindley's *Natural System*, p. 183.)



[Chloranthus officinalis.]

1, spike, the upper and lower flowers without stamens; 2, flower without its bract; 3, an interior view of the anther; 4, a magnified fruit; 5, the kernel of the fruit; 6, a section of the fruit, showing the embryo; 7, the stone of the fruit, with a portion of the shell removed; 8, a perpendicular section of the ovary, showing the position of the ovule.

CHLORIC ACID. [CHLORINE.]

CHLORIDES OF CARBON. [CHLORINE.]

CHLORINE, an elementary gaseous body discovered by Scheele in 1774, while examining an ore of manganese. He gave it the name of dephlogisticated marine acid. By the French chemists, in accordance with the views of Berthollet, it was called oxygenized muriatic acid, which was shortened by the English chemists to oxymuriatic acid: these latter terms meant that it was a compound of muriatic acid, a supposed elementary or at any rate an undecomposed body, and oxygen. Gay-Lussac and Thénard in 1809 published some experiments from which they inferred that oxymuriatic acid might be a simple substance, but they notwithstanding adhered for a considerable period to the opinion of its being a compound. About the same time Sir H. Davy commenced his examination of the same body, and from his numerous researches he concluded that it ought to be regarded as an undecomposed body; and on account of its green colour, he gave this gas the name of chlorine This opinion was at first strongly combated by Dr. Murray and Berzelius, but the latter is now a convert to what has been termed the new theory of chlorine. Chlorine was first obtained by Scheele, by treating the binoxide of manganese with muriatic acid. During the mutual operation of these compound bodies, the oxygen of the binoxide combines with the hydrogen of the acid, and water is formed; the metal of the oxide remains combined with a portion of the chlorine, while the excess which the metal does not unite with is given out in the gaseous state, and possesses the following properties: it is of a greenish colour, and hence the name chlorine, from χλωρός (chlorus), green; it has a very powerful and disagreeable odour, is very suffocating, even when considerably diluted with air, and its taste is astringent. According to Davy, 100 cubic inches weigh between 76 and 77 grains at the average temperature and pressure, and with this determination the experiments of Gay-Lussac and Thénard nearly agree; its specific gravity is consequently about 2·7. Mr. Faraday found that when this gas is subjected to a pressure of about four atmospheres, and kept cool, it is condensed into a yellow limpid fluid, which is extremely volatile, and which, when the pressure is removed, rapidly reassumes the gaseous form; its specific gravity is about 1·33; its refractive power is less than that of water; and it is a non-conductor of electricity.

Chlorine gas is absorbed and dissolved by water, and when this fluid has been recently boiled, it will take up twice its bulk of the gas at common temperatures and pressure: the aqueous solution has the colour, smell and taste of the gas itself. The equivalent of chlorine is 36, and when moist chlorine gas is exposed to a temperature of 32° Fahr., yellow crystals are formed, which are hydrate of chlorine, consisting, according to Mr. Faraday, of very nearly 1 equivalent of chlorine = 36 + 10 equivalents of water = 90. Neither light, heat, nor electricity, produces any change in the properties of chlorine gas, provided it be dry; but if it be moist, then light causes it to decompose the water, the hydrogen of which combines with it to form muriatic acid, while the oxygen is evolved in the gaseous form; and it was this experiment which chiefly induced Berthollet to adopt the opinion of its nature which has already been explained. In the decomposition of the compounds which contain it, it is evolved like oxygen at the positive pole, or anode; except when separated from oxygen, and then it goes to the negative or cathode.

One of the most curious and important properties of chlorine is the power which it possesses of destroying the colour of animal and vegetable matter in general, and hence its extensive application to the purpose of bleaching. [Bleaching.] When acids alter vegetable colours, they may in many cases be restored by the application of an alkali; but so complete is the destructive power of chlorine, that nothing whatever can reproduce the colour which it has removed. This power appears however to depend upon the intermediate action and decomposition of water, for dry chlorine gas produces no bleaching effect. It follows therefore, that its decolouring power is not direct, but intermediate, dependent upon its decomposing water, and combining with its hydrogen to form muriatic acid, while the nascent oxygen of the water produces the bleaching effect.

Chlorine gas, like oxygen, is a powerful supporter of combustion. If certain metals, and especially antimony, in the state of powder, be thrown into chlorine gas, they burn spontaneously; phosphorus also exhibits similar phenomena.

Chlorine is also a powerful disinfectant; for this purpose it was first employed by Guyton de Morveau, and within a few years compounds of chlorine, or perhaps of chlorous or hypochlorous acid (for the question is undecided), and lime or soda, have been extensively used for this purpose.

Chlorine is in general easily detected by its odour and colour, whether in its gaseous state or in solution in water. It occasions a white precipitate in solution of nitrate of silver, which speedily darkens by exposure to light. This compound is called chloride of silver, and was formerly known by the names of horn silver or muriate of silver. In this case however a portion only of the chlorine is thrown down; part of it uniting with the oxygen of the oxide of silver forms chloric acid, of which we shall presently make mention. It will be observed from the above statement that those compounds which contain chlorine are called chlorides; but this is the case only when such compounds do not possess acid properties.

Chlorine combines with almost every other elementary body, forming compounds of great importance; we shall first state the nature of those to which it gives rise by uniting with oxygen.

Oxygen and chlorine combine in several proportions, but the combination is never immediate; and different views of the number and nature of the compounds are entertained by different chemists. Thus Berzelius mentions one oxide and three acids, viz.,

Protoxide of chlorine	composed of	2	vols. of chlorine	+ 1	vol. of oxygen.
Chlorous acid	,,	2	,, ,,	+ 4	,, ,,
Chloric acid	,,	2	,, ,,	+ 5	,, ,,
Oxychloric acid	,,	2	,, ,,	+ 6	,, ,,

Berzelius however admits that there probably exists a peroxide of chlorine composed of equal volumes of chlorine and oxygen, though it has never been obtained. Count Stadion, who discovered oxychloric acid, supposes it contains seven volumes of oxygen instead of six, as above.

Dr. Thomson gives

Protoxide of chlorine	composed of	2	vols. of chlorine	+ 1	vol. of oxygen.
Quadroxide of chlorine	,,	2	,, ,,	+ 4	,, ,,
Chloric acid	,,	2	,, ,,	+ 5	,, ,,
Perchloric (oxychloric) acid		2	,, ,,	+ 7	,, ,,

Dr. Turner agrees with the last statements, which indeed differ from those of Berzelius only with respect to oxychloric acid. Dr. Turner however calls the chlorous acid of Berzelius, which is the quadroxide of Dr. Thomson, peroxide of chlorine. According however to Soubeiran, the supposed protoxide of chlorine is a mere mixture of the peroxide and chlorine. The late experiments of Balard seem to prove the existence of what he calls hypochlorous acid, formed of two volumes of chlorine and one volume of oxygen, which is the composition assigned, as just noticed, to the protoxide. Balard remarks, that if both analyses be correct it would be an additional case of isomerism; but he seems rather inclined to adopt the opinion of Soubeiran with respect to the so-called protoxide of chlorine. Leaving however these uncertainties for the present, we shall describe the various compounds above-mentioned. As no doubt exists with respect to its composition, and also for other reasons, we begin with

Chloric Acid.—It has been already mentioned that oxygen and chlorine do not combine by direct action; when however chlorine meets with nascent oxygen they unite. If chlorine gas be passed into water containing oxide of silver diffused through it, a portion of the chlorine combines with the silver and forms a chloride, which is precipitated; and the oxygen expelled from it uniting with another portion of chlorine, constitutes chloric acid, which remains in solution. Any excess of chlorine is to be expelled by heat. Or chloric acid may be made by adding dilute sulphuric acid to chlorate of barytes, in which case sulphate of barytes is precipitated, and chloric acid remains in solution. It is a colourless inodorous acid, which has a sour taste, and reddens vegetable blue colours. The solution may be concentrated by a gentle heat till it acquires an almost oily consistence; it has then a yellowish tint, a peculiar odour, and it sets fire to dry vegetable matters. It combines with bases to form salts termed *chlorates*, which were formerly known by the name of oxygenized muriates, or hyper or oxymuriates. Bodies which have a strong affinity for oxygen decompose chloric acid, by separating that element; thus sulphurous acid is converted into sulphuric acid by decomposing it, and taking its oxygen. Chloric acid is composed of

1 equivalent of chlorine = 36
5 equivalents of oxygen = 40
—
76

The chlorates, except that of potash, are not important salts: this however is used for many purposes; thus when it is heated it evolves very pure oxygen gas, and chloride of potassium remains; the oxygen is yielded both by the acid and the alkali. Chlorate of potash [Potassium] is prepared on the large scale by passing chlorine gas into a solution of the alkali; part of the chlorine takes oxygen from part of the potash and forms with it chloric acid, which unites with the remainder of the potash to form the chlorate, while the remainder of the chlorine unites with the potassium to form chloride; both salts dissolve in water, but the chlorate crystallizes first, and in rhombic plates. This salt detonates when triturated with sulphur; and when struck with phosphorus it explodes and inflames, and in both cases it yields oxygen.

Chlorate of potash is composed of

1 equivalent of chloric acid = 76
1 equivalent of potash . . = 48

Equivalent . . . 124

Oxychloric or *Perchloric Acid* is procured by the partial decomposition of the chloric acid just described. It is obtained by mixing sixty grains of chlorate of potash with about four times its weight of sulphuric acid, and heating the mixture below 212° in a glass retort; a gas, which we shall presently describe, is given out, and there remains in the retort a mixture of bisulphate and oxychlorate of potash; by washing with cold water the bisulphate is dissolved, and the oxychlorate remains. When this salt is mixed in a retort with half its weight of sulphuric acid diluted with one third of water, and the mixture is heated to about 280°, the white vapour which arises is oxychloric acid, which condenses in the receiver.

This acid is a limpid colourless liquid, has a sharp taste, and reddens litmus paper, without destroying its colour. When concentrated by evaporation its specific gravity is 1·65, and it then emits vapour when exposed to the air; it boils at 392°, and rapidly absorbs moisture from the atmosphere. When mixed with sulphuric acid and heated, the acid is distilled, and it concretes on cooling into a solid, which crystallizes in prisms. It appears to be the most stable of all the compounds of chlorine and oxygen, not suffering decomposition either by the action of light, sulphurous, or hydrosulphuric acid; it dissolves iron and zinc, with the evolution of hydrogen gas.

The salts formed by this acid into bases are termed oxychlorates or perchlorates: the first is the better name; they are decomposed by heat, yielding much oxygen gas, and are converted into chlorides. The oxychlorates are not an important class of salts.

Peroxide of Chlorine, the chlorous acid of Berzelius, is a gaseous compound evolved during the formation of oxychlorate of potash just described. This gas has a green colour; it has no smell of chlorine, but, on the contrary, an aromatic odour; it is readily dissolved in water, to which it imparts its own colour; the solution does not act upon mercury, nor does it combine with alkalis; it destroys most vegetable blue colours without previously reddening them. When heated to 212° this gas explodes violently, emits a strong light, and the residual gases occupy more space than the compound did which they formed; 40 volumes of the gas becoming 60, of which 40 are oxygen and 20 chlorine.

The changes which occur in thus preparing oxychlorate of potash and peroxide of chlorine are these: the sulphuric acid decomposing a portion of the chlorate of potash evolves chloric acid, which, at the moment of its liberation, is separated into oxygen and peroxide of chlorine; the oxygen combines with the chloric acid of the undecomposed chlorate, and converts it into oxychloric acid, and consequently oxychlorate of potash is formed, while the peroxide of chlorine, as already noticed, is evolved in the gaseous state. It is probable, that when three equivalents of chlorate of potash are acted upon by sulphuric acid, there are produced two equivalents of peroxide of chlorine and one equivalent of oxychloric acid.

Protoxide of Chlorine, the euchlorine of Davy, by whom it was discovered in 1811 This gas is obtained by exposing very cautiously to a moderate heat two parts of chlorate of potash, one of muriatic or hydrochloric acid, and one of water; the products are water, chlorine, and the protoxide of chlorine. The gases should be received over mercury, which absorbs the chlorine and leaves the protoxide.

This gas has a yellowish green colour, more brilliant than that of chlorine; its smell resembles that of burnt sugar; water dissolves eight or ten times its volume of this gas, and becomes nearly of an orange colour. It does not combine with alkalis, but it first reddens vegetable blues, and afterwards destroys them: this gas is very explosive, even the heat of the hand is sufficient to produce this effect. According to Soubeiran, as already noticed, this gas is not a definite compound, but a mixture of peroxide of chlorine and chlorine, and it has been also observed, that Balard's experiments tend to show that the portions of oxygen and chlorine assigned to this compound are such as form hypochlorous acid, which we shall now mention; protoxide of chlorine will therefore be probably removed from the compounds of these elements.

Hypochlorous Acid, to which we have just alluded, is, according to Balard, an acid existing in what is usually called chloride of lime or bleaching powder; and this, as the first-mentioned name indicates, was first supposed by Berzelius to be a chloride of lime, and afterwards a chlorite; but the more recent and minute researches of Balard seem to prove that it is a hypochlorite. This acid is thus obtained: add finely-powdered peroxide of mercury, mixed with twelve times its weight of distilled water, to chlorine gas in a bottle, and shake it well; the oxide of mercury should be slightly in excess, so as that when the absorption of the chlorine, which goes on rapidly, is over, the residue should have a reddish rather than a white colour. The whole contents of the bottle are to be put in a filter, upon which there remains oxychloride of mercury, while the filtered liquor, when distilled in vacuo, yields weak hypochlorous acid, which may be concentrated by redistillation.

Hypochlorous acid thus procured is a transparent slightly yellow-coloured fluid; its smell is penetrating and very distinct from that of chlorine or the peroxide; its taste is extremely strong but not acid. It attacks the epidermis with great activity, even more so than strong nitric acid, and imparts a brown stain to the skin. It is a very unstable compound, decomposing probably even at common temperatures. In hot weather it can be preserved for a few days only, without immersion in ice; when weaker and kept from the light, it may be preserved for a longer time. During decomposition it gives out small bubbles of chlorine gas, and some chloric acid is formed, and this decomposition is accelerated by agitation with angular bodies: it is decomposed by the action of light as well as by that of heat.

When to a concentrated solution of hypochlorous acid an equal bulk of solid dry nitrate of lime is added, a brisk effervescence is produced, which is owing to the separation of pure hypochlorous acid gas, which has the following properties: its colour is very little deeper than that of chlorine; its smell is penetrating like that of the solution; it is completely absorbed by mercury, which is transformed into a red oxychloride. It is best prepared by passing up a little of the gas at a time into a jar filled with and inverted in mercury; the nitrate of lime which is dissolved prevents the action of the liberated gas upon the metal; water dissolves nearly 100 times its volume of this gas; it is decomposed by heat with explosion. The fixed alkalis and the alkaline earths combine with hypochlorous acid.

The hypochlorite of lime, usually called chloride of lime, or bleaching powder, is a compound of great importance, both in the arts [BLEACHING] and as a disinfectant. It is prepared by exposing hydrate of lime to the action of chlorine gas, when a large quantity of it is absorbed, and the result seems to be the formation of chloride of calcium and hypochlorite of lime; the exact composition of bleaching powder is however a subject still under discussion. Another compound, the nature of which is still more problematical, is that formed by passing chlorine gas into a solution of carbonate of soda; the gas is plentifully absorbed without evolving any carbonic acid. This compound, like the hypochlorite of lime, is used as a disinfectant, under the name of Labarraque's soda liquor.

Azote and chlorine combine to form the

Chloride of azote, or more correctly the quadrichloride of azote. This compound was discovered by Dulong in 1811. These gases do not combine by direct action, but when chlorine gas meets azotic gas in the nascent state they unite. It may be prepared by dissolving an ounce of muriate of ammonia in twelve to sixteen times its weight of water, and then inverting a bottle of chlorine gas in the solution. The chlorine is gradually absorbed, and there are gradually formed small drops of an oil-like fluid which sink in the solution: these are the chloride of azote, derived from the combination of the chlorine with the azote of the ammonia.

The properties of this substance are that it is extremely explosive, sometimes detonating spontaneously, but always on the contact of fatty matter, phosphorus, and various other bodies. Its specific gravity is 1·653. It is not solidified by the most intense artificial cold. At 160° it may be distilled, but at 200° to 212° it explodes. The products of the explosion are four volumes of chlorine and one volume of azote, and as these represent equivalents, it is a quadrichloride of azote composed of

4 equivalents of chlorine 36 × 4 =	144
1 equivalent of azote . . . . =	14
Equivalent	158

Chlorine and hydrogen combine to form the

Hydrochloric Acid, commonly called the muriatic acid: when equal volumes of these gases are mixed and kept in the dark, they do not unite, but if exposed to daylight they combine slowly, and by the direct rays of the sun, the electric spark, or a taper, they unite with explosion, and there is formed a quantity of muriatic acid equal in volume to that of the two gases employed. As 50 cubic inches of hydrogen weigh 1·075 grain, and 50 of chlorine 38 07 grains, their combined weight gives that of 100 cubic inches of the gas, = 39·145 grains, or its specific gravity is 1·228. This gas is colourless, has a very pungent odour, and an acid and acrid taste. It excites coughing, unless largely diluted with air; extinguishes burning bodies when they are immersed in it; and reddens vegetable blue colours strongly. By heat it is merely expanded, but by electricity it is decomposed. The affinity of this gas for water is so great, that when it escapes into the air, it forms a white vapour by combining with atmospheric moisture; water absorbs 400 times its bulk of this gas, and the result is liquid muriatic acid, usually called muriatic acid.

As this acid is largely employed, it is prepared in a more economical manner than the direct formation of the gas, by decomposing common salt with sulphuric acid. For this purpose, 24 parts of common salt, termed chemically chloride of sodium, are mixed in a retort with 20 parts of sulphuric acid, and 12 of water, and into the receiver an equal quantity of water is put; by distillation to dryness, a colourless acid is obtained, which has a specific gravity of about 1·16.

During the mutual action of the salt, acid, and water, a portion of the water is decomposed, which yields hydrogen to the chlorine, and these form muriatic acid, while its oxygen unites with the sodium, to form soda, which with the sulphuric acid constitutes sulphate of soda, which remains in the retort. This solution of muriatic acid has the smell and acid properties of the gas itself; it emits white fumes, and reddens litmus paper. It dissolves many metals, such as iron, zinc, and tin, and forms with them chlorides, the acid being decomposed and yielding hydrogen gas during their solution. These compounds will be treated of as chlorides, under the respective metals. Muriatic acid is largely employed in the arts connected with, or dependent upon, chemical operations, as in dyeing and calico printing, and in making muriate of ammonia, or sal ammoniac [AMMONIA]; it unites also with the vegetable alkalis, as morphia, quina, &c., to form muriates; but with metallic oxides, and with the earths, which indeed are so, strictly speaking, it forms chlorides, and not muriates, on account of the decomposition which it suffers, as just explained. When mixed with the nitric acid also, it is decomposed, and a solution of chlorine is obtained, which is used under the name of *aqua regia*, or nitro-muriatic acid, for dissolving gold and platinum.

Chlorine unites with several of the non-metallic bodies; [BROMINE, IODINE, PHOSPHORUS, SELENIUM, and SULPHUR]. Having already given an account of boron and carbon, we shall briefly state the nature of the chlorides of these elementary bodies.

Chlorine and boron form

Chloride or perhaps *terchloride of boron*. It was found by Davy that boron, when recently prepared, burns in chlorine gas; Berzelius remarked that if the boron be previously rendered compact, combustion does not occur until these elements are heated. The resulting compound is a colourless gas, which, when freed from excess of chlorine by means of mercury, has the following properties: it is colourless; its specific gravity is 3·942; it is readily soluble in water, by decomposing a portion of which muriatic and boracic acids are obtained: the same effect is produced, accompanied with a white vapour, when the gas escapes into the atmosphere. It combines with ammonia to form a compound, the nature of which has not been examined. Dr. Thomson calls it borochloric acid. It has been supposed to be a terchloride, but the subject requires further investigation.

Chlorine and carbon form four different chlorides; viz. the dichloride, protochloride, perchloride, and $\frac{5}{4}$ chloride. No combination can be effected between these elements by direct action; carbon, even heated to whiteness in the gas, does not form any compound with it. The discovery of these compounds is due to Mr. Faraday. (*Phil. Trans.* 1821.)

The dichloride of carbon was an accidental product which has been only once obtained, and was formed during the preparation of nitric acid from crude nitre and sulphate of iron. It occurred in small soft colourless fibres; it fused when heated, and at 250° sublimed and condensed unchanged. It is insoluble in water, acid, and alkalis, but may be dissolved in hot oil of turpentine and in alcohol, recrystallizing as the solutions cool; it burns with a red flame, yielding much smoke and muriatic acid vapour. It is composed of

1 equivalent of chlorine . .	36
2 equivalents of carbon .	12
Equivalent . . .	48

The *perchloride of carbon*, which it will be most convenient, although not in strict order, to consider next, is composed of

3 equiv. of chlorine	108, or	1½ equiv.	54
2 „ carbon	12 „	1 „	6
Equivalent .	120	Equivalent	60
		As a sesquichloride.	

When olefiant gas, a compound of hydrogen and carbon [CARBON], is mixed with chlorine, they combine to form an oil-like liquid which is composed of chlorine, carbon, and hydrogen; by exposure to the direct rays of the sun, muriatic acid and chloride of carbon are formed during its decomposition.

This chloride is solid; its smell is rather aromatic; it is a non-conductor of electricity; its specific gravity is 2. It melts at 320°, and at a higher temperature may be distilled without suffering any change; water dissolves it but sparingly, and it is also soluble in alcohol, æther and oils.

It burns when strongly heated, but is not acted upon either by acids or alkalis; when passed with hydrogen through a red-hot tube, muriatic acid is formed and carbon deposited.

The protochloride of carbon is obtained by passing the perchloride in vapour through a red-hot porcelain tube; chlorine gas escapes in such proportion as to reduce the perchloride to a protochloride, which is a limpid colourless liquid of specific gravity 1·552: it is not solidified at 0° Fahr. and at about 170° is vaporized. When repeatedly distilled it suffers no change. It is composed of

1 equivalent of chlorine .	36
1 „ carbon .	6
Equivalent .	42

The last is the $\frac{5}{4}$ chloride; it may be formed by distilling a mixture of 8 parts of chloride of lime, 12 of water, and 1 to 1½ part of alcohol.

The chloride of carbon, which results from the mutual action of these substances, is a colourless limpid fluid; its specific gravity is 1·48, and it boils at 141° Fahr. It does not readily burn, and acids and alkalis, when moderately heated, act but little upon it.

It is insoluble in water, but dissolved by alcohol and ether. It is not decomposed by potassium. Like the other chlorides of carbon it is decomposed by being passed over ignited oxide of copper, and its composition, as well as that of the preceding, was thus ascertained.

The $\frac{5}{4}$ chloride of carbon is composed of

5 equivalents of chlorine	180
4 „ carbon .	24
Equivalent . .	204

Medical Uses.—Chlorine, when pure and concentrated, is very deleterious; it acts as an irritant poison. Its action is most violent and speedy when it is brought into contact with the respiratory organs; it then occasions such violent spasm of the glottis, or opening of the windpipe, that instant death may ensue. To enable chlorine to pass this orifice it must be very largely diluted with atmospheric air, or aqueous vapour. A strong solution of it introduced into the stomach causes irritation, inflammation, and death; and even a stream of the gas, or aqueous vapour of it, directed upon the skin, will cause a pricking or stinging sensation, followed by an eruption of pimples or even vesicles. Notwithstanding its formidable properties, it has been used in several cases with such success that no adequate substitute can be found for it. As a disinfecting agent, or means of decomposing and rendering innoxious putrid miasmata, and other sources of disease, it is unrivalled. For this purpose it may either be directly mingled with the air of the infected place, by preparing it on the spot, or by means of one of Morveau's disinfecting bottles; or it may be gradually liberated from some of its combinations, such as the chloride of soda or lime. This last method is best when human beings remain in the apartment; but the former is preferable, when they have been removed, for purifying the wards of hospitals, cells of gaols, or holds of ships. When not in a very concentrated form, the respiratory organs become habituated to breathing it, and the workmen in manufactories where it is used enjoy a marked immunity from epidemic fevers, and attain a considerable age.

From having been observed to allay chronic cough existing among the workmen of certain manufactories, it has been proposed to be inhaled in a diluted state in several chronic affections of the lungs, such as asthma, chronic bronchitis, and even phthisis pulmonaris, or consumption. In the two former it is of some utility, in the latter it is a mere palliative, but is attended with the advantage of destroying the fœtor of the breath, which is distressing both to the patient and attendants. The chlorine employed in this way must be extremely pure, the preparation frequently renewed, of uniform strength of 1¼ volume of chlorine in solution, and carefully preserved from the sun-light, which decomposes it. It may be breathed in a small quantity out of a proper apparatus four or five times a day.

A weak solution of chlorine has been employed, introduced into the stomach, with considerable success in indigestion, with loss of appetite, loaded tongue, and foul-taste in the mouth.

Its employment in the form of a bath is not common, but occasionally useful, from its irritant effect on the skin. It is doubtful whether it possesses the specific effect upon the liver which some ascribe to it.

In case of poisoning by the gas, inhaling ammonia or sulphuretted hydrogen in small quantity is useful. Should an overdose of the solution be swallowed, chalk, magnesia, or other alkali, or white of egg in water, or a draught of milk, would be proper as an antidote. On the opposite hand, chlorine is said to be a valuable antidote in case of poisoning by hydrocyanic (prussic) acid, sulphuretted hydrogen, or hydrosulphate of ammonia.

CHLORIODIC ACID. [IODINE.]

CHLO'RION, a genus of Hymenopterous insects, of the section *Fossores*. [SPHEGIDÆ.]

CHLORITE. [TALC.]

CHLOROCARBONIC ACID GAS. This acid, called by Dr. Davy, who discovered it, *phosgene gas* (from *φῶς* light, and *γεννᾶν* to produce), was formed by exposing a mixture of equal volumes of dry chlorine and carbonic oxide gases to the solar rays; combination takes place rapidly, but without explosion, and they contract to half their bulk; day-light produces the effect slowly, but in the dark it does not take place at all.

Chlorocarbonic acid gas is colourless; has a strong smell, and reddens litmus paper even when dry; it decomposes water, and there are formed hydrochloric and carbonic acid. Several metals when heated in it decompose it; they are converted into chlorides, and carbonic acid is evolved. The specific gravity of this gas is about 3·44; 100 cubic inches weigh about 107 grains; it consists of one equivalent of chlorine 36 + 1 equivalent of oxide of carbon 14 = 50. When mixed with ammoniacal gas it condenses four times its volume, and forms chlorocarbonate of ammonia, which is a white solid salt; when dissolved in the stronger acids it yields muriatic and carbonic acid, but nitric acid dissolves it without effervescence. It is a disalt composed of

1 equivalent of chlorocarbonic acid .	50
2 „ ammonia . . .	34
Equivalent . . .	84

No other chlorocarbonates are known.

CHLOROCYANIC ACID. [CYANOGEN.]

CHLOROFORME, a peculiar compound fluid, obtained about the same time by Soubeiran and Liebig. To procure it distil a mixture of alcohol and a solution of chloride of lime; separate the product from the liquid distilled with it, shake it with five or six times its volume of concentrated sulphuric acid; pour it off, mix with a little sulphuric acid, distil, and rectify from a little chloride of calcium.

Chloroforme is a limpid fluid; its specific gravity is 1 480, it boils at about 141° Fahrenheit; does not readily burn, but when a glass rod moistened with it is put into the flame of a spirit lamp, it burns with a yellow sooty flame. It is soluble in alcohol and æther; water precipitates it from them; it dissolves iodine, phosphorus, and sulphur; is not decomposed by potassium; but when this metal is heated in its vapour, combustion and explosion ensue, chloride of potassium is formed, and charcoal is deposited.

It is composed of

Three equivalents of	chlorine	36 × 3 =	108
Two „	carbon	6 × 2 =	12
One „	hydrogen	=	1
		Equivalent	121

CHLO'ROMYS. [AGOUTI.]

CHLORO-NITROUS GAS, a compound of chlorine and nitric oxide gases discovered by Mr. E. Davy; he obtained it by treating chloride of sodium with nitric acid sufficient to moisten it; the results are that the sodium is oxidized and converted into soda by the oxygen of a decomposed portion of the nitric acid, and this combining with the undecomposed portion of nitric acid, they form nitrate of soda, while the chlorine unites with the nitric oxide of the decomposed nitric acid, and they form the gas in question.

Chloro-nitrous gas is of a pale reddish colour; its smell resembles but is rather weaker than that of chlorine; it emits fumes when exposed to the air, is absorbed by water, and possesses bleaching power; it is decomposed by most substances which have an affinity for chlorine, as some of the metals, phosphorus, &c. It consists, according to Mr. Davy, of equal volumes of chlorine and nitric oxide gases, combined without condensation.

CHLOROPAL, a silicate of iron. [IRON.]

CHLOROPHÆITE, a mineral found by Dr. Mac Culloch in the Isle of Rum, &c. It occurs in small masses imbedded in basalt or a black indurated ironstone. Its colour when fresh broken is green, which becomes black by exposure to the air. It is brittle and soft enough to be scratched by a quill. Its specific gravity is 2·02. Some specimens are transparent, others are opaque. The lustre is vitreous; the fracture of the transparent sort is conchoidal, of the opaque, intermediate as to conchoidal and granular. (Phillips's *Mineralogy*.)

CHLOROPHANE. [FLUOR.]

CHLOROPHYLE. The colouring matter of leaves has been thus named by Pelletier and Caventou. It is obtained by bruising, pressing, and then washing them with water, and afterwards treating them with alcohol, which dissolves the green colour and wax; when water is added to this solution, and the alcohol distilled, the green substance, which contains wax, floats on the surface of the water; when this is heated with æther, the wax is dissolved, and chlorophyle remains nearly pure. When exposed to light, or the action of chlorine, it is bleached. Acids produce a similar effect, and by the alkalis it is converted into soap. The red tint which leaves assume in autumn appears to be owing to the formation and action of an acid; the green colour is restored by an alkali.

CHLOROPSIS. [MELLIPHAGIDÆ.]

CHOCOLATE NUT TREE. [CACAO, vol. vi. p. 96.; THEOBROMA.]

CHOCTAWS, one of the aboriginal tribes still inhabiting the southern states of the North American Union: they are now entirely restricted to the state of Mississippi, of which they occupy the middle portion, on both sides of the river Yazoo, a tributary of the Mississippi, and the country about the source of the Pearl River. Formerly they were a powerful tribe, but their number has been reduced by war and by emigration to the countries on the banks of the Arkansas. Still they probably do not fall far short of 10,000 individuals. Like some other of the southern tribes in the United States, they have applied themselves to agriculture, especially to the rearing of cattle and swine. Some missionaries have introduced among them the doctrines of Christianity, and have formed a few schools. Their language resembles that of the Cherokees.

CHOCZIM, or Chotim, a small fortified town, in the Russian government of Bessarabia or Kishenew, on the banks of the river Dniester, about 48° 30′ N. lat., and 26° 30′ E. long. Near it there is a small fortress. Its situation opposite the Polish fortress of Kaminiec rendered it a place of note in the wars between the Poles and Turks, and more recently between the Turks and the Russians. In 1739 it was taken by the Russian general Munnich. Population 4000.

CHŒROPOTAMUS, a fossil genus, instituted by Baron Cuvier on the examination of the jaws, whose general form and dimensions are analogous to those of the hog, and which would seem to belong to an animal nearly approaching the Peccaries, but larger. Teeth, six incisors and two canines in each jaw, and seven molars on each side.

Example.—*Chœropotamus gypsorum*. Found in the Paris gypsum.

CHOIR [CHURCH.]

CHOIR, that part of a cathedral, between the chancel and screen, in which divine service is performed: it is separated from the nave by the screen, over which the organ is, in England and Ireland, commonly placed.

The CHOIR is also the term by which the lay-vicars, or lay-clerks, and choristers, *i.e.* the singers, of a cathedral, are collectively designated. Their number in each cathedral varies, in most cases in proportion to the degree of integrity possessed by the respective dean and chapter at the Reformation, and subsequently. But, generally, the dignitaries contrived to retain as scanty a portion as possible of the musical members of the church, in order to augment their own emoluments; and with the same view deprived, in several instances, that part of the choir which they suffered to remain of no inconsiderable share of the revenues to which it was legally entitled, as in the case of Bangor, in which the court of chancery interposed, and restored to the organist and choir property to a large amount, whereof they had long been most unjustly dispossessed. With some striking exceptions, the choir service is now performed in by no means a reputable manner, owing partly to the paucity of singers, but chiefly to the lowness of their salaries, which, in a majority of cases, are hardly equal to the wages of the humblest mechanic; consequently, the musical duties of our cathedrals too often are allotted to persons either unqualified, or dissatisfied and negligent.

CHOISEUL, ETIENNE FRANÇOIS, DUC DE, born in 1719, rose to the highest offices in the state under Louis XV., and was in fact the ruling minister during a great part of that reign. He was made minister for foreign affairs in 1758, minister at war in 1761, and some years after he resumed the department of foreign affairs. He held this last office till December, 1770, when, in consequence of his imperious character, which had made him many enemies at court among men of all parties, the most influential of whom were the Maréchal de Richelieu, the Duc d'Aiguillon, and the Ex-Jesuit Abbé de la Ville, he was dismissed from office, and exiled to his estate of Chanteloup, where he wrote his memoirs and a satirical comedy against the royal family, and especially against the Dauphin, afterwards Louis XVI., styled 'Le Royaume d'Arlequinerie,' which he printed himself at Chanteloup, and distributed among his friends. His memoirs were published at Paris in 1790, after his death. The administration of the Duc de Choiseul was singularly unfortunate. In the war against England, which terminated by the peace of Paris in 1763, France lost Canada, and her fleets, as well as those of Spain, were defeated; and in the seven years' war France took the part of Austria against Frederic of Prussia, who triumphed over both. The Duc de Choiseul is also accused of not taking advantage of a party in Poland which, after the death of Augustus III., was disposed to offer the crown to the prince of Conti, and the result was that Catharine of Russia placed the crown of Poland on the head of her favorite Poniatowski. The duke of Choiseul's partiality for Maria Theresa of Austria has been also strongly censured. He concluded the marriage between Marie Antoinette and the Dauphin, afterwards Louis XVI. In 1760 he expelled the Jesuits from France. He is also said to have secretly encouraged the first symptoms of discontent among the English colonies of North America.

The personal character of the duke was generous though haughty; he was disinterested and splendid in his expenditure, by which he ruined his own fortune. He loved the arts and literature, and was a friend of Voltaire and the other literary characters of that age. His enemies exaggerated his faults, and attributed to him crimes of which there is not the least evidence. He died at Paris in May, 1785. (*Examen du Ministère du Duc de Choiseul* in the *Mémoires du Duc d'Aiguillon.*)

CHOKE-DAMP. [CARBONIC ACID GAS.]

CHOLÆPUS. Illiger's generic name for the two-toed sloths. [UNAU.]

CHOLERA, from χολὴ and ῥέω, signifying *bile-flux*, a disease which has derived its name from its supposed cause, a preternatural quantity and a morbid quality of the biliary secretion.

The first symptom of this malady commonly consists of griping pains of the bowels; these are soon followed by vomiting and purging: there is always a redundancy and an altered condition of the bile, and, in some cases, after the vomiting and purging have continued for some time, there supervene spasms in different parts of the body, but particularly in the upper and lower extremities, and more especially in the legs. The tongue is usually dry, the thirst urgent, and the urine scanty. The pulse, at first free and frequent, as the disease advances becomes smaller and weaker, and the strength is very rapidly reduced. This form of the disease is commonly termed *bilious cholera*.

The chief exciting causes of this malady appear to be particularly connected with temperature. It rarely if ever attacks in the spring, at least in this country, while it is seldom altogether absent in the latter part of summer, and particularly when summer is passing into autumn. Hence its exciting cause would appear to be not so much a high temperature as an alternation of temperature from heat to cold, such an alternation constantly taking place at this season of the year, and occurring every day, in the great difference that takes place between the temperature of the day and that of the night. Accordingly this disease is observed to be by far the most frequent and the most severe at the seasons when those alternations are the most remarkable; when, for example, cold easterly or northerly winds suddenly set in after hot weather, and, above all, when this cold is combined with a moist atmosphere, as 'during very warm summers and autumns occurring after a very rainy winter and spring, or after a succession of wet seasons, and when the days have been warm, bright, and sunny, and the nights cold with heavy dews.' When such a concurrence of circumstances takes place in a high degree, the disease becomes so prevalent as to be as truly epidemic as any of the forms of fever common to the climate.

It is generally conceived that the use of certain kinds of fruit which abound at this season, as cucumbers and melons, and certain vegetables, as peas and the undressed vegetables used in salads, are powerful concurrent causes. In persons very much predisposed to this malady, such articles of diet may co-operate with the season to produce it; but when the state of the season is such as to render the disease epidemic, it attacks numbers of persons who never use food of this kind. Animal food of a bad quality or too long kept, as animal food of all descriptions is very apt to be at this season of the year, is a much more powerful concurrent cause. So also is excess of food, though of the best quality, and intemperance in the use of malt, vinous, and spirituous liquors, together with whatever causes tend to diminish the vital energies, and so to lessen the power of resistance inherent in the body to the influence of noxious agents.

There is reason to believe that certain poisonous particles of matter, derived from decayed vegetable and animal substances, and diffused in the atmosphere, are among the most powerful exciting causes of cholera, as it is certain that they are of fever. Hence it has been observed that in certain districts in some southerly climates, particularly between the tropics, bilious cholera may be said, from the frequency of its occurrence, to be strictly endemic, although in a less marked degree than certain forms of fever or dysentery. 'According to my own observation,' says Dr. Copland, 'and that of several friends whose range of experience has been great, bilious cholera is very prevalent in situations which are subject to emanations from decayed vegetable matter or putrid matter of any description, particularly from swamps, moist grounds, the banks of rivers, lakes, or canals, &c., and from foul drains or cess-pools, during warm seasons, or wide and rapid changes of temperature; or when the thermometer rises high during the day, and sinks low towards the night and morning.'

The presence of these miasmata as the cause of cholera accounts for the much greater prevalence and severity of this disease, in this country, in antient than in modern times. The account given by Sydenham, who wrote about the middle of the seventeenth century, of the regular annual return of cholera and of its great fatality, may well make us rejoice at the altered condition as to cleanliness of our streets, drains, and houses, and at the different kind and better quality of our food.

'This disease,' says Sydenham, writing of cholera as it appeared in London in the year 1699, 'comes as certainly at the latter end of summer and at the approach of autumn as swallows at the beginning of spring, and as cuckows at the heat of the following season. That disease which is occasioned by a surfeit comes at any time; the symptoms are indeed alike and the cause the same, yet it is of another kind. The cholera is easily known, for there are violent vomitings and an evacuation of ill humours with great difficulty and trouble by stool: there is a violent pain and inflammation of the belly; a heart-burning, thirst, a quick pulse with great anxiety, and often a small and unequal pulse with great nausea and sometimes a colliquative sweat, contractions of the arms and legs, fainting, a coldness of the extreme parts, and such like symptoms, which frighten the bye-standers and kill the patient in twenty-four hours.'

The persons most liable to bilious cholera are either those whose bowels are preternaturally irritable, and who are consequently subject to diarrhœa, or those whose bowels are torpid, and who are consequently subject to habitual constipation. In the latter case it is probable that the biliary secretion is sometimes long retained in the gall-bladder, where it becomes changed in nature, and acquires irritating properties.

Bilious cholera is rarely fatal in this country, excepting at seasons when the concurrence of circumstances is peculiarly favourable to the production of a severe form of the disease, and when at such seasons it attacks persons very much predisposed to it, and whose constitutions have been previously enfeebled by other causes. Its ordinary duration is from twenty-four hours to three or four days, when it often spontaneously disappears; but in general medical aid is indispensable; and when the attack is severe, if such aid be not promptly afforded, the danger of the disease and the difficulty of the cure are very seriously increased.

The milder forms of bilious cholera may pass away without the occurrence of any degree of spasm; but when the attack is severe, spasm is as constantly present as vomiting or purging. And cases now and then occur in which the spasm comes on so early and is so prominent as to give its own name, *spasmodic cholera*, to the disease. Spasmodic, by no means as frequent as bilious cholera, is on the other hand a much more formidable malady. It is indeed the same in nature, and arises from precisely the same causes, but its intensity and danger are widely different. Its attack is often immediately preceded by a sense of chilliness or a distinct rigor; the griping pains are more severe than in bilious cholera; the vomiting and purging are more urgent; the matter rejected consists of a watery or slimy fluid, and very soon there come on painful and violent spasms, which attack the muscles of the abdomen, thighs, legs, thorax, and lastly the arms and hands. These symptoms are attended with a small, quick, and contracted pulse, great thirst, and the immediate rejection of whatever is taken into the stomach. 'As the disease proceeds,' says Dr. Copland, who witnessed its progress in an intertropical climate, and who experienced it in his own person, 'the pulse becomes weaker and smaller; the spasms more general; the purging constant and painful, generally with tenesmus; the vomitings are renewed upon the ingestion of substances into the stomach; and the powers of life rapidly fail. During this time the fluids evacuated from the stomach and bowels present no appearance of bile, although occasionally bile is seen in the evacuations to a small extent. In the course of a few hours the features shrink, the hands and feet become cold and clammy; the exacerbation of the spasms forces out a cold clammy sweat on the face and breast; the pulse is extremely small and weak, or nearly disappears. In a case which came before me in Africa, in 1816, the pulse could scarcely be felt four hours from the attack; and the contents of the stomach are now, in the more dangerous cases, thrown off without any effort of retching. Commonly during all this time the fæcal matters and the biliary secretions are retained, apparently owing to the extension of the spasms from the duodenum to the common biliary duct, and to spastic constrictions of parts of the colon; the epigastrum and hypochondria being sore, tense, and tumid. When the disease is treated with decision, the vomitings cease; free evacuations with a discharge of bile take place, and the patient soon recovers. But if neglected, or improperly managed, the powers of life fail rapidly; the eyes sink, and are surrounded with a livid circle; the countenance assumes a remarkably anxious cast, or is pale, wan, and shrunk; and the spasms extend to the very fingers. The breathing now becomes extremely laborious; the patient is restless, and at last is carried off, sometimes in the space of ten or twelve hours.'

The pathological state constituting the disease seems to consist of irritation of the mucous surface of the digestive tube, commencing in the duodenum and extending in each direction to the stomach, small intestines, and along the common duct to the gall-bladder and liver, with increased action of the muscular coats of these viscera and determination of the circulating fluid to them. This irritation or morbid excitement, owing to the connexion of the organic nerves supplying those parts, is propagated to the spinal nerves, by which the muscles of the abdomen and extremities are affected by painful and violent contractions; and it is chiefly owing to the exhaustion of the vital manifestations of the organic system of nerves, and to the frequent and profuse discharges, that a fatal issue takes place: the circulating organs, which are actuated by this system, being in consequence incapable any longer of performing their functions.

In regard to the treatment, Sydenham recommends in the early part of the attack the promotion of the discharge of the offending matter by means of diluents, such as weak broths and soups; and since his time this practice has been very generally followed. When the discharge has continued some time opium is indispensable, which is best given in the form of pill, in doses of from one to three grains, repeated at short intervals. The muriate of morphia, in doses of from half a grain to two grains, is also an excellent remedy. In some cases the opium should be combined with calomel; and in the intense forms of this disease, common in warm climates, twenty grains of calomel combined with opium, repeated once or twice after an interval of from three to six hours, is found by experience to be the most effectual remedy. Under such circumstances these large and repeated doses of calomel do not salivate, partly because the whole of the calomel is never retained, and partly because the system is not in a condition favourable for the absorption of what does remain in the stomach.

The malady, new to this climate, which has spread to so many different nations of the globe, and which has swept away so many of its inhabitants, commonly known under the name of *pestilential cholera*, is a totally different disease from that here treated of, and is noticed under the article PESTILENCE.

For a more minute account of the symptoms, and for the details of the treatment of bilious and spasmodic cholera, see Sydenham's works; Dr. James Johnson *On Diseases of Intertropical Climates;* Dr. Chisholm *On Diseases of Tropical Climates;* and Dr. Copland's *Dict. of Practical Med.*

CHOLESTRINE, the crystalline matter which constitutes the basis of most of the biliary concretions of man. It is inodorous, insipid, insoluble in water, but soluble in hot alcohol, from which it separates on cooling. When treated with nitric acid it acquires the properties of an acid and is called cholestric acid. [CALCULUS.]

CHOLIAMBIC, the name of a kind of verse employed by Greek and occasionally by Latin writers (*e. g.* Martial). It consisted of six feet, and was regulated by the same general laws as the iambic verse of tragedy. In two or three points it differed considerably: the fifth foot was properly and generally an iambus, though a few instances are found of a spondee in its place: the sixth foot was always a spondee or trochee. From this circumstance the name Choliambus (χωλίαμβος) is derived, which means lame iambus; the metre limps, as it were, in the sixth foot. Anapæsts appear in the first foot, but in no other. Hipponax was one of the earliest writers in choliambic verse, and has therefore been called the inventor of it. The fragments of his poetry have been collected by Prof. Welcker.

Simonides and Callimachus also wrote in this metre, and a few specimens from the latter poet remain. The age succeeding the death of Alexander contained many choliambic writers, who employed the same antiquated dialect that they found in the compositions of Hipponax and others. The fable-writer Babrius [Babrius], who lived a little before the Augustan age, revived the choliambic poetry, and, influenced probably by preceding poets, who had adopted the same metre, he appears not to have considered himself bound by the custom of his own age in the choice of words. (*Philological Museum*, vol. i., pp. 280-304.)

CHOLLET, or CHOLET, a town in France, in the department of Maine et Loire, and on the little river Moine, which flows into the Sèvre Nantaise, about 190 miles S.W. of Paris in a straight line, or 217 miles by Chartres, Tours, and Saumur, in 47° 3′ N. lat., and 0° 53′ W. long.

The town is situated in a pleasant and fertile country, not far from the left bank of the Loire. Before the revolution it had two religious houses, an antient castle in good preservation, and an hospital: the castle and hospital were destroyed in the Vendean war, and the ci-devant convent of the Cordeliers was in consequence converted into an hospital. The population in 1832 amounted to 4657 for the town, or 7345 for the whole commune. The inhabitants manufacture linen-cloth, calico, and handkerchiefs, which resemble those of India, and carry on a considerable trade in cattle.

CHOLULA, a town in Mexico, in the state of Puebla, lying in 19° 2′ 6″ N. lat., and 98° 15′ W. long. It is situated on the table-land of Anahuac, at an elevation of 6912 feet above the level of the sea, according to Humboldt. Cholula is a considerable place, being inhabited by 16,000 souls, but its manufacturing industry is limited to the fabrication of coarse cotton goods. In the country about it are numerous and extensive plantations of maguay, from which plant the natives extract the beverage called *pulque*. Close to the town stands the largest of the Mexican *teocalli*, or pyramids. It is built like the pyramid at Sakhara, in Egypt, in terraces, of which there are four. Its height is 177 feet, and the length of each side of its base is 1440 feet. Its four sides lie exactly in the direction of the parallel and meridian lines. The platform on its top has an area of somewhat more than 50,000 square feet, and in the midst of it is built a church, dedicated to the Lady de los Remedios, in which mass is read every morning by a priest of the Indian race. The prospect from this platform over the adjacent plain, as far as the great mountain-masses of Popocatepetl and Pico de Orizaba, is very grand and striking. This interesting monument of the antient inhabitants of Mexico consists of alternating strata of bricks and clay cement. At no great distance from it are two other teocalli, but of smaller dimensions.

CHONAD, CHANAD, CSANAD or TSCHANAD, a county in the southern part of Hungary, in the province 'Beyond the Theiss.' It is bounded on the north by the county of Bekes, on the south by the territory of Temeswar, on the east by the counties of Sarand and Arad, and on the west by the county of Tschongrad; it lies between 46° and 47° N. lat. and 20° and 22° E. long. Like the surrounding counties, Chonad is a level plain, broken here and there by inconsiderable eminences. The Maros flows along its southern frontier from Sajten to Klarafalva, and, like the Theiss, forms numerous swamps, which are called *Pannahdt* and *Gentschdt*. It is also watered by the Szaraz, a branch of the Maros. Chonad contains 623 square miles, yet does not include more than 2 market towns, 11 villages, and 30 prædia, or privileged settlements. Its population, in 1787, was 35,868; in 1794, 35,992; and, in 1808, 35,447; but it has advanced rapidly of late years, and may at present be estimated at 47,500. The soil is very favourable to the cultivation of every species of grain, especially wheat, which is excellent and very abundant. The culture of the vine is carried on in several places; the best wine is that made at Mako: the tobacco is also in high estimation; and, on the whole, an increased attention has of late years been paid to horticulture. Chonad contains 40,853 yochs, or 58,361 acres, of meadow and pasture land; 88,666 yochs, or 126,657 acres, of arable land; 13,977 yochs, or 19,967 acres, of vineyards, and 5712 yochs, or 8160 acres, of garden ground. The woods and forests occupy 79,526 yochs, or 113,608 acres. A fine breed of horned cattle is reared in this and the neighbouring counties: that of Mako is famed throughout Hungary. Numerous herds of swine are fattened in the oak and beech forests, and much care is bestowed on the improvement of the flocks. In no other part of Hungary is the breeding of horses carried on with more skill and success than in this county, especially in the celebrated 'Mezohegyes,' an institution founded by Joseph II. in 1785, which stands unrivalled in Hungary, and probably in Europe. These royal mews are handsome and extensive, and always contain 3500 of the finest horses, the rearing and training of which employ 500 men and soldiers. From the proximity of the Maros and Theiss, Chonad is supplied with an abundance of fish; honey also is plentiful. No minerals are found here, and the spring-water is very unwholesome.

The county of Chonad is inhabited by Hungarians, Raitzes, Walachians, Sclavonians, and Jews. The Hungarians occupy six villages; the Walachians four, and the Sclavonians one. Of these 1209 are Roman Catholics, 10,293 Greeks, 4245 members of the Evangelical communion of the seigniory of Bekes (for the most part Sclavonians), 6600 of the Reformed church, and 800 Jews. There are very few mechanics, as nearly the whole population is employed in agriculture. The yearly quota of Chonad for the national war expenses is 17,220 florins, about 1730*l.* The whole county consists of only one circle.

CHONAD, or CSANAD, the capital, on the river Maros, contains 6737 inhabitants, and was formerly a place of some importance. Its castle has long since fallen into decay. It was erected into a bishopric by King Stephen I. in the year 1036, but the bishop does not reside here. It has two churches, and is the residence of a Greek protopape. 46° 10′ N. lat. and 20° 35′ E. long. The town of Mako, on the Maros, situated to the east of Szegedin, contains 15,160 inhabitants, and the general meetings of the states of the county are held here.

CHONAD, a village in the county of Torontal, in Hungary. It lies on the river Maros, and contains 5900 inhabitants, a castle, and one Catholic and one Greek church; it was formerly the seat of the bishop of Chonad, who was subject to the archbishop of Colocza. After the conquest of the fortress of Temeswar, in 1716, it was reunited to the Banat of Temeswar, after having continued for 165 years under Turkish dominion.

CHONDROPTERY′GII, or CARTILAGINEI, one of the two great sections into which the class *Pisces* is divided.

In this section we find species which possess, in most respects, the highest degree of organization, while others possess the lowest observed in the class.

The principal character which distinguishes this section from the fishes with true bone (which usually come first in arrangements) is the cartilaginous substance of which the bones are composed, a circumstance arising from the very small quantity of earthy matter which enters into their composition. This earthy matter, when observed, is found to be disposed in small granules, and not in distinct fibres, as in the first section.

The cranium of these fishes is not divided by true sutures but is formed of a single piece: the maxillary and intermaxillary bones are either wanting or rudimentary, and their functions are performed by bones analogous to the palatines, and sometimes the vomer. Many of the vertebræ are often consolidated. The gelatinous substance, which in most fishes fills the intervals between the vertebræ (these intervertebral masses being connected only by a small cord), in this section frequently forms a thick cord, which varies but slightly in diameter.

In the Myxine (*Gastrobranchus cæcus*), no distinct vertebræ are perceivable, their place being occupied by a soft gelatinous tube. In the extraordinary little fish described by Mr. Yarrell in his 'History of British Fishes,' the lancelet (*Amphioxus lanceolatus*), this part is still more rudimentary, consisting only of a slender transparent column.

The Chondropterygii are divided by Cuvier into two orders—those which have their gills free, as in the generality of fishes; and those in which they are fixed,—that is the external edge attached to the skin. In the former of these orders, the species have but one external gill-opening, and in the latter they have several—generally five. These orders are divided into families and genera, as follows:—

Order 1. Chondropterygii with free gills.

Family 1. Sturionidæ (or *sturgeons.*)
Genus 1. Accipenser.
—— 2. Spatularia.

Family 2. Chimæridæ*
Genus 1. Chimæra.
Order 2. Chondropterygii with fixed gills.
Family 1. Squalidæ (*sharks*, &c.)
(The principal genera are)
Squalus,
Zygæna (*hammer-headed sharks*),
Squatina (*angel-fish*),
Pristes (*saw-fish*),
Family 2. Raiidæ.
(principal genera:)
Torpedo (*electric rays*),
Raia (*skate-fish*),
Trigon (*sting rays*),
Mylobates (*eagle ray*),
Cephaloptera.
Family 3. Pteromyzidæ (lampreys, &c.)
Genus 1. Pteromyzon,
2. Ammocœtes,
3. Gastrobranchus,
4. Amphioxus.

CHONDROSE'PIA, Leukard's name for a genus of cephalopoda. [TEUTHIDÆ.]

CHONDRUS (Zoology), a pulmoniferous mollusk. [PULMOBRANCHIATA.]

CHORA'GUS, the name of a public officer at Athens. Each phyle, or tribe, had a choragus (χοραγὸς), who was obliged to provide a chorus to perform at the representations in the theatre, and at many religious solemnities. The office was probably rotatory, though none but rich persons able to bear the expenditure without inconvenience could be forced to take it. (Fred. Aug. Wolf, *Prolegomena in Demosth. Orat. Leptin.* p. lxxxvii.) The choragus had entire charge of the whole choral apparatus: he paid for the dresses and the crowns, and all other decorations. He also provided and paid a teacher (χοροδιδάσκαλος, chorus-teacher), who instructed and trained the choristers in the arts and graces of their profession. Every expense of whatever kind attendant on the equipment of a chorus, either in the theatre or in any other exhibition, was discharged by the choragus. The tribes vied with one another in the splendour of their exhibitions, and especially in the sumptuousness of the choral ornaments: sometimes the expenses incurred by the state were so heavy, that both the treasury and the resources of individuals were exhausted. (See also *Xen. Hipparch.* i. 26.) In some cases the choragus seems to have led the chorus in person, as well as to have defrayed the expenses; and once a choragus acted as flute-player at Sparta. (Müller's *Dorians*, vol. ii., p. 341.) The term choragus included sometimes the gymnasiarch and the hestiator. (Fred. Aug. Wolf, *in Demosth. Leptin. Orat. Comment.* 16, 24.) The former of these had charge of the athletic exercises of the youth; and the latter was obliged to give a banquet to his tribe on occasion of any great holiday or festival: these offices were similar in kind to that of the choragus, which, probably from being the most expensive and important of the three, stands frequently for the whole. The choragus is not to be confounded with the choropoios (χοροποιὸς), who was general chorus-manager to all the tribes. (Xenoph. *Ages*, ii. 17; Müller's *Dorians*, vol. ii., p. 341, *note*.) Some age appears to have been fixed below which it was not competent to a man to be made choragus: a choragus of boys could not be under forty years of age; the age required in other cases is not known. A resident alien or metic (μέτοικος) could not hold the office. Demosthenes was on one occasion a volunteer choragus, and was grievously insulted during his term of office by Meidias. (Demosth. *against Meidias*.) A tripod was the common prize of the successful choragus, who occasionally erected a small building on which he placed the prize. Such is the choragic monument of Lysicrates at Athens, commonly called the Lantern of Demosthenes. (*Elgin Marbles*, ii. 76, 89, &c.)

CHORD (in mathematics), a straight line drawn from one point to another of a curve. [ARC.] The term chord was also used in trigonometry, with sine, cosine, &c., to denote the chord of a circle, in which case it was also called the chord of the subtending angle. But this term, not being wanted, has not passed into pure algebra with sine, cosine, &c. [CIRCLE], so that when used, it must be considered as retaining its primitive sense, namely, that of a straight line, not an abstract number expressing the ratio of a straight line to the radius. To find the chord of a given angle, multiply the diameter by the sine of half the angle. Thus the angle being 23° 20′, and its half 11° 40′, take the sine of the half, which is ·2022176. If the diameter be 100 feet, then the chord of 23° 20′ is 20·22176, or 20¼ feet nearly.

To find the chord of a given arc, find the angle subtending the given arc [ANGLE], and proceed as before. The following Table of Chords, to every degree up to 180°, will frequently be useful in rough calculations. The diameter is throughout 10,000, to avoid decimals.

TABLE OF CHORDS (DIAMETER 10,000.)

Angle	Chord.	Angle.	Chord.	Angle.	Chord.	Angle.	Chord.
1	87	46	3907	91	7133	136	9272
2	175	47	3987	92	7193	137	9304
3	262	48	4067	93	7254	138	9336
4	349	49	4147	94	7314	139	9367
5	436	50	4226	95	7373	140	9397
6	523	51	4305	96	7431	141	9426
7	610	52	4384	97	7490	142	9455
8	698	53	4462	98	7547	143	9483
9	785	54	4540	99	7604	144	9511
10	872	55	4617	100	7660	145	9537
11	958	56	4695	101	7716	146	9563
12	1045	57	4772	102	7771	147	9588
13	1132	58	4848	103	7826	148	9613
14	1219	59	4924	104	7880	149	9636
15	1305	60	5000	105	7934	150	9659
16	1392	61	5075	106	7986	151	9681
17	1478	62	5150	107	8039	152	9703
18	1564	63	5225	108	8090	153	9724
19	1650	64	5299	109	8141	154	9744
20	1736	65	5373	110	8192	155	9763
21	1822	66	5446	111	8241	156	9781
22	1908	67	5519	112	8290	157	9799
23	1994	68	5592	113	8339	158	9816
24	2079	69	5664	114	8387	159	9833
25	2164	70	5736	115	8434	160	9848
26	2250	71	5807	116	8480	161	9863
27	2334	72	5878	117	8526	162	9877
28	2419	73	5948	118	8572	163	9890
29	2504	74	6018	119	8616	164	9903
30	2588	75	6088	120	8660	165	9914
31	2672	76	6157	121	8704	166	9925
32	2756	77	6225	122	8746	167	9936
33	2840	78	6293	123	8788	168	9945
34	2924	79	6361	124	8829	169	9954
35	3007	80	6428	125	8870	170	9962
36	3090	81	6494	126	8910	171	9969
37	3173	82	6561	127	8949	172	9976
38	3256	83	6626	128	8988	173	9981
39	3338	84	6691	129	9026	174	9986
40	3420	85	6756	130	9063	175	9990
41	3502	86	6820	131	9100	176	9994
42	3584	87	6884	132	9135	177	9997
43	3665	88	6947	133	9171	178	9998
44	3746	89	7009	134	9205	179	9999
45	3287	90	7071	135	9239	180	10000

To use this Table, roughly, take out the chord of the nearest degree, multiply by the diameter, and divide by 10,000. Thus for a diameter of 2 feet, and an angle of 10° (supposing decimals are to be avoided), take out 872 opposite to 10°, and multiply by 2, giving 1744, which in inches is 20,928, which divided by 10,000, gives 2 inches, and $\frac{1}{10}$th of an inch, very nearly.

An easy method of verifying the preceding Table (if a doubt arise in any case) is contained in the following relations, which apply according as x is greater or less than 120°.

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* We adopt the names of the families as given by Mr. Yarrell. It is proper here to state that the position of the genus Chimæra is doubtful, possessing, as it does, some of the characters of both orders. As regards the gills, we will quote Dr. Richardson's account:—'The Chimæra,' says this gentleman, though placed by Cuvier at the end of the sturionidæ, seem to belong more properly to his second order of the Chondropterygii, in which the gills are fixed; for though there is only one apparent gill-opening on each side, the gills in reality adhere by a large part of their borders, and there are consequently five holes communicating with the external gill-opening.' Cuvier however was not ignorant of these facts when he placed the genus Chimæra in the first of the two orders.

$$\text{ch. of } (x - 120°) + \text{ch. } (240° - x) = \text{ch. } x.$$
$$\text{ch. of } (120 + x) - \text{ch. } (120° - x) = \text{ch. } x.$$
$$\text{ch. of } (180° + x) = \text{ch. of } (180° - x)$$

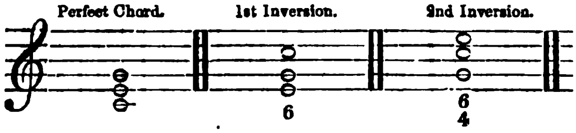
For instance, the chord of 130° is made up of those of 10° and 110°; the chord of 50° is the difference between those of 170° and 70°. These will be true within a unit, if the Table be correct.

CHORD (musical string). [CORD.]

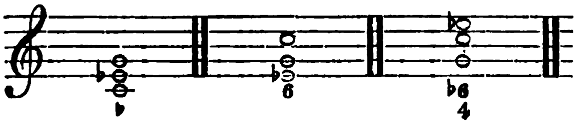
CHORD, in music, is the harmonious combination of three or more musical sounds.

To account for the origin of chords many theories have been proposed, the principal whereof are, that of Rameau,—which D'Alembert endeavoured to elucidate, and Marpurg partly built his system on—and those of Tartini and Kirnberger. These theories, in the main, all arise out of, or finally resolve into, the natural harmonics of a distended string. But it will be proper here to state that Sir John Herschel, in his admirable treatise on Sound, declares 'the insufficiency of any attempt to establish the whole theory of harmony and music on the aliquot subdivision of a musical string.' Nevertheless, the facts that result from the simple division of a stretched string agreeing with the natural harmonic divisions of a sonorous tube—the French horn for instance—and which cannot be disputed, are sufficient to prove that the foundation of what is properly called harmony was not arbitrarily laid. These facts may thus be briefly stated:—the whole string gives, of course, the gravest, or generating, sound; four-fifths of the string give the major 3rd; two-thirds give the perfect 5th; and one-half gives the octave. Thus is produced the perfect or common chord, or triad, which, together with the chord of the seventh, is the source of all other real chords.

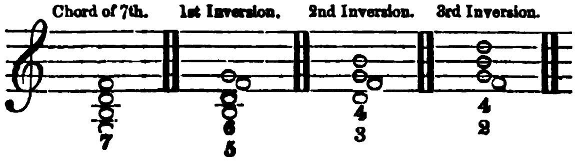
The Perfect Chord consists of any given note, together with a major 3rd and perfect 5th, which sounds may be represented by the letters C, E, G, or by the syllables *do, mi, sol*. It has two inversions, or derivatives: the first is made by taking the E (*mi*) as the base, producing the chord of the *sixth;* the second by taking the G (*sol*) as the base, producing the chord of the *sixth* and *fourth*. Example:—



This chord is denominated the Perfect Minor Chord when its 3rd is flattened; and so altered, its inversions are affected accordingly. Example:—

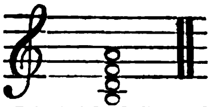


The chord of the seventh—called the dominant seventh—is formed by adding to the perfect chord a minor 7th, and consists of a given note, together with a major 3rd, a perfect 5th and a minor 7th. It may be represented by the letters G, B, D, F, or by the syllables *sol, si, re, fa*. This has three inversions: the first is made by taking the B (*si*) as the base, producing the chord of the *sixth* and *fifth;* the second by taking the D (*re*) as the base, producing the chord of the *fourth* and *third;* the third by taking F (*fa*) as the base, producing the chord of the *fourth* and *second*. Example:—

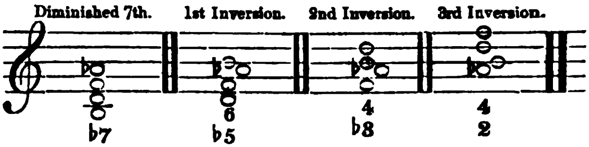


The Perfect Chord and its inversions are called consonant chords: all other chords, and their inversions, are called dissonant chords.

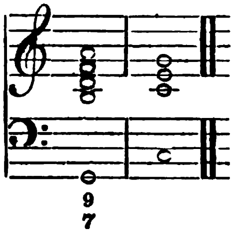
The chord of the Imperfect, or Minor, Seventh, consists of a given note, a minor 3rd, an imperfect 5th, and a 7th. Example:—



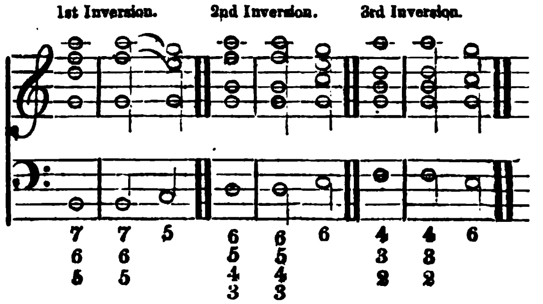
The chord of the Diminished Seventh—sometimes called the Equivocal Chord—consists of a given note, its minor 3rd, imperfect 5th, and diminished 7th. Example:—



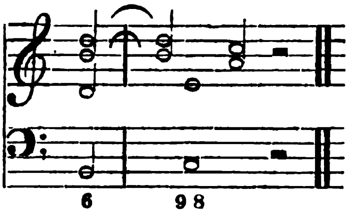
The chord of the Dominant Ninth consists of a given note, its major 3rd, 5th, 7th and 9th. Example:—



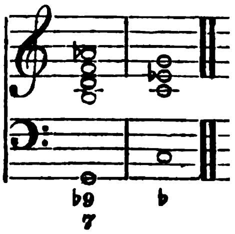
This chord has three inversions, though they are not in very common use. M. Catel gives them in the following manner:—



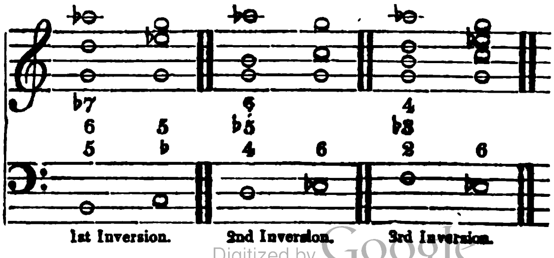
But by far the most elegant form which the chord of the Ninth and Seventh assumes, is as a retardation of the 8th and 6th. Example:—



The Dominant Minor Ninth consists of the same sounds as the Dominant Ninth, but the 9th is flat. Example:—

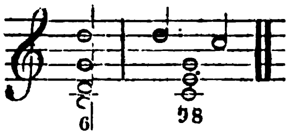


This has three inversions, which also we extract from M. Catel's treatise.

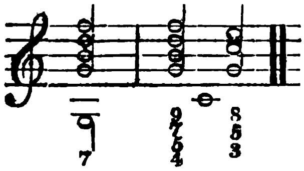


We have seen, that by adding to the perfect chord a 3rd above its 5th, the chord of the Seventh is formed: by the further addition of thirds, theorists form other chords, sometimes called *chords by supposition*. These are, the chord of the Ninth, of the Eleventh, and of the Thirteenth. The last three chords, as well as others presently to be mentioned, are mere chords of retardation: or, in other words, the dissonant notes in them are but appoggiaturas.

The chord of the Ninth consists of a given note, its 3rd, 5th and 9th, the discord retarding the 8th. Example:—

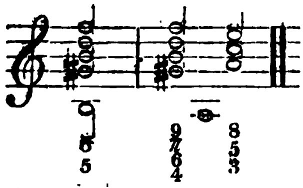


The chord of the Eleventh (more commonly called the chord of the Sharp Seventh), consists of a given note, its 4th (or 11th), 5th, major 7th, and 9th. It is a retardation of the perfect chord; the 9th and 7th retarding the 8th, and the 4th retarding the 3rd, of the perfect chord. Example:—

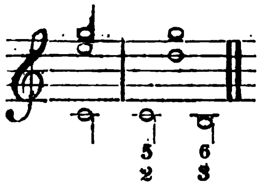


This chord is almost invariably figured by a 7̸, accompanied by a 5th, 4th and 2nd; but as the discord of the 2nd is always resolved in the base, it cannot, under such name, form a part of the chord of the eleventh.

The chord of the Thirteenth consists of a given note, its 4th, 6th (or 13th), major 7th and 9th. This is a retardation of the perfect minor chord, the 4th and 6th retarding the 3rd and 5th, the 7th and 9th retarding the 8th. Example:—

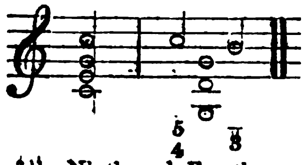


The chord of the Fifth and Second consists of a given note, its 2nd and 5th. Example:—

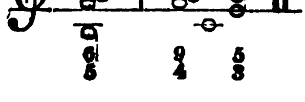


Albrechtsberger considers this chord as one form of the chord of the Eleventh, but the discord being resolved in the base proves it to be a 2nd, not a 9th. It is, in fact, the Sixth retarded by the base.

The chord of the Fifth and Fourth consists of a given note, its 4th and 5th, and retards the perfect chord, the 4th retarding the 3rd. Example:—



The chord of the Ninth and Fourth consists of a given note, its 4th, 5th and 9th. This also retards the perfect chord, the 4th and 9th retarding the 3rd and 8th. Example:—



We will only add that, the nomenclature of chords stands much in need of correction, but, unhappily, it is not the only branch of the theory of music that is confused and perplexing from want of logical accuracy and lucid arrangement.

CHOREA (remotely from the Greek χορεία, and immediately from the Latin *chorea*, a dance with singing—Chorea Sancti Viti—Saint Vitus's Dance), a disease affecting with irregular movements the muscles of voluntary motion, these muscles being no longer under the command of the will, and the power both of walking and of using the arms and hands being impaired. The chief external manifestations of this disease are in the muscles of voluntary motion; but its real seat is in certain internal organs, and more especially in those which belong to the apparatus of digestion. If the history of any case of chorea be carefully examined from the commencement, it will be found that the more manifest disorder has been preceded by deranged appetite, which is sometimes voracious, and at other times altogether lost; by constipated bowels, and by imperfect digestion. There is at the same time a remarkable failure of the general physical strength. The derangement in these organic functions is always accompanied with a greater or less degree of mental disorder. The mind is irritable and fretful, and oftentimes reserved, gloomy, and desirous of solitude. After this state of physical and mental disorder has continued some time, and the languor, lassitude, and general weakness of the system have proportionally increased, there come on irregular and involuntary twitchings of the muscles, particularly the muscles of the face, which at first are thought by the friends of the patient to be merely the effect of imitation. But these convulsive motions progressively increase, until the muscles of the extremities, face, lower jaw, head, and trunk all become agitated with violent and irregular movements. In this case the patient is incapable of walking steadily, his gait is jumping or starting; sometimes he is altogether unable to walk, and seems palsied, while he is equally unable to perform the ordinary motions with the affected arm.

A century and a half ago Sydenham gave the following graphic and correct description of the convulsive motions characteristic of this disease when fully formed. 'First it shows itself by a lameness or rather instability of one of the legs, which the patient drags after him like a fool. Afterwards it appears in the hand of the same side, which he that is affected with the disease can by no means keep in the same posture for one moment; if it be brought to the breast or any other part, it will be distorted to another position or place by a convulsion, let the patient do what he can. If a cup of drink be put into his hand he represents a thousand gestures, like jugglers, before he brings it to his mouth; for whereas he cannot carry it to his mouth in a right line, his hand being drawn hither and thither by the convulsion; he turns it often about for some time, till at length, happily reaching his lips, he flings it suddenly into his mouth, and drinks it greedily, as if designing only to make sport.'

As the disease advances the power of distinct articulation is lost: even the deglutition becomes difficult, in some cases, to such a degree that fluids are forcibly thrown up from the pharynx in attempts at swallowing them; the eyes lose their lustre; the complexion becomes pallid and muddy; the expression of the countenance languid and vacant; and in the severest cases the mouth is variously twisted and the saliva drivels from it; the tongue is protruded irregularly and spasmodically; the eyes are distorted and rolled in various directions, and the sight is occasionally defective. The muscles meantime become soft and flaccid; emaciation takes place; the pulse is weak, but not much quickened; the urine is pale and copious, and the bowels are always constipated.

The mind, irritable from the commencement, is now harassed by painful images and incongruous ideas, which every effort is made to conceal, and various desires and emotions are produced, sometimes without apparent cause. This disordered condition of the mind, when the disease is severe and long continued, ultimately terminates in a state of fatuity, of which the pallid, listless, and vacant countenance is the external sign and expression.

This disease is common to both sexes, but it is much more frequent in the female than in the male, in the proportion of about three of the former to one of the latter. It seldom attacks before the 8th nor after the 15th or 16th year of age, although no period of life is wholly exempt from it. The different muscles that are affected, and the different degrees in which they are agitated by the irregular motions, give an endless diversity to the external appearance of different cases; for the convulsive motions are sometimes slight, at other times severe, sometimes partial, at other times general; but most commonly they are partial, and sometimes they are strictly confined to one side. The duration of the disease may vary from a few weeks to many months.

Chorea is often associated with other affections more or less closely allied to it in nature, and alternates with them. In the female it is often observed in connexion with chlorosis, with the suppression of the catamenial discharge, and with hysteria, and in the male with rheumatism, paralysis, and dropsy. Occasionally it terminates in epilepsy, paralysis, dropsy, particularly hydrocephalus, and, as has been stated, complete idiotcy. Cases are on record in which it has terminated in violent convulsions, and inflammation of the brain, followed by coma and death

Such being the occasional issue, the disease ought in no case to be neglected or trifled with, especially when, as is invariably the case, the postponement of the proper treatment greatly increases the difficulty of the cure. In general, under proper management, the disease is removed without difficulty, and the return to health is commonly complete, although this is one of the affections which is peculiarly subject to relapse. It is not at all uncommon for the patient, when apparently cured, to be attacked several times in succession either with the same disease or with some one of the affections into which it has been stated to have so great a tendency to lapse. Still however those relapses are curable by persevering in the proper treatment, and it is remarkable that even when paralysis and idiotcy appear to be fully established they yield far more readily to appropriate remedies than when those affections have been induced by a primary affection of the brain.

Chorea arises in widely different states of the system, and is produced by different causes, and therefore in different cases requires a different treatment. But in the great majority of cases it arises from an accumulation of irritating matter in the alimentary canal, which must be removed by a course of purgative medicines. The choice of the purgative and the duration of the course must depend on the state of the system in each particular case; but in general the purgative must be of an active nature, and the course decided and long continued. At the same time the strict regulation of the diet, both as to the quality and the quantity of the food, is indispensable. As this malady almost invariably occurs in an enfeebled state of the constitution, active exercise in fresh and pure air, and whatever medicines of a tonic nature are best suited to the particular circumstances of the individual case, should be combined with the purgative course of treatment.

When this affection is connected, as it occasionally is, with organic disease of the spinal cord or brain, it is of the last importance to the proper treatment of the case that this organic lesion should be discriminated, and that the remedies proper to it should be promptly applied. From what has been stated it will appear that this is one of the diseases which should engage the anxious attention of parents, teachers, and all who have the charge of young persons of either sex. Not only the health or disease of puberty and adolescence, but the health or disease, physical and mental, of mature age, may depend on their prompt attention to, or neglect of, the very first symptoms of this malady.

CHORLEY, a market-town and parish in the hundred and deanery of Leyland, in the county of Lancaster, 208 miles N.W. by N. from London, 22 N.W. from Manchester, 11 miles S.W. from Blackburn, 9 miles S.S.E. from Preston, 11 miles N.N.W. from Bolton, and 8 miles N. from Wigan. It has no dependent township, and is the only market-town in the hundred of Leyland. The parish of Chorley comprizes an area of 2000 statute acres. The town is situated on a hill in the centre of the county, on the great west road from London to the North. Its name is derived from Chor, a stream that rises at Heapey, two miles distant, and after a short course along the edge of the town, joins the Yarrow and empties into the Douglas. A court-leet and baron was held here for the manor until 1827, when it was discontinued. The manor now belongs to the Fazakerleys, after having passed through the hands of the Sherburnes, the Chorleys, and the Norman families of Ferrers and Lacy. Within the present century the population has more than doubled. In 1801 it was 4516; in 1831, 9282. Seventy years ago the whole town consisted of one irregular street with a shop built across it; now the streets are wide and amount to 67, with a market-square, and about 1820 houses. The town is lighted with gas by a company formed in 1819, and is partially supplied with water by another company formed in 1823. The chief articles of manufacture are calicoes, muslins, and ginghams. Eight cotton-mills and printing and bleaching establishments find employment for a considerable part of the population. The Leeds and Liverpool canal, which joins the Lancaster canal at Whittle-le-woods, passes within about a mile E.S.E. of the town, and furnishes the means of conveying the flags, slates, and mill-stones which are got out of the quarries in the neighbourhood. Coal of good quality is abundant, and in 1833 a large bed of iron ore was discovered near Gillibrand Hall. Lead and carbonate of barytes are found in the Anglezark mines, four miles distant. About one-fourth of the land is arable, and the remaining three-fourths pasture and wood. There are four annual fairs, three of which are principally for cattle, and the last for woollen cloth, hardware, and pedlery. The market is held on Tuesday and Saturday. The town-hall, the basement area of which is used as a market-house, is a stone building, built in 1802 at the sole expense of the late John Hollinshead, Esq. Above this are rooms for the transaction of parochial and public business. The local authority is vested in a constable and visiting magistrates, who hold a petit-sessions once in three weeks.

Chorley was a chapelry in the parish of Croston until 1793, when it became one of three independent parishes, into which the former was divided. The living is a rectory in the archdeaconry of Chester. The parish church, dedicated to St. Lawrence, is an antient structure, supposed to be of Norman origin. The tower is a later erection. In this church a court is annually held by the bishop of Chester, at which he presides by proxy, for the swearing-in of churchwardens for all the parishes in the hundred of Leyland, for proving wills, and for taking out letters of administration. In the patronage of the rector of the parish church is St. George's, an elegant modern structure, built by the parliamentary commissioners at the cost of 13,707*l.* 16*s.* 9*d.*, and opened for public worship in 1825. Besides the churches there are dissenting chapels for the Unitarians, Independents, Wesleyan Methodists, and Baptists; and at Weldbank, about a mile south of Chorley, is the Catholic chapel. In the various Sunday schools 2135 children receive instruction. The Grammar-school, adjoining to the churchyard, has but a very small endowment, so that the boys educated there are not taught gratuitously. There is a large and handsome school, conducted on Dr. Bell's plan, built and supported by public subscription; there are also infant schools and a Catholic day-school, which afford gratuitous instruction to nearly 1000 children. Six almshouses, having gardens and a donative of 2*l.* per annum attached to each, were built in 1682 for aged women and widows. Other charities, amounting to nearly 30*l.*, are annually distributed among the poor. In 1828 a dispensary was established. The surrounding country is very picturesque, particularly towards the vale of the Ribble. On the north-west of the town is Astley Hall, an antient mansion, the seat of Sir H. P. Hoghton, Bart., and a little farther from the town, in the opposite direction, is Duxbury Hall. The townships adjoining Chorley are Heapey, Hoghton, Wheelton, and Witnell, and Whittle-le-Woods. (*Communication from Lancashire;* Robinson's *Description of the Parish of Chorley*, 1835.)

CHORUS, among the Greeks, was a number of persons, male or female, who sang melodies accompanied with dancing. The chorus appears to have been of Doric origin, and the Doric dialect continued to be chiefly used, even in the choral songs of Attic tragedies. (Müller's *Dorians*, vol. ii., p. 381.) Originally the choral performance was a separate exhibition, and was of a religious character: hymns were chanted in honour of Dionysus and other gods. Afterwards an actor was added by Thespis, who first introduced the dialogue; other changes were made by his successors, especially Phrynichus, till a second actor was added by Æschylus, who embodied the chorus in the constitution of the Greek drama, as a part and only a part of the representation. Many explanations of the object of the chorus have been offered by different writers. It would certainly give a very imperfect idea of its office, to say that it was only retained in order to give the other actors breathing-time, and to prevent a break in the performance. The chorus may be regarded rather as the representation of the aggregate body of spectators: the chorus generally gave utterance to those emotions of pleasure or sorrow which the audience might be supposed to feel. They sometimes took upon themselves to give instruction or to administer reproof.

The tragic chorus consisted at first of fifty, afterwards of fifteen persons; the comic chorus consisted of twenty-four. According to Julius Pollux (*Onomast.* iv. 15), the number of the tragic chorus was abridged after the performance of the Eumenides of Æschylus: the alarm caused by fifty of these ladies was too great. The chorus entered into the orchestra, and remained there performing their evolutions, and observing the thymele or altar, which was in the middle of the orchestra, as the centre of their movements. As they sang they moved in a dance, suited to the subject of their song, and modulated by the accompanying music: sometimes the movements of the dance were so appropriate as to convey to the spectators the full meaning of the chorus, independently of the words of the song. The perfection to which the Greeks carried their skill in affecting an audience by the harmonious union of dancing and music forms one of the main differences between the antient and modern theatre. The modern ballet (properly so called) will probably give the best idea of what this combination was: but by the ballet (properly so called), we understand a ballet which is a species of drama, and not what is now ordinarily presented as a ballet. The songs of the chorus consisted of three parts, the strophe (or *turning*), the antistrophe (*opposite turning*), and the epode (*after-song*): during the first they turned from right to left, during the second from left to right, and during the third they stood still in front of the spectators. When they sang, they all sang: when they took part in the dialogue, one only, the coryphæus or leader of the chorus, spoke, from the top of the thymele; and hence in addresses to the chorus there is a constant change of number—*thou* and *ye*. (Schlegel, *Transl. in Theatre of the Greeks*, p. 265.) Frequently they divided into two sets, who, by means of their two leaders, carried on a separate dialogue, which generally revealed their sentiments on the progress of the plot, their fears, anxieties, and hopes. They also chanted hymns of supplication or thanksgiving to the gods.

The choruses at Athens did not perform exclusively in the theatre, but on many occasions when there was no scenic representation at all. At the Panathenæa and the Thargelia, and at the Gymnopædia of Sparta, choruses of men and boys sang. All choruses at Athens were provided, equipped, and instructed, by persons appointed by the several tribes. [Choragus.]

CHORUS, in music, a composition sometimes in two or three, but generally in four parts, sung by many voices, accompanied by the whole band when performed in an orchestra or on the stage, but by the organ alone when sung in a choir. The chorus of the oratorio and opera has full instrumental accompaniments, but that of our cathedral services and anthems is written with only an organ accompaniment.

The term Chorus is also applied in an aggregate sense to the whole body of singers performing the chorus.

A Double Chorus is in eight vocal parts, and sung by two choirs. Many of Handel's choruses in *Israel in Egypt*, in *Solomon*, and in *Deborah*, are of this kind.

CHOSE IN ACTION is a technical term in the law of England which denotes that kind of property of which the owner is not in the actual possession or occupation, though he has a legal right entitling him to obtain the possession by an action or suit. This sort of property is, for this reason, called a thing (*res*), or *chose* in *action*, in contradistinction from property in *possession*. Thus if I contract to buy a quarter of wheat out of a large quantity, and the seller, in breach of his engagement, refuses to deliver it, my interest in the wheat under the contract is a property to which I have an absolute right, but which, as I have not bought any specific parcel of wheat, I can only reduce into possession through the medium of an action. And as long as I have only the right of enforcing the delivery of the wheat, or an equivalent in damages, and not the actual possession, my property in this respect is a chose in action, being, as a property, a thing rather *in potentiâ* than *in esse*. (Blackstone's *Comm.*, vol. ii., p. 397.) In like manner money due upon a bond or a bill of exchange is a chose in action; and also the right to compensation for damage sustained by means of the breach of any kind of contract.

The antient policy of the English law, in discouraging all contracts tending to promote litigation, introduced a rule that property in action merely, and not in possession, could not be assigned or transferred to any third person. This rule has in modern times received considerable modification. In the familiar instance of bills of exchange and promissory notes (which are strictly choses in action), an indorsement not only transfers to the indorsee the absolute right to the sum to be recovered, but also enables him to sue in the common law-courts upon the bill or note in his own name. Courts of equity in other cases protect assignments of choses in action; but in these cases the assignee must sue in the name of the original contractor, whom the law, regarding the assignment, which it does not sanction, as a nullity, treats as the party still entitled, if the assignee proceeds at law. [Assignment.]

CHOSROES. [Khosru.]

CHOTEESGHUR. [Nagpore.]

CHOUA'NS was the name given to the irregular bands of royalists in the west of France, who continued in arms after the organized insurrection of La Vendée had been suppressed by the first Consul Bonaparte in the year 1800. The Chouans were chiefly on the right bank of the Loire, in the provinces of Bretagne, Maine, and Normandy, while the Vendeans, properly so called, were on the left or south bank of that river. The Vendeans were a regular royalist party, possessing a considerable extent of country, having a kind of discipline in their army, and fighting honourably for their cause. The Chouans, who continued in arms after the Vendeans had submitted, were straggling, disorderly bodies of men, marauding over various provinces of France, hunted after by the troops of the government, and having no fixed station. Some of the royalist officers who had served in the civil wars of La Vendée became chiefs of Chouan parties, but the parties themselves were swelled by many disorderly and desperate characters, who continued a struggle which had become hopeless chiefly for the sake of revenge and plunder. Frotté and George Cadoudal became the chief leaders of the Chouans, after the Vendean chiefs d'Autichamp, Bernier, Bourmont, Chatillon, Suzannet, &c., had made their submission to the first consul. Frotté was taken and shot. Cadoudal withdrew to England, then returned to France, and continued a desultory kind of warfare, mixed up with conspiracies against the first consul, for effecting one of which he went secretly to Paris, and remained several months in that city unknown to the police. He was at last arrested, after killing several of the police, tried, and executed in June, 1804. [Bonaparte.] The Chouans scattered over France had been in great measure put down, and a vast number of them executed previous to Cadoudal's death; still we read of Chouan parties occasionally as late as 1806, under the empire, when one of them arrested the bishop of Vannes in the department of Morbihan and exacted a considerable sum for his ransom. They had then degenerated into mere robbers In general the name of Chouans was used in an unfavourable sense, while that of Vendeans was respected even by their enemies.

CHOUGH. [Corvidæ.]

CHOUMLA. [Shumla.]

CHRISM, sometimes written **CRISOME**, in its strict interpretation means 'unction,' from the Greek χρίσμα (chrisma), ointment; but is more generally received as the name for oil consecrated by the bishop and used in the Romish and Greek churches in the administration of baptism, confirmation, ordination, and extreme unction: and is, or used to be, prepared on Holy Thursday with much ceremony. Ducange (*Glossar. ad Script. Med. et Infimæ Latinitatis*, edit. Francof. ad Mœn., 1681, tom. i., col. 973) says there are two kinds of chrism, the one prepared of oil and balsam, used in baptism, confirmation, and ordination, the other of oil alone, consecrated by the bishop, antiently used for the catechumens, and still used in extreme unction. (See also Durand's *Rationale Divinorum Officiorum*, lib. vi., cap. 74, 84.) The word crisome is also found applied to the cloth which was laid over a child's face when baptised, to prevent the unguent from running off. (See the *Liturgy* compiled in the 2nd year of Edward VI.) Children likewise who die in the first month are called Chrisomes in our Bills of Mortality, probably from the circumstance of the linen-cloth having been so recently laid upon them.

CHRIST, JESUS, was born at Bethlehem, a city of Judæa, in the days of King Herod. The first chapter of St. Matthew contains the genealogy of Jesus deduced from Abraham through David to his reputed father Joseph: the third chapter of St. Luke contains his pedigree from Joseph to Adam. From Joseph to David, the two genealogies are entirely different; but this discrepancy is satisfactorily explained by the commentators. The birth of Jesus was miraculous; 'when his mother Mary (according to the words of St. Matthew) was espoused to Joseph, before they came together, she was found with child of the Holy Ghost.' Joseph, who intended to put her away privately, being warned in a dream by the Angel of the Lord, that what was 'conceived in her was of the Holy Ghost, took unto him his wife and knew her not till she had brought forth her first-born son: and he called his name Jesus.' (Matth. i.) Herod was much troubled at the miraculous circumstances which attended the birth of Christ, and at the coincidence of the place of his birth with the prophecies. In order therefore that the infant might with certainty be destroyed, he gave orders that all the male children in Bethlehem and the neighbourhood under two years of age should be put to death; but Jesus was saved by his parents, who were warned by an angel in a dream to take the child into Egypt. This part of the sacred history is recorded by St. Matthew only. According to St. Luke, when the days of the purification of Mary were accomplished, his parents took him from Bethlehem to Jerusalem to present him in the Temple, after which they returned to their own city Nazareth in Galilee. At twelve years of age Christ disputed with the Jewish doctors in the Temple at Jerusalem, whom he astonished by his answers and his understanding. Towards his parents his conduct was an example of filial obedience. He was not above following the business of his reputed father, which was that of a carpenter; and until about his thirtieth year he fulfilled the common duties of life in an humble and obscure station. His public ministry was preceded by the warnings and admonitions of John the Baptist, the son of a Jewish priest, who called upon the people to repent and believe, for the time was fulfilled, and the kingdom of God was at hand. Christ was baptised by John in the river Jordan, and shortly after commenced his ministry, being about thirty years of age. For about the space of three years he was engaged in the work of promulgating his doctrines, and confirming his divine mission by numerous miracles. In order to diffuse that religion which he came to make known, Christ selected a certain number of persons to be his constant companions, to learn his doctrines, to witness their influence, to testify to the miracles by which their truth was demonstrated, and to be prepared to propagate after his death the truths which he had thus made known. The twelve persons whom he chose are called the Twelve Apostles. They were ignorant persons, who possessed neither wealth, rank, nor education; and yet they were called to root out opinions which were deeply implanted in men's minds, and to overturn systems strengthened by all the influence which antient and venerable authorities exert over the mind. Christ next appointed from among his followers seventy disciples, whom he sent by twos to every place which he himself intended to visit. (Luke x. 1.) This appointment of the seventy disciples is not mentioned by the other evangelists. Many of the Jews being convinced by Christ's preaching, and the miracles which he wrought among them, of his divine mission, the Jewish priesthood were alarmed, and sought some means of accomplishing his death. Being betrayed by Judas, one of the twelve whom he had chosen, Christ was taken before the Jewish court of the Sanhedrim, which had the cognizance of offences against religion, and from thence to the tribunal of Pontius Pilate, the Roman procurator or administrator of the revenues of the province. Before the former he was accused of blasphemy, a charge which was supported by two false witnesses; and before Pilate as a seditious person, and a stirrer up of disaffection, a charge which was also totally without foundation. But the Jews clamoured for his death; and though Pilate saw nothing in the accusations brought against him worthy of capital punishment, he was sentenced to death in compliance with the clamour of the people, and apparently also from fear of some disturbance. In the midst of their scoffing and jeers he was led to the place of execution, and crucified, with circumstances of the greatest cruelty, between two criminals. On the third day Christ rose from the grave, according to his own prediction (Mark x. 34), and during forty days previous to his ascension into heaven he appeared among his disciples, whom he instructed more fully concerning the nature of his mission, which he now left in their hands. Fifty days after his ascension, the disciples, being assembled in Jerusalem at the feast of Pentecost (Acts ii.), were suddenly 'all filled with the Holy Ghost,' and endowed with the gift of speaking all languages. On this occasion three thousand persons were converted and received baptism. Being thus fitted for disseminating in every part of the world the principles of the new religion, the apostles and disciples whom Christ had appointed, scattered themselves througnout various countries, but principally in the east. Matthias had been chosen to supply the place of Judas, the traitor, and an additional disciple, named Saul, afterwards Paul, a person of education, and though a Jew, a Roman citizen of Tarsus, was especially called to co-operate with them.

The history of Christ has been written by four different individuals, whose accounts are received by the Christian world, and some of the arguments for the credibility of their testimony are founded upon the mode in which they accomplished their task. Matthew, who had been a collector of customs, wrote his Gospel in Hebrew for the use of the Jews soon after Christ's death; Mark is believed to have written under the direction of Peter, for the use of the Christians at Rome; Luke, whose Gospel was written for the Heathen converts, was a physician, a companion in the labours of St. Paul, and is supposed to have written his account of Christ while travelling with the apostle; John's Gospel was written after all the preceding, and notices circumstances which the other evangelists had passed over. That part of the New Testament which follows the four Gospels was also written by St. Luke, and gives the Acts of the Apostles, and the history of Christianity, for about thirty years after Christ's death.

The primitive assemblies of the converts to Christianity were called Churches ('Εκκλήσιαι). The converts at Jerusalem formed the earliest Christian society. The church of Antioch, which was founded by Paul and Barnabas, was the second; and its members first received the name of Christians, having previously been called Nazarenes, by way of derision. The first churches or Christian communities were those of Jerusalem, Antioch, Ephesus, Smyrna, Athens, Corinth, Rome, and Alexandria. The churches founded by the apostles were regarded with peculiar veneration in after times. Their authority was appealed to on points of discipline and doctrine, as it was conceived that the letter and spirit of the apostolical regulations had been more rigidly adhered to. The church of Jerusalem may be regarded as the mother of all other churches; but the church at Rome, then the capital of the world, subsequently became, with the churches of Antioch and Alexandria, which were respectively capitals of Roman provinces, by far the most important of all the churches. The four churches of Jerusalem, Antioch, Rome, and Alexandria were formed in the order in which they are mentioned, though some doubt exists as to the title of the church of Rome to priority over that of Alexandria. The church of Rome became the metropolitan of the west, while that of Antioch was regarded as the chief of the eastern churches. As the apostles extended their travels, churches were planted in various parts of Asia. Paul and Barnabas visited the islands of Cyprus and Crete, and various parts of Greece, where they made converts to Christianity. In a second visit to the churches which were formed by Paul, he regulated some of the practices into which the converts had fallen. At Corinth he remained eighteen months, during which period he exerted himself to establish firmly the faith of the Christian believers, which in that church was exposed to peculiar dangers. When unable to visit distant churches, he addressed them in 'Epistles.' Paul next directed his attention to the west of Europe, to nations 'that were yet rude and barbarous.' There is no certain record of this portion of his travels. The writings and labours of St. Paul, who is emphatically called the apostle of the Gentiles, form the most important part of the history of the second period of

Christianity. In less than forty years after the death of Christ the Gospel had been preached in every country of the then civilized world, and in some countries which were in a state of barbarism. In the year 68, that is 37 years after Christ's death, Peter and Paul suffered martyrdom at Rome.

The records as to the other apostles do not afford an adequate idea of the extent of their labours. John was banished to the island of Patmos by Domitian, and there wrote the Revelations. He was subsequently permitted to return to Ephesus, where he wrote his gospel and epistles. He was the last survivor of the apostles, and died a natural death at the close of the first century, about the year 98. The seven churches mentioned by John in the Revelations are Ephesus, Smyrna, Pergamus, Thyatira, Sardis, Philadelphia, and Laodicea.

The Christian religion, as founded by Jesus Christ, and as accepted by all Christians, whatever differences there may be in their opinions, rests for its authority upon the proofs of his divine mission. The history of Jesus Christ, as given in the Four Gospels, presents us with a series of miracles wrought by him from the commencement of his ministry to the crowning miracle of all, his resurrection from the dead, and his ascent into heaven. Whether the miracles recorded in the Gospels actually took place, or not, is a matter of historical inquiry which must be determined from the whole evidence, like any other historical fact. If the miracles are admitted actually to have taken place—if the dead, for instance, were actually raised to life, there are very few who will not allow that He who performed these miracles must have had a particular power which other men have not. It has sometimes been said that the miracles, if true, do not prove a divine mission. But if a man proclaim his divine mission, and perform miracles in confirmation of it; if he predict his own death and resurrection, and actually do die and rise from the dead in accordance with his prediction—this will ever seem to the mass of mankind sufficient proof of a divine mission, and indeed it would be difficult to say what other proof can be asked for. The second proof of the divine mission of Christ to which Christians appeal is contained in the types and prophecies of the Old Testament, which, under various figures, and in a great variety of expressions, of different ages, refer to the future coming of the Messiah, and to his kingdom. A comparison of the passages of the prophets with the passages in the history of Christ, and the application of many of these passages of the prophets by the Evangelists, and even by Christ himself on several occasions, are considered by all Christians to be a proof of the divine mission of Christ, and also a collateral evidence for the truth of those Gospels in which the prophecies are thus fulfilled. The predictions of Christ himself as to his own death, the destruction of Jerusalem, and the condition of his followers after his death, are also appealed to as evidence of his divine mission. The predictions of the prophets were accomplished in Jesus, and the prophecies of Jesus were accomplished in the subsequent history of the religion which he founded.

The diffusion of the gospel, after the ascension of Jesus, by means at first apparently so insufficient for the purpose, is also viewed by all believers as a proof that his doctrines were not of man. And further, that the early preachers of Christianity sincerely believed what they taught, is shown by their inflexible zeal in diffusing the Gospel amidst sufferings and persecutions even unto death; and this strong conviction in the minds of those who had the best opportunity of learning the genuine doctrines of Christianity must be taken as confirmatory evidence of their divine origin.

The religion which Christ came to teach has for its great sanction, the resurrection of the dead, and the doctrine of future rewards and punishments. In the Mosaic law there is no declaration of the doctrine of the resurrection, and of course the sanction of rewards and punishments in a future life forms no part of the law. Before the coming of Christ indeed there was a partial belief of a resurrection among some of the Jewish sects (Matth. xxii. 23; Acts xxiv. 15): but the preaching of Jesus proclaimed in the clearest terms a general resurrection, and rewards and punishments in a future life for all. It is this firm belief in a future state, which gave to the primitive Christians their inflexible courage and their readiness to suffer death; and which, as it was one of the main causes of the success which attended the preaching of Christianity in its early history, so is it now the vital spirit of the Christian religion. [CHRISTIANITY.]

CHRIST CHURCH, OXFORD. In 1524, Cardinal Wolsey, with the assent of King Henry VIII., announced to the University of Oxford his design to found a college there, the foundation of which he almost immediately commenced. By two bulls, one dated in 1524, the other in 1525, he obtained from Pope Clement VII. leave to enrich his college by suppressing twenty-two priories and nunneries, the aggregate revenues of which were estimated at nearly 2000*l*. The king's patent, after complimenting the cardinal's administration, enabled him to build his college principally on the site of the Priory of St. Frideswide: and the name, originally intended to be 'The College of Secular Priests,' was now changed to CARDINAL COLLEGE. The secular clergy in it were to be denominated 'The Dean and Canons Secular of the Cardinal of York,' to be incorporated into one body. He was also authorized to settle upon it 2000*l*. a year clear revenue. By other patents and grants to the dean and canons, various church-livings were bestowed upon them, and the college was to be dedicated to the praise, glory and honour of the Holy Trinity, the Virgin Mary, St. Frideswide, and all Saints. With respect to its constitution, it appears from Wolsey's statutes, still preserved in the college, that it was to be a perpetual foundation for the study of the sciences, divinity, canon and civil law, the arts, physic, and polite literature, and for the continual performance of divine service. The members were to be a dean and sixty regular canons, with forty canons of a second order. The Society, as Wolsey planned it, was to consist altogether of 160 persons, but no mention was yet made of scholars or students. This constitution continued from 1525 to 1530, when Wolsey was deprived of his power and property, and, for two years after, the foundation appears to have been interrupted, if not dissolved. It was to Wolsey's honour that, when all worldly prospects were closing upon him, he pleaded for nothing so earnestly as that his Majesty would be pleased to suffer his college to go on. What effect this had is unknown, but the urgent entreaties of the members of the society, and of the university at large, were at length successful, while at the same time the king determined to deprive Wolsey of all merit in the establishment, and transfer the whole to himself.

Accordingly, in 1532, the society was refounded by the king, under the title of 'King Henry VIII.'s College in Oxford.' The patent is dated July 8th, and orders that the said college be again founded on the same site, ground, and circuit, dedicated to the Holy Trinity, St. Mary, and St. Frideswide, and endowed with 2000*l*. yearly, for the maintenance of a dean and twelve canons, who should form a chapter, or body corporate. Dr. John Hygden, President of Magdalen College, who had been Wolsey's dean, was again appointed to the office. This second foundation continued until May 20, 1545, when the charter was surrendered by the dean and canons into the hands of the king, who dismissed them with yearly pensions, to continue until they could be otherwise provided for.

The king then changed the college into a cathedral church, translating the episcopal see from Oseney where it had been established in 1542. The name of the college now was 'The Cathedral Church of Christ in Oxford of King Henry VIII.'s Foundation;' and the society was declared to consist of a bishop with his archdeacon, (removed from the church of Lincoln,) and a dean and eight canons. All the estates were assigned to the dean and canons, on condition of their maintaining three public professors, of Divinity, Hebrew, and Greek, one hundred students in theology, arts, or philosophy, eight chaplains, and a numerous choir. No change afterwards took place in the number or constitution of the society, except the addition of one studentship. In Queen Elizabeth's reign, the family of Venables of Cheshire giving an estate to this college, it was agreed, upon a composition, that the nomination of a student should be in the heirs of that family, which was confirmed by Act of Parliament in 1601, 43 Eliz. Queen Elizabeth also ordered, in 1561, that there should be an annual election from Westminster School. The other vacancies are filled up by the dean and chapter. By the last letters-patent which were granted from King Henry VIII., the college was to be governed by statutes subsequently to be provided, but none were ever given.

The college is governed by the acts of the dean and chapter, revokable at their pleasure. There is no visitor but the king, or persons commissioned by him.

The benefactions to this college enumerated by the writers on Oxford are few, and consist chiefly of the profits arising from tenements, or sums of money, bequeathed as exhibitions, or for the better maintenance of poor students. Among them the names of Dr. Chaloner, canon of Windsor; Joan Bostock, of New Windsor; Thomas Whyte, citizen of London; William Wickham; William Thurston, Esq., of London; Dr. Richard Gardiner; Dr. Busby, Master of Westminster School; Lady Holford; and Bishop Fell, deserve especial enumeration. It may be observed that the ample endowment of the last foundation, the increasing prosperity of the society, and the rank and opulence of its members, rendered such helps less necessary in this College than in any other of the same university.

The buildings of this extensive and noble establishment have undergone as many revolutions as its foundation. Had Wolsey lived to complete his plan, it would probably have exceeded that of any college in Europe. The priory of St. Frideswide formed its principal site, the church of which serves both for the cathedral and the college chapel, and is at least of Norman, if not in some parts, of earlier date. This church is in the shape of a cross, with a spiral steeple in the centre 144 feet high. The length from east to west is 154 feet. The cross aisle from north to south 102 feet. The height of the roof in the western part 41½; in the choir 37½; and the breadth of the nave and side aisles 54 feet. It has a cloister, and the chapter-house, built about the thirteenth century, is one of the finest specimens of the early style of pointed architecture in England. The first part of the college finished by Wolsey was the kitchen, the fabric of which still retains its antient shape. The workmen next made room for the hall, by levelling a part of the old city wall which ran from Merton and Corpus College gardens behind St. Frideswide's church. They pulled down likewise the parish church of St. Michael at Southgate, standing where the Hebrew professor's lodgings are now built. In the four years which elapsed between laying the first stone and his disgrace, Wolsey had the satisfaction of seeing the kitchen, hall, the whole of the south side, with the greater part of the west side of the large quadrangle, finished according to his design; and to hear the praises which were lavished from all quarters, both at home and abroad, upon his love of literature, his taste, and his munificence. The hall is 115 feet by 40, and 50 in height. The great quadrangle, nearly a square, 264 feet by 261. The north side was intended to be occupied by a large and handsome church, but scarcely had this portion been commenced and the foundations laid, when the fall of its patron put a stop to the work, and this side of the quadrangle remained unfinished for more than a century. Wolsey's quadrangle was surmounted by an open battlement with pinnacles, instead of the present Roman balustrade which was added by Bishop Fell. The north side was finished after the restoration of King Charles II. The western gateway was completed by Sir Christopher Wren in 1682, when the bell was transferred to it commonly called Great Tom, which had formerly been the clock-bell at Oseney. The more modern buildings of this college are Peckwater and Canterbury quadrangles. Peckwater derives its name from an inn or hostel which stood upon the same site, and had been given to St. Frideswide's monastery; it received its present form and elevation in 1705. The library, which forms the south side of Peckwater quadrangle, was commenced in 1716, but was not wholly finished till 1761. The old library stood on the north side of the chaplain's quadrangle, on the other side of the college, which antiently had been a refectory to the convent of St. Frideswide. After the completion of the new library, about 1775, it was converted into rooms. Canterbury quadrangle, adjoining Peckwater, stands on the site of what was formerly Canterbury college or hall. King Henry VIII. transferred this hall with other buildings to the college, subsequent to which it was repaired and fitted up for the reception of students, and remained in that form and condition till 1773, when the old buildings were removed, and the square reconstructed upon a new design, chiefly through the munificence of Dr. Robinson, then Lord Rokeby, archbishop of Armagh, who gave more than 4000*l.* for that purpose. The Doric gateway was erected in 1778, by Mr. J. Wyatt.

Of the eminent persons who have been educated in this college it is impossible to make an enumeration, the magnitude of the establishment, and the high rank in the learned professions to which it has usually led, would extend the full list to a volume. Among the deans who have presided over the college, may be mentioned John Piers and Toby Matthew, afterwards archbishops of York, Corbet bishop of Norwich, Brian Duppa bishop of Winchester, Dean Aldrich, and Atterbury bishop of Rochester. Among the archbishops and bishops who have received their education here, we find the names of Bancroft, Prideaux, Sanderson, Potter, and Tanner; among the statesmen and lawyers, Sir Dudley Carleton, Sir Edward Littleton, Edward Sackville Earl of Dorset, Lord Littleton, William Earl Mansfield, and George Canning; among poets and orators, Sir Philip Sydney, Ben Jonson, Otway, and Villiers Duke of Buckingham. To these may be added Hackluyt, Camden, Gunter and Hooke the mathematicians, Meric Casaubon, Littleton the compiler of the Latin dictionary, William Penn the founder of Pennsylvania, Locke, Lord Bolingbroke and Desaguliers.

The present society of Christ Church, including students, independent members, under-graduates, &c., consisted Dec. 31, 1835, of 920 persons. The present dean is Thomas Gaisford, D.D. (Wood's *Annals of the University; Chalmers' History of the Colleges and Halls of Oxford;* Ingram's *Memorials of Oxford,* 4to., 1834; *Oxford Univ. Calendar,* 1834.)

CHRISTCHURCH, a parliamentary borough, market-town, and parish, in the south-west extremity of Hampshire, is pleasantly situated within the angle formed by the confluence of the Avon and the Stour, in the hundred of Christchurch, and division of New Forest West, 20 miles W.S.W. of Southampton, and 93 S.W. from London in a straight line. Its name is derived from its church and antient priory, founded by the West Saxons, in the reign of Edward the Confessor, for a dean and twenty canons. Ranulph Flambard, bishop of Durham, rebuilt the priory in the time of Rufus, and its revenues were greatly augmented by Richard de Redvers, or Rivers, earl of Devon, to whom the manor was given by Henry I. At the dissolution the annual income was 544*l.* 6*s.* (*Speed.*) Fragments of the priory walls are still standing, and of the castle keep, which are more than ten feet in thickness, and in the Norman style. The earliest notice of Christchurch is in the Saxon chronicles, where it is said to have been the military position of Ethelwold during his revolt against Edward. By the Saxons it was called Twyneham-Bourne, and Tweon-ea; and in Domesday Book, where it is mentioned as a burg and royal manor containing thirty messuages, it is called Thuinam. The church is a very fine old structure, in the form of a cross, partly of Norman architecture. From some remains that have been discovered, the town is supposed to have been of Roman origin. In the vicinity appears the site of a camp and entrenchments, with several tumuli and barrows, which have contained human bones. The living is a vicarage, in the diocese of Winchester.

Though the town is a corporation, it is wholly under the jurisdiction of the county magistrates. It sent two members to parliament since the time of Elizabeth; the number was reduced to one by the Reform Act, and the parliamentary borough was enlarged by the Boundary Act. The town is not lighted nor regularly paved, but is amply supplied with water. The salmon fisheries on the coast and river have greatly declined. The population in 1831 of the whole parish was 5344, and of the new parliamentary borough 6077. There is a free grammar-school, a national and Lancasterian school, and several endowed charities. The rivers Stour and Avon, after uniting about a mile and a half below the town, flow into Christchurch Bay, and form a spacious harbour; but from being obstructed by a moving bar of sand, it can be entered only at high water by small vessels drawing five or six feet of water. There is high water twice every tide. Good anchorage in six fathoms water is found in the bay, east of the harbour, two miles from shore. The town has little trade, and does not appear likely to improve in that respect.

CHRIST'S HOSPITAL, London. The hospitals of Christ, Bridewell, and Saint Thomas the Apostle, were founded by the same charter of king Edward the Sixth, dated 26th of June, 1553; for the support of which he granted to the mayor and commonalty, and to the citizens of London, numerous possessions within the city of London, and the counties of Middlesex, Essex, Hertford, Buckingham, Cambridge, Kent, Derby, and York. Christ's Ho pital was established upon the site of the house of Mendicants or Grey Friars, in Newgate Street, about five years after the king's grant; when about four hundred orphans were admitted, and clothed in russet, which was soon afterwards changed for the dress which they now wear, viz., a blue coat or tunic, reaching to the feet, with yellow stockings, and a round bonnet or cap. The institution has little or no income under the charter. It is apprehended that the estates which were given under it to the city of London were afterwards apportioned to the royal hospitals as the citizens thought fit. All its other estates can be traced to legacies and donations of different periods. At the suggestion of Sir Robert Clayton, then lord mayor, and a considerable benefactor, king Charles II., in 1676, granted a second charter, allowing 1000*l.* a year, for seven years, to establish a mathematical school for forty boys, and an annuity of 370*l.* 10*s.*, payable at the Exchequer, for the especial purpose of educating and placing out yearly ten boys in the sea-service.

The greater part of this hospital was involved in the destructive fire of London in 1666; but by the zeal and liberality of the corporation of London, aided by donations, loans, and the operation of the revenues of the hospital, it soon revived, and was rebuilt under the able direction of Sir Christopher Wren. The buildings, however, having, to a certain extent, fallen into decay, from their antiquity, and the funds of the charity being unequal to their entire restoration upon a plan of suitable uniformity and convenience, it was resolved, at a general court of the governors, on the 28th of January, 1803, to open a subscription for that purpose, when the corporation of London gave 1000*l.*; several of the city companies followed the example, and the donations for this purpose up to 1833, chiefly of individuals, amounted to 38,676*l.* The great work of rebuilding was commenced in 1825: and no expense has been spared in rendering those parts of the hospital which have been completed under the direction of the late Mr. Shaw, at once durable and magnificent.

The governors of the Hospital are the mayor and commonalty of the city of London, represented by the lord mayor, aldermen, and twelve common council-men, who are chosen by the rest of the common council out of their own body, according to an act of parliament obtained in 1782, to settle the disputes between the city of London and the Hospital. Besides the corporation, noblemen and gentlemen of all ranks are governors, who become benefactors to the amount of 400*l.* The number of governors of this kind is not limited. A president is at the head of the charity, who is elected for life, by the body of the governors, and is always an alderman of London. The governors present to the charity in the following manner. The lord mayor presents two, one being extra, as lord mayor; the president, two, and one as alderman; the other twenty-four aldermen present each one annually, provided any children are admitted. If the lord mayor should be president, he has two presentations as lord mayor, and two as president. The treasurer has two presentations, and one in his turn as governor. The ordinary governors fill up the remaining number in rotation, beginning each year when the last presentation ceased.

In 1683 the governors erected a handsome building in the town of Hertford, for both boys and girls at a very early age, where they are nursed and instructed until they are rendered capable of receiving the more advanced education of the foundation in London. The establishment at Hertford, when full, contains 416, of whom about 200 are taught the classics.

The accommodation in the two establishments in London and at Hertford is for 1156, including 80 girls.

In London there are four classical masters, two writing-masters, and two ushers; a mathematical, drawing, and singing master. At Hertford, there are a classical master, writing-master, two ushers, and two mistresses to the girls' school; besides nurses, &c., at each.

The whole gross income of the charity in 1815 was 43,386*l.* The expenses for that year, 40,420*l.* The governors enjoy the patronage of the rectories of Wormshill, in Kent, and Colne Engaine, in Essex; of the vicarages of Clavering cum Langley, Ugley, and the perpetual curacy of Berden, in Essex; of the vicarages of Horley, in Surrey, and Endford, in Wilts, and, alternately with the Haberdashers' Company, of the vicarages of Albrighton, in Salop, and of Bitteswell, Diseworth, and Wigston, in Leicestershire, and the chapelry of Leiston, in Suffolk. (Carlisle's *Descr of the Endowed Grammar Schools of England and Wales* 8vo., Lond., 1818, vol. ii., pp. 20—37; and the *History of Christ's Hospital*, by the Rev. William Trollope. 4to. Lond., 1834; to which latter work the reader will refer for more minute and copious details.)

CHRIST'S THORN. [Paliurus.]

CHRISTIANIA, THE PROVINCE OF, occupies the south-eastern portion of Norway, extending from 58° 48′ to 62° 40′ N. lat., and 7° 40′ to 12° 30′ E. long. Its greatest length from south to north is nearly 400 miles, and its average breadth not much short of 100 miles. According to the official statements, its area is 1580 Swedish, or 35,820 English square miles; it is therefore nearly 7000 square miles larger than Scotland. Its population is about 480,000.

The southern part of the province is washed by the Skager Rack, and bounded by a rocky and bold coast, which however only rises to a considerable elevation west of Fredrikvaern, towards the province of Christiansand. It is much indented, and contains several good harbours. The Bay of Christiania, or Christiania Fiord, stretches about 60 miles inland. At its entrance, where the Hval Oërne islands lie, it is about 15 miles wide, but it narrows gradually farther north, and is only eight miles across where it divides into two branches. These branches are from one to three miles wide, and at their respective extremities are situated the towns of Christiania and Drammen. The shores of the bay are formed by rocky but gentle hills, mostly covered with trees.

Along the western and northern side of this province extends the mountain-chain called Norrska Fjellen, or Norway Range, which commonly rises to the line of perpetual snow, and contains some summits far above it, as the Skagstöls Tind, which rises to more than 8500 feet; and the Sneehätten, which attains more than 8300 feet. These are the highest summits in the range, which in width occupies from 70 to 90 miles, this being the average distance between the inhabited places in the contiguous provinces of Christiania and Bergen. By far the greatest part of it is always covered with snow. Two roads traverse this chain. By the southern the town of Christiania is connected with that of Bergen. From Christiania it runs north-west to the northern extremity of the lake of Tyri, and hence along two of the upper branches of the river Drammen. It crosses the highest part of the range south of the Skagstöls Tind, and descends rapidly to the long and narrow Teroen Fiord, from whose shores it runs south-west over a hilly country to Bergen. The northern road leads from Christiania to Trondheim. It runs from Christiania to the southern extremity of the lake of Miösen, then along the beautiful eastern borders of the lake, and afterwards along the Lougen-Elf, nearly to its source, whence it traverses the highest part of the range, east of but near the Sneehättan. It afterwards descends through some valleys to Trondheim. On the uninhabited part of the range are built four small houses for travellers, as a refuge in snow-storms: they are called *field-stuer*, and the most elevated is 4563 feet above the sea.

The western and northern parts of the province are traversed by the numerous offsets of this range. Near the principal chain they are of great height, sometimes rising above the snow-line, as the Halling Skarven, which rises to more than 5400 feet. Farther east they are lower, but even at a distance of 15 or 20 miles from the coast they commonly rise to 1000 or 1500 feet. The valleys between these ranges are narrow, and have only small strips of cultivable land along their rapid rivers; but part of the declivities of the mountains are covered with high trees, and the mountains themselves afford silver, cobalt, and immense quantities of iron. Such is the country north of 61° N. lat., and west of 10° E. long., which contains about three-fourths of the province. The remainder is also very uneven, but the mountains rarely rise above the line of trees, and are clothed with fine forests. Most of them have a gentle ascent, which admits of cultivation; and there are also numerous level tracts between them, though nowhere of great extent, except at the town of Moss, on the eastern shores of the Bay of Christiania. The most fertile districts lie east and north-east from Christiania, along the rivers Glommen, Wormen, and the lake of Miösen, and are known by the names of Hedemarken and Guldbrandtsdalen. They produce rye, barley, and oats, in sufficient quantities to supply them as exports to the other districts of Norway

The eastern districts are drained by the Glommen, the largest river of Norway, which brings down the waters of the great lake of Miösen. Through the middle districts runs the Drammen-elf, whose numerous branches bring down all the waters descending from the Norrska Fjellen, between 60° and 61° N. lat. They unite about 25 miles from the mouth of the river, which falls into the western branch of the Bay of Christiania near Drammen. The southern districts are drained by the Louven-elf, which rises in the high Hardanger Field, runs for some time east, and then continues in a south-eastern direction to its mouth, near Laurvig, where it falls into the Skager Rack after a course of about 140 miles. In the most southern district is the lake Nord Söen, which receives the waters of a considerable mountain-district, forming part of the province of Christiansand. The lake is about 12 miles long, and enclosed with rocks. From its eastern extremity issues a powerful river, the Skeen-elf, or Brevig-elf, which forms some cataracts near the lake, but soon afterwards, at Skeen, becomes navigable for vessels of considerable burden: at its mouth is a bay, called Langesund. At the north-eastern extremity is the lake Fämund, or Fämundsöe (2352 feet above the sea), the largest of the lakes of Norway, about 24 miles long from south and north, and from two to five miles across. From this lake issues the Klar-elf, which enters Sweden, and falls into the lake of Wenern.

All the towns, except Kongsberg, are near the sea. On the east side of the Christiania Fiord is Frederikshall, on an inlet of the sea called Swine Sund, close to the boundary of Sweden, a fortified place with a harbour and 4800 inhabitants. It exports deals and iron, and has a few manufactures on a small scale. Near it, on a rock 400 feet high, is built the fortress of Frederiksteen, where Charles XII. of Sweden was killed in 1718. Frederikstad, at the mouth of the river Glommen, is a fortress, and has a harbour and arsenal. It exports deals: population, 2100. Moss, on the Christiania Fiord, with 2000 inhabitants, is a thriving place, and has twenty saw-mills and an extensive iron-work. In this place the convention was made in 1814, by which Sweden and Norway were united.

On the west of the Christiania Fiord is Drammen, with 7000 inhabitants, at the mouth of the river Drammen; it has a good harbour, and exports timber in logs. In its vicinity is a marble quarry, and higher up the river at Modum a cobalt-mine. Kongsberg, in a narrow wild valley on the Louven-elf, has 3800 inhabitants, and is a mining town; in its vicinity are silver mines, which once gave a considerable produce, but in the beginning of this century very little. Lately however the produce has considerably increased, and in 1828 it yielded more than 2000 marcs. In 1834 a lump of native silver of extraordinary size was found: this town contains a mining-school. Laurwig, at the mouth of the Louven-elf, has considerable mines in its neighbourhood, a good harbour, and 2000 inhabitants. Skeen and Porsgrund, two places on the navigable Skeen-elf, export a considerable number of deals. Near Tonsberg (1600 inhabitants) on the peninsula of Valloe, salt is made.

CHRISTIANIA, the capital of Norway, is in 59° 55′ N. lat. and 10° 50′ E. long., at the northern extremity of the Christiania Fiord, a bay extending about 60 miles inland, into which the river Agger falls close to the town. Except towards the bay, the town is enclosed by high hills and mountains, which on the north are about 5 miles distant, but on the other sides approach much nearer the town. The streets are wide and well paved; the pavement however inclines from each side to the centre of the street, which is thus converted into a common sewer. The houses have rarely more than two stories; but most of them are built of bricks, and a few of stone. It has four suburbs connected to it, which in parts are not paved. Among the public edifices are distinguished the new royal palace, the military academy, and the cathedral. In 1810 it contained hardly more than 10,000 inhabitants, but in 1826 not less than 20,581. This rapid increase is chiefly to be attributed to the circumstance, that Norway, by its union with Sweden, obtained an independent legislative government, which has its seat in this town, and by the erection of a university in 1811. The university was in 1833 attended by about 500 students, and possesses a library of 100,000 volumes, an observatory, a botanic garden, a museum, and other institutions. The sum of 33,000 dollars is annually allowed for its maintenance. Like the universities of Germany, it is rather a school for public officers, than intended to form men of science and learning. The courses last from four to six years, but the student is not bound to reside at the university the whole time. Besides the four faculties, which exist in every German university, Christiania may be considered as a mining academy; and some of the lectures are intended as a preparatory course for young men who are designed to be practical miners. There are besides a military academy, a grammar school, a commercial academy, and school for drawing, and also a society for promoting the prosperity of the country. Manufacturing industry has not made much progress, and the fabrics are woollen cloth, iron utensils, tobacco, &c. The trade in timber is considerable, though less than it was between 1801 and 1805. It exports principally deals and planks, and also a quantity of fire-wood, almost exclusively to England. The quantity of iron which is exported is not great. In one of its suburbs, called Opslo, alum is made to a considerable extent. (Von Buch's *Travels through Norway;* Schubert's *Reise durch Schweden, Norwegen, Lappland, &c.; Journal of Education, No. X.*)

CHRISTIAN KNOWLEDGE, SOCIETY FOR THE PROMOTION OF, was formed in the year 1688, and is the oldest society in the kingdom established for the education and religious instruction of the poor. It is an incorporated society, and is supported by the members of the church of England. Owing to the long time that it has been established, some of its early publications are inferior to works of a similar kind which have been more recently issued; and so long as it acted upon the principle of assisting only those schools which made use exclusively of the Society's publications, it tended to perpetuate the use of many books of little value, and kept better ones out of circulation. The establishment of the Bible Society was occasioned by the apathy of this Society relative to an issue of the scriptures in the Welsh language. The Society has latterly been stimulated into a more active course; and a standing sub-committee has been formed, which takes the management of publications relating to 'general literature and education.' The income of the Society is very large: its expenditure for the year ending November, 1835, amounted to 91,522*l.* 1*s.* 11*d.*; and for the same period it circulated 100,913 bibles, 86,061 testaments, and 192,082 prayer-books. The circulation of all its various publications amounted to 2,475,172.

CHRISTIANITY, that system of religion which has for its founder Jesus Christ.

The history of Christianity may be divided into three periods, of which the first embraces the life and ministry of Jesus Christ; the second comprehends the acts of the apostles after the death and resurrection of Christ, and the formation of the Christian church; the third period comprehends the history of the church from the termination of the labours of the apostles to the present day, and is a distinct subject from the history of the first two periods, so far as concerns the essential doctrines of Christianity.

The communities or churches founded by the apostles soon began to differ in various points of doctrine and discipline. From these differences arose a long series of violent disputes and animosities among the various religious parties or communities into which the whole body of Christians was divided. The frame of civil society also, in all the countries into which Christianity was gradually introduced, was necessarily affected by the new religion. Thus the history of the Christian church immediately subsequent to the cessation of the apostles' mission, and indeed we may say during the time of their mission, is inseparable from the history of all the several political societies among which Christianity was established. The history of Christianized Asia, Africa, and Europe, for several centuries, might with more propriety be called the history of the church in this or that country, than any thing else. The word church is here used in that proper and large sense which is pointed out at the end of the article Church.

Viewing, however, the history of the church as a distinct subject, and paying no regard to the events of civil society, except so far as they are immediately and intimately connected with the church (the term here being used in a narrower sense), such a history is generally supposed to possess a sufficient unity of subject, as distinguished from civil history, to form a separate and distinct division of historical inquiry. Accordingly we have numerous histories of the church, whose professed object is to develop the progress of Christian doctrines, of the various opinions on matters of faith and discipline which have divided Christians, and of the various communities or associations into which Christians have been distributed. But these histories, in all ages, being mainly written by the clergy, are often not so much histories of the church as of the clergy; not so much histories of the great body of Christians in this or that country, as of those whose immediate interests were often little identified with the interests of those whom it was their business to instruct. Such a contracted view of the history of Christianity, and of the history of the church in the several countries where Christianity is established, must always appear unsatisfactory to those who, considering the origin of the religion of Jesus Christ, its progress, and its development, as the great subject of the political drama of the civilized world for eighteen centuries, regard the history of *the* church or of *a* church not as in any respect dissociated from civil history, but as a component part of it. Intimately blended with all the relations of life, with all the great events of political society, and now for at least fourteen centuries directing or influencing all the functions of government, and by turns obstructing or retarding the progress of knowledge, according to the various forms in which it has been moulded for political purposes, a history of the church, distinct from the political history of the same nation and the same period, can have little value, except so far as it may be a good history of the clergy. Such a history of the church, however, has been often attempted by men neither deficient in industry nor learning; but the one-sided view which they have taken has never satisfied careful inquirers, and has only had the effect of forming in the minds of those who read much and think little, a certain confused notion of some essential difference between the history of the church and the history of those who, in various ages, have composed that church. On the other hand, writers of what is called history in the usual acceptation of the term, often seem to consider the history of the church as hardly lying within their sphere. It is true that those great events in the history of the church which have changed the face of society are not and cannot be overlooked by such writers; but the influence of the slow and incessant working of the great principle of Christianity, which is intimately blended with all the social systems of all the countries where Christianity is established, and by its all-pervading power penetrates to their remotest and minutest members, and enters into all the recesses of domestic life, is rarely glanced at, and seldom, if ever, duly estimated by writers of history. The history of civilization, which is the history of a continued progress, would appear to every reflecting person inseparable from the history of Christianity, or, in other words, of the church, taking this word in its large and proper sense. The public acts of the clergy as a body receive a place among other public events in our annals and our histories; but as the real history of a people is generally sunk in the history of their rulers, so that of the true church is merged in the history of the clergy.

A history, then, called a history of *the* church, in the sense in which we believe all writers of general church history have understood the term, appears to be a division of history which ought either to be entitled a History of the Clergy and of their Acts and Opinions, or it ought so to be blended with general civil history as to render a separate name unnecessary.

Instead of attempting a history of the church in any sense, which cannot be accomplished in a satisfactory way within the limits of any Cyclopædia, we have treated of the characteristic doctrines and discipline of the various bodies of Christians, whether properly called churches, or improperly so called, under their several heads. (See the Articles CHURCH; CATHOLIC CHURCH, &c.; and ATONEMENT, &c.)

Christianity is at present diffused over a large part of the world; but it can only be said to be established, either by the authority of the state, or by general consent, in the following countries. Christianity is established in all parts of Europe except the Ottoman dominions. In America, it is established in all those countries which are now under the dominion of descendants of Europeans, which are, in fact, the largest and best parts of the continent. In Africa, it exists in Abyssinia in a very corrupt state, and among the Copts of Egypt, who are now very inconsiderable in numbers. In Asia, the Christian religion is established in Armenia, but the number of Armenian Christians must not be estimated by the population of the country, for the merchants of this active and industrious people are found in many parts of Europe and Asia. In Syria, a branch of the Greek church still exists in the mountains of Libanus and the island of Cyprus; another in part of Syria and Diarbekr; and the Nestorians, who also belong to the Greek church, are found in Asiatic Turkey, about Mosul on the Tigris, in Persia, and also in some parts of India under the name of Christians of St. Thomas. In all the foreign dependencies of European powers, and especially those of the British empire, Christianity may be considered as established; though in many cases, as, for instance, in the British possessions in India, the number of Christians is very small, when compared with the natives. But the zealous and persevering labours of European and American missionaries are now diffusing a knowledge of Christianity, and with it, of the useful arts of life, over countries hardly accessible to commercial enterprise; and it may safely be predicted that by their efforts, and the spirit of colonization which distinguishes some of the European nations, Christianity will rapidly spread itself over a much larger part of the habitable globe. The two other religions which occupy so large a portion of the earth's surface, Mohammedanism and Buddhism, are limited as to the sphere within which they can extend their doctrines, and it seems unlikely that they will pass the limits within which they are now confined. But Christianity, being the religion of the most enterprising part of the human race, of those whose life consists in action more than in tranquillity and repose, is in a state of continual progress and diffusion; and it is probably to this difference between the temperament of most of the nations of Europe (a difference in some degree dependent on climate and local circumstances), and those of Asia and Africa, that Christianity still languishes among its comparatively few native professors in Asia and Africa, while the zeal and superior activity of the European race animate the missionaries of the United States and of England to preach the doctrines of Christianity in the very place of its birth, and to rival the old Catholic missionaries in zeal and courage. As the Apostles and the martyrs of the church testified the sincerity of their faith by their willingness to undergo every kind of suffering, and even death; so, in our own days, the apostles of Christianity, penetrating among the most uncivilized and savage tribes of the earth, have exhibited examples of a courage, perseverance, and self-devotion unparalleled in the history of man.

In Africa, Christianity has hitherto made the least progress: and indeed wherever the Mohammedans have settled in that country, it has gradually decayed or disappeared. The Christian churches of the south coasts of the Mediterranean, which were established at an early period in the history of the Church, no longer exist; those of Asia Minor have disappeared, and in Syria and Palestine, the cradle of Christianity, it still maintains a feeble and uncertain existence.

The great Christian churches are—

1. The Greek, or Eastern Church, divided into four principal branches.
2. The Latin, or Western, or Roman Catholic Church, which is single, and undivided.
3. The Protestant Church.

The Protestant cannot be called a Church in the sense in which the Catholic is called a Church, as it is not one undivided community, but consists of numerous independent communities. Still, as distinguished from the Catholic community, the whole body of Protestants is sometimes designated, though improperly, as the Protestant Church.

CHRISTIANSAND, THE PROVINCE OF, comprehends the most southern part of Norway, extending from Cape Lindesnaes (called by our seamen the Naze), or from 58° to a little north of 60° N. lat. It is comprised between the meridians of 5° and 10° E. long. Its length south and north is 140 miles, and its average breadth may be about 100 miles, which gives an area of 14,000 square miles. This computation does not differ much from the official statement, which gives to this province an area of 470 Swedish or 14,100 English square miles, or nearly twice the surface of Wales: its population amounts to 215,000 souls.

Cape Lindesnaes is considered as the southern extremity of the mountain-chain, which traverses Norway from south to north as far as 62° N. lat., and then turns E.N.E. till it joins the Kölen Range at 63° N. lat. This chain is named by modern geographers very properly the Norrska Fjellen, or Norway Range. It begins with Cape Lindesnaes, but does not attain the perpetual snow-line south of 59°; so that those parts of it which are called Heck Field and Bygle do not rise 4000 feet above the sea, which in this parallel is the line of perpetual congelation. But north of 59°, the Iocle Field, Hougle Field, Gute Field, and Hardanger Field, rise somewhat above it. The highest summit of the Hougle Field is 4668 feet. The highest mountain, however, the Gousta-Fell, is not in the principal range, but east of it: the elevation of this mountain is 5535 feet above the sea. From these high mountain-masses, which occupy more than half its surface, the country slopes gradually towards the sea, forming everywhere a rocky, bold, and frequently a high shore, which on the east and south is slightly indented, but on the west forms a bay of considerable extent, the Bukke Fiord. Two of its branches run many miles into the mountains, and terminate at the foot of the high range. The northern and larger is called Närstrand Fiord, and the southern Lyse Fiord. The latter may be considered as separating the mountains from the hilly country which extends southward to Cape Lindesnaes.

The north-eastern part of Christiansand, about the Gousta Fell, is a very high country, called Tellemarken, and inhabited by a poor but hardy and enterprising race of men. The numerous clefts are filled with water, which rushes down in rapids and cataracts with incredible velocity. The waterfall of the Rinkan Foss is 450 feet high. These waters unite in three streams, which fall into the lake of Nord Soën, from which issues a powerful and rapid stream, the Skeen-Elf or Brevig-Elf. The southern districts of the province are mostly wide and fertile valleys, with a warmer climate than could be expected in such a high latitude. Agriculture is duly attended to, and the hills are covered with forests of oak, pine, fir, and birch. These forests are the principal wealth of the country, and supply materials for the building of the numerous boats employed in fishing, and are also an article of export in the shape of planks and deals. The fishery is not important, except that of lobsters, which are perhaps nowhere found in such immense numbers as along the southern coast between Hellesund (east of Christiansand), and Lister Fiord (north-west of Lindesnaes). The principal rivers are the Nid-Elf, which runs about 80 miles, and the Torridals-Elf, whose course is about 100 miles: both are too rapid to be navigated.

Besides the capital, Christiansand, there are the following places: Arendal, north-east of Christiansand, is built on piles, and its streets are formed partly by wooden bridges and partly by canals. Its harbour, which is safe but not large, is formed by the island of Trommoe. Deals and planks are exported, and in its neighbourhood some iron mines are worked. Vessels are also built. The population does not much exceed 2000 souls. Mandal, between Christiansand and Cape Lindesnaes, at the mouth of the Mandals-Elf, has a safe harbour, to which many vessels, when damaged in the dangerous navigation of this sea, resort. It exports salmon, both salt and dried, and has about 3000 inhabitants. Stavanger, on an arm of the Bukke Fiord, called the Tunge Fiord, has a spacious and safe harbour, and its inhabitants, who in 1825 amounted to 3777 souls, are actively employed in fishing and trading. Much earthenware is also made.

CHRISTIANSAND, a town of Norway, situated on the northern coast of the Skagerck, opposite the northern shores of the peninsula of Jutland, in 58° 10′ N. lat., and 8° 20′ E. long. It stands on an extensive bay, where the Torridals-Elf enters the sea: its harbour is safe, and affords a secure shelter for vessels that navigate the Baltic along this rocky coast. The town has long broad streets laid out with the utmost regularity, and covered in the middle with deep sand. The houses, though chiefly of wood, are very neat and pleasant, and separated from one another by gardens. The principal branch of industry is ship-building, this place being situated in the only district of Norway where oak grows, and hence most of the vessels belonging to the merchants of Christiania and Drammen are built here. It exports also logs and deals to England. On this coast lobsters are taken in great numbers, and this fishery extends round Cape Lindesnaes on the western coast of Norway as far as Cape Stadtland. Lobster fishing affords occupation to numbers of people, and the produce of their labour is sent to London. Christiansand is the capital of the province of the same name, and contained, in 1826, 7488 inhabitants.

CHRISTIANSTAD, a town in southern Sweden, in 56° 1′ N. lat., and 14° 5′ E. long. It is the capital of Christianstads Lan, which comprehends the northern and eastern districts of the antient province of Scone or Skäne. The town is built on the river Helge An, which near it enlarges into a small lake, and is fortified. The streets are straight and wide, and the houses mostly built of wood. The harbour of the town is Ahus, a small place about 10 miles from it at the mouth of the river Helge An. The town was founded by Christian IV. of Denmark, towards the middle of the seventeenth century, when a canal was begun, to form a convenient water-communication with the harbour, but as its commerce was, and is still, very limited, this work has gone to decay. Some woollen and linen goods are made here, and good gloves. Population, 2900.

CHRISTIERN II., of Denmark, born in 1481, was the son of King John, and grandson of Christiern I. He ascended the throne on his father's death in 1513. In 1520 he succeeded in having himself elected king of Sweden, which country had been long distracted by civil factions. [MARGARET OF WALDEMAR.] Christiern took an atrocious, but, as he fancied it, an expeditious way of getting rid of all opposition for the future. Having assembled the chief nobles and prelates at Stockholm on the occasion of his coronation, he had them suddenly arrested and publicly executed. He also massacred a number of the citizens of Stockholm. (Puffendorf.) Gustavus Erickson, a descendant of the antient kings, who was a prisoner in Denmark, having contrived to escape, took refuge in the forests of Dalecarlia, where he roused the peasantry, attacked Christiern and his worthy satellite the archbishop of Upsa., defeated them, and drove the Danes from Sweden. [GUSTAVUS VASA.] Soon after Christiern was deposed by his own Danish subjects, who elected Frederick, duke of Holstein, in 1523. Christiern retired to Flanders, whence, after ten years, he set off with some Dutch troops, and made an attempt to recover his Danish dominions. He failed, and being taken prisoner, was put in prison, where he died in Jan., 1559. He has been called the Nero of the North.

CHRISTINA (of Sweden), the daughter of the great Gustavus Adolphus by Maria Eleonora, princess of Brandenburg, was born on the 8th of December, 1626. Her father bestowed great care on her education, and having no son to succeed him was anxious to cultivate in her a strong and masculine disposition. Even when a mere infant he expected that she, as the daughter of a warrior, should hear the roar of artillery without emotion. On his departure for the wars in Germany, Gustavus Adolphus appointed a regency, and, carrying his daughter in his arms, presented her to the assembled states of the kingdom as their future sovereign.

Gustavus fell at Lutzen in November, 1632. Christina, then six years of age, was proclaimed queen by the states, who left her in the hands of regents or guardians,—the five great dignitaries of the crown, who were charged with the administration of affairs and the task of completing the young queen's education. The Chancellor Oxenstiern, an experienced and enlightened statesman, was at the head of these dignitaries, and the other members of the regency were persons of ability and upright intentions. They, however, pursued the plan of education and discipline that had been traced out by the king himself, and to this we must, in part, attribute the singular character afterwards displayed by Christina.

From her earliest years she was surrounded by grave masters and scholars, who crowded and oppressed her intellect with Latin, Greek, Hebrew, history, and politics; and for her lighter amusements she was allowed to ride on horseback in masculine attire, to hunt, to shoot, and review troops. The society of her own sex was soon insupportable to her. It is generally stated that she made considerable progress in several antient and modern languages, and in other branches of knowledge, and that at the council table she showed a searching wit and great precocity of reason. But her wit was almost always of that sort which is nearly allied to madness; her knowledge was not digested, and her mind wanted the equilibrium which is given by pure taste and sound judgment. Bayle says she read daily some pages of Tacitus in the original.

In 1644 she took the reins of government into her own hands, and, much favoured by circumstances, acted rather a conspicuous part in the affairs of Europe. She at once finished a war with Denmark, obtaining by treaty the cession of some territory to Sweden; she pressed on the peace with Germany against the advice of Oxenstiern and others, and finally became a party to the treaty of Westphalia in 1648, by which, in consequence of the victories of her brave troops, she obtained several millions of dollars, three votes in the diet of the Germanic empire, and the cession of Pomerania, Wismar, Bremen, and Verden.

When pressed by the states to marry, she constantly and firmly refused. The assigned motives of her refusal have been preserved in several eccentric speeches which her majesty is said to have delivered without blushing. Among those who aspired to her hand was her own cousin Charles Gustavus, a prince of excellent qualities. In 1649 she was induced by the states to declare him her successor; but she would not allow the prince any share of her sovereign power, of which she was exceedingly jealous. Soon after the naming of her successor was over, she had herself crowned with great pomp, under the title of *King*.

Having now no wars to engage her attention, she gave herself up with all the energy of her character to arts and literature, or rather to a mania of patronizing artists and men of letters. Her court was soon crowded, good being mixed with the bad, the empty pretender with the real man of science, the sage with the buffoon. She attracted to Stockholm, Saumaise (Salmasius), Vossius, Bochart, Huet, Chevreau, Nandé, Meibom, and other foreigners, chiefly Frenchmen. To some of these she gave places and offices; others were mere retainers and hangers-on of the court. Descartes was her guest, but he died there soon after his arrival, his weak constitution, as it is said, being unable to resist the rigour of that northern climate.

Bourdelot, a gossiping intriguing French abbé, who pretended to some knowledge of medicine, and who was retained in quality of her physician, became the great favourite of the queen by flattering her vanity and ridiculing her court of philosophers and men of letters, whose jealousies and jarrings were incessant. This court was expensive and unpopular. Christina spent enormous sums, for so poor a country as Sweden, in the purchase of books, manuscripts, statues, pictures, antiquities, and curiosities. But reverence and affection for her father's memory stifled the murmurs of the Swedes, and when, to the astonishment of every body, she first spoke of abdicating, she was most earnestly entreated to remain on the throne. For some short time after this she showed a renewal of good sense and energy, and a disposition to public business. It was at this interval that Cromwell's ambassador, Whitlock, saw a good deal of her majesty, and that his secretary or follower, Morton, picked up that curious information about her court and herself which was afterwards published in England. (*Journal of an Embassy to Sweden in* 1653, 1654, *from the Commonwealth of England*, by Charles Morton.) Her distaste for what she called the splendid slavery of royalty, her desire to indulge in all her caprices in perfect liberty, and (a stronger motive perhaps than any other) her wish of presenting an extraordinary spectacle to the world, soon returning upon her, she formally signified her decided intention of renouncing the crown in May, 1654, and on the 16th of June her abdication took place with great solemnity, she being then only in the 28th year of her age.

Christina reserved to herself the revenues of some districts in Sweden and Germany, the entire independence of her person, and supreme authority, with the right of life and death over all such persons as should enter her service and form her suite. A few days after this public act she set off for Brussels, where she privately abjured the Protestant religion. A little later she publicly embraced Catholicism in the cathedral of Innspruck. People have doubted the sincerity of her conversion, and some of her witty sayings seem to evince no great reverence for the Roman church. From the Tyrol she travelled to Rome, where she made a sort of triumphal entrance, riding on horseback, dressed almost like a man. Here she surrounded herself with poets, painters, musicians, numismatists, and the like. Quarrelling however with some of the college of cardinals, she made a journey into France in 1656. At Paris she of course made a great sensation. Her constant companions were authors and academicians; for the society of her own sex she showed a greater contempt than ever, and the only French woman about whom she seemed to take any interest was Ninon L'Enclos. Her stay in Paris is said to have been shortened by Cardinal Mazarin, who, finding her inclined to engage in some intrigues against his authority, took such measures as rendered that capital an unpleasant residence for her. She, however, returned to France in the following year, and added to her notoriety by committing a murder in the royal palace of Fontainebleau, where apartments were allowed her. Monaldeschi, her master of the horse and chief favourite, who had been entrusted with all her secrets, was suddenly accused by her of a breach of confidence and high treason, and ordered to prepare for death. Lebel, a monk of the order of the Trinity, who was summoned to hear the offender's confession, implored for a pardon, or at least a suspension of so irregular a sentence, but Monaldeschi was forthwith put to death by Sentinelli, another Italian, and the captain of her body guard, in the *gallerie du cerf*, or stag-gallery. The court was offended, but took no public notice of this atrocious act, which Christina justified by stating that by her deed of abdication she had reserved to herself supreme power over her own suite—that she was still a queen wherever she went, and that Monaldeschi was guilty of high treason. Strange to say, she found defenders elsewhere; and among them was Leibnitz, who wrote an elaborate apology, or rather justification of the deed at Fontainebleau. French writers have pretty generally stated that Monaldeschi was only a traitor in love, and that he perished from a fit of jealousy; but there is no proof of any such connexion, which is in opposition to the whole tenor of Christina's life and conduct. The real nature of the offence is a mystery.

Finding herself avoided in France, the queen thought of visiting England, but the Protector Cromwell turned the dark side of his countenance towards her; she therefore did not land in England, but returned to Rome, where she presently involved herself in great pecuniary difficulties, and a quarrel with the pope (Alexander VII.). Upon the death of the king, her cousin, Charles Gustavus, in 1660, she travelled hastily from Rome to Stockholm, where, according to most accounts, she not only showed a regret at having abdicated, but a strong desire to re-ascend the throne. But the minds of the people were entirely alienated, and her change of religion was an insuperable barrier. She returned once more to Rome, which she never again left, except for one or two short intervals, during the remaining twenty-eight years of her life. Through that long period her occupations were various. She took part in several political intrigues; she is even said to have aspired to the elective crown of Poland; she interested herself for the Venetians in Candia, besieged by the Turks; she quarrelled anew with the pope and cardinals, who had liberally supplied her with money; she engaged actively in the Molinist or Quietist controversy; she indulged in the dreams of alchemy and judicial astrology; she violently censured Louis XIV. for his revocation of the Edict of Nantes and *dragonades* against the Protestants of France; she founded an *accademia*, or literary society; she corresponded with many *savans*, and she made a large collection of objects of art and antiquity. The ruling passion, which made her unhappy and ridiculous, was the ambition of influencing great political affairs when all power and influence had departed from her. She died at Rome with great composure on the 19th April, 1689, in the sixty-third year of her age. Though she wrote continually, not much of her writing has been preserved. Her 'Maxims and Sentences,' and 'Reflections on the Life and Actions of Alexander the Great,' were collected and published by Archenholtz, in his memoirs of her life, 4 vols., 4to., 1751. From the somewhat tediously minute work of Archenholtz, who was librarian to the landgrave of Hesse Cassel, and an honest pains-taking man, Lacombe derived the materials for his life of Christina, and D'Alembert his reflections and anecdotes of the same personage. Her 'Secret Letters' and 'Memoirs of her own Life, dedicated to God,' are forgeries. (See Archenholtz, as above; Catteau-Calville's *Histoire de Cristine, Reine de la Suède*; Fortia's *Travels in Sweden*; *Biographie Universelle*; the works of Bayle—her contemporary and correspondent; Voltaire; and Horace Walpole.)

CHRISTMAS, the festival in memory of Christ's Nativity, the day of which is observed on the 25th of December. St. Chrysostom informs us that in the primitive times Christmas and Epiphany were celebrated at one and the same feast (*Homil. in Diem Nativ. D. N. J. Christi*, Opera edit. Montfaucon, tom. iii. fol. Par. 1718, p. 354), probably from the belief that the rising of the star in the east and the birth of Christ were simultaneous. The separation took place at the Council of Nice, A.D. 325. The Armenians however continued to make but one feast of the two, as late as the thirteenth century.

The learned have long been divided upon the precise day of the Nativity. Some have fixed it at the Passover; others, among whom was archbishop Usher, at the feast of Tabernacles; and it has been observed, that if the shepherds were watching their flocks when it occurred in the field by night, it could hardly have happened in the depth of winter. Be this as it may, the 25th of December has been the day most generally fixed upon from the earliest ages of the church. Sir Isaac Newton, in his 'Commentary on the Prophecies of Daniel,' (Pt. i. c. ii. p. 144,) has a chapter 'Of the Times of the Birth and Passion of our Saviour,' in which he accounts for the choice of the 25th of December, the winter solstice, by showing that not only the feast of the Nativity, but most others, were originally fixed at cardinal points of the year; and that the first Christian calendars having been so arranged by mathematicians at pleasure, without any ground in tradition, the Christians afterwards took up with what they found in the calendars. So long as a fixed time of commemoration was solemnly appointed, they were content. The reader who would know more on this subject, may consult Baronii 'Apparatus ad Annales Ecclesiasticos,' fol. Lucæ, 1740, p. 475, et seq.; and a curious tract entitled, 'The Feast of Feasts; or, the Celebration of the Sacred Nativity of our blessed Lord and Saviour Jesus Christ; grounded upon the Scriptures, and confirmed by the practice of the Christian Church in all ages.' 4to. Oxf. 1644.

The season of the Nativity is no longer marked by that fervid hospitality which characterized its observance among our forefathers. At present Christmas meetings are chiefly confined to family parties. The wassail bowl, the yule-clog, and the lord of misrule, with a long train of sports and customs, which formerly prevailed at this season, are forgotten: even Christmas carols are nearly gone by: and the decking of churches, and of a few houses of people in humble life, with holly and other evergreens, forms now almost the only indication that this great festival is at hand. For the customs formerly prevalent, before, at, and about Christmas, see Brand's *Pop. Antiq.*, 4to edit., vol. i., pp. 350–415.

CHRISTMAS ROSE. [HELLEBORUS.]

CHRISTOPHE, HENRY, was born about 1767 or 1768. The place of his birth seems to be uncertain, for St. Christopher, St. Croix, St. Domingo, and Granada, are mentioned by different writers. He first attracted attention when a young man as a skilful cook at a tavern in Cape-Town, St. Domingo. In 1790, on the insurrection of the blacks in the French part of that island, he joined the insurgents, who paid great respect to his gigantic stature, energy, and courage. As the negroes succeeded he was promoted in military rank. Toussaint Louverture, the generalissimo of the blacks, employed him to put down an insurrection headed by Moise, or Moses, that general's own nephew. Christophe, by employing consummate artifice, got possession of Moses, who was put to death by his uncle, on which Christophe succeeded to his command in the northern province of French St. Domingo. He subsequently suppressed other revolts which troubled the dawn of negro freedom. In 1802, when General Leclerc, the brother-in-law of Napoleon Bonaparte, conducted a strong expedition from France to regain St. Domingo from the blacks, Christophe boldly defended Cape-Town; and when obliged to retreat, he burnt a great part of the town, and carried off 3000 men, with whom he joined Toussaint Louverture. When Toussaint was treacherously seized and transported to Europe, Christophe rallied with Dessalines, who then became commander-in-chief of the blacks. Through the effects of climate and a fierce desultory warfare, in which no one was more distinguished than Christophe, there was no longer any French force in the island by 1805. Dessalines then assumed supreme power in Hayti, and advanced Christophe. Not long afterwards Dessalines was accused of abuse of powers, and Christophe, joining with the mulatto Pethion, got up an insurrection, and murdered him in October, 1806. Christophe was then proclaimed generalissimo and president for life of the republic of Hayti, and he named his confederate Pethion his lieutenant and governor in the southern provinces. The negroes, imitating the republican proceedings of their old masters the French, had a national assembly of their own, which met at Cape-Town, and gave plausible grounds for Pethion, who was probably only jealous of his superior, to quarrel with Christophe. The mulatto general accused the president of a design against the liberties of the republic; the president called the general an anarchist and a revolted subject, and taking up arms drove him back to Port-au-Prince, where Pethion however maintained himself and what he called his republic for nearly eleven years.

In 1811 Christophe being undisputed master of the greater part of the country, had himself proclaimed king of Hayti, under the title of Henry I.; royalty, at the same time, being made hereditary in his family. Still following the fashions of Paris, he then organized a court and an hereditary nobility, creating black dukes, counts, barons, &c. On June 2, 1812, he was publicly crowned, and the ceremonies, all after the French pattern are said to have been very solemn and imposing. On the fall of Napoleon, the house of Bourbon entertained hopes of regaining their old colony, but they were frustrated by the power and skill of Christophe, who possessed several qualities that fitted him for government. On the death of Pethion, in 1818, he endeavoured to get possession of his state by force of arms, but he was beaten back with great loss by the republican blacks under their new president, General Boyer. These reverses, added to subsequent losses by fire, and other accidents, materially weakened him, at a moment when his tyranny and cruelty had rendered him generally unpopular at home, and the state of his health unfitted him for exertion. He was lying in bed from the consequences of an apoplectic stroke in Sans-Souci, a fine palace which he had built and fortified, when an insurrection burst around him, which had been aided by President Boyer. The insurgents had already proceeded to extreme measures, and the duke of Marmalade (a significant title), one of the first dignitaries of the kingdom, had proclaimed the abolition of monarchy. Seeing that nobles, generals, officers, and men, alike deserted him, to avoid being taken prisoner, Christophe shot himself through the heart on the 8th of October, 1820. His widow and children, with his favourite, General Noël, took refuge in Fort Henri, but the garrison presently surrendered, when his eldest son, Noël, and some inferior officers, were massacred.

During his reign, Christophe entertained some enlightened views. At one time he encouraged education, and the printing of books and newspapers. He even made a code of laws, which he called 'Code Henri', as Bonaparte had called his 'Code Napoléon.'

(*Amer. Cyc.*; *Biog. des Contem.*; Malo, *Hist. de Hayti.*)

CHRISTOPHER, DUKE of WURTEMBERG, was born in 1515. His early life was past in great troubles. In 1519-20 the confederated Suabian cities expelled his father Ulric from his dominions, and transferred the dukedom to the house of Austria. Christopher was carried to Vienna, where he narrowly escaped being made a prisoner by the Turks during their siege of that capital, under the great Solyman. In 1532 the Emperor Charles V. determined to confine him in a monastery in Spain, being more apprehensive of his talents than of those of his father the expelled duke, who was still living. When near to the Spanish frontier, Christopher escaped from his escort and fled to Bavaria, where his uncle, the reigning duke, and Philip the landgrave of Hesse, took up his own and his father's cause. The landgrave in particular made many efforts to recover for Duke Ulric his antient inheritance, but the Emperor Charles and his brother Ferdinand obstinately refused to relinquish so valuable a territory. Recourse was then had to arms. The French king, Francis I., secretly supplied large sums of money; and marching rapidly on Würtemberg, the landgrave in 1534 defeated the Austrians in the battle of Laufen, and restored Duke Ulric, who was well received by his people, and thenceforward placed under the safe protection of the great Protestant league of Schmalkalden. The recovery of Würtemberg was a great advantage on the side of the Protestants, but it was not until 1552, or two years after the death of Ulric and the accession of Christopher, that the Lutheran religion was fully established in that duchy. Finding, after a reign of two years, his authority was firmly established, Christopher proceeded to complete the work of the Reformation; and it is as a church reformer that he is honourably distinguished from the Protestant princes his contemporaries. He neither seized the church property for himself, nor distributed it among his nobles and courtiers. He appropriated it to the purposes of education, and to the support of the ministers of the new religion. A great fund was formed out of it and kept sacred, under the name of the 'Würtemberg church property;' the revenue derived from which sufficed to support what were called the Würtemberg cloister schools—destined for the education of the clergy—the great theological seminary at Tübingen, and other establishments for the instruction of the people. Christopher also extended the liberties of his subjects, and gave them a code of laws. After a popular and beneficial reign of eighteen years, he died in December, 1568

CHRISTOPHER, HERB. [Actæa.]

CHRISTOPHER'S, ST., or ST. KITT'S, one of the Caribean islands, was discovered by Columbus in November, 1493, who was so delighted with its appearance that he gave it his own Christian name. At this time it was well peopled by the Caribbs, by whom it was called Liamuiga, or the Fertile Island. It was never colonized by the Spaniards, but was the first of all the British settlements in the West Indies. A party under Mr. Thomas Warner took possession of it in 1623, and four years afterwards it was shared with some French settlers. After various bloody contentions, the island was wholly ceded to the English, in whose possession it remained till 1782, when it was taken by the French, but restored at the peace of 1783. In 1805 it was again ravaged by the French, who however did not retain possession.

St. Kitt's contains about 44,000 acres, nearly one half of which is unfit for cultivation. The other part is almost entirely occupied with plantations of sugar-cane, leaving only a small portion for cotton, indigo, pasturage, and provisions. The centre of the island is occupied by rugged barren mountains, which contain some hot springs. The highest point, called Mount Misery, 3711 feet above the sea, is an exhausted volcano, the crater of which is still apparent. The soil of the plains is chiefly a dark grey loam.

The island is divided into nine parishes, and contains four towns—Basseterre, Sandy Point, Old Road, and Deep Bay. Basseterre is considered the capital. Its shores are protected by several small batteries. It sends ten members to the House of Assembly at Antigua, of which government it forms a part. The climate, though hot, is considered healthy, but the island is subject to violent hurricanes. It lies N.W. and S.E., 17 miles in length and 6 in breadth, and is separated from Nevis by a strait only a mile and a half wide.

CHROMATIC. [Achromatic; Optics.]

CHROMATIC SCALE, in music, is the scale of semitones [Scale]; and by *chromatic music* is commonly signified that kind of harmony in which extreme intervals are much used.

In the Greek music the *chromatic* (from *χρῶμα*, *colour*) was the second of the three *genera*, and, according to the opinion of some, was so denominated because the notes, or musical characters, in that genus were written in colours. Others think that the word was figuratively employed, and expressed a greater variety of shade, more of contrast, than the other *genera*. Having no data to judge from, it is impossible to say which of the two opinions is the correct one; and, in truth, the question may just as well remain in its present state.

CHROMIC ACID. [Chromium.]

CHRO'MIS, a genus of fishes. [Labridæ.]

CHROMIUM, a metal discovered by Vauquelin [Vauquelin], a distinguished French chemist, in the year 1797. He found it in a rare Siberian mineral, which contained lead, and called, from its colour, *red lead*, but which is now known as *chromate of lead*. Previous but very imperfect attempts had been made to determine the nature of this substance. Vauquelin proceeded in the following manner: he boiled 100 parts of the ore in a solution of 300 parts of bicarbonate of potash; after long ebullition it was found that 22 parts of the mineral were dissolved; the 78 remaining were boiled in diluted nitric acid, which dissolved 64 and left 14 parts; these, again treated with carbonate of potash, left only 2 parts, which, being red lead, were neglected. The nitric solution being evaporated yielded a crystallized nitrate of lead, which being converted into sulphate gave such a quantity of it as indicated 56·68 of metallic lead.

The alkaline liquors being mixed and evaporated, yellow crystals were procured; these, dissolved in water, and treated with dilute nitric acid, yielded, by spontaneous evaporation, crystals, which were the acid of the new metal, and to which Vauquelin gave the name of *chrome*, from its property of colouring the compounds into which it enters; and he concluded from his analysis that the Siberian red lead consisted of nearly

Chromic acid	34·88
Oxide of lead	65·12
	100

When this chromic acid, or, better, the oxide of chromium presently to be described, is mixed with charcoal in a crucible and very strongly heated, it is decomposed; this however is effected with difficulty on account of the great affinity of the metal for oxygen, and also of the high temperature requisite to fuse the metal; this is indeed so great that it cannot be obtained in a button or one mass, but is pulverulent, of a yellowish white colour, and metallic lustre. Its specific gravity is generally stated at 5·9, but according to Dr. Thomson it is but little above 5. The appearance of the metal varies however according to the circumstances under which it is reduced; thus Liebig obtained it as a black powder, by acting upon one of its chlorides with ammonia; from another chloride and ammoniacal gas it was obtained of a chocolate brown colour, and so finely divided that when heated in the air it burnt.

Chromium suffers but little change by exposure to the air; it conducts electricity. Acids act upon it but slightly, the nitric even dissolving it only after long ebullition; nor is the solution readily effected even when hydrochloric acid is added to the nitric so as to produce nascent chlorine: hydrofluoric acid when heated dissolves it, and hydrogen gas is evolved: heat acts but little upon this metal; even the flame of the blowpipe scarcely affects it.

Before describing the various compounds which this metal forms with different elementary bodies, or the nature of the more complex combinations of which it forms a part, it will be proper to describe the various ores which have been met with since its original discovery in the Siberian red lead, beginning however with a description of that substance.

Ores containing Chromium.

Chromate of Lead. Red Lead. Occurs massive and crystallized. Primary form of the crystal, an oblique rhombic prism. Colour, deep orange-red. Lustre, adamantine; sometimes translucent, rarely transparent. Specific gravity, 6. Hardness, 2·5, 3. Brittle; streak, orange-yellow. Cross-fracture, uneven, passing into conchoidal, with a splendent lustre. With the blowpipe, crackles and melts into a greyish slag. Soluble in nitric acid, solution yellow. Occurs in the gold mine of Berezof in Siberia, in the Ural, and Brazil.

When pure it is composed of

Chromic acid	31·71
Oxide of lead	68·29
	100

Massive varieties, amorphous; structure columnar, granular.

Subsesquichromate of Lead. Monochroite. Occurs massive and crystallized; form of the crystal imperfectly described. Colour, red. Lustre, resinous. Translucent on the edges. Specific gravity, 5·75, very soft. Powder, tile-red. Fuses by the blowpipe into a dark mass. Occurs with chromate of lead in the Ural. It is composed of

Chromic acid	23·31
Oxide of lead	76·69
	100

Chromate of Lead and Copper. Vauquelinite. Occurs massive, and in minute crystals. Primary form, an oblique rhombic prism. Colour, black or greenish-black. Lustre, adamantine, nearly opaque. Specific gravity, 5·5 to 5·78. Hardness, 2·5, 3. Streak, greenish. Fracture, uneven.

Before the blowpipe, fuses into a dark grey globule of metallic lustre, surrounded with beads of metallic lead.

The massive varieties are amorphous, botryoidal, reniform. Structure compact, fine granular.

Found with chromate of lead in Siberia.

Composed of, according to Berzelius,

Chromic acid	28·33
Oxide of lead	60·87
Oxide of copper . . .	10·8
	100

Chromate of iron. Chromiron—occurs massive and crystallized; crystal, the regular octahedron; colour, blackish; lustre, imperfect metallic; opaque; hardness. 5·5; brittle;

specific gravity, 4·321; streak, brown; fracture uneven, imperfect conchoidal; not attracted by the magnet; cleaves parallel to all its planes.

Analysis of the crystals from Baltimore, by Dr. Thomson:

Green oxide of chromium	52·95
Peroxide of iron	29·24
Alumina	12·22
White matter	3·09
Water	0·70
A trace of silica	
	98·20

The massive is amorphous, with a granular or compact structure; it is found in the island of Unst, in Scotland, and sometimes interspersed with green oxide: it occurs also in France and in North America, especially near Baltimore. Oxide of chromium has been observed in some aërolites.

We proceed now to the binary compounds of chromium, and first those which result from the combination of

Oxygen and Chromium.

1. *Chromic acid* may be prepared in several ways; one of the best is to dissolve bichromate of potash in water, and to pass through the hot solution hydrofluate of silica, which combines and forms a difficultly soluble salt with the potash, and the chromic acid remains in solution: this is to be evaporated to dryness in a platinum capsule, and the residue dissolved in a very small quantity of water: this solution, when further concentrated by evaporation, deposits red crystals of chromic acid, which are deliquescent, and very soluble in water. The solution is devoid of smell, but has a sour styptic taste; the solution is red or yellow, according to the degree of concentration: this acid is also very soluble in alcohol, and when the solution is heated it is decomposed, the results being oxide of chromium, formic acid, and æther. It acts upon and destroys vegetable colouring matter, and combines with bases to form salts, called chromates.

According to Berzelius, chromic acid is composed of

3 equivalents of oxygen	24
1 „ „ chromium	28
Equivalent	52

2. *Oxide of chromium*, or rather *sesquioxide of chromium*, may be prepared in several modes, almost all of which are dependent upon the partial deoxidizement of chromic acid; thus when chromate of potash is mixed with its own weight of muriate of ammonia, and heated to redness, oxide of chromium is left, being formed by the deoxidizement of the acid by the hydrogen of the ammonia. Alcohol, sugar, sulphur, protonitrate of mercury, and oxalic acid, produce corresponding effects. The properties of this oxide are, that it has a green colour, it is insoluble in water, and unchanged by heat: the alkalis do not act upon it, but it is soluble in acids, forming salts with them. When combined with water so as to form a hydrate, it is of a bluish tint, and is then more readily dissolved by acids than after it has lost its water by a red heat.

It is the colouring matter of the emerald.

It is composed of

1½ equivalent of oxygen	12
1 „ „ chromium	28
	40

A brown oxide of chromium has been supposed to exist, but it is probably a mixture of the acid and green oxide.

Azote and *hydrogen* do not combine with chromium.

Chlorine and *chromium* combine in two proportions: the sesquichloride may be prepared by dissolving the sesquioxide in hydrochloric acid, and evaporating the solution to dryness at 212°; a green residue is obtained, which consists of the sesquichloride combined with water; when this is heated to about 400°; the water is expelled, and the pure sesquichloride remains of a reddish colour, when the operation is so conducted as to prevent the access of carbonic acid: when strongly heated in a close vessel it sublimes in scales of a peach blossom colour. This compound is readily soluble in water; the solution is green, and remarkable for the sweetness of its taste.

It is composed of

1½ equivalent of chlorine	54
1 „ „ chromium	28
	82

Terchloride of chromium is prepared by heating a mixture of chromate of potash, fused chloride of sodium, and sulphuric acid in a glass retort. By their mutual action a red vapour is evolved, which, passed into a cooled receiver, condenses into a fluid of a fine red colour. By water it is immediately decomposed, and yields a mixture of chromic and hydrochloric acids. It is composed of

3 equivalents of chlorine	108
1 „ chromium	28
	136

Fluorine and chromium form two compounds: the *Sesquifluoride* is procured by dissolving oxide of chromium in hydrofluoric acid; by their mutual decomposition and evaporation to dryness, water and the sesquifluoride are formed, and the latter remains as a green powder, which is soluble in water and composed of

1½ equivalent of fluorine	28·5
1 „ chromium	28
Equivalent	56·5

Terfluoride of chromium is prepared by distilling a mixture of chromate of lead, fluor spar, and sulphuric acid in a leaden retort. A red coloured gas comes over, which acts rapidly on glass, and is decomposed by water, with the formation of chromic and hydrofluoric acids. It is composed of

3 equivalents of fluorine	57
1 „ chromium	28
Equivalent	85

Bromine and chromium form two bromides, which are stated to be sesquibromides and terbromides. They are unimportant compounds.

The *non-metallic solids*, or at least several of them, combine with chromium; but this is not the case with carbon.

Sulphur and chromium may be made to combine, though not by direct action, in several different modes; the simplest is to heat the hydrate intimately mixed with sulphur in a close vessel; this sulphuret is of a dark grey colour, unctuous to the touch like plumbago, and when slightly heated in the air it burns like a pyrophorus, and is converted into oxide of chromium and sulphurous acid gas. It is not acted upon by nitric acid, but nascent chlorine dissolves it. It is a sesquisulphuret, composed of

1½ equivalent of sulphur	24
1 „ chromium	28
Equivalent	52

Phosphorus and chromium form phosphuret of chromium. It is prepared by acting on the sesquichloride by phosphuretted hydrogen. It is black, insoluble in hydrochloric acid, and but slightly acted upon by nitric acid or nascent chlorine. It is composed of

1 equivalent of phosphorus	16
1 „ chromium	28
Equivalent	44

The *salts of chromium* are next to be noticed. There is perhaps no metallic substance which so perfectly acts as an acid to bases and as a base to acids as this metal; the difference depending, of course, upon its degree of oxidizement, that is, whether it be an acid or an oxide. The compounds of the chromic acid and bases will first be mentioned, or the chromates.

Chromate of potash. This salt is used in large quantity and is prepared by reducing chromiron to powder, mixing it with nitre, and subjecting the mixture to a high temperature in a crucible. The nitric acid of the nitre is decomposed, its oxygen acidifies the oxide of chromium of the chromiron, and this uniting with the potash of the nitre, forms chromate of potash, which is washed out from the residue of peroxide of iron, and the solution is evaporated and crystallized.

The crystals of chromate of potash are yellow; the primary form is a right rhombic prism. It has a bitter disagreeable taste, is soluble in about twice its weight of water at 60°, and much more so in boiling water; it is insoluble in alcohol, and unalterable in the air; it turns turmeric paper reddish brown, but is a neutral salt, composed of

1 equivalent of chromic acid		52
1 „	potash .	48
		100

Bichromate of potash may be prepared by adding chromic acid to a solution of the chromate, but it is more economically obtained by adding nitric acid. By evaporation crystals of bichromate are obtained; the primary form is a doubly oblique prism, and they are frequently large. Bichromate of potash has a penetrating, bitter, metallic taste; and is not alterable by exposure either to air or moderate heat. It is soluble in about ten times its weight of water at 60°, and more so in boiling water: the solution reddens litmus paper. When heated to whiteness, half of its acid is decomposed into oxide of chromium of a very fine colour, mixed with chromate. It is decomposed, as already noticed, by various deoxidizing bodies, such as alcohol, sugar, &c. It is composed of

2 equivalents of chromic acid .		104
1 „	potash . . .	48
	Equivalent . .	152

It contains no water.

Chromate of soda and bichromate of soda are salts analogous to those of potash just described. The former is yellow, and so very soluble that the least increase of temperature causes it to fuse in its water of crystallization. The bichromate is red.

Chromate of lime is soluble in water, and crystallizes in silky plates.

Chromate of magnesia. The neutral chromate is yellow; it is very soluble, and crystallizes in prisms. The bichromate is red.

Chromate of barytes. It is prepared by the double decomposition of chromate of potash and nitrate of barytes. It is of a yellow colour, insoluble in water. It is decomposed by sulphuric acid, which throws down the barytes in the state of sulphate, and a compound of sulphuric and chromic acids remains in solution. Hydrochloric acid converts it into chlorides of chromium and barium. It is composed of

1 equivalent of chromic acid .		52
1 „	barytes . . .	76
	Equivalent . .	128

Chromate of chromium. This compound is obtained by dissolving hydrate of chromium in chromic acid; the solution is of a brown colour; by evaporation a solid uncrystallized mass is obtained, which attracts moisture from the air, and dissolves readily in water and in alcohol. It is a bichromate, composed of

2 equivalents of chromic acid		104
1 „	sesquioxide of chromium .	40
	Equivalent	144

Bichromate of iron is prepared by saturating the acid with perhydrate of iron. The solution is decomposed by water, which precipitates peroxide of iron, and holds the chromic acid in solution. It appears to be a bichromate, composed of

2 equivalents of chromic acid . .		104
1 „	peroxide of iron .	40
	Equivalent . . .	144

Chromate of manganese is obtained by dissolving the carbonate of manganese in chromic acid. The solution is brown, and has a sharp metallic taste. It is decomposed by evaporation, and yields no crystals.

The above described metallic chromates are unimportant, but the chromate of lead is a compound, which is extensively employed as a pigment and in calico printing.

As a pigment it is prepared by the double decomposition of chromate of potash and nitrate of lead. The precipitate is of a fine yellow colour, totally insoluble in water, but dissolved by nitric acid; and it mixes well with oil. It is composed of

1 equivalent of chromic acid .		52
1 „	oxide of lead .	112
	Equivalent . .	164

It is also used in calico printing.

Dichromate of lead is prepared by digesting the chromate in solution of potash; this removes half the chromic acid, and the remaining salt is of a fine scarlet colour, insoluble in water; when heated it becomes brick red, but its scarlet colour returns as it cools; by the addition of nitric acid it is reconverted to neutral yellow chromate. It consists of

1 equivalent of chromic acid .		52
2 „	oxide of lead .	224
	Equivalent . .	276

These are the most important chromates; the salts which contain oxide of chromine as a base are not at all employed: we shall mention only the most distinctly marked of them.

Nitrate of chromium. Oxide of chromium dissolves readily in nitric acid; it is however difficult to saturate it. The solution when evaporated to dryness leaves a reddish substance, which dissolves easily in water. It does not appear to yield crystals, nor has its composition been ascertained; it is however probably a neutral nitrate.

Sulphate of chromium is prepared by dissolving the hydrate in dilute sulphuric acid; the solution is of a dark green colour, and has a sweetish taste. By evaporation to dryness a dark-coloured tasteless matter remains, which is not altered by exposure to the air, and does not readily dissolve in water. It is probably a neutral sulphate.

The arseniate, carbonate, and phosphate of chromium are all insoluble compounds, which are not at all employed, nor indeed is any salt of oxide of chromium; but, as already noticed, the chromates of potash and lead are largely used, and oxide of chromium is employed to give a green colour to glass and to porcelain.

CHRONICLE, CHRO'NICON (from χρόνος, time), denotes a history in which facts are digested in order of time, though not necessarily in successive years, as is distinctly implied in the word Annals. It must be owned however that the two terms have been indiscriminately used for histories in which the succession of years has been the governing principle of the narrative. The term Chronicle, at the present day, is seldom used but in speaking of our old histories, as the 'Saxon Chronicle;' 'Caxton's Chronicle;' 'Fabyan's Chronicle;' 'Holinshed's Chronicle;' &c. This term was also adopted by the French, as in 'Les Chroniques de France (appellee la Chronique de St. Denys), compiles par l'ordre du Roy Charles VIII.,' 3 tom., fol. Par. 1476 [ANNALS.]

CHRONICLES, the name of two books of the Old Testament. In the original Hebrew they constitute only one book, entitled דִּבְרֵי הַיָּמִים (Debri Haimim) *Verba Dierum*, Words of Days; that is, diaries or journals. In the Septuagint they are called *Παραλειπόμενα, res prætermissæ*, 'things omitted.' The Books of Chronicles have been so called from being considered as supplementary to the Books of Samuel and of Kings; the histories of which they repeat with considerable variations. Some commentators and critics state decidedly that the compiler is unknown. (Vatablus, Hoffmann.) The name Chronicles seems to have been first applied by St. Hieronymus (Jerome), who is followed by Du Pin, Bishop Patrick, and most modern commentators, in supposing that Ezra, otherwise Esdras, was the compiler of these books, about twenty-six years after he compiled the Books of Kings, and eighteen after the return of the Jews from the seventy years' captivity in Babylon. (Dr. Allix, *Reflex. on Old Test.*, vol. ii., c. 1.) Eichhorn enumerates several reasons for attributing them to Ezra (*Einleitung*, vol. ii., pp. 579—601), the chief of which is, a similarity to the Books of Kings and Ezra in style, orthography, and idiom. The Jews also ascribe them to Ezra. There are however several considerations which diminish the probability of their being his work (Calmet's *Dict.*, by Taylor), one of which is, that (*Chron.* iii. 19, et seq.) an account is given of the posterity of his contemporary Zerubbabel, which extends several generations beyond the time of Ezra, who is supposed to have died at the age of 120, a year or two after compiling the Chronicles (Ezra, in Taylor's Calmet); but nothing, as Eichhorn observes, is certainly known of the time either of his birth or his death. The apparent improbability that the histories of the Books of Kings should be re-written by the same person with such numerous discrepancies and contradictions as are found between Kings and Chronicles, is thus explained by the commentators: they state that Ezra, on his return to Judæa, discovered more and better materials than he possessed when he compiled the Books of Kings at Babylon, and therefore the Chronicles are to be regarded as *addenda* and *corrigenda*. Some however of the variations are not improvements: for example, in the history of Jehoram (2 Chron. xxi.), which is repeated verbatim from 2 Kings viii. 17, &c., this king is said (v. 5 and 20) to have died at the age of 40, as related in Kings; but the probable statement in Kings (v. 26) that his son Ahaziah's age, on succeeding him, was 22, is altered in Chronicles to 42 (ch. xxii. 2), making the son two years older than the father. It stands thus in the authorized version, but in some antient MSS. of Chronicles it is written 22. The numerous contradictions throughout Chronicles and Kings, in facts, dates, numbers, names, and genealogies, are acknowledged by many learned critics. They form the subject matter of nearly the whole of Dr. Kennicott's First Dissertation on the State of the Hebrew Text; where they are treated as corruptions, interpolations, and mistakes. In the narrative 1 Chron. xviii. 3, which is taken verbatim from 2 Sam. viii. 3, there occurs, besides a variation of proper names, an alteration of 700 horsemen to 7000: and exactly 'the same mistake' (Kennicott) occurs in the passage cited in 1 Chron. xix. 18, from 2 Sam. x. 8. Compare also the numbers in 1 Kings iv. 26, with 2 Chron. ix. 25; and 1 Kings ix. 23, with 2 Chron. viii. 18. Many passages and chapters in Chronicles and Kings appear to have been transcribed verbatim from records made before the Babylonian captivity, while the Temple was standing: as 2 Chron. v.; and 1 Kings viii., which are word for word alike, and speak of the ark, the former in v. 9; the latter in v. 8, as being in the Holy Place 'unto this day:' though neither Kings nor Chronicles are supposed to have been written until from sixty to ninety years after the Temple, and all its contents had been demolished, or carried off by Nebuchadnezzar. Another instance is in 2 Chron. viii. 8. In fact, the compiler or abridger appears to have had before him a collection of various antient memoirs, genealogies, annals, registers, &c., from which he quoted indiscriminately 'without taking the trouble to reconcile inconsistencies.' (Rees's *Cyclopædia; Theolog. Dict.*, by J. Robinson, D.D.) The last thirteen verses of 1 Chron. ch. i., occur verbatim in Genesis, ch. xxxvi., and appear to have been transcribed from some historical document made after Saul, the first king, reigned in Israel (see v. 31), which was 400 years after the death of Moses. Another curious particular is that the two last verses of 2 Chron. concerning the proclamation of Cyrus, are the same which begin the following Books of Ezra. In Rees's *Cyclopædia*, this fact is accounted for in the following words:—'Some transcriber having finished Chronicles at v. 21, proceeded, without leaving the usual space, to write the Book of Ezra; but finding his mistake he broke off abruptly, and began Ezra at the usual distance, without indicating his error by erasing the passages which he had carelessly subjoined to Chronicles.' The broken sentence with which Chronicles end at 'go up,' is completed in v. 3 of Ezra 'to Jerusalem,' &c. Grotius, in his Comment. on Chron. says, 'Is mos libros continuandi est antiquus, quem et Procopius sequitur fine Vandalicorum et Gothicorum initio.' (*Opera Omnia*, tom. i., p. 189.)

To this suggestion may be added a fact not noticed by the commentators, that the Jews, in the public reading of their scriptures, to avoid ending with the recital of any calamity producing dejection, add the commencement of the next paragraph, or repeat a portion of that which precedes, in order to finish with something consolatory. Accordingly, in Hebrew copies, at the end especially of Isaiah, Malachi, Lamentations, and Ecclesiastes, a masoretic sign is given, formed of the initials of these four books (יתקק) to indicate the recital of some antecedent or subsequent passage. It is supposed by St. Hieronymus that the present books of Chronicles are those of the kings of Judah and of Israel, so often referred to in the books of Kings. The objection to this supposition is, that these references are not unfrequently made to what is not to be found in the present book of Chronicles. The Chronicles referred to in Kings are generally thought to have been a voluminous work from which ours are only a brief and mutilated abstract. Grotius, Capellus, Spinosa, Clericus, R. Simonius, Whiston, and others, hold this opinion. Carpzof, in his 'Introduc. ad Vet. Testament,' rejects it as 'very absurd.' The chief design of this compilation seems to have been to exhibit, first, the genealogies, ranks, and functions of the priesthood, in order that, after returning from the captivity, they might re-assume their proper dignities: and secondly, by describing the distribution of lands before the Captivity, to direct the families of each tribe in regaining their antient inheritances. The first book is a recapitulation of sacred history from the creation to the death of David. The second book gives the history of the kings of Israel and Judah from Solomon, to the return from Babylon. Jerome attaches a great importance to the study of these books his words are, 'The book of things omitted (the book of Chronicles), i. e., an epitome of the Old Testament, is of such great importance, that if a man lay claim to a knowledge of scripture without knowing this book, he is only deceiving himself; for every single name, and every juxtaposition of words, both refer to innumerable things omitted in the Books of Kings, and explain innumerable difficulties in the Gospel' (Hieronymi *Opera*, 1734, tom. i., p. 277); and in his preface 'ad Lib. Paralip.,' he says, 'This work contains all the learning of the Scriptures.' The same father enjoins a young friend (*Epist.* 7 *ad Leta.*), to learn by heart the whole of the two Books of Chronicles, together with the Pentateuch, Prophets, Kings, Esdras, Esther, and Solomon's Song. The authority of the books of Chronicles is established by St. Paul's applying a prophetic passage (Heb. i. 5) to the character of our Saviour from 1 Chron. xvii. 13 and 14; see also chap. xxii. 10.' (Bishop Mant's *Bible.*) For the purpose of comparison and critical investigation, see the table of Chronicles, Samuel, and Kings, in Horne's 'Introduction to the Bible,' vol. iv., p. 58, and vol. ii., p. 37: also Cruttwell's 'Concordance of Parallels,' p. 147. A notice of the Commentators on the books of Chronicles—Hieronymus, Procopius, Bede, Crommius, Lavater, Leonhartus, Sanctius, Serarius, Strigelius, Jackson, &c., may be found in Jo Gotlobb. Carpzovii 'Introduc. ad libros Canonicos,' 4to., 1731, tom. i., pp. 279–303, and tom. ii., pp. 466–487: in William Crowe's 'Catalogue of Commentators,' 12mo., 1668, pp. 46–49, and in Hoffmanni 'Lexicon.' See also 'Poli Synopsis Criticorum,' fol., vol. i., p. 714, et seq.; Bishop Patrick's 'Comment.,' vol. ii., p. 529; Du Pin 'Compleat Hist. of the Canon.,' fol., p. 84. Eichhorn, 'Einleitung in das Alte Testament,' ubi supra; Kennicott's 'Dissertation,' and 'Reply' to it, by Julius Bates, pp. 104–185; and the Abbé Richard's critical treatise on the apparent contradictions of Chronicles and Kings.

CHRONOLOGY (χρονολογία), a Greek word, literally signifying 'time-reckoning.' In contradistinction to history, which connects events according to the manner in which each is produced or occasioned by another, chronology regards events simply according to the order of time. It is evident however that the succession of events in the order of time makes a very important part of their exposition in the relation of cause and effect; for whatever else there may be in the bond which unites what we call a cause and its effect, the circumstance that the cause precedes the effect in the order of time is always present. A history therefore cannot be written even in the loosest manner, nor an intelligible narrative put together, without chronology being so far attended to that the events shall be related in the order in which they happened. Even what is called the epic method of taking up the story in the thick of the interest, rather than from the beginning of the series of events out of which the interest grows, is no exception. In whatever mode it may be thought best for the effect intended to be produced that the several portions of the story should be arranged and exhibited, each portion must in itself be detailed chronologically, else it will be incomprehensible And even in an epic poem an order of time is always strictly observed throughout, though the poet may select a different series of events through which to take his course from that which would be adopted by the historian. In the Æneid, for example, it is true that the events of the shipwreck of Æneas and his followers, and their reception by Queen Dido, which are related in the first book of the poem, happened subsequently to the destruction of Troy, and their adventures in the course of their navigation to Carthage, which pass before the reader in the second and third books; but these last mentioned events are really not what the poet professes to relate in these two books. What they profess to contain is the discourse addressed by Æneas to Dido, at the banquet in her palace; and the delivery of this discourse happened not before but after the events related in the first book of the poem.

The order of a history, however, will often differ from that of a purely chronological arrangement in this respect. In the former each connected series of events is related separately, and thus forms a unity, in which the progress and development of certain principles, causes, or given conditions of society are exhibited. In the latter, events of various naturally distinct series are necessarily intermixed, nothing being attended to except the order of time in which they happened. Thus a mere chronological table, or chronicle, of the events of the last century would enumerate, under no arrangement except the order of time, the events which had taken place during that period in all the countries of the world, and in all the departments of human action, and also it might be of inanimate nature; if the scheme were comprehensive enough, the notice of an inundation of the ocean, or an eruption of Vesuvius, might break in upon the detail of a succession of scientific discoveries, or the incidents of a political revolution. History, in the pursuit of its proper business of tracing each effect to its cause, necessarily avoids this intermixture. It first follows one chain of events, at least up to a certain point at which a pause may conveniently be made, and then it takes up another chain. Still each chain is continued in the chronological order of its links. Every long history, indeed, must in this way be properly a collection of many short histories; and these latter will be numerous in proportion to the extent and complexity of the subject. Neither a history nor a chronicle need embrace all the recorded or remarkable events of the period over which it professes to extend; the one as well as the other may be confined to events or transactions of any particular kind, as well as of any particular period. But whatever variety of matters may be comprehended in a history, it is at the option of the historian, and belongs to his art, to dispose them into as many distinct narratives, or portions of a narrative, as may appear best suited for their clear and effective exposition; whereas all the facts, however various, which a chronicle or chronological table may comprehend, must be related in one narrative or series. Though an intermixture of all kinds of events with those that more peculiarly belong to chronology, which are the events of political society, is not unusual in tables of chronology, the events of any one branch of human action or speculation, or, as already observed, the phenomena of nature, might often with more propriety be exhibited in separate chronological tables.

It has sometimes been attempted to combine in a chronological table, with its own peculiar advantages, something of this distinctness or separation of one subject from another which is found in a history, by employing a particular form of type or other appropriated mark for each series of connected events. This method was first employed, as far as we know, and indeed it is there claimed as new, in a short general chronological table at the end of the work entitled 'Elements of General History,' by Alexander Fraser Tytler (afterwards Lord Woodhouselee), 2 vols., 8vo., Edinburgh, 1801. In this table the series of the kings and emperors of Rome is printed in a larger Roman type than the rest of the table, that of the emperors of Germany in Italic capitals, that of the kings of England in the old English letter, that of the kings of France in small Italics, &c. 'By this method,' to quote the explanation of the compiler, 'the succession of the sovereigns in the different kingdoms is immediately distinguishable to the eye, as well as the duration of their reigns, while the intervening space is filled by the remarkable events that occurred at that period all over the world; and thus the connexion of general history is preserved unbroken.'

Some histories are written in a more, some in a less strict chronological order. It is observed by Dionysius of Halicarnassus, in a comparison between Herodotus and Thucydides, that Thucydides has followed the order of time, Herodotus that of things, and that on this account Thucydides is obscure and difficult to understand. While Thucydides, he says, has divided his single subject into many parts, Herodotus, having in his history embraced many different subjects, has formed them into a single whole, of which the several parts perfectly correspond. But though the method of Herodotus may be the best adapted for conveying a clear view of each particular portion of history of which he has treated, every series of naturally connected events forming a narrative or story by itself, it is not easy to gather from his work any notion of the synchronism of events, or of the relation of those of one series to those of another in point of time. Larcher, in the preface to his French translation of Herodotus (edition of 1802), has noticed that Photius has complained of the confusion occasioned by the digressions of this author, and that other critics have been disposed to deny that he followed any regular or intelligible plan. Larcher however dissents from this judgment, and explains what he conceives to have been the plan of Herodotus (*Preface*, pp. xxv.—xxxii.). He has also printed, with annotations, in his sixth volume, three memoirs by the Abbé Geinoz, in vindication of Herodotus against the attacks of Plutarch; and of these the third (pp. 601—627) is an exposition of the method and plan of the historian. His history is of the form of an epic poem, of which the main subject is the wars of the Greeks and Persians. The digressions, which correspond to the episodes of an epic poem, and, as in the case of that on Egypt, take up an entire book, render it very difficult for a young student to form an idea of the history as a whole. But if the episodes are cut out, the whole history exhibits the main subject in a regular progress and order. The chronological system of Herodotus has been amply illustrated by Larcher in his 'Essai de Chronologie sur Hérodote,' printed in the sixth volume of his first edition (1786), and, greatly altered and enlarged, in the seventh volume of his second edition.

But although both Herodotus and Thucydides have, each after his own method, so far adhered to a chronological arrangement as to relate the events in the order of time in which they happened, neither of these writers has throughout his narrative attended to chronology in any scientific sense. They were both prevented from doing this by the want, in that early age, of any fixed epoch or starting point from which to reckon. It has been well observed, that 'the best simile for dates is to say, that they are to history what the latitude and longitude are to navigation—fixing the exact position of, and serving as unerring guides to, the object to which they are applied.' (Nicolas's *Chronology of History*, *Preface*, p. vi.) In this view the histories of Herodotus and Thucydides may be compared to charts or maps drawn without the aid of parallels of latitude or meridian lines, in which indeed the situations of cities and mountains, the courses of rivers, and the general form of countries and outline of coasts might be represented with a certain degree of correctness, but not with the precision requisite for any scientific purpose. Thucydides, however, in recording the events of the Peloponnesian war, keeps to the order of the years; and he fixes the date of the commencement of the war (ii. 2), by referring to the truce made after the capture of Eubœa, to the priesthood of Chrysis in Argos, to the ephorship of Ainesias at Sparta, and the archonship of Pythodorus at Athens. In speaking of events that happened long before the war (i. 13, 19), he refers to the end of the Peloponnesian war as the point from which to reckon backwards.

The determination of the length of the year and the regulation of the calendar appear to have occupied the attention of the antients before they ever thought of dating events from a fixed epoch. But the latter object was of interest only to historical inquirers; the former matters were naturally in the hands of the cultivators of astronomy, who were the best qualified for their management, and were besides more immediately interesting and important to the whole community. There is a curious passage in the 'Clouds' of Aristophanes, in which the clouds, addressing the people of Athens, report a complaint made by the moon about the displeasure she had incurred from the gods in consequence of the confusion into which their festival days had fallen; the allusion, it has been supposed, being to Meton's reformation of the calendar, which had recently been introduced. (*Clouds*, 603, &c.) Aristophanes was a contemporary of Thucydides.

The first æra, or computation of time from an epoch, made use of among the Greeks was that of the Olympiads. 'Hail, venerable Olympiads, ye guardians of time, ye vindicators of the truth of history, ye bridlers in of the fanatical licence of chronologists!' exclaims Joseph Scaliger in his Animadversions on Eusebius, in a paroxysm of chronological enthusiasm. The date of the original institution of the Olympic games is placed in very remote antiquity; but it was a long time even after their revival by king Iphitus (B.C. 884) before they came to be used for the purpose of fixing historical events. The following paragraph is from the introduction to Playfair's Chronology, with the exception of the dates within brackets: 'Hellanicus (B.C. 496—411) regulated his narration by the succession of the priestesses of Juno at Argos. Ephorus (B.C. 300) digested things by generations. The Arundelian marbles (B.C. 263) make no mention of olympiads, and reckon backwards from the time then present by years. In the histories of Herodotus (B.C. 484—413) and Thucydides (B.C. 471—391) the dates of events are not ascertained by any fixed epochs. The olympiads were not commonly applied to this purpose in so early a period. Timæus of Sicily, who flourished in the reign of Ptolemy Philadelphus (B.C. 283—245), was the first who attempted to establish an æra, by comparing and correcting the dates of the olympiads, the Spartan kings, the archons of Athens, and the priestesses of Juno. Eratosthenes (B.C. 194), the father of chronology, and Apollodorus (B.C. 115) digested the events recorded by them, according to the olympiads and the succession of Spartan kings.' When the olympiads were adopted as an æra, the reckoning was made to commence from the games at which Corœbus was the victor, being the first at which the name of the victor was recorded. The olympiad of Corœbus accordingly is considered in chronology as the first olympiad. Its date is placed 108 years after the restoration of the games by Iphitus, and is calculated to correspond with the year B.C. 776.

The statement we have just quoted from Playfair is given at greater length, and with references to the authorities, in the first chapter of Sir Isaac Newton's Chronology. Of the names that have been mentioned, only Eratosthenes and Apollodorus can be considered as having been systematizing chronologers, or as having employed themselves on the science of chronology. The merits of Timæus appear to have consisted in his endeavouring to ascertain with greater precision than any preceding historian the dates of the events of which he treated in his histories of Sicily, of the wars of Pyrrhus, &c. An account of his works is given in Clinton's 'Fasti Hellenici,' iii., 489—491. The fragments of Timæus have been collected by Goeller, in his work, 'De Situ et Origine Syracusanorum,' 8vo., Leipzig: 1818. Eratosthenes, the eminent astronomer, seems to have endeavoured to establish what may be called a system of chronology by ascertaining the dates of certain antient events, which might serve as fixed points from which to reckon all other events. We have no account however of the process by which he arrived at his conclusions. The fragments of his chronological as well as of his other writings, with the passages of the antient authors in which each is mentioned, and notes, have been published by Gottfr. Bernhardy in a small volume, entitled 'Eratosthenica,' 8vo., Berolini, 1822. The dates which he affixed to the principal events of antiquity are given from Clemens Alexandrinus, in Clinton, i., 124. Those of Apollodorus, who made some corrections on the system of Eratosthenes, are given in Clinton, i., 125, as preserved by Eusebius on the authority of Porphyry. Clinton has shown that the leading dates of Eratosthenes and Apollodorus were adopted generally by subsequent chronologers, both Greek and Latin. Among the Romans the most eminent authority in chronology was Varro, who flourished in the century immediately preceding our æra, but of whose numerous and learned works very little remains. Belonging to a much later age, the third century of our æra, there has been preserved the work of Censorinus, entitled 'De Die Natali,' which is in the greater part a treatise on dates, epochs, and other matters appertaining to the science of chronology. There is a passage in the twenty-first chapter of Censorinus, containing a memorandum of the distance of the year in which he wrote (A.D. 238) from the first olympiad, from the building of Rome, from the reformation of the calendar by Julius Cæsar, and from other epochs, which has been thought so important to chronology, that Petau has attributed its preservation to the special goodness of Providence

The establishment of the first olympiad as a common epoch may be said to have given birth to chronology as a science, by introducing into historical writing the general practice of dating events with reference either to that or to some other fixed point. The principal business of chronologers after this was to determine the relationship of each of these epochs to every other.

The common æra of the Roman historians commences from the foundation of the city of Rome. But there was a great variety of opinion among the antients, as there has continued to be among the moderns, respecting the true date of this event. The Romans themselves for the most part followed either the computation of Cato, which places it in B.C. 752, or that of Varro, which assigns it to B.C. 753. Some writers, among others Livy, appear to reckon sometimes by the one, sometimes by the other: most modern chronologers follow that of Varro. This practice of dating events from the building of Rome may be regarded as the first adoption of the simple method of reckoning from a fixed point by single years, and as forming therefore one of the great stages of chronology.

Another usual mode of reckoning among the Latin historians was by the annual consulships. Often both the year of the city and the names of the consuls are given.

The method of reckoning from the first olympiad was occasionally employed long after the birth of Christ. 'Some writers,' says Playfair, 'have continued the use of the olympiads to the 312th year of the Christian era. Cedrenus (a Greek monk of the eleventh century) has brought them 80 years lower, making the 393rd year of our Lord the last olympian year.' Sir Harris Nicolas (*Chronology of History*, p. 2) speaks of the computation by olympiads having ceased after the 364th olympiad, in the year of Christ 440. Particular writers may have reckoned by olympiads down to that date, as they might down to the present day; but it had certainly long before ceased to be the common practice to do so. From A.D. 312 the regular public mode of computation throughout the Roman empire, both west and east, was by the indictions, which were cycles or periods of fifteen years, beginning with that year. [INDICTION.] The practice of dating events by indictions was at one time followed in most of the kingdoms of modern Europe, and in France was not altogether discontinued till the end of the fifteenth century. The method of dating events from the birth of Christ is said to have been first practised by a Roman monk named Dionysius the Little about the year 527. It came into general use in Italy before the termination of that century, but in France not until the eighth century, in Spain not until the fourteenth, and in Portugal not till after the commencement of the fifteenth. The method of reckoning from this epoch, being now universally adopted throughout Christendom, and being the only computation generally used both in historical accounts of past events and in dating current time, has furnished a chronological measure of much more extensive application than any other which had preceded it. It is generally held that the birth of Christ actually took place about four years earlier than the date assigned to the event by Dionysius; but this mistake of the inventor of the vulgar æra does not affect its value as a scheme of chronological notation. It is quite unimportant which the point is from which we reckon, if it be a determinate point.

There is one inconvenience however attending the choice of an event for reckoning from so recent as the birth of Christ, namely, that it necessarily introduces two modes of reckoning, and leaves the events of a large, in fact of the largest, portion of history to be as it were dated backwards, or according to the distance of each behind the assumed epoch. Even the æra of the olympiads was not free from this objection; for although, as we learn from Censorinus, Varro considered the historical age to commence only with the first olympiad, the traditions even of the Greeks ascended to fully four hundred years beyond that date. The histories and traditions of the Hebrews, and other antient nations, extend much farther back. To provide a more comprehensive mode of reckoning, Joseph Scaliger, in 1582, invented what he called (after Julius Cæsar) the Julian period, being a cycle of 7980 years, which is the product of the continued multiplication of 28, the number of the solar cycle, 19 that of the lunar, and 15 that of the indiction. The advantage of this construction of the period is, that the place of any of its years in any one of these cycles is at once found by a simple process of division. It is found that the first year of the Christian æra must, according to its position in these three cycles, have been the 4714th of the Julian period. We have therefore, in this period, a chronological measure which may be applied, if necessary, over all that space before the birth of Christ. But as some chronologers have carried the creation of the world, or the beginning of human history, back to a date still more remote than B.C. 4714, a Capuchin friar, named Jean Louis d'Amiens, in 1683, proposed another period, to which (after Louis XIV.) he gave the name of the Louisian, composed of 15960 years, which number he produced by the multiplication of the numbers of the solar and lunar cycles not by 15, the number of the indiction, but by 30, the number from which the epact is reckoned. In this period the vulgar æra commences with the year 7373. But the Louisian period has been very little used by chronologers.

If the date of the creation of the world, or rather of man's appearance on the earth, could be certainly established, that would form the natural and most convenient point from which to commence the reckoning of time and to date the events of human history. None of the antient chronologers attempted to fix this point; a common opinion then held was, that the world was eternal; some conceived that any attempt to discover the commencement of its existence would be an act of impiety. Even among the Jews and Christians, whose sacred writings begin their record of events from the creation, there has been the greatest diversity of opinion as to that epoch. Kennedy in his 'Scripture Chronology,' affirms that 300 different opinions might be collected as to the length of time that elapsed between the creation and the incarnation. John Alb. Fabricius, in his 'Bibliotheca Antiquaria,' has given a list of 140 of these determinations. Dr. Hales, in his 'New Analysis of Chronology,' has collected above 120. In the 'L'Art de Vérifier les Dates,' vol. i., p. xxvii., &c., is given a list of 108. Playfair has given one of 88. Desvignoles, in the preface to his 'Chronology of Sacred History,' asserts that he has collected above two hundred such calculations, of which the longest makes the distance between the two points to have been 6984, and the shortest only 3483 years.

The uncertainty and controversy upon this subject have been principally occasioned by the disagreement in the ages assigned to the Patriarchs, and in other numbers, between the Hebrew text of the Old Testament, and the texts of the Samaritan and Septuagint versions. From the creation to the deluge the computation of the Hebrew text makes 1656 years to have elapsed; the Samaritan version only 1307; and the Septuagint 2262. The common opinion of modern theologians, and also of chronologers, has been that the Hebrew text is correct; and it is upon this assumption that Archbishop Usher, whose reckoning has been most generally adopted, has fixed the distance between the creation and the birth of Christ at 4004 years. But those who hold a contrary opinion, although the least numerous, have, according to Bayle, been usually *des savans d'élite*, inquirers of a superior order. It is maintained by Father Pezron, in his work 'De l'Antiquité des Tems,' that the Hebrew text was designedly corrupted by the Jews in the first century, and the time that had elapsed from the creation made to appear shorter than it really was, in order to meet the argument derived from what is said to have been an old Jewish tradition, that the coming of the Messiah should take place when the world was six thousand years old. Rabbi Akiba is supposed by Pezron to have been the author of the falsifications. Pezron makes the world to have been 5872 years old at the birth of Christ. The supposition of the corruption of the Hebrew text, and the preference due to the Greek translation of the LXX., has been recently adopted and supported by Dr. Hales, who will scarcely however be reckoned one of the *savans d'élite*.

Among modern systems of chronology, one of the most remarkable and peculiar is that proposed by Sir Isaac Newton, in his posthumous work, 'the Chronology of Antient Kingdoms amended,' 4to., London, 1728. Newton, assuming the nearly entire valuelessness of the determinations of the dates of antient events by the Greek chronologers and their followers, proceeds to form a new system on considerations wholly independent of their authority. In the first place he has endeavoured to show that the antient historians, when 'a little after the death of Alexander the Great, they began to set down the generations, reigns, and successions, in numbers of years, by putting reigns and successions equipollent to generations, and three generations to 100 or 120 years (as appears by their chronology), have made the antiquities of Greece three or four hundred years older than the truth.' He contends that the reigns of kings on an average do not exceed eighteen or twenty years. Secondly, he has endeavoured to ascertain the date of the famous Argonautic expedition by an ingenious calculation founded upon the known precession of the equinoxes at the rate of a degree in seventy-two years*, and the assumption of the equinoctial and solstitial colures having at the time of the expedition cut the ecliptic in the cardinal points. From these data he determines the expedition to have taken place about the year B.C. 928, which gives an antiquity less by about three centuries than that commonly assigned to the event. But the grounds on which Newton has assumed the position of the colures at the time of the expedition are now generally acknowledged to be quite insufficient. Although the full exposition of this system was not published till after the death of the author, its general principles got abroad during his lifetime, and were attacked from various quarters. The two chief early assailants of the Newtonian chronology were the learned French Jesuit Souciet, and Nicolas Freret, known for his many valuable contributions to the memoirs of the Academy of Inscriptions. In latter times the system has been examined by Playfair (pp. 35—37), and by Hales (vol. i., pp. 26—29). See also Sir David Brewster's late *Life of Newton*, and a valuable note by M. Daunon to the article on Newton by Biot in the 'Biographie Universelle,' vol. xxxi., pp. 180—186. Clinton denies that the general uncertainty of the early Greek chronology is so great as is supposed by the scheme of Newton.

Although Newton's deduction of the date of the Argonautic expedition from the precession of the equinoxes cannot be depended on, owing to the want of any authority for the position of the colures at the time of the expedition, the science of astronomy has in another way rendered valuable assistance to that of chronology. This it has done by the means which it affords of ascertaining the exact date of many eclipses of the sun and moon which are recorded by antient writers, and are sometimes connected by them with historical events that happened at or near the same time. In the first volume of the great French work, 'L'Art de Vérifier les Dates' (pp. 146-265), are given lists first of all the eclipses of the sun and moon which could have been seen to the north of the equator for ten centuries preceding the birth of Christ; and secondly, of all those recorded before that epoch by antient writers. In a subsequent volume of the same work there is inserted a list of the visible eclipses that have happened since the commencement of the vulgar æra. Lists of eclipses, solar and lunar, are also given in Playfair's 'Chronology,' pp. 175-219. As an example of the astronomical examination of a recorded antient eclipse, see the article ALYATTES.

One of the earliest of the Christian systematic chronologers is Sextus Julius Africanus, who appears to have flourished in the first half of the third century. Of his chronological work, entitled 'Pentabiblos,' however, beginning with the creation, which he dated B.C. 5499, and ending with A.D. 221, only some fragments remain. [AFRICANUS, vol. i. p. 190.] The most important of the works of the early Christian chronologers which we now possess is the Chronicon of Eusebius Pamphili, bishop of Cæsarea, in the fourth century, of which an edition was published with notes by Joseph Scaliger in 1658, in one volume folio, containing the Latin translation by Saint Jerome, and Scaliger's attempted restoration of the lost Greek text. The Armenian version of the Chronicon of Eusebius, which is more complete than the previous editions, was published at Venice in 1818, with a literal Latin translation, and another Latin translation of it, in the same year, at Milan. There is a famous Spanish commentary upon the Chronicle of Eusebius, by Alfonso Tostato, printed at Salamanca, in five volumes folio, in 1506. The work which is to be considered as having laid the foundation of the modern science of chronology is that of Joseph Scaliger, 'De Emendatione Temporum,' first published in folio at Paris in 1583, and afterwards, much augmented and amended, at Leyden in 1598, and at Geneva in 1629. Another important work of that age is that of Dionysius Petavius, or Petau, 'De Doctrinâ Temporum,' two vols. folio, Paris, 1627, with the Continuation in one vol. folio, Paris, 1630, entitled 'Uranologion, sive Systema variorum auctorum qui de Sphæra ac Sideribus, &c. commentati sunt.' An abridgment of this work, under the title of 'Rationarium Temporum,' was published at Paris in 8vo. in 1630, and has been several times reprinted. Of other early continental works on chro-

[*] Properly a degree in about 71½ years

ology the following are some of the most valuable, or the most celebrated:—Sethi Calvisii 'Opus Chronologicum,' Leips. 1603, often reprinted; J. Bapt. Riccioli, 'Chronologia Reformata,' 2 vols. fol., Bonon. 1669; 'L'Antiquité des Tems rétablie et défendue,' par le Père Paul Pezron, Paris, 4to., 1687, and the Defence of that work by the author, Paris, 4to., 1691; Hier. Wecchietti Florentini, 'Opus de Anno Primitivo ab exordio Mundi ad Annum Julianum accommodato,' fol., August. Vindel., 1621, a work for which the learned and unfortunate author was shut up during the remainder of his life in the prisons of the Inquisition, his crime being his maintenance of the opinion that Christ did not celebrate the passover the last year of his life, and, in instituting the Eucharist, did not make use of unleavened bread; Philippi Labbe et Philippi Brietii 'Chronologia Historica,' 5 vols. fol., Paris, 1670; 'Chronologie de l'Histoire Sainte,' par Alphonse Desvignoles, 2 vols. 4to., Berlin, 1738. The work of the Benedictine monks, Maur d'Antine, Durand, and Clemencé, first published in 1 vol. 4to. at Paris, in 1750, has, in the latest edition, extending to 38 volumes 8vo., published at Paris, 1818-1831, become the most extensive and important work on general chronology that exists. The principal works by English authors upon this science are the 'Chronicus Canon Ægyptiacus, Ebraicus, et Græcus,' of Sir John Marsham, fol., London, 1672, and also Leipzig, 1676, and Francfort, 1696; Archbishop Usher's 'Annales Utriusque Testamenti,' fol., Lond., 1650, and several times reprinted; Sir Isaac Newton's work, already noticed; Jackson's 'Chronological Antiquities,' 3 vols. 4to., 1752; Blair's 'Chronology and History of the World, from the Creation,' fol. 1754, and again, 1768, with additions; Kennedy's 'Complete System of Astronomical Chronology, unfolding the Scriptures,' 4to., 1762; Playfair's 'System of Chronology,' fol., Edin., 1784; and the Rev. Dr. William Hales's 'New Analysis of Chronology, in which an attempt is made to explain the History and Antiquities of the Primitive Nations of the World, and the Prophecies relating to them;' 3 vols. 4to., 1800-1812. There is also a useful introduction to chronology by Bishop Beveridge, entitled 'Institutionum Chronologicarum Libri Duo, una cum totidem Arithmetices Chronologicæ Libellis,' 8vo., Lond., 1669, and several times reprinted. Particular portions of antient chronology have been ably illustrated by Corsini in his 'Fasti Attici, in quibus Archontum Atheniensium series, Philosophorum, aliorumque illustrium virorum ætas, atque præcipua Atticæ Historiæ capita, describuntur,' 4 vols. 4to., Flor., 1744—61; by Wesseling, in his edition of Diodorus Siculus, 2 vols. fol., Amster., 1745; by Dodwell, in his 'Annales Thucydidei et Xenophontei,' 4to., Oxford, 1702; and by Larcher, in his 'Essai de Chronologie sur Hérodote,' already mentioned. But in so far as the Greek chronology is concerned, the most comprehensive, elaborate, and valuable work that has appeared is that of Mr. H. F. Clinton, entitled 'Fasti Hellenici: the Civil and Literary Chronology of Greece, from the earliest accounts to the death of Augustus,' now completed in three volumes 4to., of which the first, comprising the Chronology from the earliest accounts to the time of Pisistratus, was published at Oxford in 1834; the second, comprising the period from Pisistratus to Ptolemy Philadelphus, in 1824; and the third, completing the review to the end of the reign of Augustus, in 1830.

The volumes of chronological tables that have appeared are too many to be enumerated. Several of the systematic works on chronology that have been mentioned contain collections of such tables. The only other work which we shall mention is a most useful and, as far as we have examined it, very accurate publication, in one small volume, by Sir Harris Nicolas, entitled 'The Chronology of History' (1833), forming the 44th volume of Dr. Lardner's 'Cabinet Cyclopædia.'

[See the articles Æra, Epact, Epoch, Cycle, Day, Month, Year, Indiction, &c.]

CHRONO'METER, a name applied to those timekeepers which are used for determining the longitude at sea, or for any other purpose where an accurate measure of time is required, combined with great portability in the instrument. The general appearance of what is termed a pocket chronometer is that of a common watch, and it is generally made to go the same time, with once winding up, namely 30 hours. Those used for nautical purposes are larger, having dial-plates from three to four inches in diameter, and are usually made to go from two to eight days between each time of winding up; they have, in addition to the hour, minute, and seconds', circles, one on which a hand denotes the time in days that the piece has been going since the last winding up. Each chronometer is well secured in a brass box, mounted on gimbals in order that the machine may preserve one uniform position, and enclosed in a mahogany case.

A chronometer, like a common watch, has for its moving power a main-spring, the variable force of which is equalized or rendered uniform by the introduction of the fusee, a very beautiful contrivance, which, when properly made, completely answers the intended purpose. This fusee is nothing more than a variable lever, upon which the main-spring acts through the medium of the chain. A common observer would say of the fusee that it was a sort of cone upon which the chain was wound from the barrel by the operation of winding up the machine; but it is in reality a mathematical curve which has this peculiar property, that as the chain winds upon it, the distance from the centre of motion of the fusee to the semidiameter of the chain which is in contact with it continually varies; and also that it varies in this proportion, viz.: that the distance of the centre of motion of the fusee to the semidiameter of the chain at that point where it leaves the fusee for the barrel, multiplied by the force of the main-spring acting on the chain at that time, shall be what mathematicians term a *constant quantity*: that is, shall be the same whatever point of the fusee may be taken. Thus: suppose the chain, which receives its power to turn the fusee from the main-spring, pulls with a force of 9 oz., and that the distance from the centre of motion of the fusee to the semidiameter of the chain at that part where it leaves the fusee is 42 hundredths of an inch, or, expressed decimally, ·42; then $9 \times {\cdot}42 = 3{\cdot}78$. Now let the spring be wound up to different points at which its force will be respectively 12 oz., 18 oz., 20 oz., 30 oz., and 40 oz., the corresponding distances at which the clain must pull from the centre of the fusee will be respectively ·315, ·21, ·189, ·126, and ·0945 of an inch, for ${\cdot}315 \times 12 = 3{\cdot}78$. ${\cdot}21 \times 18 = 3{\cdot}78$, ${\cdot}189 \times 20 = 3{\cdot}78$, ${\cdot}126 \times 30 = 3{\cdot}78$; and ${\cdot}0945 \times 40 = 3{\cdot}78$. Thus at any given distance from the centre of motion of the fusee, its power to turn any machinery is uniformly the same; and as the great or main wheel, which communicates motion to all the rest, in the watch or chronometer, is attached to the fusee, their centres of motion coinciding with each other, it follows that the power at the teeth of the main wheel is perfectly uniform: this power is transmitted through the medium of a train of wheels and pinions till it comes to the escapement, which is of the detached kind. It is necessary here to observe, that by a detached escapement is meant one in which the impulse which causes the balance to vibrate is given suddenly, and the balance performs two vibrations before it receives another impulse; so that the balance vibrates nearly independently of the maintaining power, the impulses being given so rapidly that the force applied acts on the balance during an extremely small part of one out of every two vibrations.

A chronometer differs from a common watch, in the escapement which has been just described, and in having a compensation for heat and cold. We shall here describe only the peculiar mode of effecting this compensation, as applied in a modern chronometer. It consists in having what is technically termed an expansion balance; this balance, with its appendage, the balance-spring, forms a very important part of a modern timekeeper; and there are few mechanics who can begin and finish this part alone; when they can do this, and adjust the machine to time, it is a proof they possess talents of no ordinary kind, for it requires a keenness of sight, a delicacy of touch, a degree of patient perseverance combined with tact and judgment in detecting errors, almost beyond belief; and last, but not least, a temper not to be ruffled by oft-repeated disappointments.

The figures 1 and 2 represent each a balance; some being made with weights, W W, as in figure 1; others with screws, as in figure 2. The nature and purposes of this balance will be best understood by explaining the mode of manufacturing one of them.

A circular piece of steel, of the thickness of the intended balance, is turned perfectly true, with a small hole in its centre, in which its arbor or axis is afterwards secured, and upon which it is ultimately poised; the piece of steel is then put into a melting pot (sometimes secured to it by a pin through the hole in the centre) with a sufficient quan-

Fig. 1

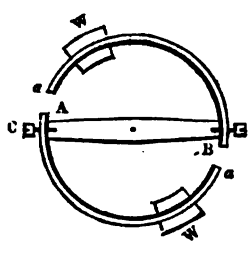
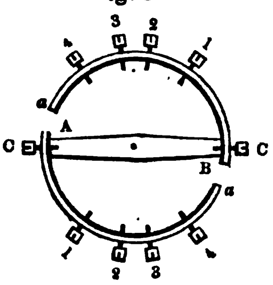


Fig. 2



tity of fine brass to cover the steel when the brass is melted. After having cooled gradually, the superfluous brass is filed away from each side of the flat piece of steel, so that the steel is completely cleared of brass everywhere, except on the edge: by this means the artist is enabled to judge of the comparative soundness of the juncture of the ring of brass to the steel which it now encircles, and if any unsoundness appears it is thrown aside; if perfectly sound, the brass is now reduced by a file upon its outer edge, so as to present a ring of tolerably equal thickness all round, and is left about double the thickness wanted; it is then very carefully condensed either by the hammer or a burnisher as equally as possible, after which the steel is turned out of the centre and the brass from the outer edge, leaving a compound ring perfectly true of the proper thickness for the balance, and having the brass part about twice the thickness of the steel. Within the steel rim a bottom is left, out of which the bar A B is cut; the cutting through of the compound rim is the last thing done to the balance previous to its required adjustment, and this is done by dividing it on opposite sides, as shown in the figures by the letters *a*, *a*, *a*, *a*; so that each arm may present nearly a semicircle, secured at one end to the bar A B, and being free to move through the rest of its length, as will be shown when we explain the principle of action. In those balances where weights are used, a piece of brass is turned somewhat thicker than the balance, a groove is also turned in it whose depth is equal to the thickness of the balance, and breadth is just sufficient to allow the brass to move round on the balance with a slight pressure when formed into the weights W W, which are secured in their places by a small screw through their outer edge pressing against the rim of the balance. Two screws, C C, are called mean-time screws, and are merely used for altering the rate of the time-keeper, having nothing to do with the compensation.

The principle upon which this balance acts is as follows:—an increase of temperature diminishes the elastic force of the balance-spring, which would cause the machine to lose; but the same degree of heat expands the outer rim of the balance, which is brass, more than it does the inner one, which is steel; and not being able to separate, a curvature of the whole arm takes place, which carries the weight W towards the centre, and thereby the inertia of the balance is so much lessened as to allow the balance-spring to exert the same influence over the balance as it had previous to the change of temperature. Again, a diminution of temperature increases the elasticity of the spring, which would cause the machine to gain; but the brass contracting more than the steel, produces a curvature of the arm outwards, which increases the inertia of the balance, and allows the spring no more influence over it than it had previous to the change of temperature. The proper situations of the weights W W are found by experiments on the rate of the machine. It is evident that the nearer the weights are to the moveable ends *a a* of the arms, the greater will be the space through which they move by any change of temperature, and consequently the greater the variation in the inertia of the balance; whence, if an increase of temperature causes the machine to lose, or a decrease of temperature causes it to gain, it shows the compensation not to be sufficiently active; or, in other words, the inertia of the balance is not altered sufficiently to compensate for the effect produced by the increased or diminished elasticity of the spring, and consequently the weights must be set nearer to the moveable ends *a a* of the arms. If an increase of temperature causes the machine to gain, or a decrease to lose, then the weights must be moved farther from the moveable ends *a a* of the arms. In adjusting those balances made with screws, it will readily be perceived that the moving in or out the screws 4 4 will produce a greater effect than 3 3, and these again a greater than 2 2, and so on; and also that in the adjustment two opposite screws must always be moved in or out the same quantity: it will be further seen, that the mean-time screws C C can produce no effect on the compensation, as no motion is given to them by the curvature of the arms. It has been found by experiment, that in every balance-spring of sufficient length, there is a part of it which will be isochronal, or nearly so, and this length being found, it is not desirable to alter it in bringing the machine to time; for, if it be shortened, the long vibrations will be quicker than the short ones, and if lengthened, the short vibrations will be quicker than the long ones; and to avoid this source of error, the two screws C C have been introduced, the drawing out of which from the centre causes the machine to lose, and the screwing them in to gain. Considerable advantages have been anticipated by some persons from the application of a balance-spring of glass, the invention of Mr. Dent, of the firm of Arnold and Dent, of the Strand, London, but we believe it is not yet in a state to induce the inventor to bring it before the public, though we are informed that there is every prospect of ultimate success.

The following have been some of the most eminent chronometer-makers in this country, which has certainly produced them superior to those of any other nation in the world:—Harrison, Mudge, Earnshaw, Sen., Arnold, Sen., Brockbank, Barraud, and Messrs. Arnold and Dent.

CHRONOMETER, in music, an instrument by which the movement, or time (*i.e.* the quickness or slowness) of a composition is determined.

The musical chronometer is by no means a modern contrivance; so far back as the year 1636 Mersenne described and recommended it, in his *Harmonie Universelle;* and Malcolm, a very sensible writer, urged its use more than a century ago. Yet, owing to the prejudices of musicians, it has till lately not been employed, though its utility has never been disputed by any person of discernment, Diderot only excepted, who most likely was led astray by some bigot incapable of taking a clear view of the subject. We must however do Dr. Crotch, an enlightened professor, the justice to say, that it is now upwards of thirty years since he advocated the use of a pendulum. The opponents of a *time-measurer* either blindly or wilfully presume that it is meant rigorously to govern the *whole* of a composition, and that thus the beautiful effects of acceleration and retardation are to be sacrificed; but those who have advised the employment of a pendulum never contemplated its being used for any other purpose than to indicate the time to be adopted at the *commencement* of a movement. From the want or neglect of some contrivance by which the intention of composers might have been transmitted, we are now obliged to guess the true movements of the most classical works; and it is notorious that many compositions of the highest excellence, and among them several of recent date, are frequently performed in times which could not have been intended, because by good critics admitted to be exceedingly prejudicial to their effect. The invention, by the ingenious M. Maelzel, of a most accurate and convenient machine which he calls a Metronome, is beginning to convince musicians of the utility of a pendulum; and we are persuaded that not many years will elapse before it will be universally adopted, both by composers and performers. [METRONOME.]

CHRUDIM, a circle in the eastern part of Bohemia, is bounded on the north by the circle of Königgrätz, and on the east and south by Moravia. Its area is 1218 square miles, and it contained, in 1817, a population of 248,758, and in 1834 of 300,100 inhabitants, who are chiefly native Bohemians. The circle is traversed in the western part by the Elbe, and along its whole length, from east to west, by several rivers, which form a junction, and receiving the name of Chrudimka, fall into the Elbe near Königgrätz. The eastern division of the circle, where it joins the Glatz chain, is mountainous and thickly wooded; the western part is level, and watered by numerous streams; it also contains about 400 ponds. The soil is fertile and produces excellent corn, hay, clover, &c. and flax; it abounds in pasture and woodland, game, fish, &c., and contains also iron, some mineral springs, and precious stones. Much attention is paid to the rearing of horses; but the chief employment of the inhabitants is manufacture of flax and wool; there are likewise extensive potteries, glass-houses, and paper-mills. The circle contains 9 towns, 25 market-towns, and 761 villages.

The chief towns of the circle, besides Chrudim, the capital, are Leitomeschl on the Lauzna, containing 5806 inhabitants, a college, gymnasium, and manufactories of linen, spirits, &c. Pardubits, a royal town at the junction of the Chrudimka with the Elbe, with 3665 inhabitants, a high school and establishments for rearing horses for the army; Landskron, with 4246 inhabitants; manufactories of chintz, cottons, and linens; dyeing, bleaching, &c. Hohenmauth on the Meyto, 4568 inhabitants, factories of cloth; Policzka, 2823 inhabitants, contains a high school, and carries on trade in cloth, flax, and linen; and Wildenschwerdt, 2878 inhabitants, has manufactories of cloth and linens.

CHRUDIM, the capital of the circle, a royal appanage, lies on the right bank of the Chrudimka. It is well built, surrounded with walls, and contains a magnificent collegiate church, a capuchin convent, and a high school (Hauptschule). It is the seat of the local government, and, in 1834, had a population of 5625 inhabitants. The city has its own civil court. The time of the foundation of Chrudim is not known; but it is certain that it was reckoned one of the Bohemian towns in the year 1055. N. lat. 49° 46′, E. long. 15° 50′.

CHRY'SALIS. [PUPA.]

CHRYSA'NTHEMUM, a name applied to a genus of composite flowers, most of which are wild in different parts of Europe, and of little general interest; it is however popularly known from its also comprehending the Chrysanthemum Sinense, a Chinese half-shrubby plant, whose numerous varieties constitute one of the chief ornaments of gardens in the months of October, November, and December. The native state of this species is not certainly known, all the many varieties now in gardens having been bought in the markets of Macao, from the Chinese traders. In the cultivated state the plant has bluish-green broad leaves with sharp serratures and deep lacerations; and the flower-heads consist exclusively of ligulate florets of almost every colour, except blue. Pure white, bright yellow, deep and pale red, rich purple, and a dark morone brown, occur in different varieties of this favourite flower, and together contribute to the beauty for which the species is so much admired. It is probable that the numerous varieties cultivated by the Chinese and now introduced to Europe have been the result of ages of careful improvement, and that their properties have been derived partly from mere sporting and partly from intermixture with allied species unknown in Europe; for among those now cultivated are varieties remarkably different in constitution, some being capable of bringing their beautiful flowers to perfection in the open air, and others hardly unfolding them even beneath the atmosphere of a green-house or stove. They all strike root with great facility by cuttings, which should be taken from the parent plant at midsummer, and planted in a cool frame under a bell-glass. After rooting they may be successively transferred from one sized pot to another, until they have formed two or three stout stems ready for flowering, when they must be finally left at rest. If the soil in which they grow is rich, and the air cool and moderately moist, with a free exposure to light, cuttings struck at midsummer will flower beautifully in the succeeding autumn. The size and perfection of their flowers is increased by about half of the flowerheads that naturally appear being destroyed. As the varieties of this plant are very different in their degree of hardiness and beauty, the following classification of them is transferred from the pages of the Horticultural Transactions:—

1. *Flowers large or showy; requiring protection.*

Superb white.
Paper white.
Sulphur yellow.
Golden yellow
Curled lilac.
Curled blush.
Semi-double quilled pink.
Starry purple.
Early crimson.
Pale flamed yellow
Tasselled white.
Semi-double quilled white.
Quilled flamed yellow.
Tasselled lilac.
Large lilac.
Blush ranunculus flowered.
Brown purple.
Two-coloured red.
Pale buff.

2. *Flowers large or showy; quite hardy.*

Quilled white.
Superb clustered yellow.
Golden lotus-flowered
Parks's small yellow.
Rose or pink.
Purple.
Buff, or orange.
Changeable white.
Tasselled yellow.
Small yellow.
Early blush.
Pale pink.
Changeable pale buff.
Spanish brown.

3. *Flowers large or showy; but produced sparingly.*

Semi-double quilled orange.
Expanded light purple.
Large quilled orange.
Quilled light purple.
Two-coloured incurved.

4. *Flowers small, or late; not worth cultivation.*

Double Indian white.
Yellow warratah.
Windsor small yellow.
Quilled salmon colour.
Semi- double quilled pale orange.
Late pale purple.
Double Indian yellow
Late quilled yellow.
Quilled yellow.
Quilled pink.

The varieties of the 2nd class may be cultivated without any protection by having their stems pegged down upon the surface of the earth so as not to be allowed to rise more than a few inches above it when in flower. So treated they form a charming ornament of a flower-garden; but the other kinds do not like this treatment.

Lately seeds of these plants have been obtained at Oxford and in Jersey, and many new varieties have been raised, among which are some that rival the handsomest of the Chinese sorts; but not much is at present known of their merits. None of them can however be compared to the 'two-coloured incurved,' which is the finest and rarest of the whole.

CHRY'SAOR. One of the numerous genera into which De Montfort divided the belemnites.

CHRYSA'ORA, (Zoology). [MEDUSA.] Also applied to a genus of polypifers of the family *Milleporidæ*. [MILLEPORIDÆ.]

CHRYSI'DIDÆ, a family of Hymenopterous insects of the section *Pupivora*. Distinguishing characters:—No nervures to the under wings; terminal segments of the abdomen forming a jointed retractile ovipositor; abdomen of the females with only three or four distinct segments, concave or flat beneath; antennæ thirteen-jointed in both sexes, and geniculated; mandibles slender, curved, and pointed; maxillary palpi filiform, generally longer than the labial palpi, and five-jointed; the labial palpi are generally three-jointed.

The Chrysididæ are most of them, if not all, of parasitic habits, that is to say, they seek the nests of other insects where they deposit their eggs to the destruction of the rightful owners; each species of this family apparently confining its attacks to the nest of some other Hymenopterous insect, and generally selecting those of the same species. They are all of brilliant colouring, very active, and fly about in the sunshine; some are seen upon flowers, and most of them upon old walls, palings, and sand-banks. Some of these species are called *ruby-tail flies*.

Chrysis ignita will afford a good illustration of this family. This insect is rather less than half an inch in length, has the head, thorax and legs of a rich blue or green colour, and the abdomen of a burnished golden-copper hue; this part is truncated at the apex, and furnished with four little spines.

It will be perceived that the above is a description of a little four-winged fly, which so often attracts our notice from its brilliant colouring, and is so common on our garden walls when the sun is on them. This little insect is in constant motion, for if it ceases running or flying for a moment its little horns still keep up their vibratory motion. If we watch one of these insects for a short time, we perceive that it thrusts its head into every little hole in the brick-work; it is then searching after the nest of a wasp-like insect which builds in these situations.

The principal genera comprised in the family *Chrysididæ* are Panorpes, Chrysis, Stilbum, Hedicrum, Elampus and Cleptes. An account of the habits of one of the species of Panorpes will be found under the head *Bembex*, where the habits of *Bembex rostrata* are given, that being the species whose nests are subject to the attacks of the Panorpes which we are about to describe.

The genus *Panorpes* is distinguished from the other genera above mentioned principally by the elongated maxilla and labium, which appear like a proboscis, and the palpi being very small and two-jointed. *Panorpes carnea* is about half an inch in length, and considerably broader than the *Chrysis ignita* (above described); the head, thorax, and base of the abdomen are of a blue-green colour; the remainder of the abdomen and the legs (with the exception of the thighs, which are blue) are of a reddish-yellow colour. It is found in various parts of Europe, but has not yet been discovered in England.

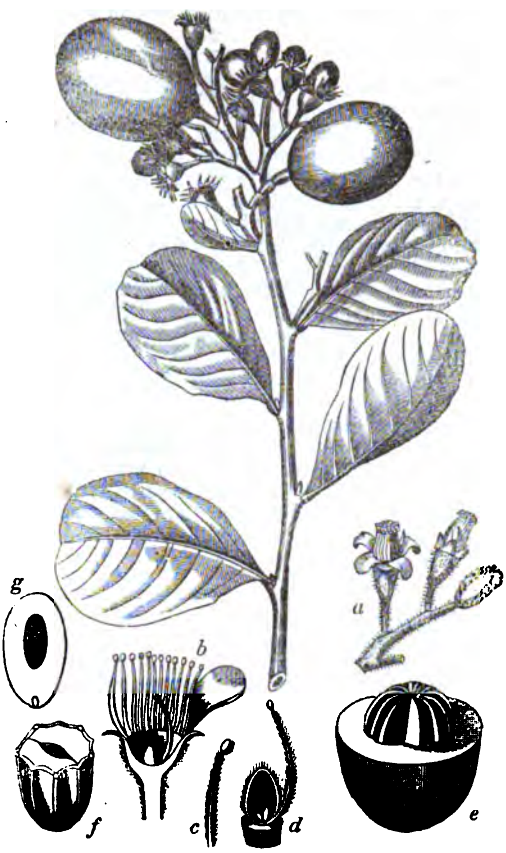
The technical characters of the genus *Chrysis* are:—Maxillary palpi five-jointed, and longer than the labial; labial palpi three-jointed; thorax not narrowed in front; labium rounded. About six or seven species of this genus are natives of England. *Chrysis bidentata* is rather less than *C. ignita*, and differs from that species in having the thorax as well as the abdomen of a rich copper-like hue: the latter however has the apex blue. *Chrysis cyanea* is entirely of a blue colour.

CHRYSIPPUS, son of Apollonius, was born at Soli in Cilicia, B.C. 280. He appears to have been driven to study by having, in some way, lost or squandered his patrimony. When he determined on devoting himself to philosophy he went to Athens, and attended the instructions of Cleanthes, whom he afterwards succeeded. (Strabo, xiii., p. 610, Casaub.) Cicero (*De Nat. Deor.* ii. 6.; iii. 10), in common with other antient writers, describes Chrysippus as a skilful and acute dialectician, and (i. 15) accounts him the most ingenious expositor of the Stoic dreams. Habits of industry probably gave him an advantage over his rivals. Diogenes Laertius reports, upon the authority of Diocles, a statement of Chrysippus's nurse, that he seldom wrote less than 500 lines a day. It appears however that he indulged largely in quotations; and the actual amount of his original labour in composition cannot be gathered from the number of his productions. He is said by Diogenes to have written upwards of 705 volumes, many on the same subject. Cicero (*Tusc. Quæst.* i. 108) gives him the character of a careful collector of facts. After Zeno he was considered the main prop of the Porch (Cic. *Acad. Quæst.* iv. 75); and allusions are frequently made to the estimation in which he was held. (Juvenal, *Sat.* ii. 5; xiii. 184; Horace, *Epist.* i. 2. 4.)

Chrysippus sometimes exposed himself to the attacks of his enemies, Carneades in particular, by defending two opposite sides of the same question: but the arguments which were good in his were good also in others' hands. He frequently succeeded in entangling his hearers by the use of the logical form *sorites*, which is said to have been invented by him, and is called by Persius (*Sat.* vi. 80) 'Chrysippus's heap.' Sorites (σωρείτης) means 'a heap,' and is in logic a heap of propositions in the syllogistic form. (Cic. *Acad. Quæst.* iv. 16; Whately's *Logic*, p. 122.) Chrysippus did not spare his adversaries in his replies to their arguments; and some anecdotes which are told of him seem to show that he occasionally overstepped the bounds of moderation. Notwithstanding this, his style of argumentation was so much admired, that it was said, if the gods themselves were to use a system of logic, they would adopt that of Chrysippus.

Chrysippus appears to have held substantially all the main doctrines of the Stoic theology, though in some minute particulars he is said to have differed from Zeno and Cleanthes: the charges of impiety made against him are probably to be ascribed only to a peculiar method of advocating his opinions. He died, apparently from an apoplectic fit, at the age of seventy-three, B.C. 207. (Diogenes Laertius, book vii., *Life of Chrysippus*; Fabricii *Bibliotheca Græca*, vol. ii. pp. 392, 393.)

CHRYSOBALANA'CEÆ, a natural order of Polypetalous Exogens, allied to Rosaceæ and Fabaceæ (Leguminosæ), from which it differs in the style proceeding from the base of the ovary, and in its stamens being very irregular, often placed only on one side of the ovary. They are trees or shrubs, with alternate stipulate simple leaves, and flowers in loose racemes, corymbs, or panicles. Many species have no petals. They are exclusively natives of the tropics, where they often bear the name of plums. The grey or rough-skinned plums of Sierra Leone are produced by species of Parinarium, and the Callimato or cocoa plum of the West Indies belongs to Chrysobalanus Icaco. The fruit of the latter is described as long, black, clammy, sweet, and agreeable; the plant forms a shrub seven or eight feet high, with very long sharp-pointed leaves, dark green on the upper and pale on the under side: it loves a cool moist soil.



[Chrysobalanus Icaco.]

a, flowers in different stages of development; *b*, vertical section of the flower; *c*, stamen; *d*, vertical section of the pistil, showing the ovules in the base of the ovary; *e*, horizontal section of fruit, showing the inclosed nut; *f*, transverse section of nut; *g*, a cotyledon, with the plumule at its base.

CHRYSOBERYL, the *Cymophane* of Haüy, occurs massive and crystallized. Primary form, a right rhombic prism. Its colour is green, sometimes with a yellow or brown tinge, with occasionally a blue opalescence. Streak white. Lustre vitreous. It is translucent or transparent. Specific gravity about 3·8. Hardness 8·5. Fracture conchoidal. Before the blow-pipe it suffers no change alone; with borax it fuses into a transparent glass.

The massive variety occurs in rounded pieces.

It is found in Brazil, and in Connecticut, North America.

Analysis. Seybert first found that it contained glucina. The following are his and Dr. Thomson's analyses·—

Seybert.		Thomson.	
Alumina .	73·60	Alumina .	76·752
Glucina .	15·80	Glucina . .	17·791
Silica . .	4·06	Protoxide of iron	4·494
Protoxide of iron	3·38	Volatile matter	0·480
Oxide of titanium	1·00		99·517
Moisture .	0·40		
	98·18		

CHRYSOCHLO'RA, a genus of Dipterous insects of the family *Stratiomydes*. Technical characters:—Body elongated; antennæ with the basal joint short, the third long, conical, and compressed; stylet terminal, elongated; third posterior nervure of the wings not reaching the hinder margin.

Only three species of this genus are described; they are all of large size.

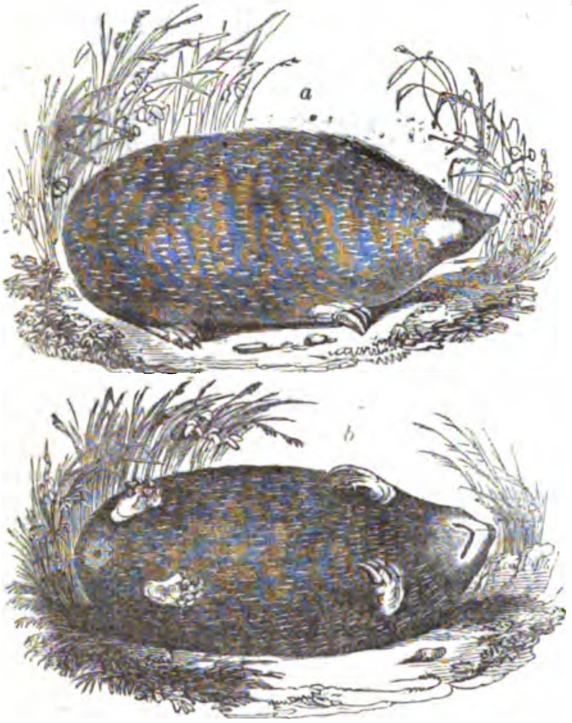
Chrysochlora amethystina is about three-quarters of an inch in length; the head and antennæ are black; there is a white spot at the base of each antenna; the thorax and abdomen are of a violet blue colour, the latter has a yellow spot on each side of the second, third, and fourth segments, the legs are black.

It inhabits the Isle of France and the East Indies. The remaining two species are from South America; their colouring is black and yellow.

CHRYSOCHLO'RIS, Lacepède's name for a genus of mammiferous animals allied to the moles (*Talpa*), but differing from them in their dentition and in other particulars. Dental formula:—Incisors $\frac{2}{4}$, canines 0, molars $\frac{9-9}{8-8}$ = 40. The true molars are long, distinct, and nearly all in the shape of triangular prisms.

The muzzle is short, wide, and reflected. There is no external ear, nor any appearance of the eye externally. The fore-feet have three claws only; the exterior claw is very large, arched, and pointed, forming a powerful instrument for penetrating and digging the earth; the other two diminish gradually. The hind feet are furnished with five claws of ordinary size. The fore-arm is supported by a third bone placed under the ulna, to strengthen it when the animal is employed in excavation. The body is thick and short. The hair, or rather fur, which is thick set, has a metallic lustre. Example. *Chrysochloris Capensis*, Desmarest; *Taupe dorée* of the French; *Talpa Asiatica* of Linnæus. Hair brown, presenting in certain lights very brilliant changeable green, bronze, and coppery tints. Cuvier says that it is the only quadruped whose covering reflects those metallic tints which render so many birds, fishes, and insects brilliant. There is no apparent tail.

Locality and Habits—The Cape of Good Hope, where it is said to live much in the same way as the mole, and to prey like it upon worms, &c.



[Chrysochloris Capensis]

a, the animal on its feet; *b*, the same turned up to show the claws, &c.

Lesson gives two species, the second being *Chrysochloris rufa* of Desmarest, *Talpa rubra* of Gmelin, described as having a short tail, four toes on the hind feet, the fur red inclining to bright ash, and as being somewhat larger than the European mole. *Locality*, Guyana. But Cuvier, in a note to the last edition of the 'Règne Animal' (where he gives only one species, *Chrysochloris Capensis*), says that the red mole of America (*Talpa rubra* of Gmelin), figured in Seba i., pl. xxxii., f. 1, is probably only a *chrysochloris* of the Cape, represented from a dried specimen, for in that state the fur would appear purple; but he adds that the *Tucan* of Hernandez ('Hist. Quad. Nov. Hisp.,' tract 1, p. 7, c. xxiv.), which is regarded as one of its synonyms, would rather appear, from its two long teeth in each jaw, to be a vegetable feeder, a *rat-taupe*, or some other subterranean rodent, such as the *Diplostoma*. Now pl. xxxii., fig. 1, in the first volume of Seba, is described by him to be *Talpa alba nostras*, a white European mole. Fig. 2 is indeed stated to be *Talpa rubra Americana*, the red American mole; but it is represented with a tail, and Seba describes it as having but four claws on the posterior feet. The dried state of the specimen might account for the colour, but not for the tail, and hardly for the four hind claws instead of five.

CHRYSOCOLLA. [COPPER.]

CHRY'SODON (Zoology), Oken's name for the *Pectinaires* of Lamarck, the *Amphictènes* of Savigny, and the *Cistenes* of Dr. Leach, forming a part of the genus *Amphitrite* of Cuvier, who well observes that these perpetual changes of names (and, he adds, in this case there is not even the pretext of a change of the limits of the group) will terminate in making the study of nomenclature more difficult than the study of facts. [TUBICOLÆ.]

CHRYSOGA'STER, a genus of Dipterous insects of the family *Syrphidæ*. Technical characters:—Body much depressed; no false nervures to the wings; third joint of the antennæ oval or orbicular.

About fourteen species of this genus have been discovered in England: they are all of moderate size, and their colouring is metallic.

Chrysogaster splendens is about one-third of an inch in length; the head is green; antennæ yellow; thorax golden-green; abdomen purple-black; greenish towards the sides; the legs are black; wings brownish.

This and all the other species recorded as British have been found in the neighbourhood of London.

CHRYSOLITE: *Peridot* of Haüy. Olivine is a variety of this mineral, and *Chusite* also, according to Dr. Thomson.

It occurs massive and crystallized. Primary form, a right rhombic prism. Colour green, sometimes brownish or yellowish; streak white. Lustre vitreous. Translucent, transparent, double refracting. Specific gravity 3·33 to 3·41. Hardness 6·5 to 7. Fracture conchoidal.

Massive varieties:—Amorphous; granular.

The chrysolite used in jewellery is brought from the Levant, and supposed to be found in Upper Egypt. The variety, on account of its colour called *olivine*, occurs in basalt in Bohemia, Hungary, and on the banks of the Rhine. The following are the analyses of

	Klaproth.	Vauquelin.
Silica . .	39·	38·
Magnesia . .	43·5	50·5
Protoxide of iron	19·	9·5
	101·5	98·0

Some varieties contain small portions of alumina and of the oxides of nickel and manganese. It does not fuse or lose its transparency before the blow-pipe. With borax it fuses into a coloured glass, and with soda into a brown scoria.

CHRYSO'LORAS, EMMANUEL, a learned Byzantine of the fourteenth century, was sent to Italy about 1397, by the Emperor Manuel Palæologus, to request the assistance of the Venetians and the pope, and the other Christian princes, against the Turks. Having fulfilled his mission, he settled at Venice, where he gave lessons in the Greek language. He afterwards taught the same at Florence, Pavia, and lastly at Rome, where he grew into favour with the papal court, and was sent to the council assembled at Constance, where he died in 1415. Poggio Bracciolini, Leonardo Bruni, and Filelfo, were the most distinguished pupils of Chrysoleras in Greek. Chrysoloras wrote a Greek grammar (entitled Ἐρωτήματα, *Questions*), which was one of the first published in Italy, and was afterwards printed at Ferrara in 1509. He also wrote several epistles in Latin, in one of which, addressed to the Prince John Palæologus, son of Manuel, he draws an eloquent comparison between Constantinople and Rome, which has been often quoted. Chrysoloras ranks among the restorers of classical learning in Italy.

John Chrysoloras, the nephew of Manuel, taught Greek in Italy: he returned to Constantinople, where he died, about A.D. 1427. Demetrius Chrysoloras, probably a native of Thessalonica, wrote on philosophy and theology. Some letters of his to the Emperor Manuel Palæologus still exist in MS, and some other works of no importance.

CHRY'SOLUS. One of De Montfort's genera, ranged under the genus *Nonionina* of D'Orbigny, belonging to the order *Foraminifera* of that author.

CHRYSOME'LIDÆ, a family of Coleopterous insects, of the section *Cyclica*. Distinguishing characters:—Antennæ wide apart at the base and inserted before the eyes: body generally short and convex; tarsi short and rather broad, four-jointed, the penultimate joint bilobed; all th joints, excepting the terminal joint, covered beneath with a velvet-like substance.

The Chrysomelidæ constitute a very numerous and beautiful family of the beetle tribe: they are generally of moderate size, and frequently very brilliant in colouring.

Between seventy and eighty species have been discovered in England, and the number of species contained in collections from various parts of the world may probably amount to four or five hundred.

This group may be divided into two sections, those in which the head is hidden beneath the thorax, and the body is frequently somewhat cylindrical; and those in which the head projects from the thorax so as to be distinctly seen when the insect is viewed from above, and where the body is generally rounded, or oval, and convex.

The first of these sections may again be readily subdivided according to the proportions of the antennæ. In some, the antennæ are short and more or less serrated: here belong the genera *Clythra*, *Lamprosoma*, and *Chlamys*. The species of this last genus are among the most remarkable of coleopterous insects. They are of small size, the largest being about half an inch in length, and the thorax and elytra are generally very uneven, and studded with numerous angular projections. This circumstance, together with the extremely brilliant colouring with which they are adorned, has caused them to be compared to pieces of minerals; indeed, one which is now before us, and which is of a beautiful red hue, we have known to be mistaken at first sight for a piece of copper ore. Most of the species of Chlamys inhabit Brazil, and none are found out of the western hemisphere. The generic characters are:—head vertical; thorax humped; the posterior margin produced in the region of the scutellum; body somewhat cube-formed; antennæ with the basal joint rather long, the second very small; the remaining joints dilated, and more or less serrated; labial palpi sometimes forked.

The remainder of the Chrysomelidæ of the first section have the antennæ long and slender. The genera are *Cryptocephalus*, *Choragus*, *Euryope*, and *Eumolpus*.

The second section, or those in which the head is apparent when the insect is viewed from above, comprises the genera *Colaspis*, *Podontia*, *Phyllocharis*, *Doryphora Cyrtonus*, *Paropsis*, *Apumæa*, *Timarcha*, *Chrysomela Phædon*, and *Prasocuris*.

The genus to which the name *Chrysomela* is now restricted, is principally distinguished by the following characters:—maxillary palpi with the terminal joint as large, or larger, than the preceding one, and of the form of a truncated cone, or nearly oval; the elytra are separate, i. e., not joined at the suture: no sternal projection.

Upwards of forty species of this genus have been discovered in England.

Chrysomela Banksii is one of the largest species of the genus: it is rather less than half an inch in length, and of a brown colour with a metallic lustre; the thorax has an indentation running parallel with and close to the lateral margins: the elytra are coarsely punctured. the legs and antennæ are ochre-coloured. It is found on nettles in the neighbourhood of London and elsewhere, but is rather local. *C. sanguinolenta* is about three-eighths of an inch in length, and of a dull blue-black colour; the elytra are rather rough. *C. graminis* is about the same size as the last, and of a bright green colour; this species is abundant in various parts of Cambridgeshire. *C. polita* is about a quarter of an inch in length, and very glossy; the head, thorax, and legs are green, and the elytra are of a reddish ochre colour. This species is very common in marshy situations. *C. cerealis* is about the same size as *C. sanguinolenta*. This is one of the most beautiful species of the genus. It is tolerably common in France and Germany, but till found on the summit of Snowdon (within the last three or four years), was scarcely known as a British insect. It is very glossy; the legs, antennæ, and under parts are blue: the elytra are adorned with longitudinal stripes of blue, green, and red; and the same colours are observed on the head and thorax. *C. Goettingensis* is of a purple colour, and the elytra are very finely punctured. This species is very common in chalk districts. [CYCLICA.]

CHRYSO'PHILA, a genus of Dipterous insects. [LEPTIDES.]

CHRYSO'PHORA, a genus of Coleopterous insects, of the section *Lamellicorne*, and family *Xylophili*. The principal generic characters consist in the immense size of the hind legs of the males. The sternum is produced into a somewhat pointed process between the second pair of legs; the posterior thigh of the male is very thick; the tibiæ are curved and produced at the apex internally into a long bent process: the hind legs of the female are thick, but comparatively short, and the hinder tibiæ are abruptly terminated: the outer claws of all the tarsi are larger (in both sexes) than the inner; they differ in the male, however, in being broader than in the female, and those of the anterior pair of legs are bifid; their outer claws are very long, and the insect has the power of bending them under so as to fix their points beneath a projection of the fourth joint of the tarsus:[*] they are probably used for clinging to the slender branches or leaves of trees.

But one species of this genus is known—*Chrysophora chrysochlora;* it is of a rich metallic green colour; the head, thorax, and scutellum are shagreened; the elytra are rugose throughout; the tibia of the hind leg is of a brassy or copper-like colour; all the tarsi are blue-black. The length of the hind leg of the male exceeds that of the body, which is about one inch and a half; the female is rather less. This beautiful insect inhabits Columbia.

CHRY'SOPHRYS, a genus of fishes of the family *Sparidæ*, and order *Acanthopterygii*. The species of this genus are distinguished from their allies by their having at least four rows of teeth above and three below; those in front are somewhat conical, and the remainder are molars of a rounder or oval form; the body is deep and compressed; the operculum is covered with scales; branchiostegous rays, six.

One of the species of this genus, the *Gilt-head* (Chrysophrys aurata), has been met with off our own coast, but it is here extremely rare. One of its chief localities appears to be the Mediterranean. It is about twelve inches in length; the body is somewhat oval, tapering towards the tail; and the greatest depth (which is about one-third of the whole length) is a little behind the gill opening, above which part the dorsal fin commences, and continues (in a specimen twelve inches long) to within about an inch and a half of the root of the tail. The pectoral fins are long and pointed; the tail is slightly forked. The colour is grey above and silvery beneath; numerous longitudinal gold-coloured bands adorn the sides of the body, and there is a semilunar band of the same colour between the eyes.

CHRYSOPHYL'LUM CAINI'TO, a West Indian fruit, commonly called the star apple, and belonging to the natural order Sapotaceæ. Like the rest of its kindred, it abounds in a sweet harmless milky juice, that flows most copiously when the tree is beginning to mature its fruit, which grows on a moderately sized spreading tree, with very slender flexile branches. The leaves are dark green on their upper surface, and are covered beneath with a remarkably satiny ferruginous pubescence. The flowers grow in small purplish bunches, and are succeeded by a round, fleshy, smooth fruit, resembling a large apple. In the inside it is divided into ten cells, each containing a black shining rhomboidal seed, and surrounded by a white, or sometimes purplish, gelatinous pulp, traversed with milky veins, and of a very sweet agreeable flavour. In an unripe state, the taste is said to be astringent and unpleasant. When cut across, the seeds, which are regularly disposed round the axis of the fruit, present a stellate figure, from whence the name of star apple is derived. There is a smaller species, which produces the fruit called the damson plum. The tree is common in the hot-houses about London, and is well represented in a fruit-bearing state in Sloane's 'Jamaica,' plate 229.

CHRYSOPRASE: Green Quartz. [SILICON.]

CHRY'SOPS, a genus of dipterous insects, of the family *Tabanidæ*. Technical characters:—Head hemispherical; antennæ elongated, second joint nearly as long as the first, both covered with fine hairs: third joint equal in length to the first and second taken together, and having five false joints or divisions; eyes of a golden green colour, with purple lines or spots.

Eight or nine species of this genus have been discovered, two of which only are found in this country.

Chrysops cæcutiens is rather larger than the common house-fly, the expanded wings measuring about two thirds of an inch. It is black; the male has a yellow spot on each side of the first segment of the abdomen; the female, in addition to these spots, has the second segment yellow, with two diverging black lines in the middle; the wings are whitish, the anterior border is broadly margined with black, and there is a broad black band near the middle: the wings of the male are nearly all black.

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[*] This same structure may be observed in some other allied genera.

Most persons undoubtedly have been troubled more or less with the insect above described when walking in the country, especially in the neighbourhood of water. Three or four will sometimes settle on us at the same time, and if on the arm their presence is soon discovered by a sharp prick, caused by their thrusting the proboscis through the sleeve; the bite however is not venomous, and for the slight pain caused by it we are repaid by a sight of the little insect. Nothing can be more beautiful than its large eyes, which seem to reflect all the colours of the rainbow: they may be described as green with purple spots, but the green varies to golden and red hues in certain lights. When it first settles this fly is not easily caught, but it soon becomes so engaged in its occupation that it may almost be touched before it will move.

The other British species is the *Chrysops relictus*, which very closely resembles the one just described.

There is another genus of flies closely allied to Chrysops, and having the same habits; we mean the genus *Hæmatopota*, the principal characters of which are:—Antennæ with the basal joint generally long, thick, and downy in the male, conical and without down in the female; third joint with four divisions, of which the first is thick and longer than the others taken together; no ocelli; wings when at rest sloped like a roof.

Hæmatopota pluvialis is about the same size as the species of Chrysops just described; the eyes are green, having the under part purple, with yellow markings; the thorax is grey, varied with black; the body is black, with a central yellowish longitudinal line, and there is a row of spots of the same colour on each side of this; the wings are greyish, spotted with brown.

Four species of this genus are found in England; the one just characterized is very common.

CHRYSOSTOM. [Dion.]

CHRYSOSTOM, ST. JOHN (*χρυσόστομος, i. e.* the golden-mouthed), the most renowned of the Greek fathers, was born of noble and very opulent parents, A.D. 354 (some writers say 344 and 347), at Antioch, the capital of Syria. In early life he lost his father Secundus, who was commander of the imperial army in that province; and his mother Anthusa, from the age of twenty, remained a widow, in order to devote herself wholly to her son's improvement and welfare. He was educated for the bar, and studied oratory at Antioch under Libanius, who declared him worthy to be his successor, were it not that the Christians had made him a proselyte. He was taught philosophy by Andragathius, and spent some time in the schools of Athens. After a very successful commencement of legal practice, he relinquished the profession of law for that of divinity. At this time the rage for monachism was extremely prevalent, and Chrysostom retired to a monastery in a mountain solitude near Antioch, where, in opposition to the pathetic entreaties of his mother, he adopted and adhered to the ascetic system with rigid austerity during four years. The manners and discipline of the anchorites with whom he associated resembled, as described by himself, those of the Essenes, in fasting, praying, reading, subsisting on vegetable food, maintaining silence and celibacy, and discarding all consideration of *meum* and *tuum*. (*Homil.* 72, *on Math.*, and 14, *on Timoth.*, tom. ii.) At the age of twenty-three he was baptized by Meletius, bishop of Antioch, after which he withdrew into a solitary cavern, where, without any companion, he spent about two years in committing to memory the whole of the Bible, and in severely mortifying his carnal affections. Having neither bed nor chair, he reposed suspended by a rope slung from the roof of his cave. The damp and unwholesome air of the place reduced him at last to so ill a state of health, that he was obliged to return to Antioch, where, being ordained a deacon by Meletius (A.D. 381), he commenced his career as a very eloquent popular preacher, and published several of his declamatory discourses and argumentative treatises. Five years afterwards he was ordained priest, and at the age of 43 was made vicar to Flavianus, successor to Meletius. His fame as a church orator was now so established, that, on the death of Nectarius, archbishop of Constantinople, he was enthusiastically chosen by the people and priesthood of the city to fill that important office. Chrysostom, on this and former occasions, appears to have reiterated with sincerity the *noli me episcopari:* however, by the mandate of the Emperor Arcadius, he was consecrated and enthroned A.D. 398 by Theophilus, patriarch of Alexandria, who afterwards proved to be one of the most envious and malignant of his enemies. Chrysostom bestowed upon the indigent the whole income of his large patrimonial inheritance; and with the revenues of his episcopal see he founded and endowed an hospital for the sick, which procured for him the appellation of John the Almoner. Several times a week he preached to crowded audiences, and his oratorical sermons were received by the people with such shouts and acclamations of applause, that his church became a sort of theatre, which attracted great numbers who had hitherto attended only the circus and other places of amusement. The resolute and fearless zeal of Chrysostom in the reformation of clerical abuses, and in the denunciation of licentiousness among the great, soon began to draw upon him the enmity of a confederate party, whose bitter retaliation finally effected his banishment and death. Much is said by various writers both in commendation and reprehension of his character and conduct. The church historian Socrates describes him as being 'sober, temperate, peevish, irascible, simple, sincere; rash, rude, and imprudent in rebuking the highest personages: a zealous reformer of abuses; extremely ready to reprove and excommunicate; shunning society, and apparently morose and haughty to strangers.' Such qualities embroiled him in continual quarrels with the secular clergy, courtiers, and statesmen, and especially with the wealthy female devotees of luxury and fashion. He appears to have delighted in incurring the implacable hatred of rich young widows, by often reminding them of their paint and ugliness. His zeal for the promotion of his own sect was equalled only by his intolerance towards all others. He caused many temples and statues in Phœnicia to be demolished, and especially persecuted the Arians, refusing them the use of a church in the city, and parading in the streets Trinitarian singers of hymns, with banners and crosses, until the opposition vocalists fell to fighting and bloodshed. The vigour and perseverance of his efforts to reform the loose ecclesiastical discipline permitted by his indolent predecessor, occasioned the formation of a faction which sought to be revenged by his assassination. In his visitation in Asia, two years after his consecration, he deposed at one time no less than thirteen bishops of Lydia and Phrygia; and in one of his homilies (tom. ix., p. 29) he charges the whole episcopal order with avarice and licentiousness, saying that the number of bishops who could be saved bore a very small proportion to those who would be damned. It appears to have been a common custom at that time among the clergy to have each one or more young females residing with them, ostensibly for the purpose of receiving pious instruction as pupils. When therefore Chrysostom enjoined the discontinuance of this custom, as in all cases very questionable, and in many most evidently criminal, he at once excited in the hearts of a great portion of his clergy a personal animosity, very similar to the wrath of Achilles when deprived of his mistress. It has already been remarked that the vanity and vices of the female sex were a favourite topic of Chrysostom's impassioned declamation. In these invectives he used no reserve in reproving even royalty itself. The personal resentment and indignation of the beautiful and haughty Empress Eudoxia was probably therefore the real cause, as Gibbon suggests, of all the disasters by which he was henceforth overwhelmed; for she patronized the confederation which the deposed bishops formed with his adversary Theophilus, who assembled at Chalcedon a numerous synod, by which there were preferred against Chrysostom above forty accusations, chiefly frivolous and vexatious, which, as he refused to acknowledge himself amenable to such a tribunal, and made no defence, were subscribed by forty-five of the bishops present, who in consequence resolved upon his immediate deposition. He was therefore suddenly arrested and conveyed to Nicæa in Bithynia, A.D. 403. This Theophilus is described by Socrates, Palladius, and several others, as a bishop addicted to perjury, calumny, violence, persecution, lying, cheating, robbing, &c. After Chrysostom's banishment Theophilus published a scandalous book concerning him—a sort of collection of abusive epithets—in which Chrysostom is called a filthy demon, and is charged with having delivered up his soul to Satan. It was translated into Latin by the friend of Theophilus, St. Jerome, who joined in the abuse Chrysostom was the idol of the great mass of the people. He was a pathetic advocate of the poor: his pulpit orations were calculated to excite their strongest emotions. When it was known therefore that their favourite preacher was banished, an alarming insurrection ensued, which rolled on with such fury to the palace gates, that even Eudoxia entreated the emperor to recall Chrysostom, for already the mob had begun to murder the Egyptian attendants of Theophilus in the streets. Only two days elapsed before Chrysostom was brought back to Constantinople. The Bosporus, on the occasion, was covered with innumerable vessels, and each of its shores was illuminated with thousands of torches. The archbishop however gained little wisdom from experience; for soon after, when a statue of the empress was set up near the great Christian church, and honoured with the celebration of festive games, he preached in very uncourteous terms against the ceremony, and compared Eudoxia to the dancing Herodias longing for the head of John in a charger. The result of this offensive conduct was the calling of another synod, which ratified the decision of the former, and again Chrysostom was arrested, and transported to Cucusus, a place in the mountains of Taurus. Another uproar was made by the mob, in which the great church and the adjoining senate-house were burnt to the ground. The death of Eudoxia shortly afterwards, and a tremendous storm of hailstones, were regarded by the people as the avenging visitation of heaven. A great number of the poorer class, who were always Chrysostom's most faithful adherents, refused to acknowledge his successor, and formed for some time a schism, under the name of Johannites.

Chrysostom bore his misfortunes with fortitude, and being still possessed of abundant wealth, he carried on very extensive operations for the conversion of the people about his place of banishment. His enemies soon determined to remove him to a more desolate tract on the Euxine, whither he was compelled to travel on foot, beneath a burning sun, which, in addition to many deprivations, produced a violent fever. On arriving at Comana, he was carried into an oratory of St. Basil, where, having put on a white surplice, he crossed himself and expired, September 14, 407, being about sixty years of age. Thirty-five years after his death and burial at Comana, his remains were brought with great pomp and veneration to Constantinople by Theodosius II. It is said they were afterwards removed to Rome. The Greek church celebrates his feast 13th November; the Roman, 27th January.

The works of St. Chrysostom are very numerous. They consist of commentaries, 700 homilies, orations, doctrinal treatises, and 242 epistles. The style is uniformly diffuse and overloaded with metaphors and similes. 'Chrysostom's peculiar talents were those of a declamatory preacher whose art lay in warming the passions, not in convincing the reason; and whose pompous style and rhetorical flourishes, instead of being adapted to a simple narration of facts, were apt rather to exaggerate facts into miracles.' (Dr. Middleton, *Mirac. Powers*, p. 72.)

Dr. A. Clarke, in his 'Succession of Sacred Literature,' vol. ii., has given a brief analysis of the principal treatises. He concludes by remarking, that in the works of Chrysostom there is hardly anything that favours the doctrines of the church of Rome; the opposite of which may be established by a very few examples. Chrysostom believed in the real presence of Christ in the eucharist, as a sacrifice (*Homil.* 24, *on Corinth.*); in the efficacy of prayers of and for the dead (*Homil.* 3, *on Philip.*): he states it to be one of the daily duties of a priest (*Six Books on Priesthood*) to pray for the dead. He often speaks of the miracles daily wrought by the relics of martyrs (ii., p. 555), by the sign of the cross (vii., p. 552; ii., p. 387; v., p. 271), and by consecrated oil (vii., p. 387). His belief in demoniacal possession and exorcism is shown in his 'Address to Stagirius.' His church was full of images and pictures (ii., p. 78).

The chief value of Chrysostom's works consists in the illustration which they furnish of the manners of the 4th and 5th centuries. They contain a great number of incidental but very minute descriptions that indicate the moral and social state of that period. The circus, theatres, spectacles, baths, houses, domestic economy, banquets, dresses, fashions, pictures, processions, chariots, horses, dancing, juggling, tight-rope dancing, funerals, in short every thing has a place in the picture of licentious luxury which it is the object of Chrysostom to denounce. Montfaucon has made a curious collection of these matters from his great edition of the works of Chrysostom, 13 vols folio (editio optima). (*Mémoires de l'Acad. des Inscrip.*, vol. xiii., p. 474, and vol. xx., p. 197; also Jortin, *Eccles. Hist.*, vol. iv., p. 169, et seq.) The 'Golden Book' of St. John Chrysostom concerning the education of children, 12mo., p. 1659, is translated from a MS. found in the cardinal's library at Paris, 1656. The precepts are very curious. The boy is to see no female, except his mother; to hear, see, smell, taste, touch, nothing that gives pleasure; to fast twice a week, to read the 'Story of Joseph' frequently, and to know nothing about hell till he is 15 years old. Chrysostom is described by his biographers as being short in stature, with a large bald head, a spacious and deeply-wrinkled forehead, short and scanty beard, hollow cheeks and sunken eyes, having a look of extreme mortification, but in his movements remarkably brisk, energetic, and smart. He was strongly attached to the writings of St. Paul. His surname Chrysostom was not applied until some time after his death. The biographers of Chrysostom are very numerous: Socrates, lib. vi.; Sozomen, lib. viii.; Theodoret, lib. v.; *Vie de St. Jean C.*, by Hermant, 8vo., 1665; Menard; Erasmus; Du Pin; Tillemont; Palladius; Photius; Ribadeneira; Gibbon, c. 32; Moreri's *Dict.* contains a further list; Priestley, *Hist. Church*, vol. ii.; Usher, *Historia Dogmatica*, p. 33; six sermons have been translated by Rev. W. Scott; and the *Treatise on Priesthood* by Bruce, &c. There is a recent life of Chrysostom by Neander.

CHTHAM'ALUS. [CIRRHIPEDA.]

CHUB. [LEUCISCUS.]

CHUBB, THOMAS, was born in 1679, at East Harnham, a small village near Salisbury. His father, who was a maltster, died without property, and left his mother in indigence to provide for four children. Thomas, the youngest, after receiving a little instruction in mere reading and writing, was apprenticed to a leather glove and breeches-maker in Salisbury. He was afterwards, as a journeyman, engaged in the business of a tallow-chandler in the same city. In both these employments he continued to be more or less concerned until the end of his life; and it certainly is a proof of remarkable mental energy that, in the midst of duties so humble, and merely manual, he contrived, by unassisted application, to acquire a general knowledge of literature and science, and to become a distinguished writer on subjects of religious and moral controversy. The discussion which arose on the publication, in 1710, of the Arian work of Whiston on Primitive Christianity, induced Chubb to write his 'Supremacy of God the Father asserted;' consisting of eight arguments from Scripture, proving the Son to be a subordinate and inferior being. It was published in 1715, under the immediate superintendence of Whiston, and by opposite parties was equally extolled and condemned. Chubb replied to his Trinitarian opponents in 'The Supremacy of the Father vindicated.' In 1730 he published a collection of his occasional tracts in a handsome 4to. volume; containing, besides the two works just mentioned, thirty-three others on faith, mysteries, reason, origin of evil, persecution, liberty, virtue, governmental authority in religion, &c. Pope, in one of his letters to Gay, after speaking of Chubb as 'the wonderful phenomenon of Wiltshire,' says of this volume, 'I have read it through with admiration of the writer.' Among the eminent individuals who admired the writings of Chubb, and sought to be of service to him, was Sir Joseph Jekyl, master of the rolls (the early patron of bishop Butler), who appointed him steward, or supervisor, of his house in London; an office of which the duties appear to have been as little suited to the character of Chubb as those of a tallow-chandler. Accordingly some of the witty adversaries of Chubb made themselves extremely merry with the grotesque appearance of his short and fat figure as he officiated at his patron's sideboard, adorned with a powdered tie-wig and a dress-sword. After a year or two he relinquished his stewardship, returned to Salisbury, and to the last 'delighted in weighing and selling candles.' (Kippis's *Biog. Brit.*). His next publications were 'A Discourse on Reason, as a sufficient guide in matters of Religion;' 'On Moral and Positive Duties, showing the higher claim of the former;' 'On Sincerity;' 'On Future Judgment and Eternal Punishment;' 'Inquiry about Inspiration of the New Testament;' 'The Case of Abraham;' 'Doctrine of vicarious Suffering and Intercession refuted;' 'Time for keeping a Sabbath;' and several other tracts upon interesting points of religious dispute. In 1738 appeared his spel of Jesus asserted.' Chubb would explain ~~what~~ the Christian gospel is, and what it is not: he shows therefore that, as it is said to have been preached to the poor by the founder of Christianity himself and his disciples, antecedently to many transactions of his life, and of course to the events of his death, it could not be a history of his own actions and final sufferings, but was the doctrine of moral reformation which he announced as a rule of conduct, and consequently that the several historical accounts of those transactions and events, with the doctrines founded thereon, are not the gospel, nor any part of it; and, moreover, that nothing is so entirely foreign to its nature and object as the subsequent establishment of state hierarchies, and the metaphysical subtleties since introduced by the political managers of Christianity. In the following year, 1739, Chubb put forth a vindication of this work, and of the discourse annexed to it, against the doctrine of a particular Providence. The following are some of the answers of his opponents: 'Confutation of Chubb's True Gospel,' by the Rev. Jos. Hallett; 'Remarks on Chubb's True Gospel,' by the Rev. George Wightwick, 1740; 'Answer to Chubb's True Gospel,' by a Sufferer for Truth; 'Letter to Chubb on his True Gospel,' by Richard Parker, 1739; 'Remarks on Chubb's True Gospel, and Discourse on Providence,' by the Rev. Caleb Fleming, 1738; 'Remarks on Chubb's Vindication of his True Gospel,' by the Rev. C. Fleming, 1739. To these Chubb replied in his 'Enquiry into the Grounds and Foundation of Religion,' 1740; in which he advocates the priority of a natural religion. This occasioned 'A Vindication of Revealed Religion,' in answer to 'Chubb's Grounds,' by John Phelps, 1740. In 'A Discourse on Miracles,' published 1741, Chubb contends that they furnish no proof of divine revelation. This discourse elicited 'Animadversions on Chubb's Discourse,' by the Rev. C. Fleming; and 'Examination of Chubb's Discourse,' by a Layman, 1742. 'An Enquiry concerning Redemption,' in 1743, and 'Four Dissertations,' in 1746, on portions of the Old Testament history, were the final works of Chubb. The last was answered in 'Truth and Modern Deism at variance, shown by a careful Examination of Chubb's Four Dissertations,' by the Rev. C. Fleming, 1746. In February of the same year, Chubb, according to his desire, died suddenly at the age of 68, as he sat in his chair. Though he left several hundred pounds, his income was to the last so scanty, that it is said he often thankfully accepted from Cheselden, the eminent surgeon, the present of a suit of left-off clothes. His posthumous works, consisting of numerous tracts similar to those already mentioned, were published in 2 vols., 8vo., 1748; and were answered by Fleming, his indefatigable opponent, in 'True Deism the Basis of Christianity; or, Observations on Chubb's posthumous Works.' Dr. Leland, in his 'View of Deistical Writers,' vol. i., has devoted above 80 pages to remarks upon them. For notices of Chubb, see also bishop Law's 'Theory of Religion.' The writer of the article in Chalmers's 'Biographical Dictionary,' in accordance with the proverbial uncharitableness of that work, considers Chubb as an impious and contemptible writer, and wonders how Dr. Kippis could admit the elaborate account of him which occupies twelve folio pages of the 'Biographica Britannica.' The truth is, that, with an occasional blunder, arising from an ignorance of the Greek and Hebrew languages, the writings of Chubb, in following the metaphysical school of Dr. Clarke, exhibit a great argumentative skill, and a style remarkable for a temperate and critical propriety, and a pleasing fluency. The sentiments of liberality and benevolence which pervade his writings, with the zealous endeavour to promote the cause of civil and religious liberty and rational improvement, confirm the opinion which is given of their author by the amiable writer of 'John Buncle,' Mr. Amory, who says, 'I knew him well; he was a sincere good man as ever lived.' The publication, by one of his friends, of 'A Short and Faithful Account of the Life and Character of the celebrated Mr. Chubb,' 1747, drew forth from the Rev. Mr. Horler, of Winchester, a specimen of the most revolting scurrility, entitled 'Memoirs of Mr. Chubb; or, a fuller and more faithful Account of his Life, Writings, Character, and Death,' 1747. The author, after asserting, without the slightest evidence, that Chubb was addicted to the most abominable vices, declares that he would have his corpse, and that of every similar sceptic, instead of being decently buried, 'dragged by a halter round the neck to a gibbet, where the hangman having cut out the heart, plucked out the tongue by the roots, and chopped off the right hand, should burn the whole in a fire made with the books which he wrote; and his ashes being thrown into the air with execration and contempt, would make all those who bow the knee at the name of Jesus, lift up their heads with joy and great gladness.' This work produced 'A Vindication of the Memory of Mr. Chubb from the scurrilous and groundless Calumnies of a late infamous Libel;' 1747. All the above-mentioned works are in the library of the British Museum.

CHUDLEIGH. [DEVON.]

CHUMPANEER, a subdivision of the province of Guzerat, situated between 22° and 24° N. lat., and between 73° and 75° E. long. It is bounded on the north by the river Mahy or Mhye; on the south by the Nerbudda; on the east by Malwa; and on the west by the district of Baroach. This territory is principally possessed by the British government and the Guicowar, but on the decline of the Mogul empire, some portion, including the town of Chumpaneer, fell into the hands of the Mahrattas; and there are besides a few petty chiefs, or Rajahs, who acknowledge a limited kind of dependence upon the actual possessors of the sacred mountain upon which the antient town and fortress of Chumpaneer were built. This mountain rises out of an extensive plain to the height of about 2500 feet. Chumpaneer is described by Abul Fazl 'as a fort upon a lofty mountain, the access to which, for upwards of two cose, is exceedingly difficult, and there are gates at several parts of the defile.' The cose is explained by the same author 'to consist of 1000 steps made by a woman carrying a jar of water on her head and a child in her arms.' At the northern base of the mountain are the remains of a city, supposed to have been the capital of a Hindoo principality before the Mohammedan invasion. The city was taken in the year 889 of the Hegira, answering to 1485 of the Christian æra, by Mahmood, the Mohammedan ruler of western Guzerat. Half a century later it was taken by the emperor Humaiyoon, and when described as above by Abul Fazl in 1582 consisted principally of Hindoo and Mohammedan ruins. The town does not contain at present more than between 200 and 300 inhabited houses, but the ruins of antient buildings extend for several miles on each side of the mountain: there are two forts on the mountain; the upper one is considered to be of great strength.

(*Ayin-i-Akbari; Report of Committee of House of Commons of* 1832, political division.)

CHUQUISACA. [BOLIVIA.]

CHUQUISACA, the capital of Bolivia, in South America, is situated near 19° S. lat., and between 64° and 65° W. long. It lies in one of the valleys which descend from the eastern declivity of the eastern chain of the Bolivian Andes, at an elevation of about 14,700 feet above the level of the sea; to which circumstance its delightful climate must be ascribed. This valley contains the Cachimayo, a tributary of the Picomayo, which is a branch of the Paraguay river. The town, which was formerly called Charcas, or La Plata, and, at a certain period of the war with the Spaniards, Sucre, from the name of the general who gained the victory of Ayacucho, is on the whole well built, and has a magnificent cathedral, with large towers rising from each angle. There are also several churches and convents, with domes and steeples, which from a distance give it the appearance of a large town. But the place is of moderate extent, having only a population of 26,000. It has an appearance of neatness and cheerfulness, not very common in the towns of South America. Since it has become the seat of the legislature and government of the republic, great changes have been effected. The palace in which the archbishop of Charcas once resided has been assigned to the president of the republic. Some of its well-built convents have been converted into institutions of education, one having been given to the university, and another turned into a mining-school and a college of arts and sciences, both of which were founded in 1826. (General Miller; Temple.)

CHURCH, or **KIRK**, which is precisely the same word in a varied orthography, is supposed to be the Greek word *κυριακός* (kuriakos), a derivative of *κύριος* (lord), one of the designations of Jesus Christ, the founder of the Christian system. It is one of the Saxon adoptions from the Greek. Κυριακός is an adjective, and we must understand after it some word denoting flock, or house, the Lord's flock, the

Lord's house; the two senses in which kirk, or church, is used.

Of church, as denoting an edifice appropriated to Christian purposes, we treat in a separate article. We have now to speak of it as a term used tó designate bodies or communities of men, when contemplated under the aspect of being persons who are followers of the Lord Jesus Christ. We shall endeavour to exhibit and illustrate the various senses in which it is used with as much completeness as our limits will allow. The word church has been used from the most remote period to represent the Greek term *ἐκκλησία* (Ecclésia), which often occurs in the New Testament, which was adopted into the Latin language without any change, and which gives us our words ecclesiastics and ecclesiastical, which correspond to the Saxon terms churchmen, and of churchmen. The meaning of the word *ecclesia* among the classical Greek writers is 'meeting or assembly,' and in this or the somewhat modified sense of 'community' it was adopted by the writers of the New Testament.

The whole community of Christians thus constitute the church. This is the sense in which the word is most commonly used in the New Testament. as when it is said that 'the Lord added daily to the church such as should be saved' (Acts ii. 47); 'Head over all things to his church' (Eph. i. 22); 'concerning zeal, persecuting the church' (Phil. iii. 6): and when our Lord said, 'Thou art Peter, and on this rock I will build my church' (Matt. xvi. 18), he contemplated that majestic assembly, the multitude, whom no man can number, who in ages to come should form the great Christian community. And as, when thus used by the Apostles, it comprehended all the disciples of Christ, without regard to questions which divided the opinions of Christians even in the earliest times, so it is still often used to denote the whole body of Christians, notwithstanding any peculiarities in their church-order and ritual, or however they may understand the instructions on some points of Christ and the Apostles.

But it soon came to be regarded as essential to the idea of a church that the believers should be bound together by a species of mutual pledge, and form a compact and united body. Certain outward forms of profession came to be regarded as requisite for every member, such as baptism, and partaking in the Lord's Supper; certain officers, as bishops, pastors, and deacons, were regarded as essential; as well as certain uniform services, and the acknowledgment of certain propositions as containing a just exposition and summary of the doctrine of Christ and the Apostles. A continued effort seems to have been making from a very early period in the history of Christianity to bring the body of professing Christians into this state of consistency and uniformity. And to give the greater effect to the effort, the bishop of Rome, who was represented as the direct successor of St. Peter, the rock on whom the church was to be built, received by almost universal consent a kind of headship, or supremacy, and about him was gathered a council, consisting of other bishops, pastors, and deacons, forming a supreme authority in this compact community, and a court of ultimate appeal. Nearly the whole body of professing Christians in the states of western Europe were, by various means, brought to enrol themselves in this great confederacy, and they formed for many ages the church, a numerous and in the main a well-ordered and well-governed community.

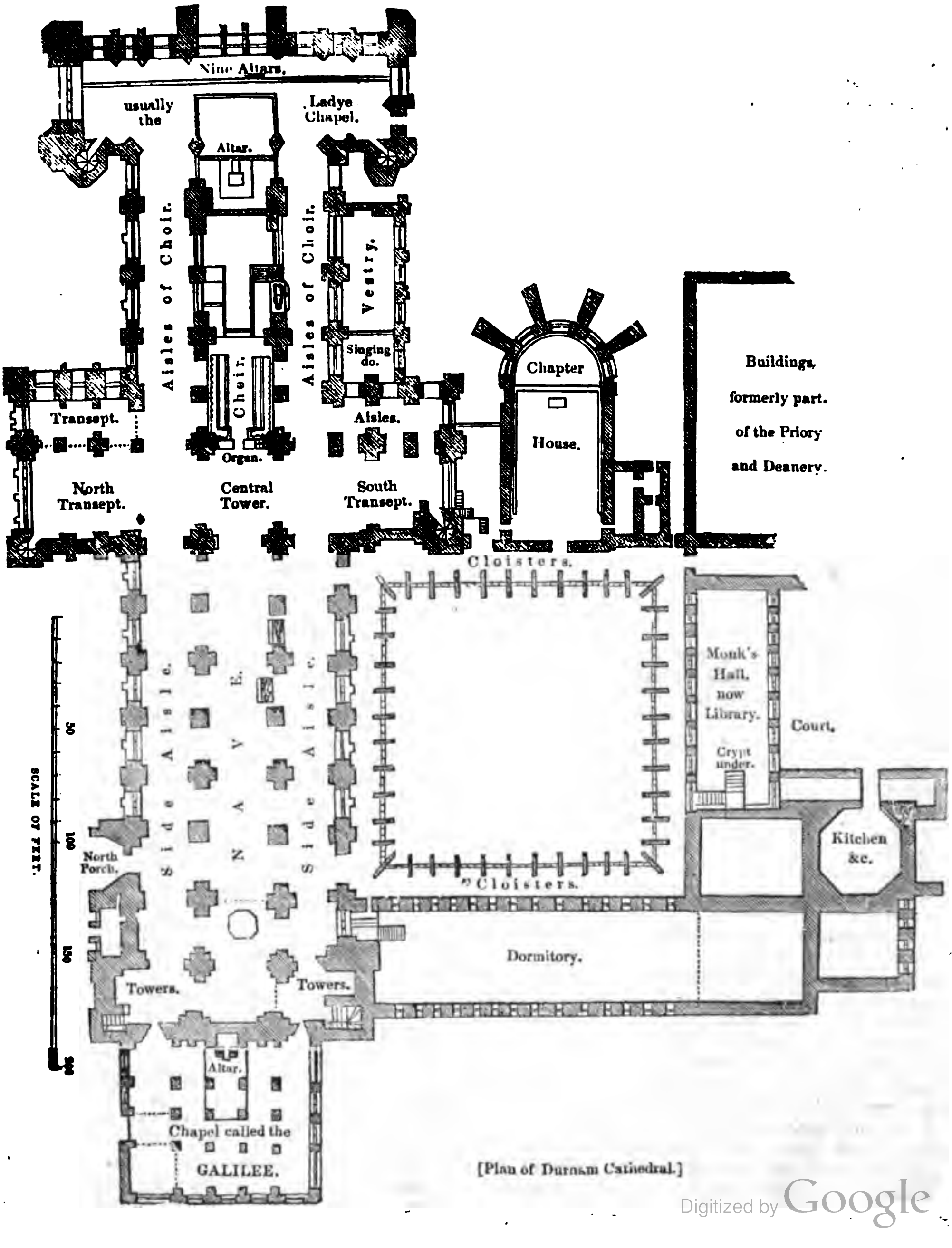
At the Reformation, certain states of Europe separated themselves from this great community of Christians. The separation was made on various grounds: objections to the tyranny of the ecclesiastical authorities; to their exactions; to their assumption of powers not sanctioned by reason or Scripture; to the corrupt lives of some of the persons near the head of the church; together with an opinion that the ceremonies enjoined in the rituals were superstitious, if not idolatrous; and that many things were taught to the people as Christian verities which not only had no countenance from Scripture, but which were opposed to the plain teachings of Christ and the Apostles. Many of the more learned and more virtuous reformers did not look to the breaking-up of the church, but to the reformation of it in doctrine and discipline, leaving the community of believers in the compact and, in the main, beautiful consistency and order in which they found them. But the resistance which was made to the efforts of the reformers, combined with other things, rendered this impracticable, and nothing remained for the states in which the call for reformation was the loudest, and where a strong sense of the corruption of the Roman Catholic system had possessed the minds both of rulers and people, but to break off from the great confederacy, and to renounce entirely all connection with and all spiritual allegiance to the pope, the great head of the church. Hence arose another use and application of this term *church*, and we hear of the church of Geneva, the church of Scotland, and the church of England, meaning the Christian members of those political confederacies, or belonging to those nations, when regarded under the aspect of being professed believers in Christ.

The expediency and the right of particular nations thus to detach themselves from the great community of Christians, and to establish churches of their own, have been the subject of controversy. The Protestant, however, regards the point as settled, and in each of the three states above mentioned, as well as in other Protestant states of Europe, there are *national churches* established, founded on the public law, and regulated by the same public will which regulates affairs purely political and secular. Those national churches of Protestantism vary among themselves on almost every point both of order, ritual, and doctrine, according to the peculiar opinions of the persons who happened to possess the chief influence at the time when the new faith, form, and order were established, or who at a somewhat later period had influence sufficient to modify the church in any of those points. Hence there is no common church of Protestants. Each Protestant nation has its own church, and regulates its own spiritual affairs without communication with other Protestant people. It is a system of national independency. These national churches, however, are not found to comprehend all persons who in their political character are members of the respective nations. In the English, the Scottish, and other Protestant nations, there are many persons who continue to profess that they adhere to the antient and great community, that they are members of the Christian church in the second of the senses of which we have spoken, and who abstain from connecting themselves in any manner with the national church, having their own system of faith, worship, and order as a branch of the great catholic or universal church. Again, there are a great multitude of Protestants who do not regard themselves as members of the church of England or of the church of Scotland; some who object to the frame and order of the church as in England being episcopal, and in Scotland being presbyterian; some who have scruples respecting points in the public service book of the church of England; some who regard the Articles of Faith as not presenting a just view of the doctrine really taught in Holy Scripture; some who think that the church as at present constituted does not leave the ministers sufficiently at liberty for the influential performance of their duties; and some who think that practically the system is not favourable to the prevalence of Christian influences, which they regard as the main object in every appointment connected with the church. We touch but upon the broad and leading objections. But there are many also who separate themselves from the national union because they object to the principle of a national church. They contend that there should be no such church regulated by councils and parliaments, but that the believers in Christ should be left at entire liberty, each person for himself to connect himself with others, if he see proper to do so, and thus to form Christian communities on principles and for purposes such as each individual might approve for himself. The Congregationalists or Independents of England, the most numerous class of English dissenters, in the declaration of their faith, church order, and discipline, issued by authority in 1833, avow the principle that each society of believers associated together for religious purposes is properly a Christian church. The question about which there has been so much disputation, of the union of church and state, is in effect, and when stripped of its abstraction and its personification, nothing more than the question whether there shall be a union of the people of each nation in one Christian society, the affairs of which are regulated by the national will as that will is collected on other subjects; or, whether there shall be no expression of a common will, but each person be left to receive or neglect Christianity, and to make his public profession of it in whatever way seems to him to be best. Our limits do not allow us to enter into the discussion of this question, but we may state the main arguments briefly thus:—In behalf of a national church it is contended that without some public provision there would soon be many parts of the country without Christian ministrations at all; that by securing an order of well-instructed ministers, there is the best preservative that can be devised against the prevalence of injurious superstition and dangerous errors; that affairs of such importance as these should be subjected to the consideration and direction of the enlightened mind of a people; and that practically from the moment that property is acquired by any body of professing Christians, that body must become amenable to the state, must apply to the state for direction whenever questions arise respecting it, so that it is in fact impossible entirely to disjoin affairs of religion from affairs of state. On the other hand, it is contended that to set up articles of faith and forms of worship is an injurious invasion of the rights of Christians; that to connect the profession of particular opinions with temporal advantages is unfavourable to the progress of inquiry and of truth, and has a tendency to produce simulation in Christian ministers; that the system leads to political subserviency, and fosters a worldliness of spirit; and that practically the system is not acceptable to the nation, as is evinced by the multitude of the persons who, notwithstanding the losses and inconveniences to which in consequence they subject themselves, yet do not belong to the church.

The Methodists do not, we believe, speak of themselves as a church; but their system is in all its great features that of a Presbyterian church.

We have now gone through the principal senses in which this term *church* is used when it is applied with any propriety. But we cannot conclude without noticing one other sense in which the word is often used, and we notice it to condemn it as mischievous, and in every point of view incorrect and improper. We mean when *church* is used to denote *the officers of the church*, the bishops, priests, and deacons; a use of it neither sanctioned by etymology nor the usage of primitive times, and which is calculated greatly to mislead, as things which are predicated, and truly predicated, of the church in its proper sense of a community of believers in church order, and appointed with proper church officers, may be transferred inadvertently to *church* when it is the officers only who are meant. 'The interests of the church,' for instance, a very common phrase, are properly the interests of the great English community looked upon in the aspect of its relation to Christianity, not the interests of the officers or ministers only. Their proper designation is not the church, but the clergy.

CHURCH. An ecclesiastical edifice, sometimes built after the model of a modern basilica, and sometimes in the form either of a Latin or a Greek cross. The basilica form however must be considered as belonging to the churches



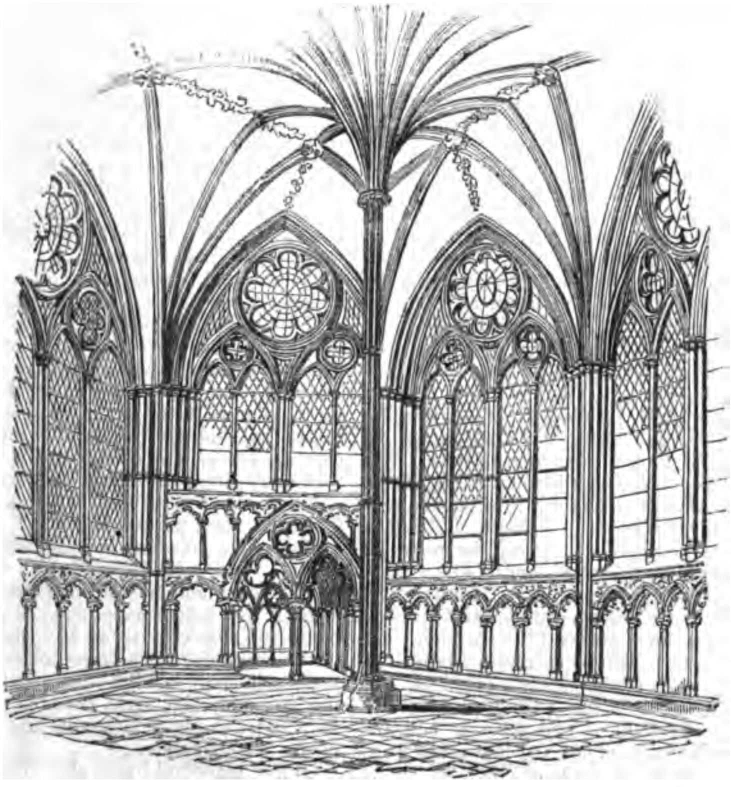
[Plan of Durham Cathedral.]

of the early Christians. The origin of the difference between the form of the Latin and Greek cross belongs to the period of the schism in the church. The Latin was in common use until the Reformation. Some resemblance to the basilica form may be traced in modern churches erected since the Reformation to the present day. The most perfect resemblance to the church basilica is observable in the cathedrals of Europe, and especially in England. Attached to these edifices there are still many of the various buildings which formed the monastic establishments of former days. A church or cathedral with a Greek cross has the transept as long as the nave and choir: the greater part of the Greek churches are built in this form. The Latin cross has the nave much longer than the transepts and choir. Many of our modern churches consist of only one long nave, with an altar at the east end: the cross form, or transept, is in some instances scarcely perceptible, and in others entirely omitted. In the nave of the church, towards the east end, are placed the pulpit and reading-desk, sometimes on one side, and sometimes in the centre of the nave. A sounding-board is often constructed over the pulpit in order to assist the voice of the preacher. The altar end of the church is raised by a step or steps, and is enclosed. The font is sometimes placed near the entrance and at others near the altar; and the stoups, or small stone basins, set in niches and originally intended for holy water, are often seen in village churches. At East Dereham these stoups are on the exterior of the porch. Near the altar in antient churches there are sometimes three niches with seats in them raised each a step above the other.

Churches are of five classes, metropolitan, cathedral, collegiate, conventual, and parish churches. The term cathedral is derived from καθέδρα, 'a seat,' from the seat or throne of the bishop being placed therein. Cathedrals are the chief ecclesiastical structures of the dioceses in which they are situated.

Almost every cathedral is varied in plan, although the leading features, the nave and choir, are found in almost all. The plan usually consists of a galilee, or chapel, at the principal entrance; the nave, or main body of the church; the side aisles, which do not rise so high as the nave, and are placed on each side of the nave, sometimes with chapels, at other times without, between the openings formed by the windows; the choir, or place for the ceremonies of the church; the transept, or division at right angles to the end of the nave next the choir, which projects on each side, and forms a cross on the plan. Some cathedrals have a double transept, and the transepts have often aisles. At the end of the choir is the high altar, behind which is usually a ladye chapel, or chapel to the Virgin. The choir end of a cathedral is sometimes terminated by an apsis, or semicircular end. The term apsis was originally applied to the whole choir, or part railed off from the nave, like the end of a church basilica. Along the sides of the choir are ranged richly-carved seats, ornamented with arches, pinnacles, and tracery, carved in oak. The bishop's seat, richer than the others and raised above them, is on one side, at the eastern end. The choir has also side aisles. Cloisters and a chapter-house are usually attached to English cathedrals, but the latter are rarely met with on the continent, the chapters being usually held in the cathedral, or in a chapel within the cathedral or abbey. The minor parts of a cathedral are the muniment room, the library, the consistory court, the vestries of the dean and chapter, minstrels' chapels, a font, and a minstrel's gallery.

Beneath the body of the cathedral there is usually a crypt, or low basement, supported on arches springing from thick columns, as in Canterbury cathedral and others. Both externally and internally the antient cathedrals of England, France, and Germany display all the luxury of Gothic architecture. Like all ecclesiastical buildings, they stand with the altar towards the east, and the principal entrance to the west; the transept is placed north and south. At the point of intersection of the transept with the nave there is usually a lofty tower, sometimes surmounted by an elegant spire, as in Salisbury cathedral. Sometimes the principal or western front has a tower at each angle, which in some instances are also terminated with spires. The nave of a Gothic cathedral is supported by clustered columns, arched from one to the other, over which there is usually a row of small arches forming a gallery, which is called the *triforium*, and above are windows called clere-story windows. The aisles are lighted by windows placed between the openings of the arches of the nave; and, externally, the buttresses of the aisles often rise, supported on an arch, to the wall of the nave: these are called flying buttresses. The exterior walls of the cathedral, with its towers, are generally decorated with buttresses, surmounted with pinnacles; and between the buttresses are the openings or windows of the nave and aisles. The ceiling of the nave is sometimes of stone, and covered with tracery formed by the intersection of the arches which spring from the clustered columns of the



[Chapter-house, Salisbury.]

nave. The west or principal front is usually the most highly decorated with tracery, pinnacles, and sculptured figures. In the side aisles, and the aisles of the choir, there are often chapels richly designed, which contain the tombs of the founder, &c. Our cathedrals abound with monuments of various epochs, from the early Norman period of our history to the present time. The chapter-house and cloister are large and important features in many of our cathedrals. The finest chapter-houses in England are of a polygonal form on the plan, with a seat running round from the entrance, and the interior decorated with sculpture, and in some instances with painting. In some chapter-houses a column, or cluster of columns, rises from the centre of the room, from which spring the sides of pointed arches, meeting the other halves of pointed arches rising from the column or columns at the angles of the walls.

The chapter-house of Salisbury cathedral contains some of the finest specimens of the kind of sculpture usually found in such buildings.

The cloisters are rectangular enclosures, with a richly-ornamented and arched gallery running round the sides, and a wall forming the back of the enclosure: the arches, which are filled with tracery, look into an area, where probably the monks were formerly buried. There are also cloisters in some of the colleges of Oxford and Cambridge. The cloisters seem to be very similar to, and perhaps derived from, the crypto-porticus of antiquity. [CHALCIDICUM.] The Campo Santo at Pisa appears to have been originally a large cloister, similar to our cathedral cloisters. This part of the ecclesiastical structure may have been used not only for exercise, but for study. In England the cloisters were probably glazed: in Italy they are often decorated with frescoes, by celebrated masters. Chantries, or chapels for singing mass, were formerly founded by the pious for the benefit of their souls. They are often placed between the pillars of the nave, as the chantry of Cardinal Beaufort at Winchester: the effigy was also placed within the chantry. Some are complete chambers formed in the aisle of the choir as at Ely, and others are independent of the cathedral, as at Westminster. In some antient and modern cathedrals and large churches the principal feature is a dome, as St. Sophia's at Constantinople, St. Paul's, London, St. Peter's at Rome, and St. Mark's at Venice, Santa Maria de' Fiori at Florence, the Pantheon at Paris, and many others.

Some parish churches have very much the form of a cathedral, as Christ church, Hants. The chancel of a church, which is often the property of a layman, corresponds in situation to the choir of a cathedral, and, like it, is railed off from the body or nave of the church. [CHANCEL.] The chancels of our churches often contain the monuments of individuals connected with English history and literature, as at Arundel church, and Stratford-upon-Avon. In parish churches however the great tower is seldom placed at the intersection of the nave and transept, but forms the entrance at the west end, and contains the belfry. One of the most antient and best preserved parish churches in this country is St. Cross at Winchester. Norfolk and Suffolk possess many fine churches, some of which are remarkable for the lightness of their construction. (*Views of Collegiate Churches*, by J. P. Neale; Ferrey's *Christ Church, Hants.*)

The antient cathedrals of England are Bristol, Chichester, Canterbury, Carlisle, Chester, Durham, Ely, Exeter, Gloucester, Hereford, Lichfield, Lincoln, Norwich, Oxford, Peterborough, Rochester, Salisbury, Wells, Winchester, Worcester, and York. St. Paul's, London, is modern. Besides these there are several edifices, called minsters, which possess a cathedral character both in their construction and in their uses, as Westminster, Beverley-minster, and Lichfield and York cathedrals, which still retain the name of minster. Abbey churches had also a cathedral character.

The cathedrals of Norwich, Westminster, Canterbury, Peterborough, and Gloucester, have a semicircular apsis.

Ely has a centre tower and lantern 170 feet high, and a fine tower at the western entrance, much higher: it had two towers at the angles of the western entrance, but only one remains. The style of the building externally is Norman and early English. The nave is a beautiful specimen of the Norman style, the elevation consisting of three tiers of arches, with long clustered shafts round each pier. The elevation of the choir internally presents a superb design of decorated English. It was erected, with the equally beautiful chapel of St. Mary between the years 1321 and 1349. The tower and lantern, supported on eight large piers, were unique until the erection of St. Paul's. Ely lantern is said to have suggested to Sir C. Wren the idea of the lantern over the dome of St. Paul's. This cathedral has the ladye chapel at one side, and not at the east end.

Salisbury is in many respects one of the finest English cathedrals, and the most uniform in style. It has two transepts. The ladye chapel has been, perhaps injudiciously, thrown into the choir. There is a porch entrance on the north side, leading into the nave. The cloisters, which are very extensive and magnificent, lead into a very elegantly-designed chapter-house. There is a small muniment-room attached to the south end of the second transept. The tower is supported by four massive piers, surrounded with smaller columns: the tower is surmounted by a spire; the whole height is 404 feet. This spire was added some time after the tower was finished; and the weight of it has considerably warped the piers, in consequence of which the summit of the spire is near two feet out of the perpendicular.

Hereford cathedral has a nave, side aisles, a north porch, two transepts, a choir, a ladye chapel, cloisters, and a chapter-house. The nave and chapter-house are in ruins. The architecture of the nave is Norman. The east end is built in the early English style. Underneath the ladye chapel is a crypt; and at the intersection of the nave there is a very large square tower.

Worcester cathedral is very similar in plan, having two transepts, but no side aisles to the larger transept which intersects the nave. The chapter-house and cloister are situated like those of Hereford; and at the intersection of the nave there is a handsome tower. The interior of the nave is in the early English style. The chapter-house is in the Norman style.

Wells cathedral, in plan, differs very much from all the rest. The chapter-house is on the north side of the church; the cloisters are in the usual place, the south, but they have only three sides; the entrance to them is from under the south-western tower of the cathedral. Here we have two western towers, a north porch, and a transept, with side-aisles; and at the end of the choir a very elegant ladye chapel, with a termination at the east end, somewhat similar to the apsis of a basilica. The architecture of the nave is early English: the towers appear to be much later in style. There is a crypt under this cathedral.

Exeter cathedral, founded in 932, rebuilt in 1112, has a chapter-house, used as a library, in the form of a parallelogram, unlike the usual form, which is polygonal. The cloisters of this cathedral were destroyed during the Commonwealth. The singularity of the design of this edifice consists in its having two towers, in the Norman style, one at the north and the other at the south end of the transept. The nave is very fine, and in the early English style.

Bristol cathedral, founded about 1142, is inferior to many others: it is irregular and imperfect in the plan, being without a nave. There is however some curious Norman work in the chapter-house.

Peterborough cathedral, rebuilt 1117, is on the plan of a simple Latin cross, with one large and two small towers at the western end, terminated with spires. The altar end of the choir has the termination in the form of the antient apsis: the ladye chapel is behind the altar. The transept has side-aisles and a tower at the intersection with the nave. The west end is remarkable for three large arches, under the centre of which is a small porch, with a library over it. The style of this cathedral is partly Norman, mixed with early English. Some parts are of a later date, as the east end, which is in the perpendicular style, or that kind which has been termed Tudor.

Gloucester cathedral, rebuilt 1089, differs from the preceding. The apsis is very large: attached to this part of the building, and at the entrance of the side-aisles, are chapels: the ladye chapel extends backwards. The chapter-house and cloisters are on the south side. On the north side of the cloister is a projection called a lavatory. On the south side there is a beautiful porch. An elegant tower, in the perpendicular style, rises from the intersection of the nave and transept. The walls and columns of the nave are in the Norman style.

Oxford cathedral has a short nave, a choir, a north transept, with an aisle, longer than the south transept, which is without aisles. Two large chapels on the sides of the choir cloisters, and a rectangular chapter-house, are attached on the south side.

Hereford cathedral has an aisle, a north porch, double transepts, a choir, ladye chapel, cloisters, and remains of an octangular chapter-house.

Carlisle cathedral, formerly a priory, is small, and inferior to the other cathedrals.

Chichester cathedral has a nave, side aisles, transept, a choir, ladye chapel, now a library, and an irregular enclosed cloister. There is also an isolated bell-tower, like the Italian campanile in principle. This cathedral has an elegant spire.

Chester has a nave, side-aisles, and south transept, now a parish church; a choir and ladye chapel at the east end; a cloister to the north, and a rectangular chapter-house, and school-room, to the north of the cloister.

Lichfield has a nave and choir, nearly the same length; a ladye chapel, with a semi-octangular head or apsis; an aisle on one side of the transept; and a chapter-house with parallel sides terminated at two ends with semi-octangular figures.

Canterbury has a nave, and a cloister on the north side leading to the chapter-house, which is in the form of a parallelogram; double transepts, choir, and side chapels. At the end of the choir is an elegant chapel, with an apsis, and a circular chapel beyond, called Becket's Crown. The font is in a circular chapel, leading from the north transept. To this building is attached a library. The crypts underneath the entire cathedral are the finest in the kingdom. There are three towers, one in the centre, and two at the west end.

York is on a very elegant plan. The transept has double aisles; there is an elegant octangular chapter-house leading from the north transept, a superb centre-tower, two western towers, a record-room, and consistory-court. There is also a small crypt.

Winchester has a regular plan: the cloister was rectangular, but both it and the chapter-house have been destroyed. The transept is remarkable and unique, on account of the aisles running round the three sides. A small ladye chapel is attached to the east end, and there are extensive crypts under the cathedral.

Lincoln has a nave, a choir, and double transepts. Behind the choir is a place called the Presbytery: a small galilee is attached to the south transept. The cloister, which is comparatively small, leads to a magnificent chapter-house, of a polygonal figure, ten-sided, with flying buttresses. The western transept has aisles, and a large tower at the intersection with the nave. At the west entrance there are two smaller towers. Lincoln cathedral is very perfect.

Norwich has a long nave, and one transept; the east end is terminated by an apsis, beyond which there is a ladye chapel, and at the side of the apsis two chapels, formed by two segments of a circle. Attached to the side-aisle of the choir is a consistory-court. There are large cloisters on the south side of the edifice. The chapter-house has been destroyed.

Worcester cathedral has a nave and side-aisles, north porch, double transepts, choir and side-aisles, and a ladye chapel. On the south are the cloisters and king's school, and a chapter-house, circular within, and polygonal on the outside, with a column in the centre, as at Lincoln and Salisbury.

Westminster has a long nave and transept, with double aisles, an apsis at the east end of the choir, with four semi-polygonal chapels round it: beyond is the sumptuous ladye chapel built by Henry VII. The cloisters are to the south, as well as the chapter-house, an octangular building; beyond are some smaller cloisters connected by dark passages with the great cloisters. (See the plan in the *History of St. Peter's Church, Westminster*, by J. P. Neale.)

Rochester has a nave and side-aisles, a double transept, but on the north side of the choir only, a choir, and a chancel at the end of it. The chapter-house is at the south-east, and in form is a long parallelogram. A low tower rises from the intersection of the transept and nave, and on the west is a chapel.

Bangor cathedral consists of a choir, nave, transept, aisles, and a quadrangular tower at the west end. The clere-story windows are circular: those below are pointed.

Bath abbey, now a cathedral church, is in the form of a cross, making two small transepts without aisles; a small vestry is attached to the south transept, and a great tower rises at the intersection of the transept. The choir is the same width as the nave.

The cathedral of St. David's is partly Norman and partly of the pointed style. It consists of a nave, choir, transepts, side aisles, and a western tower. For a brief account of the cathedral of St. Asaph, see St. Asaph's.

A comparison of the principal Measurements of the English and Welsh Cathedrals, except St. Asaph's and Llandaff.

Cathedrals.	Extreme length.	Extreme breadth.	Height of chief tower and steeple.	Length of Nave.	Breadth of Nave.	Height of Nave.
	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.
Canterbury	545	170	230	188	27	80
Carlisle	242	130	123	110	34	73
Chester	375	200	127	120	41	..
Chichester	410	151	300	146	26	65
Bristol	203	127	133	..	..	..
Bath	240	257	..	111	37	..
Bangor	223	96	60	141	..	34
Durham	507	194	210	203	37	69 6 in.
Ely	535	190	266	203	30	76
Exeter	408	155	153	96	31	66
Gloucester	427	154	223	160	33	68
Hereford	350	174	160	125	28	63
Lichfield	403	177	252	143	26	58
Lincoln	505	242	264	176	37	81
Man	125	73	..	60	30	..
Norwich	415	200	309	205	28	75
Oxford	168	116	145	61	22	45
Peterborough	480	198	143	234	35	73
Rochester	383	170	156	140	32	55
Salisbury	474	230	404	196	32	81
St. David's	..	..	..	124	..	..
St. Paul's	512	283	360	170	39	90
Wells	415	155	165	164	32	68
Winchester	556	230	148	240	32	78
Worcester	425	145	193	174	30	67
Westminster	530 9 in.	220	225 4 in.	154	30	105
York	518	241	200	210	43	93

The above are taken from Britton's 'Architectural Dictionary;' Neale's 'Westminster;' Browne Willis's 'Survey of the Cathedrals,' and 'History of the Mitred Parliamentary Abbeys;' and Dugdale's 'Monasticon.' For more minute admeasurements, see the works quoted at the end of this article.

The numerous cathedrals of France, Italy, and Germany present beautiful specimens of architecture, not only in the Gothic style, but also in the Italian style. The cathedrals of Amiens, Beauvais, Nôtre Dame de Paris, as well as others, are beautiful examples of Gothic. Cologne, and Freiburg, in the Breisgau, are equal if not superior to any cathedral in England. The cathedral, or Duomo, at Padua is partly in the Italian style, and the western front, though perhaps not in correct taste, produces a masterly effect. St. Peter's is the largest cathedral in Europe. Vienna and Strasburg have the highest spires; the former is 465 feet, the latter 456 feet high. (For information on English cathedrals we must refer the reader to Britton's *Cathedrals*, seventeen of which have been treated by him in separate publications, beautifully and correctly illustrated; Bentham's *Ely*, and Miller's *Ely*; Dugdale's *Monasticon*; Dodsworth's *Salisbury*, Wild's *Lincoln and Worcester*; Browne Willis's *Survey of the Cathedrals*.)

CHURCH, STATES OF THE. [Papal States.]

CHURCHILL. [Marlborough.]

CHURCHILL, CHARLES, was born in 1731, in Westminster, where, in St. John's parish, his father was curate. After accomplishing the usual period of grammatical studies in Westminster School, he was taken by his father to Oxford to be matriculated in that university: but his volatility and vivacity of imagination, which already had prevented his becoming distinguished in the scholastic routine, occasioned his rejection at the entrance examination. It is said that the sage solemnity of the examiner's visage, arrayed in a large bushy wig, contrasted so strangely with the frivolous grammatical questions proposed for solution, that Churchill imprudently indulged in a fit of laughter; and instead of making the proper replies, he aggravated the indecorum of his conduct by making facetious and satirical remarks, and proceeded to interrogate the examiner on which, of course, he was dismissed with indignant displeasure. He was shortly after admitted a member of the university of Cambridge, where however he took no degree, but soon returned to Westminster, where he became passionately attached to a young lady of the name of Scott, whom, although he was but in his seventeenth year, he precipitately married, without any means or plan of subsistence. After a year's residence in his father's house, he retired with his wife to Sunderland and prepared for taking orders. At the age of 25 he was ordained by bishop Sherlock, who is said to have exclaimed, 'Good God! before what sort of an examiner must this gentleman have been, when he was pronounced to be deficient in scholastic education?' Most of his biographers state that he now repaired to a curacy in Wales of 30*l.* a year, and that in order to provide for his family, he sought to augment this miserable pittance by fitting up a cider-cellar, and undertaking to supply this article to the neighbourhood; a project which terminated in his becoming a bankrupt. But this statement is contradicted by the editor of his works, published in 1804, who asserts, in a prefixed biographical account, which appears to be collected from authentic documents, that Churchill went at this period to officiate in the curacy of Rainham, in Essex, previously held by his father, and that he there opened a school. It is probable that the cider story may have arisen from some confused relation of the fact that Churchill was first ordained deacon on the small curacy of Cadbury, in Somersetshire, which, as being not far from Wales, and famous for cider, presents sufficient data for the makers of marvellous and interesting anecdotes. In 1758, on the death of his father, he succeeded to the curacy of St. John's, in Westminster, and from this period a total alteration took place in his character and habits, which, from having been hitherto those of a moral, domestic, and studious man, became gradually ruined, and terminated in avowed and abandoned licentiousness. This change may be attributed to his intimacy with the talented and profligate poet, Robert Lloyd, whose father, Dr. Lloyd, a master of Westminster school, about this time interposed as the friend of Churchill, and rescued him from jail by advancing to his creditors a composition of five shillings in the pound; but, to the credit of Churchill, it must be added, that he himself subsequently paid the whole amount. His first poems were 'The Bard' and the 'Conclave,' for which he was unable to obtain a publisher. 'The Rosciad,' a very clever and severe satire upon the principal theatrical managers and performers at that time, was published in 1761, at his own risk; the London publishers having refused to give five guineas for the MS. It obtained an amazing popularity, and was answered by the numerous parties attacked in Churchilliads, Murphyads, Examiners, &c. The subject is one on which the author, as a poet and constant play-goer, was well qualified to express a critical judgment. Like most of Churchill's productions, it is more remarkable for energy and eloquent roughness of sarcasm, than for polished phraseology or refined sentiment. His next poem, 'The Apology,' written in reply to his critical adversaries, is perhaps the most finished and correct of his works. The poem called 'Night' was intended as an apology for his own nocturnal celebrations of the rites of Bacchus. These orgies, in which Churchill was associated with the convivial wits of his time, Colman, Thornton, &c., are well described in Charles Johnson's 'Chrysal; or, the Adventures of a Guinea.' The argument of the 'Apology' is bad enough; showing only that the open avowal of vice and licentiousness is less culpable than the practice of it under the hypocritical assumption of sanctified temperance. 'The Ghost,' a poetical satire on the ridiculous imposture of Cock-lane, served but little to increase the literary fame of its author. With the exception of a few well-delineated characters, it is a series of rugged Hudibrastic incongruities. 'Pomposo,' in this poem, is intended for Dr. Johnson, who had designated Churchill 'a shallow fellow.' In 1762 Churchill became acquainted with John Wilkes, and contributed to the pages of the 'North Briton.' To gratify his political patron, he wrote 'The Prophecy of Famine; a Scots Pastoral,' which was greatly extolled, not only by Wilkes, and the politicians of his party, who said it was 'personal, poetical, and political,' but by the literary public. The editor of the last edition of Churchill's works declares it to be 'one of the most admirable specimens of satirical composition in the English language.' There is much humour in the following imitation of Virgil's 'Ante leves ergo pascentur in æthere cervi,' &c. (*Eclog.* 1.)

> 'Ah, Jockey, ill advisest thou, I wis,
> To think of songs at such a time as this.
> Sooner shall herbage crown these barren rocks;
> Sooner shall fleeces clothe these ragged flocks;
> Sooner shall want seize shepherds of the south,
> And we forget to live from hand to mouth.'

The praise and profit which Churchill obtained by this jeu d'esprit seem to have overwhelmed his common sense: he plunged at once into the greatest irregularities of conduct, which drew from his parishioners a serious remonstrance, and induced him to relinquish the clerical profession. At the same time he quarrelled with and separated from his wife, who herself is said to have been any thing but a prude. The utter recklessness of his conduct at this period is shown by his seduction of a tradesman's daughter in Westminster, whom he shortly afterwards abandoned. His poem called 'The Conference' was composed whilst he seemed to suffer some feelings of contrition. A published letter to one of his friends on the occasion of his quitting his profession and his wife, contains the following assertion:—'I have got rid of both my causes of complaint—the woman I was tired of, and the gown I was displeased with. I find no pricks of conscience for what I have done, but am much easier in my mind. I feel myself in the situation of a man who has carried a d——d heavy load a long way, and then sets it down.' After throwing aside his clerical habit, he appeared in a blue coat, gold-laced waistcoat, large ruffles, and a gold-laced hat. His satirical 'Epistle to Hogarth' was revenged by the artist's caricature of 'The Reverend Mr. Churchill as a Russian bear' in canonicals, holding a club and a pot of porter, with a pug-dog which is treating the poet's works with great indignity. We have still to mention several poems, all of which are more or less satirical; namely, 'The Duellist;' 'The Author;' 'Gotham;' 'The Candidate;' 'Independence;' 'The Journey;' and 'Farewell.' Of these, 'The Author' is by far the most pleasing: the satire is general, and delineates with great effect the prim pedantry of collegiate life. 'The Candidate' is replete with poetical fire and spirit. 'Farewell' is comparatively tame, and 'Gotham,' which was written during a short fit of retirement and reformation, is chiefly descriptive. Churchill was a close and occasionally a very successful imitator of Dryden. His verses have much of the fervour and force of this great poet; and at the same time all the coarseness and ruggedness of Donne and Oldham. He has been styled the bard of liberty, and the scourge of tyranny. He was frank, sincere, and generous to a fault; and apparently not naturally vicious, but the unfortunate victim of dissolute companions. Cowper, in a long passage in his 'Table Talk,' assigns him, on the whole, a distinguished place as a poet, calling him a 'spendthrift alike of money and of wit.' He died at Boulogne, in 1765, while on a visit to Wilkes, his intimate friend. His complete works were published in 8vo., in 1804, with a life and portrait. Some interesting particulars are given in 'Genuine Memoirs of Mr. Churchill,' 12mo., 1765.

CHURCHWARDENS are parish officers, who by law have a limited charge of the fabric of the parish church, of the direction and supervision of its repairs, and of the arrangement of the pews and seats. Certain other duties are imposed upon them on particular occasions. There are usually two churchwardens in each parish, but by custom there may be only one. It is said by some authorities that by the common law the right of choosing churchwardens is in the parson and the parishioners. This is however by no means universally the case, as a custom prevails in many parishes for the parishioners to choose both, and in some both are elected by a select vestry. The eighty-ninth canon of 1603 directs that 'churchwardens shall be chose yearly in Easter week by the joint consent of the ministe and parishioners, if it may be; but if they cannot agree the minister shall choose one and the parishioners another. It has however been questioned how far these canons ar binding upon the laity, even in matters ecclesiastical.

The usual duties of churchwardens are, to take care th the churches are sufficiently repaired; to distribute seat among the parishioners, under the control of the ordinary to maintain order and decorum in the church during th time of divine service; and to provide the furniture for th church, the bread and wine for the sacrament, and th books directed by law to be used by the minister in co ducting public worship. In addition to these ordinar duties, the churchwardens are by virtue of their offic overseers of the poor, under the statutes for the relief the poor; they are also required to present to the bish all things presentable by the ecclesiastical laws, which r late to the church, minister, or parishioners. In larg parishes there are sometimes officers called sidesmen (s nodsmen) or questmen, whose business it is to assist th churchwardens in inquiring into offences and making presentments. Churchwardens and sidesmen were formerly required to take an oath of office before entering upon their respective duties; but by a recent statute, 5 and 6 Will. IV., c. 62, s. 9, it is enacted that, in lieu of such oath, they shall make and subscribe a declaration before the ordinary, that they will faithfully and diligently perform the duties of their offices.

If churchwardens are guilty of any wilful malversation, or if they refuse to account to the parishioners at the termination of their period of service, they may be proceeded against summarily before the bishop by any parishioner who is interested, or the new churchwardens may maintain an action of account against them at common law; in which action the parishioners, other than such as receive alms, are admissible as witnesses. (Stat. 3 Will. III., c. 11, sec. 12.) On the other hand, in all actions brought against them for any thing done by virtue of their office, if a verdict be given for them, or if the plaintiff be nonsuited or discontinue, they are entitled to double costs by Stats. 7 Jas. I. c. 5, and 21 Jas. I. c. 12.

Under the 59th Geo. III., c. 12, s. 17, churchwardens and overseers are empowered to take and hold lands in trust for the parish as a corporate body; and by a decision under this act, they can also take and hold any other lands and hereditaments belonging to the parish, the profits of which are applied in aid of the church rate. (Burn's *Justice*, and Burn's *Ecclesiastical Law*, tit. 'Churchwardens.')

CHUSITE. Found by Saussure in the porphyritic rocks near Limburg; occurs massive, granular, translucent and of a greasy lustre. Dr. Thomson refers it to Chrysolite.

CHUTA NAGPORE (LITTLE NAGPORE), a large zamindary in the district of Ramghur, forming the southern extremity of the province of Bahar, and containing, according to Major Rennell, 9329 square miles. The name Nagpore is indicative of the belief that the territory contains diamonds; and the distinctive title Chuta serves to distinguish it from the district of the same name in the Boonsla dominions. The surface of the country is much diversified. For the most part it is hilly and covered with jungle, the growth of which was, until very recently, much encouraged by the successive rajahs as the means of preventing invasion and preserving their independence, although it renders the climate unhealthy, especially to strangers. The country presents also several extensive plains, the soil of which is very fertile, and yields abundant harvests of pulse, wheat, barley, cotton, and sugar. The whole district is well watered, so far at least as relates to the irrigation of the land; the hills contain the sources of many streams, which do not attain any considerable size, so as to be navigable, until they have quitted the limits of the territory: under these circumstances, rice is produced in great abundance. Iron ore abounds in many parts of the district, but the expense of smelting would be so great that it is more advantageous to import iron from England than to establish furnaces upon the spot.

The country is but thinly populated in general, and contains only a small number of villages. Among the hills are some tribes who use little or no clothing, and are considered by the Brahmins as barbarians. For a long time subsequent to the first possession of Bahar by the English, the rajahs of Chuta Nagpore assumed and exercised independent powers, and did not allow of the jurisdiction of the English courts of justice. In 1809 a military force was sent into the country in order to establish the power of the British, and to organize a systematic police, which ends were accomplished with some difficulty. Previously to that time the rajah had paid to the government no more than 13,000 rupees per annum out of a clear revenue of 160,000 rupees, the residue being employed in keeping on foot a numerous body of soldiers. It has always been the system of the rajah to hold no personal communication with Europeans, and not to admit them into his presence. On the occasion just mentioned, the rajah, Govindnauth Sahi Deo, quitted his usual place of residence, and retreated into the jungle, where he succeeded in concealing himself, although brought to consent to the measures dictated by the English commander. Our present knowledge of the geography of the district and of its internal condition is very imperfect.

(Rennell's *Memoir*; *Report of Committee of Commons on the Affairs of India*, 1832.)

CHYDO'RUS (Zoology), Leach's name for a genu of *Branchiopoda* of the section *Lophyropa*. [BRANCHIOPODA.]

CHYLE (χυλός), the product of digestion formed by the action of the pancreatic juice and the bile on the chyme in the duodenum. [CHYME and DIGESTION.]

CHYME (χυμός), the product of digestion formed by the action of the stomach on the food. [DIGESTION.]

CIBBER, CAIUS GABRIEL, a celebrated sculptor, was a native of Holstein, and came to England during the Protectorate of Oliver Cromwell. The two figures of Raging and Melancholy Madness, which adorned the principal gate of Old Bethlehem Hospital, were his work, and also the bassi-rilievi on the pedestal of the London Monument. He married the daughter of William Colley, Esq. of Glaiston, in Rutlandshire, and granddaughter of Sir Anthony Colley, a stanch royalist, who in the cause of Charles I. reduced his estate from 3000*l.* to 300*l.* per annum. By this lady he had Colley Cibber, the actor, dramatist, and poet laureat. Mr. Cibber was employed in the latter years of his life by the earl, afterwards duke of Devonshire, in the improvement and decoration of the magnificent family seat at Chatsworth; and at the time of the Revolution in 1688, he took arms under that nobleman in favour of the prince of Orange.

CIBBER, COLLEY, was born, according to his own statement, on the 6th of November, O.S., 1671, in Southampton Street, Covent Garden. In 1682 he was sent to the Free School at Grantham, Lincolnshire. In 1687 he returned to London, and in 1688 was at his father's request received as a volunteer in the forces raised by the earl of Devonshire in support of the prince of Orange. In 1689 he indulged an early conceived inclination for the stage, by fixing upon it seriously as his profession; and after performing gratuitously for about eight or nine months, obtained an engagement at a salary of ten shillings per week. This pittance was afterwards increased to fifteen shillings; but a feeble voice and a meagre person were considerable obstacles to his progress, and the trifling part of the Chaplain in Otway's 'Orphan' was the first in which he obtained any notice. His performance of Lord Touchwood at a very short notice, in consequence of Mr. Kynaston's illness, obtained him the commendations of Congreve and five additional shillings per week. At this time, being scarcely twenty-two years of age, after a very short courtship, he married Miss Shore, to the great anger of her father, who immediately spent the greatest part of his property in the erection of a little retreat upon the Thames, which he called Shore's Folly. Mr Cibber's professional progress was very slow for some years, notwithstanding his having turned author, and the success of his comedies, 'Love's Last Shift,' 'Love makes a Man,' 'She Would and She Would Not,' 'The Careless Husband,' &c. In 1711 however he became joint patentee with Collier, Wilks, and Dogget, in the management of Drury Lane, and afterwards with Booth, Wilks, and Sir Richard Steele; which latter partnership continued till the death of Mr. Eusden, the poet laureat, in 1730, when Cibber was appointed to succeed him, and sold out, having become during his nineteen years' management so great a favourite with the public in the performance of fops and feeble old men, that after he had retired from the stage he was occasionally tempted back to it by the offer of fifty guineas for one night's performance. In 1745 he played Pandulph in his own tragedy of 'Papal Tyranny,' being at that time in the seventy-fifth year of his age. On the 12th of December, 1757, about nine in the morning, he was found dead in his bed by his man-servant, with whom he had been in conversation about three hours before apparently in perfect health. He had recently completed his eighty-sixth year.

Mr. Cibber has described himself with considerable candour in his well-known and very amusing 'Apology' for his life. Vain, inconsistent, and negligent, he was withal a quick-witted, good-humoured, and elegant gentleman. His person, though spare and unprepossessing in youth, improved considerably as he advanced in life: a fact confirmed by a fine portrait of him in the collection at the Garrick Club, in his favourite part of Lord Foppington. As a writer of comedy, he is inferior perhaps only to Congreve, Wycherly, and Vanbrugh; but his Birth-day Odes are by no means exceptions to the usual dulness of such compositions. His best comedy is allowed to be 'The Careless Husband,' the dialogue of which is delightfully easy and polished; but the play which brought him the most money was his adaptation of Molière's 'Tartuffe,' entitled 'The Nonjuror,' on which Bickerstaff afterwards founded his 'Hypocrite.' For this play King George I., to whom it was dedicated, sent him 200*l*. He was the author and adapter of nearly thirty dramas of various descriptions, amongst which, besides those already mentioned, we may record 'The Provoked Husband,' written in conjunction with Sir John Vanbrugh, and the modern acting version of Shakspeare's 'Richard III.' His 'Apology' is published in two vols., 12mo., and his dramatic works in five vols., 12mo.

CIBBER, THEOPHILUS, the son of the laureat, was born on the 26th November, 1703. At the age of thirteen he was sent to Winchester school, where he remained but three or four years, for in 1721 we find him on the stage performing in the 'Conscious Lovers.' He acquired considerable reputation in characters similar to those supported by his father. He married early an actress of the name of Johnson, who died in 1733, and in 1734 he formed a second union with Miss Arne. His extravagant habits forced him to retire to France in 1738, and on his return he separated from his wife under very discreditable circumstances. After twenty years more passed some in prison and the rest in alternate prodigality and penury, he engaged with Mr. Sheridan of the Dublin theatre, and sailed for Ireland in company with Mr. Maddox, a dancer on the wire, in the month of October, 1758. The vessel was however driven by a storm on the coast of Scotland, and going immediately to pieces, Cibber, his companion, and the greater number of the passengers perished.

Cibber wrote and altered a few unimportant dramas, and was concerned in a work entitled 'An Account of the Lives of the Poets of Great Britain and Ireland,' 5 vols., 12mo., which was published under his name only.

CIBBER, SUSANNA MARIA, the daughter of Mr. Arne, an upholsterer in Covent Garden, and sister of Dr. Thomas Arne the composer, made her first appearance as a singer. In 1734 she married Mr. Theophilus Cibber, son of the laureat, and in 1736 attempted the part of Zara in Hill's tragedy of that name. Her success was most decided, and she rapidly became a great and deserved favourite. Her union with Mr. Cibber was an unfortunate one, and a separation took place about five years afterwards. She died January 30, 1766, and was buried in the cloisters of Westminster Abbey. Garrick is reported to have exclaimed when he heard of her death, 'Then Tragedy expired with her!'

CICADA'RIÆ. [HOMOPTERA.]

CICADE'LLA (Latreille), CERCO'PIDÆ (Leach), a family of insects of the order Hymenoptera and section Cicadariæ. This family is synonymous with the Cicada Ranatra of Linnæus. The species may be distinguished from those of allied groups by their having the antennæ situated between the eyes. These insects are generally small, and leap by means of their hind legs.

The genera may be arranged under two heads or sections; those in which the head is hidden by the pro-thorax, which is always very large, generally much humped, and has the posterior portion produced over the abdomen, sometimes so as to completely cover that part, or even extend beyond its apex; the antennæ are very small, and inserted in a cavity on the head. To this section belong the genera *Membracis*, *Tragopa*, *Darnis*, *Bocydium*, and *Centrotus*.

There are perhaps no insects more remarkable in structure, and whose appearance is more grotesque, than most of the species of this group. Their peculiarity arises from the great development of the pro-thorax: this part is sometimes so large as greatly to exceed in size all the other parts taken together. We have selected for illustration two species of the genus *Bocydium*, as being the most remarkable; the first is the *Bocydium tintinnabuliferum*. In this species the thorax is black and glossy; the posterior part is elongated and pointed, and from the disc there arises a vertical appendage, the summit of which bears four slender horizontal stalks, each of which is furnished with a little round black spherical body: these little globes are covered with fine hairs; the abdomen is reddish, and the wings are variegated with the same colour.

The second is the *Bocydium galeritum*. This species, as well as the one just described, inhabits Brazil; the pro-thorax is of a dark reddish-brown colour; the posterior part is elongated; the disc is elevated into a process which is at first compressed, but at the summit becomes dilated into a broad angular mass, and throws out a flattened portion, which suddenly bends downwards towards the body, and then runs parallel with it. The wings are transparent, with the exception of the basal and apical portion of the upper ones. The principal distinguishing characters of the genus *Bocydium* consist in the elytra being wholly or partially exposed *i. e.*, not covered by the pro-thorax; and the posterior prolongation of the pro-thorax narrowed and pointed.

Fig. 1.

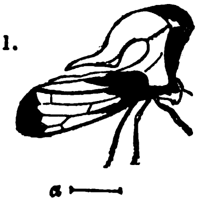


Fig. 2.

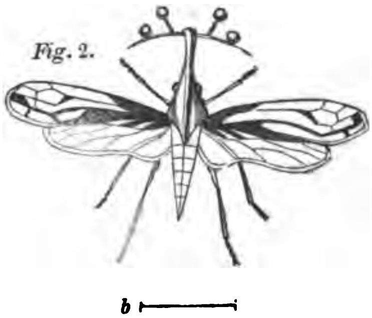


Fig. 1. Bocydium galeritum. *a*, natural length.
Fig. 2. Bocydium tintinnabuliferum. *b*, natural length.

Of the genus *Centrotus* two species are found in England; the more common species is *Centrotus cornutus*. This little insect is found on the leaves of the hazel and other shrubs, in the early summer months. It is about one-third of an inch in length, and of a brown colour; the pro-thorax is prolonged posteriorly (this part is compressed and pointed, and extends nearly to the apex of the abdomen), and the sides are dilated, and form two horn-like projections: a character from which the insect has received in France the name of *le petit Diable*. The wings are brownish and semi-transparent. In this genus the wings are exposed, as in the last, but the species differ in having a visible scutellum.

In the second division of the *Cicadellæ*, the head is on a line with the upper surface of the pro-thorax, or nearly so; the latter part is of moderate size, and without the extraordinary processes which characterize the former division—the wings are consequently always entirely exposed; the scutellum is distinct and of a triangular form. To this division belong the genera *Æetalion*, *Ledra*, *Ciccus*, *Cercopis*, *Eulopa*, *Euplex*, *Penthimia*, *Jassus*, *Tettigonia*, and some others.

Of the genus *Cercopis* (Latreille) we have many species in this country. They are all small. The largest and most beautiful of the British species is the *Cercopis vulnerata*. This insect is about one-third of an inch in length; black; the upper wings are obscure, and have each two large red spots (one at the base and another in the middle), and a fascia of the same colour near the apex, the black and the red being about equally divided; the under wings are transparent. This species is not uncommon in various parts of the country, and is found on the herbage in woods. *Cercopis spumaria* is one of the most common insects we have, being found in abundance on the various plants in our gardens. It is sometimes called the frog-hopper, from its habit of leaping when approached. Its colour is brown, the under wings are transparent, the upper wings have two white spots, one in the middle and another towards the apex. The larva, in form, resembles the perfect insect, except that it is destitute of wings; it is soft and of a greenish colour, and is always found on the leaves of plants inclosed in a frothy liquid, with which it surrounds itself, probably as a protection against the sun's rays. This frothy liquid is commonly known in England by the name of cuckoo-spit, and in France it is called *crachat de grenouille*. The pupa differs only from the larva in having rudimentary wings; the perfect insect is about three-sixteenths of an inch in length.

The characters of the genus *Cercopis* are:—Antennæ with the third joint conical, and terminated by an inarticulate seta; head furnished with ocelli. This genus was established by Fabricius, and has lately been subdivided. The insect last described belongs to one of these sub-genera (*Aphrophora* of Germar), in which the head has the posterior margin concave, and the ocelli are more widely separated than in the genus *Cercopis* as now restricted. The characters of some other sub-genera will be found in a paper by Mr. Lewis, in the first part of the *Transactions of the Entomological Society*.

The genus *Ciccus* differs from *Cercopis* principally in the species having the seta of the antennæ articulated and composed of five joints; the anterior part of the head usually projects.

CICE'R, a genus of leguminous or fabaceous plants, allied to the vetch. A five-lobed calyx which projects on the upper side, and an inflated two-seeded pod with tuberculated seeds, give its character. One species, *Cicer arietinum*, the Chick pea, a native of Egypt and the Levant, is cultivated in the south of France for its seeds, which bear a striking resemblance to a ram's head. They have for ages been a common food in the eastern parts of the world, but their taste is unpleasant to Europeans. It is an annual, and bears pale violet solitary flowers. Two or three other species are known to botanists.

The most remarkable circumstance about *Cicer arietinum* is, that during the heats of summer its leaves and stem exude little viscid drops, which, on evaporation, leave behind crystals, nearly pure, of oxalic acid. Its grateful refrigerating qualities are owing to this acid. Persons who walk through the fields where it grows, with common leather shoes, find them destroyed by the acid. Those who are predisposed to calculous complaints should avoid its excessive use, either as a salad or boiled. The frequent use of this vegetable, or any other abounding with oxalic acid, leads to the formation of the oxalate of lime, or mulberry calculus, in the bladder, which is the most painful, and the least influenced by internal treatment. (See Majendie *on Gravel*, 2nd French edit.)

CI'CERO, MARCUS TULLIUS, was born at Arpinum on the 3rd of January, 106 B.C., in the consulship of Q. Servilius Cæpio and C. Atilius Serranus, and was thus a few months older than Pompey, who was born on the last day of September in the same year. [ARPINUM.] The family seat was on the south bank of the little stream Fibrenus (fiume della posta), near its junction with the Liris (Garigliano), where the stream of the Fibrenus dividing, forms an island and cascade, the scenery of which is the subject of the dialogue at the beginning of the second book 'De Legibus.' The villa Ciceronis is now occupied as a Dominican convent.

The grandfather of Cicero was living here at the time of his birth, and appears to have been a man of influence at Arpinum, where, on a petty scale, the political disputes formed a counterpart to those at Rome. The old man seems to have entertained the same views of public polity as his son, and vehemently opposed the introduction of the vote by ballot into the municipal proceedings at Arpinum, when a law to that effect was proposed by one Gratidius, whose family was intimately connected with the Marii, and whose sister, it may be observed, was the wife of old Cicero, and consequently the grandmother of the orator. The matter in dispute was referred to the consul Scaurus at Rome, who expressed his regret that a man of old Cicero's energy should have preferred to exert his talents in a petty corporation rather than on the great theatre at Rome. There is likewise a characteristic saying of his recorded by his grandson, that the men of his day were like Syrian slaves,—the more Greek they knew the greater knaves they were,—an observation probably aimed at his opponent Gratidius, who was well acquainted with that language. This Marcus Cicero had two sons, Marcus and Lucius. The younger of these, together with his uncle Gratidius, who was killed there, served under Antony the orator in his government of Cilicia. Lucius left a son of the same name, to whom his cousin Cicero was much attached, and whose death he deplores in one of his earliest letters to Atticus.

Marcus Cicero, the father of the orator, though he was on intimate terms with the leading men of the times, was compelled, by the delicacy of his health, to live in retirement; but this enabled him to pay the more attention to the education of his two sons Marcus and Quintus. His wife Helvia had a brother, Aculeo, the intimate friend of L. Crassus, a man equally distinguished for his oratory and the public offices he had held; and the two sons of Aculeo, with their cousins the young Ciceros, received their education together under teachers selected by Crassus. It is to this circumstance probably that we must attribute the special direction of Cicero's talents to the study of oratory. He was afterwards removed by his father to Rome, where he had the assistance of Greek instructors, more particularly the poet Archias, who was living under the roof of L. Lucullus. As soon as he had exchanged the boy's dress for the toga, he was placed under the care of Q. Mucius Scævola, the augur, and father-in-law of his father's friend Crassus, and upon his death attached himself to the pontifex of the same name, who excelled all his contemporaries in his knowledge of law, and added to his other accomplishments considerable powers of eloquence. While Cicero was thus preparing himself for the forum, he relieved the severity of his legal and philosophical studies by an intermixture of poetry. Even as a boy he had composed a poem called 'Pontius Glaucus,' which was extant in Plutarch's time, and he now translated the 'Phænomena' of Aratus into Latin verse, besides writing two original poems, one called 'Marius,' in honour of his fellow-townsman, which received the commendation of Scævola, and another entitled 'Limon.' But he was now arrived (B.C. 89) at the age when he was called by the laws of his country to the military profession, and he served his first campaign in the Marsic war under Pompeius Strabo, the father of the great Pompey, and was present when Sulla captured the Samnite camp before Nola. The termination of the Marsic war in the following year gave Cicero an opportunity of attending the lectures of two distinguished Greek philosophers; first Philo, who then presided over the Academy, and soon after Apollonius Molo of Rhodes, who had been driven from their homes by the arms of Mithridates. This prince had been long watching for an opportunity of attacking the authority of Rome. The late civil war in Italy had induced him to throw off all disguise. He had overrun the Roman province of Asia, and was already master of nearly all Greece, when the Romans concluded the war with their Italian allies, with the intention of opposing their formidable enemy in the East. But unhappily that which should have led to a union of their strength was the cause of divisions still more disastrous. The command of the war against Mithridates was disputed between old Marius and Sulla, and led to a series of civil commotions. Sulla however, who was at the time consul, had the important province of that war allotted to him. The appointment excited the furious opposition of the Marian party, and Sulla was unable to maintain the superiority of his party at Rome but by bloodshed and proscription. His departure for the Mithridatic war was the signal for re-action, and Marius re-entered Rome (B.C. 87) with the support of the consul Cinna, and put to death all the most distinguished leaders of the aristocratic party, who were unable to make their escape to Sulla's army in Attica. Cicero's schoolfellow Pomponius was probably one of the fugitives, for he left Rome about this period, and by a twenty years' residence in Athens acquired the surname of Atticus. Of Cicero's pursuits during the three or four next years little more is known than that he wrote some rhetorical works, which dissatisfied his maturer judgment; probably the work entitled 'De Inventione,' besides translating the 'Œconomics' of Xenophon, and several dialogues of Plato. He was also in the habit of declaiming both in Greek and Latin, and received instruction in philosophy and logic from the stoic Diodotus, whom we find afterwards living under his roof, where in fact he died, leaving his property to Cicero. He had also a second opportunity of hearing Molo at Rome, when the philosopher was sent on an embassy to remind the senate of the services of his countrymen in the late war against Mithridates. In his twenty-sixth year (B.C. 81), when Sulla had extinguished all the democratic elements of the Roman constitution, Cicero made his first appearance as an advocate. The speech in favour of Quinctius, though not the first he delivered, is the earliest of those which are now extant. In the following year his voice was first heard in the forum in defence of Sextus Roscius of Ameria, on a charge of parricide. The subject matter of the trial was intimately mixed up with the late civil dissensions, so that it attracted much public attention. Cicero fully prepared himself for the occasion, and produced so powerful an impression, that, to use his own words, the public voice at once placed him among the first orators of Rome. When he had spent two years in the severe duties of his profession, the delicacy of his health led him to withdraw for a time from Rome. He first visited Athens (B.C. 79), where he devoted six months to Antiochus of Ascalon, the most distinguished philosopher of the old Academy. He also attended Phædrus and Zeno of the Epicurean school, in company with his friend Atticus, and practised declamation under the directions of an able rhetorician, named Diogenes, of Syria. He next traversed the whole Roman province of Asia, still cultivating his favourite pursuit of oratory under the first teachers of that country; and then crossed over into Rhodes, where, for the third time, he placed himself under Molo, and derived considerable benefit from his instruction, in correcting the redundancy of his style, and moderating the vehemence of his voice and action. He studied philosophy likewise under Posidonius.

In the year B.C. 77, after a two years' absence, during which Sulla had died, Cicero returned to Rome, and married Terentia, whose rank and station in society we may estimate by the fact that her sister Fabia was one of the vestal virgins. He applied himself again with zeal to the law courts and the forum, in which at this time the most distinguished orators were Aurelius Cotta and Hortensius; but next to them stood Cicero, whose services were in constant demand for causes of the highest importance. But independently of the reputation he was acquiring, he was at the same time opening the way to the political honours of his country; and it is a somewhat singular coincidence, that in the year B.C. 76 the three first orators of Rome, Cotta, Hortensius, and Cicero, were successful candidates for the several offices of consul, ædile, and quæstor, which they respectively filled in the following year. The provinces of the quæstors being distributed to them by lot, the island of Sicily fell to Cicero's share, or rather the western portion of that island, which had Lilybæum for its chief town; the whole island being under the government of S. Peducæus as prætor, with whom Cicero, and above all Atticus, lived on terms of the closest intimacy, until Peducæus fell with Pansa at the battle before Mutina. Sicily was one of the granaries, as it were, of Rome, and the quæstor's chief employment in it was to supply corn for the use of the city; and as there happened to be a peculiar scarcity this year at Rome, it was necessary to the public quiet to send large and speedy supplies. This task Cicero accomplished, he tells us, and at the same time gave the highest satisfaction to all parties in the province. In the hours of leisure he employed himself, as at Rome, in his rhetorical studies; so that on his return from Sicily his abilities as an orator were, according to his own judgment, in their full perfection and maturity. Before he left Sicily he made a tour of the island, and gratified himself by a visit to Syracuse, where he discovered the tomb of Archimedes, which had been lost sight of by his countrymen, and was found overgrown with briers. He came away from the island extremely pleased with the success of his administration, and flattering himself that all Rome was celebrating his praise. In this imagination he landed at Puteoli, and was not a little mortified on being asked by the first friend he met, 'How long he had left Rome, and what news he brought from thence?' This mortification however led him to reflect that the people of Rome had dull ears, but quick eyes; so that from this moment he resolved to stick close to the forum, and to live perpetually in the view of his countrymen.

Pompey was at this time carrying on the war against Sertorius in Spain. Nicomedes, king of Bithynia, soon after died, leaving the strange legacy of his kingdom to the Romans; and the king of Pontus, ever ready to avail himself of the dissensions of the Romans, and justified on the present occasion by the Bithynian intrigue, renewed his hostilities by a double invasion of Bithynia and Asia. The two consuls, Lucullus and Cotta, were both sent to oppose him; and while the arms of Rome were thus employed in the different extremities of the empire, a still more alarming war (B.C. 73) broke out at home, which originating with some gladiators led to an extensive insurrection of the slaves, and under the able conduct of Spartacus threatened the very existence of the state. During this turbulent period Cicero persevered in a close attendance upon the forum, though none of the speeches which he then delivered have been preserved, excepting those which relate to the prosecution against Verres. Peducæus had been succeeded, after one year's government of Sicily, by Sacerdos, and he, after the same interval, by Verres; for it was a principle of Roman policy to give to as many as possible a share in the plunder of the provinces; though occasionally superior influence, not the merit of the individual, led to a continuance of his government for two or even three years. Such was the case with Verres, who during three years made the Sicilians feel all those evils in their worst form which the Roman principles of provincial administration in bad hands were so well calculated to produce. Cicero had many difficulties to overcome in his endeavours to subject the criminal to the punishment of his crimes. In the first place the judices (jury), under the law of Sulla, would consist exclusively of senators; that is, of those who had a direct interest in protecting provincial mal-administration. Moreover at the very outset there started up a rival in one Cæcilius, who had been quæstor under Verres, and claimed a preference to Cicero in the task of impeaching him. A previous suit, technically called a *divinatio*, was necessary to decide between the rival prosecutors. Cicero succeeded in convincing the jury that his opponent's object was, to use another technical term, *prevaricatio;* that is, to screen the criminal by a sham prosecution. This previous point being settled in his favour, he made a voyage to Sicily to examine witnesses and collect facts to support the indictment, taking his cousin Lucius Cicero to assist him. Fifty days were spent in their progress through the island, in which he had to encounter the opposition of the new prætor Metellus, who was endeavouring, with many of the leading men at home, to defeat the prosecution. On his return to Rome he found it necessary to guard against all the arts of delay which interest or money could procure for the purpose of postponing the trial to the next year, when Hortensius and Metellus were to be consuls, and Metellus's brother one of the prætors, in which character he might have presided as judge on the trial. Cicero was induced therefore to waive the privilege of employing twenty days in the accusation; and a single speech on the 5th of August, followed by an examination of his witnesses and the production of documentary evidence, produced an impression so unfavourable to Verres, that even his advocate Hortensius was abashed, and Verres went forthwith into exile.

The five other speeches against Verres, in which Cicero enters into the details of his charges, were never actually spoken, if we may believe the commentator upon these orations—who passes under the name of Asconius—but were written subsequently at his leisure; partly perhaps to substantiate his charges before the public, but still more as specimens of what he could do in the character of an accuser, which he did not often sustain.

Though a verdict was given against Verres by the jury of senators, yet the past misconduct of that order in their judicial capacity had been so glaring that the public indignation called for the election of censors, whose office had slept for some years; and the magistrates so appointed erased from the roll of the senate sixty-four of that body, expressly on the ground of judicial corruption. To remedy the evil for the future a new law was passed, at the suggestion of the prætor Aurelius Cotta, hence called the *lex Aurelia*, by which the equites (knights) and certain of the commoners (*tribuni ærarii*) were associated with the senators in the constitution of public juries. It was subsequent to the enactment of this law that Cicero made the speeches in defence of Q. Roscius, M. Fonteius, and A. Cæcina. The first of these was the celebrated actor, whose name has since become proverbial. The suit grew out of a compensation which had been made for the death of a slave, whom Roscius had educated in his own profession. M. Fonteius was the object of a prosecution for extortion and peculation (*de repetundis*) in the province of Gallia Transalpina; and must have been guilty, if we may judge from the fragments of his advocate's speech which have come down to us. The cause of Cæcina was of a private nature, and turned entirely upon dry points of law The ædileship of Cicero (B.C. 69) had little of that magnificence which was so commonly displayed in this office, but it gave the Sicilians an opportunity of showing their gratitude to the prosecutor of Verres, by supplies for the public festivals. After an interval of two years Cicero entered upon the office of prætor (B.C. 66), and it fell opportunely to his lot to preside in the court of extortion; a court especially provided against that ordinary offence in the administration of the provinces. The year of Cicero's prætorship was marked by the conviction of Licinius Macer, in opposition to the influence of his kinsman Crassus. But the most remarkable event in his prætorship was the passing of the Manilian law, by which the command of the war against Mithridates was transferred to Pompey, whose claims Cicero supported in a speech which still remains. It was in this year too that he defended Cluentius. This speech likewise exists, and gives a sad spectacle of the uncertainty of life and property at this period. Before the close of his prætorship he betrothed his daughter Tullia, who could not have been more than ten years old, to C. Piso Frugi. She was at present his only child, for his son Marcus was not born until the middle of the following year, which was also the birth-year of Horace.

On the expiration of his office he declined the government of a province, which was the usual reward of that magistracy, preferring to employ his best efforts at home towards the attainment at the proper period of the consular office. This was perhaps his chief object in undertaking the defence of C. Cornelius, the tribune of the preceding year, against a charge of treason, which was supported by the whole influence of the aristocracy. The guilt of Cornelius consisted in his energetic and successful support of the law against bribery in elections, called the *Lex Acilia-Calpurnia*. Cicero published two orations spoken in this cause, the loss of which is the more to be regretted, as they were reckoned among the most finished of his compositions, both by others and by himself. The return of Atticus from Athens at this time was most opportune to his friend Cicero, who looked upon the following year (B.C. 64) as the most critical in his life; and Atticus being intimately connected with the influential men of the aristocratic party, could give essential assistance to a new man, as the phrase was, against six candidates, two of whom were of patrician blood, while the fathers or ancestors of all had already filled public magistracies. Cicero's father just lived to witness the election of his son to the highest office in the state.

From this point the life of Cicero is the history of the times. Of the orations he made in the year of his consulate he has himself given a list in a letter to Atticus.

On the kalends of January, immediately upon his assuming the consular robes, he attacked a tribune, P. Servilius Rullus, who had a few days before given notice of an Agrarian law, the meaning of which term has already been explained under that name. Of this speech, which was addressed to the Senate, there exists a considerable fragment, and enough to show that Cicero was already prepared to attach himself to the aristocratic party, whereas up to this time his political life had been of an opposite complexion. His panegyrist, Middleton, seems to acknowledge the change, and attributes his past conduct to that necessity by which the candidates for office were forced, in the subordinate magistracies, to practise all the arts of popularity, and to look forward to the consulship as the end of this subjection. Before the people indeed, to whom he addressed two speeches upon the same subject, Cicero still wore the popular mask; and while he expressed his approbation of the principle of Agrarian laws, and pronounced a panegyric on the two Gracchi, he artfully opposed the particular law in question on the ground that the bill of Rullus created commissioners with despotic powers that might endanger the liberties of Rome, and he prevailed on one of the other tribunes to put his veto upon the bill. In the defence of Rabirius, who was charged with the murder of the tribune Saturninus three-and-thirty years before, he goes so far as to maintain the right of the senate to place Rome in a state of siege, if we may borrow a modern term, or, in other words, to suspend all the laws which protect the lives of citizens, yet, in the same speech, he endeavours to curry favour with the people by heaping the highest praises on their favourite Marius. Rabirius had already been convicted by the judges appointed to investigate the charge; but appealed, as the law allowed him, to the people, who accordingly assembled in the Field of Mars to hear the appeal. While the trial was proceeding, it was observed that the flag upon the Janiculum on the other side of the Tiber was lowered. This of necessity broke up the assembly, according to an old law which was made when the limits of the Roman empire extended only a few miles from the city, and was intended to protect the citizens from being surprised by the enemy. The object of the law had long passed away, but Roman superstition still maintained the useless ceremony, and the aristocratic party employed it on the present occasion in the hands of Metellus the prætor to annul the proceedings of justice. The orations in which he defended Otho against the populace, who were enraged at his law for setting apart special seats in the theatre for the order of the knights, and that in which he opposed the restoration of their civil rights to the sons of those who had been proscribed by Sulla, were also delivered this year, but nothing remains of them. Of the conspiracy against Catiline, and the several speeches which were made by Cicero in relation to him, it is unnecessary to say more than will be found under the head **Catilina**.

Two other causes, in which Cicero's services as an advocate were called forth during this year, were those in which he defended C. Calpurnius Piso, the consul of 67 B.C., and L. Murena, the consul elect. The oration in defence of Piso is not extant, but it appears that the prosecution was for extortion in his government of Cisalpine Gaul, and was maintained at the instance of Cæsar. Cicero, in a speech made on a subsequent occasion, seems to admit the guilt of his client, and to account for his acquittal on grounds altogether foreign to the merits of the case; another proof of the change that had taken place in the patriotic prosecutor of Verres. His conduct is not less reprehensible in the affair of Murena, who was charged with bribery, treating, and other violations of the law, in his late election to the consulship. His guilt will not be doubtful to a careful reader of his advocate's speech. The prosecution was supported by Sulpicius and Cato, the former a man who may be looked upon as almost the founder of Roman law as a science, and Cato certainly the most honest of his party. Yet Cicero, instead of grappling with the charge, descends to a personal attack on the advocates opposed to him, rallying the profession of Sulpicius as trifling, and the principles of Cato as impracticable. His defence amounts in fact to a defence of the crime rather than the criminal, which was the more discreditable, as he himself had only a few weeks before carried a new law against bribery.

The success of Cicero, in crushing the Catilinarian conspiracy, would probably have earned for him the unmixed good will of the aristocratic party, had he not offended them by the vanity and presumption which that success engendered, and which were the more offensive to them in one whose origin they despised. So completely was he carried away by his sense of his services to his country that he wrote a history of his consulship in Greek, and even sung his own glories in verse; but the most decisive evidence of his unbounded vanity is the extraordinary letter which he addressed to his friend Lucceius. (*Ad Fam.* v. 13.)

On the other side he had damaged his reputation with the people by his evident change of principles; and the precipitate execution of the conspirators, without the form of a trial, was an offence against the laws of the country which the sanction of the senate could not justify. Already on his laying down his office there were symptoms of that hostility which gradually increased, and in a few years drove him in disgrace from the city which he had lately saved.

But we must return for a while to his forensic exertions. While the associates in the crimes of Catiline were, for the most part, prosecuted and driven into banishment, it pleased the party of the senate to screen P. Sulla, whose guilt is generally asserted by the historians of the times. Hortensius and Cicero were his advocates, and the support of the latter is reported to have been bought by a loan of money, which Cicero required for a purchase he was then making of a house on the Palatine Hill. To see this in its true light, it should be recollected that the receipt of a fee was at variance with the avowed principles of the Roman bar. The anecdote stands upon the authority of A. Gellius, which might have been insufficient, were it not indirectly yet decisively confirmed by more than one passage in Cicero's letters. In the following year Quintus Cicero, the brother of the orator, was appointed to the government of the rich province of Asia, as successor to L. Flaccus, who came home with the usual reputation for extortion, for which he was called to account two years after. This L. Flaccus had been the chief prætor in the consulship of Cicero, and in that capacity had been of great service in the detection of the conspiracy, so that he had a certain claim upon Cicero, which was not neglected. But this trial was preceded by one of the same nature which more nearly concerned the orator.* C. Antonius, who had been his colleague in the consulship, was recalled from the province of Macedonia, where he had presided for two years, and had to defend himself against an impeachment for the gross rapacity of which he had been guilty. This province had originally fallen to the lot of Cicero, who took credit on many occasions for his disinterestedness in transferring the lucrative appointment to his colleague. He omitted to state that there was a secret agreement between them, by which Antonius bound himself to make a pecuniary return to Cicero; and the extortion of which the proconsul had been guilty was in part owing to this obligation. The very day on which Antonius was condemned was marked by an event still more fatal to the peace of Cicero—the adoption of Clodius, his enemy, into a plebeian family. The object of this ceremony was to render Clodius eligible to the tribunate, from which, as a patrician, he was excluded; and no sooner was the obstacle removed than he offered himself as a candidate, and was elected without opposition. After some little manœuvring, the cause and object of which are not very intelligible, he made public advertisement of several new laws, which were all aimed at the authority of the senate; and among them was one to the effect that whoever took the life of a citizen uncondemned and without a trial should be interdicted from fire and water. Although Cicero was not named in this law, it was so evidently aimed at him, that it was necessary for him at once to decide upon the course he would pursue. Some recommended him to resist the law by force, but when he found that Pompey was unwilling to support him, he took the advice of his friends Cato and Hortensius, which coincided with the views of Atticus, and leaving the field to his adversaries, went into voluntary exile. Leaving Rome towards the end of March (B.C. 58), he proceeded to Vibo with the intention of crossing over into Sicily, but from this he was prohibited by the governor, Virgilius, although he was of the same political party, and was under obligations to Cicero. He received about the same time information from Rome that a special law had been passed, which forbade him to appear within a distance of four hundred miles. Under these circumstances he changed his route, and proceeded first to Brundisium, where he was hospitably entertained for some weeks, in defiance of the law. He then crossed over to Dyrrhachium, where he was received by Plancius, the quæstor of the province, and conducted by him to Thessalonica. The conduct of Cicero in his exile was such as might have been expected from one whose mind had been so extravagantly elated in prosperity. He gave himself up entirely to despondency; spoke of his best friends as enemies in disguise, not even sparing Atticus and Cato; and so completely lost the control of his feelings and his conduct, that his mind was supposed to be deranged. In the mean time, his friends at Rome, whose fidelity he doubted, were actively engaged in taking measures for his recall. Already on the 1st of June an unsuccessful motion was made in the senate to that effect. The election, too, of his friend Lentulus Spinther to the consulate, offered a brighter prospect for the ensuing year, but in the interval there occurred a little incident which gave him fresh uneasiness. Some of his enemies had published an oration, which he had composed some years before in an angry moment, against an eminent senator, and had shown privately to his intimate friends. Its appearance at so untoward a moment alarmed Cicero, who imagined it had been destroyed, and he wrote to Atticus requesting him to disavow it. 'Fortunately,' says he, 'I never had any public dispute with him, and as the speech is not written with my usual care, I think you may convince the world that it is a forgery.'

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* We have omitted a mysterious affair which occurred this same year, B.C 59. The facts are these: One Vettius, only known to us before this as an

Towards the end of the year his residence at Thessalonica became disagreeable to him, and indeed he thought dangerous. His enemy Piso had been appointed governor of Macedonia, and the troops who were to serve under him were already expected. Even before this, some of the accomplices of Catiline, who were living in Macedonia as exiles, had been plotting, it was said, against the life of Cicero. He therefore found it safer to remove to Dyrrhachium, where he had friends, although it fell within the distance prohibited by the law. His residence upon this coast afforded an opportunity likewise for an interview with his friend Atticus, who was in the habit of visiting a favourite estate near Buthrotum. While Cicero was harassing himself with perpetual fears and suspicions, his cause was proceeding prosperously at Rome. The tribunate of Clodius terminated in December; the new tribunes were, almost without exception, friendly to his recall; and on the first day of the new year the new consul Lentulus moved the senate for his restoration. His opponents, however, were not yet driven from the field. The tribunitial veto was employed more than once to check the proceedings. Scenes of riot and bloodshed disgraced the streets of Rome. Yet at last, on the 25th of May, a decree in his favour passed the senate; and on the 4th of August a law, in confirmation of the decree, was carried by the people in the great meeting of the Centuries. Cicero, in anticipation of these measures, had embarked for Italy on the very day the decree of the senate was passed, and landed the next day at Brundisium, where he was received by his daughter Tullia. The inhabitants of the city were profuse in the honours they paid him, and when the news, that the law had passed the Centuries, summoned him to Rome, the inhabitants of the cities through which he passed flocked in crowds to congratulate him.

Cicero's return was, what he himself calls it, the beginning of a new life to him. He had been made to feel in what hands the weight of power lay, and how dangerous it was to lean on the support of his aristocratical friends. Pompey had served him on the late occasion of his recall from exile, and had acted with the concurrence of Cæsar, so that it was a point of gratitude as well as prudence to be more observant of them than he had hitherto been. To the former he took an early opportunity of showing his gratitude by proposing that he should be commissioned to provide for a better supply of corn at Rome, where the unusual price of bread had already occasioned serious disturbances. For this purpose he recommended that Pompey should be invested with absolute power over all the public stores and corn-rents of the empire for five years. The proposition was readily accepted, and a vote passed that a law to that effect should be brought before the people. This law was favourably received by all parties, and Pompey named the proposer of the law the first among his fifteen assistant commissioners, an appointment which the latter accepted, with the stipulation that he should not be called away from Rome. Meanwhile although Cicero was restored to his former dignity, there was a difficulty in the restitution of his property. The chief delay was about his house, on the Palatine Hill, which Clodius had contrived to alienate, as he hoped, irretrievably, by demolishing the building and dedicating a temple upon the ground to the goddess Liberty. The senate therefore could only make a provisional decree, that if the college of priests discharged the ground from the claims of religion, the consuls should make a contract for rebuilding the house. The pontifical college was accordingly summoned to hear the cause on the last day of September, and Cicero personally addressed them in a speech which he himself considered one of his happiest efforts, and which he thought it a duty to place as a specimen of eloquence in the hands of the Roman youth. The speech, however, which now occupies a place among his works, under the title *Pro Domo sua apud Pontifices*, as well as those bearing the names of *De Haruspicum Responsis*, *post Reditum in Senatu*, and *Ad Quirites post Reditum*, all professing to have been delivered during this year, have been pronounced by the ablest critics to be spurious. The college gave a verdict in terms somewhat evasive; but the senate concluded the matter by a distinct vote in Cicero's favour; and the consuls immediately put the decree in execution by estimating the damage which had been done to Cicero's property. In this estimate his villas near Tusculum and Formiæ were included. But the estimation was far below what Cicero thought himself entitled to, and he attributed this injustice to the jealousy of the aristocracy, who, as they had formerly clipped his wings, so were now unwilling that they should grow again. Scarcely had the house upon the Palatine begun to rise, when a mob, instigated, according to Cicero, by Clodius, attacked the workmen, and afterwards set fire to the adjoining house, in which his brother Quintus lived. This riot was only one of many which at this time disgraced the city.

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informer of Cicero's in the Catilinarian business, and as having endeavoured to implicate Cæsar on that occasion, is arrested as a conspirator against Pompey's life. He denounces some leading senators, including M. Brutus, as his accomplices, and is thrown into gaol. The next day, being again brought out by Cæsar, he includes Lucullus and Cicero in the charge. That same night he is strangled in gaol. While some declared he had been suborned and then murdered by Cæsar, others believed the charges made by Vettius, and attributed his death to the accused. The authorities are, Cic. *ad Att.* ii., 24; *Pro Sextio*, 63; *In Vatin.*, 10; Sueton. *Jul. Cæs.*, 17 and 20; Plutarch, *Lucul.*, 42; Appian, *Bel. Civ.*, 12-2; Dion, 37-41 and 38-9.

Milo, as well as Clodius, had his armed bands, and was avowedly seeking for an opportunity of murdering Clodius; while Cicero himself appears as a party in a forcible attack upon the Capitol for the purpose of destroying or carrying off the brazen tablets on which the law of his exile had been engraved. One of those who took an active part in the disturbances was P. Sextius, who, in his tribunate, had been instrumental in the restoration of Cicero. He was brought to trial for these disturbances the following year, when Cicero, in gratitude, undertook his defence, and obtained an acquittal; and, not satisfied with a mere verdict, he the next day made a furious attack in the senate upon a senator, Vatinius, who had been one of the chief witnesses against Sextius. Cicero was less fortunate in his defence of L. Calpurnius Bestia, who was prosecuted about the same time for bribery in the last election of prætors. In the same year he gratified his powerful friends Pompey and Cæsar by appearing as the advocate of L. Cornelius Balbus, a native of Gades, who had received the citizenship of Rome. The legality of his franchise was the subject-matter of the trial. It is somewhat strange to find Cicero so closely allied as he was at this time with Cæsar, on whom he had showered his abuse on nearly every occasion; but the fact and the disgrace of it are acknowledged by himself repeatedly in his letters to his friend Atticus. 'It is a bitter pill,' says he, 'and I have been long swallowing it, but farewell now to honour and patriotism.' There exist two other speeches delivered by him during the same year: one of these was in the senate, on the annual debate about the appointments to the provinces, and he employed the opportunity thus afforded in a furious attack on the private lives and public conduct of Piso and Gabinius, who had been the consuls at the time of his exile, and had assisted his enemy Clodius, and recommended their recall from the provinces they were then governing. He concluded his harangue by defending his alliance with Cæsar. The other speech just referred to was made in defence of Cælius, a man who by his open profligacy and unprincipled conduct was notorious even among his countrymen. He was charged with the crime of procuring the murder of an ambassador from Alexandria, and also of attempting to poison a sister of Clodius. Cælius was acquitted, and lived for many years on most intimate terms with Cicero; indeed the letters that passed between them constitute a whole book in his miscellaneous correspondence. On the return of Piso from his government of Macedonia, at the beginning of the following year, he complained of the attack which had been made upon him by Cicero in the debate about the provinces. Cicero replied to him in another invective, more violent than the former. One would hope that the speech purporting to have been spoken on this occasion was not genuine, for if it is, no one can read it without awarding to Cicero the prize among orators for coarseness and personality; and in fact he takes credit to himself, in his treatise on the perfect orator (*de Oratore*), for his invective powers.

In the spring of the following year he commenced the treatise on politics (*de Republicâ*), the loss of which the learned had long regretted, when Angelo Maio, in 1823, discovered a considerable portion of it in the Vatican library. The manuscript, which is of parchment, contained a treatise on the Psalms, in a small distinct character; but Maio perceived underneath traces of a larger type, in which he soon recognised the style of Cicero, and the matter, nay even the title, of the *de Republicâ*. But to return to the narrative, the greater part of the year 54 B.C. was employed by Cicero in his usual occupation of defending the accused. 'Not a day passes,' says he, in a letter to his brother, 'without my appearing in defence of some one.' Among others, he defended Messius, one of Cæsar's lieutenants, who was summoned from Gaul to take his trial; then Drusus, who was accused of prevarication, or undertaking a cause with the intention of betraying it; after that, Vatinius, the last year's prætor, and Æmilius Scaurus, one of the consular candidates at the time, who was accused of peculation in the province of Sardinia; about the same time likewise his old friend Cn. Plancius, who had received him so generously in his exile, and being now chosen ædile, was accused by a disappointed competitor of bribery and corruption. All these were, as usual, acquitted; but the orations are lost, excepting the one which he delivered in favour of Plancius, and a considerable fragment of that for Scaurus. This fragment is another of the discoveries of Maio, who found it in the year 1814, with some other fragments of Cicero's orations, in the Ambrosian library at Milan. As was the case with the '*De Republicâ*' the text of Cicero had been obliterated as much as possible from the parchment to make room for the Latin poem of the Christian writer Sedulius. Cicero's undertaking the defence of Vatinius, who had been always intimately allied with Cæsar, and on that account had on more than one occasion been the object of Cicero's abuse, his personal deformity being a favourite topic of raillery with the orator, at once surprised and offended the aristocratic party. They did not conceal from him their disgust, and Cicero found it necessary to make what defence he could of his political tergiversation in a long and ably written letter to his friend Lentulus Spinther, who was then governor of Cilicia (*Ad Fam.* i., 9). The compliment of an epic poem addressed to Cæsar was another proof of the change in his political views; but a still more decisive piece of evidence is furnished by his conduct in relation to Gabinius, who returned at this time from his government of Syria, and was immediately overwhelmed with public prosecutions. Cicero had not forgotten that Gabinius, as one of the consuls at the time of his exile, had supported his enemy Clodius; and he had openly avowed his opinion of his crimes in Syria—crimes, too, which, if we may believe Cicero, included murder, peculation, and treason, in every form; but he was willing to sacrifice both his public and his private feelings at the intercession of Pompey. In the first trial he was called as a witness against Gabinius, but had the prudence to put his evidence in such a form as to give the highest satisfaction to the accused. In the second he became still bolder, and appeared as his advocate, but was unable to save him from conviction, fine, and banishment. The speech delivered by Cicero is not extant, and probably was never published. There is preserved however the speech made by him on the trial of C. Rabirius Postumus, which was an appendix to that of Gabinius. The whole estate of the latter had proved insufficient to answer the damages in which he had been cast; and the Roman law, in such a case, gave the right of following any money illegally obtained to the parties into whose hands it had passed. Rabirius had acted at Alexandria as the agent of Gabinius with Ptolemy, and in that capacity was said to have received part of the ten thousand talents which the king had paid the Roman general as the price of his services. As this trial followed closely upon the preceding, and was so intimately connected with it, the prosecutors could not spare the opportunity of rallying Cicero for the part which he had acted. In the end of the year Cicero consented to be one of Pompey's lieutenants in Spain, and was preparing to set out thither, when he was induced to abandon the appointment on perceiving from his brother's letters, who was at that time serving in Gallia, that such a step would probably give umbrage to Cæsar, for the recent death of Julia had already broken the chief link which held Cæsar and Pompey together. At the beginning of the following year, news was received of the death of Crassus and his son Publius, with the total defeat of his army by the Parthians. By the death of young Crassus a place became vacant in the college of augurs, for which Cicero declared himself a candidate, and being nominated by Pompey and Hortensius, was chosen with the unanimous approbation of the whole college. This appointment had been for some years the highest object of Cicero's ambition; and the addition to his dignity was of service to him at this time, as he was putting forth all his influence to further the election of his friend Milo to the consulate. The constant disturbances in the city prevented the comitia from being held until the year was closed, and in the middle of January the murder of Clodius by one of Milo's gladiators, in the presence, and at the command too, of his master, placed Milo in a different position. The fury of the people at the death of their favourite broke out in the most violent excesses, which were only aggravated by the endeavours of Milo's powerful friends to screen him from punishment. These disturbances were at last quieted by the appointment of Pompey to the consulship, who was armed too with extraordinary powers by the senate, and finally Milo was brought to trial, condemned in spite of Cicero's eloquence, and banished from Italy. Cicero is said to have been so alarmed on the occasion, by the presence of the military whom Pompey had stationed around the court to prevent any violence, that his usual powers failed him; and indeed the speech which is found among his works, under the title of the defence of Milo, is very far from being that which he actually delivered. In the two trials of Saufeius, one of Milo's confidants, which grew out of the same affair, Cicero was more successful; and he had soon after some amends for the loss of his friend in the condemnation of two of the tribunes, who had been their common enemies, for the part they had taken in the late commotions. One of these, T. Munatius Plancus, Cicero himself prosecuted, which is the only exception, besides that of Verres, to the principle which he laid down for himself of never acting the part of an accuser. It appears to have been soon after the death of Clodius that Cicero wrote his treatise 'On Laws' (de Legibus), three books of which are still preserved; but the work in its original form contained probably, like the 'De Republicâ,' to which it is a kind of supplement, as many as six books, for antient authors have quoted from the fourth and fifth. But the civil and literary pursuits of Cicero were soon interrupted by the demand for his services abroad. Among the different laws which Pompey brought forward for checking the violence and corruption which the candidates employed for the attainment of public office, was one which disqualified all future consuls and prætors from holding any province until five years after the expiration of their magistracies. But before the law passed, Pompey procured an exception for himself, getting the government of Spain and Africa continued to him for five years longer, while, to gratify Cæsar on the other side, Cicero, at the special request of Pompey, induced one of his friends to bring forward a law by which Cæsar's presence might be dispensed with in suing for the consulship in the following year. There was valid ground for this privilege being conferred upon Cæsar in the circumstances of the Gallic war, where the success of the Roman arms would have been seriously endangered by his absence. Thus Cicero and Pompey were the chief instruments in passing the very law which they afterwards declared unconstitutional and invalid, and so brought upon their country the horrors of civil war. As the magistrates of the time being were precluded from provincial government by Pompey's law, it was provided that for the next period of five years the senators of consular and prætorian rank, who had not held foreign command upon the expiration of their magistracies, should divide the vacant provinces by lot: in consequence of which, Cicero most reluctantly undertook the government of Cilicia, with which were united Pisidia, Pamphylia, Cyprus, and three dioceses, as they were called, of the adjoining province Asia. Thus Cicero found himself in the very position which it had ever been one of his chief objects to avoid, and his friends were the more uneasy as that quarter of the empire was threatened by the Parthians in revenge of the late invasion of their territories by Crassus. Under these circumstances Cicero was fortunate in having among his lieutenants two such men as his brother and Pontinius. The latter had established a high military reputation by his successes and triumph over the Allobroges, while the merits of Quintus Cicero as a soldier had been proved and acknowledged by Cæsar in Gallia.

Still the government of a province was suited neither to the taste nor the talents of Cicero, and he urged all his friends before his departure, as well as in nearly every letter he subsequently wrote, not to allow the command to be extended beyond the year which the law of Pompey required, or the year itself to be lengthened out by the caprice of the pontifical college; for the length of the Roman year at this time varied according as it was the pleasure of that body to insert more or less intercalary days in the month of February, and the Pontifices were guided in this not by any fixed rule, but by private motives, lengthening or shortening the year to favour a friend or injure an enemy.

Cicero left the city about the 1st of May, and on his arrival at Tarentum paid a visit to Pompey, with whom he had a conference on the serious aspect of affairs, and was assured by him that he was prepared for the dangers which threatened them. In the middle of June he proceeded from Brundisium to Corcyra and Actium, thence partly by land and partly by water to Athens, where he spent ten days, and then crossed in fifteen days to Ephesus, touching at several islands on the way. He had here a foretaste of the duties he would have to perform; for among the deputations which waited upon him at his landing was one from the citizens of Salamis in Cyprus, to lay before him their complaints against the extortion and cruelty of a Roman citizen named Scaptius, who had claimed from the city a large sum upon a bond, together with an accumulation of interest at the rate of forty-eight per cent.; and who had used the military authority he held under the late governor, Appius, to besiege the senate of Salamis in their council-room, until five had died of starvation. As Brutus had recommended the interests of Scaptius to Appius, who was his father-in-law, so he now laboured to place him in the same degree of favour with Cicero, and was seconded in this suit by the letters of Atticus; but the extortion raised Cicero's indignation, and he resisted the claims of Scaptius, though Brutus, in order to move him the more effectually, at last confessed what he had all along dissembled, that the debt was really his own, and Scaptius only his agent in it.

Cicero however was the friend of justice up to a certain point only, for when he refused the usurious interest, Scaptius in a private interview told him that though the principal was only one hundred and six talents, the Salaminians through some mistake believed it to be two hundred, and suggested that Cicero might safely give an award for the larger sum. Cicero himself gives us this anecdote in his letters to Atticus (v. 21), adding that he assented to the proposal, but was unable to effect the object because he found the Salaminians more precisely acquainted with the accounts than Scaptius had anticipated. This same Brutus, whose character is so commonly put forward as one of the finest examples of Roman virtue, had applied for the assistance of Cicero in another affair of a nature somewhat similar. The king of Cappadocia, whose empty coffers proved how dearly he paid for the protection of the Roman senate, owed him, he said, a very large sum of money. But Cicero was unable to render him the least assistance in the recovery of this money, as the king owed a much larger sum to Pompey, whose position in the political world at Rome gave him a higher claim, and yet was unable to pay him the full interest of the debt. These instances afford a good example of the miseries which resulted from the Roman form of provincial government. But Cilicia had felt these miseries in a degree more than usually severe under the late governor Appius, the traces of whose extortion were visible every where, and could only be compared, says Cicero, to the track of a wild beast. Indeed he found employment enough in healing the wounds which Appius had inflicted. Cicero appears not to have concealed his feelings upon this subject: at any rate the accounts which reached Appius led him to believe that Cicero was encouraging his enemies at Rome in their determination to bring him to public trial; nor could he believe the protestations of Cicero to the contrary, when he found his prosecutor Dolabella was about to be married to Cicero's daughter. He again expostulated, but Cicero replied to his complaints by disclaiming all knowledge of any such matrimonial negotiation, the falsehood of which is demonstrable from the letters which he wrote at the same period to Atticus. But Appius and Pompey were allied by the marriage of their children, and the latter induced Cicero to promise everything from the province that could be of service to the accused, so that the guilty governor was acquitted without difficulty. The military proceedings of Cicero were not of a very interesting nature. He had proceeded at once on his arrival in the province to the south-eastern frontier, which was threatened by the Parthians; but the Roman officer who commanded in the adjoining province of Syria had so completely occupied the attention of the enemy, that Cicero's troops never came in sight of them. Being unwilling however to let the army return into winter-quarters without effecting anything, he attacked some of the mountain tribes of Amanus, whose position had hitherto protected them, and took a number of prisoners; while his troops had a pretext for saluting him 'imperator.' He was also successful in the siege of a robber-fort called Pindenissus, for which his friends at Rome obtained him the honour of a public thanksgiving. His other services in Cilicia include nothing deserving especial notice, and he was happy when the year of his appointment expired, and enabled him to return to Italy. He landed at Brundisium towards the end of November, displaying his laurel-wreathed fasces, for his friends, and among them Pompey, flattered him with the notion that his eminent military services deserved nothing less than a triumph. But when he reached the neighbourhood of Rome on the 4th of January, he found matters of a more serious nature in agitation. The senate had just passed a decree that Cæsar should dismiss his army, and when M. Antony and another tribune opposed their veto to it, proceeded to that vote which gave the consuls and other magistrates a power above all the laws. The tribunes fled to the camp of Cæsar, who, considering this decree as equivalent to a declaration of war, advanced with a rapidity which destroyed all the arrangements of the senate. The consuls fled from Rome, accompanied in their flight by Cicero and the leading men of the aristocracy, in the hope of defending the southern part of the peninsula. With this view the principal senators had particular districts assigned to them, Cicero undertaking to guard the coast south of Formiæ and the country around Capua; but the rapid advance of Cæsar drove Cicero from his purpose. He disavowed the military engagement he had undertaken to fulfil; made different excuses for not joining Pompey in his march to Brundisium; and finally, when Cæsar made himself master of Corfinium, and by his magnanimous liberation of Lentulus Spinther, and other senators, gave the lie to those reports of his cruel intentions which his enemies industriously circulated, Cicero deemed it a favourable opportunity to open a negotiation with Cæsar, under the pretext of thanking him for his generosity to his friend Lentulus. In the middle of March Pompey sailed from Brundisium, abandoning Rome and Italy to his opponent. The return of Cæsar from Brundisium to the capital afforded an opportunity for an interview, in which it appears to have been stipulated that Cicero should remain in Italy, and observe a strict neutrality.

When Cæsar proceeded to Spain to oppose the Pompeian troops under Afranius, he left Antony in command of Italy, with especial directions to watch the movements of Cicero, who, residing upon the coast, occasionally showed symptoms of a disposition to slip off and join Pompey in Greece. This vacillation was not unobserved by Antony, and drew from him a monitory letter; but in vain. An account of some temporary success obtained by Afranius in Spain, magnified by himself and injudicious friends into a certain prospect of speedily destroying Cæsar and his army, led many of the wavering to fly from Italy to the camp in Greece. Cicero appears to have been one of these; at any rate he made his escape in the early part of June, and met with a cold welcome from the army of the senate. He was not present at the battle of Pharsalia, having stayed behind at Dyrrhachium, where he received the news of that decisive engagement, and, refusing to join those who determined to cross over into Africa with the intention of still maintaining the war, he again committed himself to the mercy of the conqueror, and landed at Brundisium at the end of October, B.C. 48. Here he passed many miserable months, the laurels upon his fasces drawing upon him an attention which he would gladly have avoided, while the news of Cæsar's difficulties in Egypt and the successes of the Pompeians in Africa again inclined the balance of the war. All this time he had received no intimation of pardon from Cæsar himself, though he was assured of his safety by Cæsar's friends. On the other hand, should the Pompeians ultimately succeed (and they were already talking confidently of coming over from Africa into Italy), he was sure to be treated as a deserter, for he well knew that while Cæsar pardoned even his enemies when they submitted to his power, it was a declared law on the other side to consider all as enemies who were not actually in their camp. After a long series of mortifications, he was cheered at last by a kind letter from Cæsar himself, and still more when Cæsar landed at Brundisium after his successful expeditions in the east, and gave him a reception which at once removed his fears and induced him to follow the conqueror to Rome. About the end of the year Cæsar embarked for Africa, and again the empire was in suspense; for the name of Scipio was thought ominous and invincible on that ground. Cicero, to relieve his mind, now shut himself up with his books, and entered into a close friendship with Varro, a friendship which was consecrated by the mutual dedication of their learned works to each other—of Cicero's 'Academic Questions' to Varro, of Varro's 'Treatise on the Latin Language' to Cicero. One of the fruits of this leisure was his dialogue on famous orators, called 'Brutus,' in which he gives a short character of the chief orators of Greece and Rome. But though the work was finished at this time, it was not made public till the year following after the death of his daughter Tullia.

He now parted with his wife Terentia, who had lived with him more than thirty years; and whatever may have been the causes or pretexts for this separation, he exposed his conduct to no little suspicion by marrying, almost immediately after, a young ward named Publilia, possessing much beauty and very considerable property, over which he had been placed as trustee by her father's will. Terentia subsequently married Sallust, the historian, and even after his death again entered into the married state once, if not twice. She is said to have lived to the age of 103. Amid these domestic troubles, Cicero perhaps found some consolation in the marked attention paid to him by Cæsar, who returned victorious from Africa in the summer of 46 B.C.; but any gratification he may have derived from this source must have been diminished by his consciousness of the offence he was giving to his former friends through his close intimacy with the dictator. The panegyric which he composed about this time in honour of Cato has indeed often been alleged as a proof of his being no temporizer; but if the treatise had come down to us, we should probably have found that Cicero had succeeded most happily in blending his eloge upon the conquered with a well-tempered flattery of the conqueror. That he possessed this happy and useful talent is apparent from the speech he delivered at this time in favour of Ligarius, and the defence of Marcellus might be put in evidence to the same effect, if there were not strong grounds for doubting the authenticity of the oration bearing that name. At the end of the year Cæsar was called away in great haste into Spain to oppose the sons of Pompey; and young Cicero requested his father's permission to go to Spain, that he might serve under Cæsar with his cousin Quintus, who was already gone thither. Cicero objected to his serving in arms against their former friends, and thought it more desirable that he should go to Athens to devote a few years to philosophy and literature. Soon after he had parted from his son, whom he was doomed never again to see, he was oppressed by the severest affliction, the death of his daughter in child-bed. Tullia had been thrice married; first to Piso, who died about the time of Cicero's return from exile, and then to Crassipes. For her third marriage with Dolabella both parties qualified themselves by a divorce from their consorts; and at the time of her death, arrangements for another divorce had been carried so far that her father was already applying for payment of an instalment upon her dowry.

In this new grief Cicero drew little comfort from the condolence of his friends. All the relief that he found was in reading and writing, and he composed a treatise 'Of Consolation' for himself, which was much read by the fathers of the Christian church, especially Lactantius, to whom we are indebted for the few fragments that remain. His domestic grief was completed by the misery of his ill-assorted marriage, which he was happy to dissolve after a union of less than a year. In this desolate condition he fled as usual to his books, and no period of his life produced a richer literary harvest. He has himself given us a list of the works which he wrote in this and the following year. (*De Div.*, ii., 1.) The *Orator* completed his rhetorical works, forming a sort of supplement to his three books entitled *De Oratore*, and the *Brutus*. His philosophical writings of this period were, the *Hortensius*, so called in honour of his deceased friend, in which he recommends the study of philosophy; four books in defence of the Academy, dedicated, as has been already mentioned, to Varro; five books entitled *De Finibus*, and addressed to Brutus, in which he contrasts the opinions of the different sects of philosophy on the subject of the *summum bonum;* the Tusculan disputations, in the same number of books, on a variety of points which involve the happiness of human life; three books on the Nature of the Gods; one on Divination, or the art of seeing into futurity; another on Fate; and the beautiful treatise on Old Age. These were followed by an essay on *Glory*, which has been lost since the invention of printing; the *Topica*, addressed to his friend Trebatius; and the *De Officiis*, which was dedicated to his son.

The publication of these works extended over the years 45 and 44 B.C. In the autumn of the former of these years Cæsar returned from Spain, and Cicero was induced to quit his retirement and come to Rome, where he soon after exerted his talents in the service of an old friend, Deiotarus, king of Galatia, who had incurred the displeasure of Cæsar by his firm support of the Pompeians, and indeed was charged with having formed a plot to assassinate Cæsar a few years before. Cicero failed in obtaining pardon for his friend; but his intimacy with the Dictator seemed daily to be increasing, when the Ides of March changed the whole face of affairs. Cicero was present at the scene of assassination in the senate-house, where he had the pleasure, he tells us, of seeing the tyrant perish; but the conspirators were grievously disappointed in the results of their crime. As soon as the first stupor had passed away, the public indignation drove the murderers from Rome, and Cicero himself deemed it prudent to make a temporary retreat. He proceeded first to Rhegium, then crossing to Sicily, on the 1st of August he arrived at Syracuse, whence he sailed next day, and was driven back by cross winds to Leucopetra. Here he met with some people lately from Rome, who brought him news of an unexpected turn of affairs there towards a general pacification, so that he was induced to set out immediately on his return. He touched at Velia, where he had his last interview with Brutus, and arrived at the capital on the 31st. The senate met the next morning, but Cicero, not finding things in the favourable state which he expected, was unwilling to meet Antony, and excused himself from attending, as being indisposed by the fatigue of his journey. The next day Antony was absent, and Cicero delivered the first of those orations which he called Philippica, as being rivals of the invectives which Demosthenes directed against the king of Macedon. The violence of this harangue committed him with Antony, and he again retired for security to some of his villas near Naples, where he composed and published the second Philippic. This speech, if that name can be given to what was never spoken, was a furious invective, well charged with falsehood, against the whole life of Antony, and was supposed to have been the chief cause of Cicero's death. The departure of Antony for Cisalpine Gaul left Rome again open to Cicero, who returned there on the 9th of December, and ten days after delivered his third Philippic, the chief object of which was to procure the sanction of the senate to the late proceedings of Octavianus in opposition to Antony. Having effected this object, he passed into the forum and harangued the people upon the same subject in his fourth Philippic. The ten other speeches bearing this name were delivered from time to time in the senate or the forum, to excite the people of Rome against Antony and his friends; but the prospects of the oligarchy were finally disappointed by the treachery of Octavianus and Lepidus in joining their arms to Antony, and thus sharing the whole power of the state among them. The proscription which followed, though it can in no way be justified, was levelled against men who had been themselves assassins, or the avowed advocates and panegyrists of assassination. Cicero himself had lauded the murderers of Cæsar as the greatest benefactors of their country; nay, it is doubtful whether he was not himself privy to the conspiracy, though he may have wanted the courage to use the dagger himself; and afterwards when he found Antony in his way, he repeatedly expressed his regret that the conspirators had not served up one more dish at the glorious feast of the Ides of March. Cicero was at his Tusculan villa with his brother and nephew when he received the news of the proscription, and of their being included in it. He fled to Astura on the coast, where he found a vessel ready for him, in which he immediately embarked, but was compelled by the weather to land again the same day near Circeii. The following day he embarked a second time, but again landed at Caieta, whence he proceeded to his Formian villa. In the middle of the night his slaves informed him of the approach of the soldiers who were intrusted with the murderous commission; he made an attempt to escape in a litter, but being overtaken in a wood, the scene was speedily finished. The assassins cut off his head and hands, says Plutarch, and carrying them to Rome, presented them to Antony, who had them fixed up on the rostra in the forum. Cicero was killed on the 7th of December, in the year 43 B.C.

The works of Cicero have been repeatedly published in mass, as well as separately, but perhaps the best edition of his entire writings is that by Orellius. Of his separate works the following editions deserve particular notice. The 'Variorum,' as it is called, by Graevius, containing the Orations, the Letters ad Familiares and ad Atticum with one volume of his Philosophical Works. The notes of Manutius are exceedingly valuable. 2. 'De Divinatione et De Fato,' G. H. Moser. 3. 'De Legibus,' Moser et Creuzer. 4. 'De Natura Deorum,' by the same. 5. Ditto, by Heindorf. 6. 'De Republicâ,' by Moser. 7. 'Oratio pro Cluentio,' by Classen. 8. 'Pro Milone,' by Orellius, 1826. 9 'Pro Plancio,' by Wunder. 10. 'Orationes Philippicæ,' by Wernsdorff. 11. 'The Orations,' by Garatoni, at Naples. To those who value a correct text, Wunder's Collation of the Erfurdt MS., published at Leipzig in 1827, will be of great service. The critical writings of Madvig of Copenhagen are also deserving of study, together with his excellent 'Disputation on Asconius.' Mention has been made of the doubts as to the genuineness of certain of the Orations. F. A. Wolf has examined the claims of the four Orations, 'Post Reditum in Senatu,' 'Ad Quirites post Reditum,' 'Pro Domo sua,' and 'De Haruspicum Responsis,' in a volume published at Berlin in 1801. In the following year he published an edition of the 'Pro Marcello,' with his reasons for believing it to be spurious. In regard to the letters ad Brutum, see BRUTUS. The student of Cicero's writings should also possess the account of his 'Life,' by Conyers Middleton. It has been freely employed in this article, but the strong bias of the author in favour of his hero has been throughout corrected from the writings of Cicero himself, more particularly his letters to Atticus, which having been written in confidence to an intimate friend, and never intended for publication, furnish a test for trying the character of the writer such as few public men could stand with impunity. Middleton has made two great errors in forming his notion of Cicero and the men who lived in his times. He has believed all that he has said of himself, and all that he has said of his enemies; and besides this, he has, with something of disingenuity, softened down these points where he has unintentionally borne evidence against himself. The translations of Cicero's writings in English are not of great merit. One of the best is Melmoth's translation of the 'Letters;' but his style is too florid. The French language possesses an excellent translation of the 'Letters to Atticus,' by the Abbé Mongault, accompanied by a Commentary no less excellent; and the German language has a still more valuable translation of all the 'Letters' in chronological order, by Wieland, with notes, and a number of historical chapters, which are tainted however with an undue partiality to Cicero. A most laborious and useful work for the student of these times, but still retaining much of the same prejudices, will be found in the 'History of Rome, in its transition from a republican to a monarchical form of government; or Pompey, Cæsar, Cicero, and their Contemporaries,' by Professor Drumann, of Königsberg. Two volumes have alone appeared, which descend no lower than the letter C (Cornificii), for the work is drawn up in an alphabetical order according to the gentile names.

CICERO'NE, a name given by the Italians, especially of Naples and Rome, to the guides who show travellers the antiquities of the country. It was a common saying in Italy, when speaking of a learned or eloquent man, 'è un Cicerone,' 'he is a Cicero;' and the poor guides and valets de place, who, generally speaking, are neither learned nor eloquent, and often make ridiculous blunders on the most trivial subjects, have now usurped the name of Cicerone.

CICHORA'CEÆ. [COMPOSITÆ.]

CICINDE'LIDÆ, a family of Coleopterous insects, of the section *Adephaga*, and sub-section *Geodephaga*. The true carnivorous beetles are included in a large section called *Adephaga*, all the species of which group may be distinguished by their having six palpi. The section Adephaga is divided into two sub-sections, the *Geodephaga* and the *Hydradephaga*. The former derive their subsistence on the land, and the latter in the water. The structure of the insects in these two groups, in order to suit them to their habits, is therefore of necessity essentially different (as far as secondary characters of form, &c. are concerned), the former being formed for running, and the latter for swimming. In the number of joints to the tarsi (which is always five), and the antennæ (which is eleven), and the parts of the mouth, they are however alike; these latter are generally considered primary characters. To make ourselves more clearly understood, we may compare the section *Adephaga*, among beetles, to the *Carnivora* among the *Mammalia*; the *Geodephaga* to the bears, weasels, dogs, and cats; and the *Hydradephaga* to the seals and otters. We may again carry our simile further by comparing the *Cicindelidæ* to the cats or tigers, the beetles belonging to this family being most pre-eminently voracious.

The *Cicindelidæ* are divided into two groups; those species in which the emargination of the mentum is furnished with a tooth or pointed process in the middle, and those in which this process is wanting. To the first group or section belong the genera *Manticora*, *Platychei le*, *Mega* *cephala*, *Oxycheila*, *Iresia*, *Cicindela*, *Dromica*, *Euprosopus*, and *Ctenostoma;* and to the second section belong the genera *Therates*, *Tricondyla*, and *Colliurus*.

The typical genus of the family we are treating of is *Cicindela*, and in this genus, as is generally (if not always) the case in typical genera, the species have a wide geographical range, and are very numerous. Taking Dejean's Catalogue as our guide, we find the genus Cicindela containing upwards of 200 species, and the number of species contained in all the other genera taken together is about 40. The species of Cicindela are found in every quarter of the globe; whereas the other genera mentioned are very local; they are all extra-European, some being entirely confined to Africa, several to South America, and others to India.

The technical generic characters of Cicindela are:— labial palpi moderately long, in this respect not exceeding the maxillary palpi; last joint of all the palpi truncated at the apex, and about the same width as the preceding joints; three basal joints of the anterior tarsi dilated in the males and covered beneath with a velvet-like substance.

As regards the form, the most striking character of the Cicindelæ is the great projection of the eyes; the jaws are very long and sharply pointed, and furnished on the inner side with three tooth-like processes; the head is generally equal in width to the thorax, or sometimes exceeding it; the thorax is either somewhat cylindrical, or rather depressed and nearly square, and is transversely indented before and behind. The elytra are generally rather depressed and almost double the width of the thorax; the legs and antennæ are long and slender.

The colouring of the Cicindelæ is generally rich and metallic; the upper surface is usually more or less shagreened, and hence is not glossy; the under surface is glossy, and generally sparingly covered with hairs of a pale colour.

With respect to their habits, it has been before remarked the Cicindelæ are extremely voracious; we may add, they are very active, and almost always take to the wing when approached, and hence are caught with difficulty; their flight is however short. The situations which they inhabit are generally sandy plains or heaths, and sometimes the sea-shore or the shores of rivers, &c.; but some of the other genera of the Cicindelidæ, from their form and colouring,* appear to be more particularly adapted to these last-mentioned situations.

Six species of the genus Cicindela have been found in England, of which the most common is *Cicindela campestris*. This insect is found more or less abundantly throughout the country, and is very common in the neighbourhood of London; it is rather more than half an inch in length, and of a bright green colour; the anterior and posterior margins of the thorax, the legs, and the basal joints of the antennæ are of a rich copper colour; the under side of the body is glossy and of a blue-green colour; the wing-cases are each adorned with six cream-coloured spots, one on the shoulder or outer angle, another at the apex, three on the outer margin at nearly equal distances apart, and one on the disc, a little lower down than the third marginal spot from the shoulder.

The larva of this insect is very well known, and may be found almost at any time during the summer in sandy situations: it lives in cylindrical burrows, varying from six inches to a foot in depth, these burrows being excavated by itself. Like the perfect insect, it is very voracious, and in fine weather may be seen with its head on a level with the surface of the soil, lying in wait for any insect which may happen to crawl over its cell. Its form is remarkable: the head is very large and slightly concave; the jaws are also large and curved upwards; the body is furnished with six legs, attached to the three first segments, and is humped near the middle of the back, at which part there are two tubercles, each of which is furnished with a horny hook; these hooks, and the body being naturally of a bent shape, enable the animal to sustain its position at the top of the cell, or to ascend and descend very quickly: the concave head and the recurved mandibles form a kind of natural basket in which the soil is brought to the mouth of the cell during the progress of its excavation.

Four other British species of the genus Cicindela, *C. sylvatica*, *maritima*, *aprica*, and *sylvicola*, have white or cream-coloured spots in the same situations as in *C. campestris*, but they are joined together in pairs; the two towards the base of the wing-case form a curved dash which surrounds the shoulder; the one on the disc of the elytron and that at the margin nearest it are also joined, and form a bent fascia, and the two at the apex form a bent dash, which follows the outline of that part of the wing-case. This disposition of the markings, viz., a lunular spot at the shoulder, a bent fascia in the middle, and another lunular spot at the apex of the elytron, is that which is most commonly found in the species, and the most common colour is brownish bronze; such is the colour of *C. maritima*, *riparia*, and *sylvicola;* the latter sometimes varies to a green hue

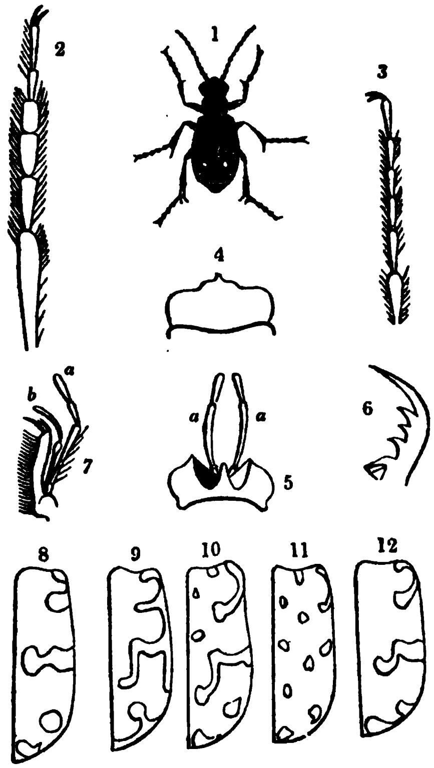

Fig. 1, Cicindela campestris; *fig.* 2, anterior tarsus of the male; *fig.* 3, do. of female; *fig.* 4, labrum of another species of Cicindela; *fig.* 5, mentum of do.; *a*, *a*, labial palpi; *fig.* 6, mandible; *fig.* 7, maxilla, *a* external maxillary palpa, *b* internal maxillary palpa; *figs.* 8, 9, 10, 11, and 12, wing-cases of five different species of Cicindela, to show the variation in the markings.

In some exotic species of Cicindela the elytra are adorned with numerous spots; eleven is the greatest number we have found; of these, however, three or four are often obliterated, and the others are joined (two or three together), so as often to form three irregular-shaped oblong dashes or fasciæ.

In some instances the markings run one into the other, so that there is more white than ground colour; and in one species, now before us, the wing-cases are entirely white. These markings vary but slightly in individuals of the same species.

The Cicindelidæ, in most arrangements of insects, form the first family of the Coleoptera.*

CICISBE'O, in Italian, means a gallant, a man who courts the ladies. The term is also applied to a knot of ribands, which used to be worn appended to the hilts of swords or to the handles of fans. (*Dizionario della Crusca.*) In like manner a Cicisbeo is a man who hangs upon a lady, is constantly by her side and at her beck, and attends her wherever she goes. This derogatory custom has long prevailed with married ladies, especially in the towns and among the fashionable classes, in Italy and other southern countries; but the country people and the humbler class of citizens have generally remained free from it. Even in the towns the practice is losing ground of late years. The words *cavalier servente* and *patito* are also used in the same sense.

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* The colouring of insects, as well as their form, often affords a clue to their habits.

* We have entered more than usually into detail in this article, because the insects here treated of constitute a group in which cabinets are very rich in species; it therefore affords good illustrations of various points of general application in entomology which it may be hereafter necessary to refer to. Whilst writing this, and in endeavouring to trace the markings of the various species of Cicindelæ to one source, we have discovered (upon referring to other families of the Coleoptera also) that in most beetles, where markings occur, they may be traced to variations of one pattern.

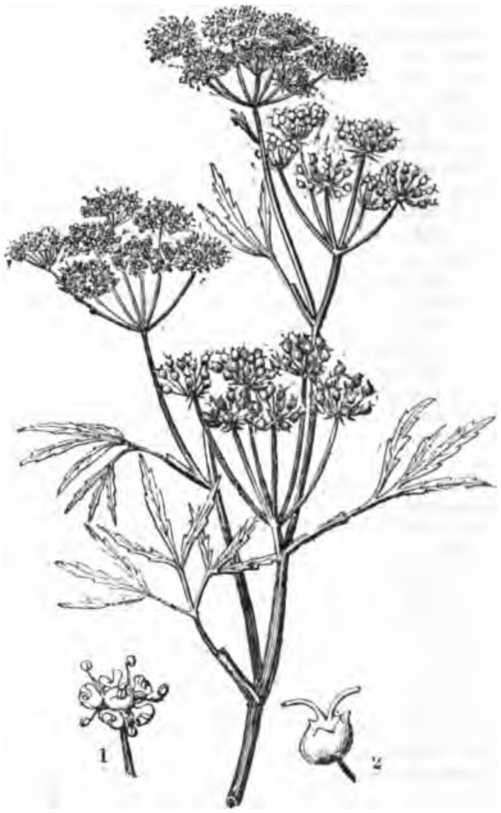
CICOGNA'RA, COUNT LEOPOLD, was born at Ferrara, November 26, 1767, and, although the inheritor of considerable wealth, began early to distinguish himself by his application to study. While yet a youth he made considerable proficiency in mathematics and physics, whereby he recommended himself to the notice of Spallanzani, Scarpa, and many other eminent individuals at the university of Pavia. Having completed his course of studies there he proceeded to Rome, where he occupied many years not only in studying the great works of art, but likewise in practising himself both in drawing and painting, for which he had almost from his boyhood manifested more than ordinary talent. After visiting Naples and Sicily, in which latter country he published, at Palermo, his first literary effort, a poem, entitled *Le Ore del Giorno*, he successively visited Florence, Milan, Bologna, and Venice, for the purpose of making himself thoroughly acquainted with the various treasures of art in those cities. In 1795 he fixed himself at Modena, and during the twelve following years appears to have given much of his attention to public affairs, having been for some time minister at the court of Sardinia. He resigned his post in 1808, when he was made president of the Academy of the Fine Arts at Venice; an office for which he was well qualified no less by the public-spirited zeal with which he discharged it than by his knowledge of art itself and the literature belonging to it. From this epoch in his life may be dated the commencement of his career as a writer, during which he enriched the branch of literature just mentioned by many important works. In that same year (1808) he published a treatise on 'The Beautiful' (*Il Bello*). This was succeeded by his great work, 'The History of Modern Sculpture' (*Storia della Scultura dal suo risorgimento in Italia al Secolo di Napoleone*), an undertaking to which he had been urged by his friends Giordani, D'Agincourt, and Schlegel. It is in three folio volumes, the first of which appeared in 1816, and the last in 1818, and contains about 180 outline plates, exhibiting a vast number of subjects from the earliest period —the age of the Pisani and Donatello—to that of Canova, to a notice of whose works the whole of the seventh or last book is devoted. Although fastidious criticism has taxed it with some defects, it is undeniably a performance of great research and erudition, bringing down to the present century the history of the art from the point at which it had been left by D'Agincourt, who himself had taken it up where Winckelmann had quitted it. Besides a vast body of information as to the professed subject, this work also embraces much subsidiary matter of great interest, particularly the descriptive and historical notices of St. Mark's at Venice, the cathedrals of Milan and Orvieto, St. Peter's and many other Basilicæ.

His next publication was a catalogue raisonné, in two thick 8vo. volumes, of his own library, an immense collection of works in every department of the fine arts. This is a most valuable addition to bibliography, and shows that Cicognara spared no cost in the pursuit of his favourite studies. He likewise produced a work entitled *Memorie per servire alla Storia della Calcografie*, and numerous articles relative to subjects of art and artists, printed in various journals, but never, unfortunately, given afterwards to the world in a collective form. Even had he produced none of the works above enumerated, the name of Cicognara would have been transmitted to posterity with honour by the two splendid architectural volumes, entitled *Le Fabbriche piu Cospicue di Venezia*, 1815—20, of which the greater share of the literary part and the chief conduct of the work belong to him, although he was assisted in it by Diedo and Selva, who furnished the accounts of many of the buildings. It is illustrated with 250 engravings, wherein will be preserved all the most interesting structures of Venice when the now-mouldering originals shall have fallen into utter decay.

He died at Venice, of a disease of the lungs, March 5, 1834, and his obsequies were performed with great solemnity in the cathedral of St. Mark.

CICO'NIA. [STORKS.]

CICU'TA VIRO'SA, or **WATER HEMLOCK,** is a wild poisonous plant of the Umbelliferous order, found occasionally by the sides of ditches and ponds. It is a perennial plant, with a large fleshy white root covered externally with fibres, and divided internally into several low chambers filled with a milky or yellowish juice. The stem is erect, hollow, cylindrical, striated, and two or three feet high. The leaves, especially the lower ones, are decomposed or thrice-pinnated; the leaflets are narrow, lanceolate, deeply and irregularly toothed. The umbels are usually destitute of involucre, or, if they have one, it is nothing but a single linear bract; the partial umbels have several such bracts. The flowers, which are white, have the ordinary umbelliferous structure. They are succeeded by globular double fruit, crowned by the style and the five teeth of the calyx, and showing on each of their convex faces five salient simple angles. Its medicinal properties are similar to those of common hemlock [CONIUM], but more energetic. Its roots have been mistaken by children and country folks for parsnips, and have been eaten with fatal consequences.



[Cicuta virosa.]

1. A flower. 2. A young fruit.

CICUTA. [CONIUM.]

CID. The adventures of this famed Castilian hero are nearly as much involved in fable and romance as those of our King Arthur and his Knights of the Round-table; nor is it easy, at this distance of time, to separate the truth from the exaggeration of tradition and the inventions of ballad-writers. Ferreras and one or two other Spanish writers think, however, they have established the following facts.

The Cid (from the Arabic *El Seid*, 'the Lord'), so called by the Moors of Spain whom he subjugated by his victories, was born at Burgos somewhere about 1040. His real name was Rodrigo Diaz de Bivar. He attached himself to Sanchez II., king of Leon and Castile, whose life he once saved in battle. At the siege of Zamora Sanchez was treacherously slain, and his brother Alfonso, the next in order of succession, was suspected of the deed. The Cid insisted that, before taking possession of the vacant throne, Alfonso should purge himself by taking an oath of his innocence of his brother's murder; and when the rest of the nobles hung back, he alone exacted and made the king repeat the vow, to which he added the most awful maledictions in case of perjury. After such a step he could expect little court favour, and the state of Spain encouraged his propensities to war and adventure. His life was a continued series of combats with the Moors, who occupied by far the largest and richest parts of the country. He fell upon them in Aragon, burning, plundering, and slaughtering wherever he went; he took Alcoçer, and making that place his strong-hold, he was gradually joined by a numerous band, half patriots, half freebooters, with which he made innumerable incursions into the neighbouring territories of the Moors. Still gathering force he penetrated to the district of Ternel, at the south-western extremity of Aragon, and there established himself in a strong fortress on a rock, which is still called 'La Peña de el Cid' (the rock of the Cid). By the sudden death or murder of the Moorish lord of Valencia, he was encouraged to extend his incursions into that province, and to the shores of the Mediterranean. Here, too, he was eventually enabled to establish himself. After a long siege he took Valencia, the capital city, and held it until his death, which happened about 1099.

It appears the Cid really had a wife named Ximena, the Chimène of the celebrated French tragedy 'Le Cid,' but the story of his affecting courtship, and the struggle and contrast of affections in the heart of his mistress, are mainly inventions of Corneille. The Spanish Chronicles and ballads, from which the French tragedian took the notion of his plot, or from a drama founded upon them, do indeed relate that the Cid had killed Ximena's father; but they destroy all interest in the heroine by saying that after her father's death, and before any tender addresses on the part of his slayer, she earnestly begged the king to marry her to the Cid, 'because,' she is made to say by these naïve writers, 'I am quite certain that his possessions will one day be greater than those of any man in your dominions.'

The original 'Cronica de el Famoso Cavallero Cid Ruy Diaz Campeador' is supposed to have been written in the 13th century, about 150 years after the hero's death. Mr. Southey, in his curious work, makes use of a printed edition of 1593, and says the first and only other edition was printed in 1552; but there is a copy of an edition in the library of the British Museum which bears the date of 1541.

The 'Poema de el Cid,' which is believed to contain rather more historic truth than the prose chronicle, was written about the middle of the 12th century, or only some 50 years after the Cid's death. The author has been called the 'Homer of Spain,' but his name has not been preserved. Mr. Southey says his work is unquestionably the oldest poem in the Spanish language, and (in his opinion) the finest beyond all comparison. This praise is perhaps extreme, but the 'Poema' contains some powerful passages, and is highly interesting from its undoubted antiquity.

Besides this poem the Spaniards have an immense number of romances and ballads relating to the exploits of the national hero. No fewer than 102 of these are in the real old style of the 13th and 14th centuries; many are evidently more modern, and many more have never been printed. In some of these ballads the wonderful achievements of Bernardo de el Carpio, Ferran Gonzalez, and the rest of the twelve peers (for Spain had her twelve *peerless* knights, as well as Britain and France) are interwoven with the adventures of the great Cid. An ample notice of these different works will be found in Mr. Southey's 'Chronicle of the Cid,' 1 vol. 4to., 1808.

CID'ARIS. [ECHINIDÆ.]

CIDER, or **CYDER**. A word used to signify the juice of apples expressed and fermented. The article APPLE contains a general view of the culture of apple-trees; what is here stated as to the management of apple-trees has special reference to the English cider counties.

In the Hereford district (under which name we shall refer to that county with the adjoining cider districts in Gloucestershire, Monmouthshire, and Worcestershire, while by the name of the 'Devonshire district' similar portions of Dorsetshire, Somersetshire, and Cornwall will be distinguished), where the varieties of cider-apple cultivated are far more numerous than in any other part of England, the New Foxwhelp (a seedling from the old), the Wilding, the Cherry Pearmain, the Yellow and Red Norman,* are among the many sorts that are preferred. It appears to be almost immaterial whether the crab-stocks are grafted before or within a short time after they are removed from the nursery to the orchard in which they are to stand. In Herefordshire it is usual to insert the grafts about six feet from the ground, and to plant the trees about 66 feet between the rows, and 36 between the trees where the soil is rich; if the soil is poor, less distance is allowed, as the trees will not spread with so great vigour. This seems a preferable method to that practised in Devonshire, where the grafts are inserted at from three to four feet from the ground, and the trees planted about 16 feet apart. The advantage which in Devonshire is gained from the trees being less exposed and broken by the wind, and perhaps from a greater produce of apples, is more than counterbalanced by the entire loss of the land, usually a wilderness of weeds, into which horses run in the winter, and calves in the spring, but where neither grown cattle nor the plough can ever be admitted. In the Devonshire district, the situations chosen for orchards are generally hollow dells or shelving banks, in the neighbourhood of the farm-houses, the land on which they are planted being put to little other use; while in the Herefordshire district the choice is determined chiefly by the quality of the soil, without reference to the position of the farm-house. In their youth the trees do comparatively little injury to the land, while they receive considerable benefit from the frequent stirring by the plough of the soil round their roots, so that newly-ploughed lands, or hop-yards which may be again laid down to grass as soon as the trees have acquired some strength, are spots frequently chosen. This practice is agreeable to the very sensible instruction given by Mr. Marshall, *Rural Economy of Gloucestershire*:—'Plant upon a recently broken-up worn-out sward; keep the soil under a state of arable management until the trees be well grown, then lay it down to grass, and let it remain in sward until the trees be removed and their roots decayed, when it will again require a course of arable management.' (vol. ii., p. 302.)

In February or March, or, where the soil is light, in October or November, holes should be dug about six feet in diameter, each being adapted in depth to the root of the tree that it is to receive. The best earth, with the turfs, if the spot is grass land, should be thrown into the bottom of the hole, and the roots of the tree separated with the hand in horizontal layers with the richest mould between them; all the earth may then be thrown in and firmly trodden down. If the stocks are strong, the best and cheapest method of protection from the injuries of cattle is a frame of willow staves, about six feet long, cleft as those used for the bars of hurdles: these should be hammered about six inches into the ground, round the tree, and as near it as can be done without injuring the roots, perhaps three inches from it: the staves should then be nailed together with two bands of narrow iron hooping, one a foot and a half from the bottom, another at a like distance from the top, at the same time binding them round the tree as tightly as can be done without injury to the bark. Where the stocks are not strong, the best fence is 'one large post, slit with a saw and placed flat-way, with the faces to the plant, and about two feet apart, with rails on each side, nailed upon the edges of the posts.' (Marshall.) In the Hereford district these fences are much used; they are cheap and effectual, and from their narrowness offer little impediment to ploughing and other purposes of agriculture, which are here carried on as much in the orchards as in any other lands.

Very little attention is paid to enriching the soil round the trees when once they have been planted. In Devonshire it is common to see the weeds which are cropped in the orchards, heaped near the stem, there to decay and nourish the roots; and in Herefordshire the more careful planters cause the earth to be dug once a year round trees that have been recently planted: neither is there so much care taken with the trees themselves when they have once grown strong, as the benefits which have been derived from a better system of management would warrant. In by far the largest proportion of orchards, with the exception of gathering the fruit, nothing is done to the trees from the beginning of the year to the end. To remove superfluous wood by judicious pruning (an art of which many that practise it are most mischievously ignorant), to remove part of an excessive crop of fruit, to cleanse from moss and mistletoe, which latter in frosts forms excellent food for sheep, are practices too frequently neglected.

The fruit of the different varieties of apple ripen at different times of the year, earlier or later, according to the season. Among the earliest are the Codling and American Must, which begin to fall from the trees at the end of September; and while the majority attain their maturity about the end of November or the middle of the following month, there are some from which the apples will not fall until six or eight weeks later. The customary method of picking the fruit is by striking the trees with poles, provincially called 'poulting,' and then gathering the fallen apples; but though this practice is almost universal it is frequently mischievous, from the young bearing wood being broken by the violence that is used. It is better economy to pay a small extra price for collecting the fruit which falls at several times, than to injure the trees by knocking down all the fruit, the unripe as the ripe, to save a few shillings. The apples will fall by degrees, and at intervals a boy may be sent into the trees to shake the branches: in all practicable cases the use of the pole should be avoided. When the apples have been gathered, each sort by itself is collected into heaps, about ten inches deep, where they remain for a month, or more, until they become mellow; they are then ready for the mill.

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* It has been objected to 'Norman' cider, that it will not carry to a distance without damage.

Cider is manufactured with very rude machinery, by the following process. The apples are thrown into a circular stone trough, usually about eighteen feet in diameter, called the *chase*, round which the *runner*, a heavy circular stone, is turned by one or sometimes two horses. When the fruit has been ground until the rind and the core are so completely reduced that a handful of 'must' when squeezed will all pass without lumps between the fingers, and the maker sees from the white spots that are in it that the pips have been broken, a square horse-hair cloth is spread under a screw-press, and some of the must is poured with pails upon the hair, the edges and corners of which are folded inwards so as to prevent its escape. Ten or twelve of these hairs are piled and filled one upon the other, and then surmounted with a frame of thick boards.[*] Upon this the screw is slowly worked down by a lever; and with the pressure, a thick brown juice exudes from the hairs, leaving within them only a dry residue, which, in years when apples are scarce, is sometimes mixed with water, ground again, and the liquid pressed out as before. This latter product is called 'water cider,' a thin unpalatable liquor, which is given to the labourers early in the year.

The cider is received by a channel in the frame of the press upon which the hairs stand, emptying into a flat tub called a 'trin.' From the trin it is poured with buckets or 'racking cans' into casks, placed either out of doors, or in sheds where there is a free current of air. In about three or four days, more or less according to the heat of the weather, the liquor usually will ferment; the thick heavier parts will subside as a sediment at the bottom of the cask, and the lighter become bright clear cider. This should then be 'racked' or drawn off into another cask, and the sediment be put to strain through linen bags, and what oozes from them should be restored.

It is during the fermentation that the management of cider is least understood, and there is the greatest hazard of injury. It is necessary also to know what fruit will by itself make good cider, which kinds should be ground together, and what proportions should be mixed. But it is in the preservation of strength and flavour after the cider is ground that the principal difficulty consists: *slight* fermentation will leave the liquor thick and unpalatable; *rapid* fermentation will impair both its strength and durability; *excessive* fermentation will make it sour, harsh, and thin. Other things being equal, that cider will probably prove the best in which the vinous fermentation has proceeded slowly, and has not been confounded with the acetous. The remedies used in cases of cider not clearing are either yest or the addition of cider in a state of fermentation, isinglass, eggs, or a quart of fresh blood stirred up with the liquor, in which last case it is to be racked on the following day; these do not always prove effectual. But the common evils are excess or rapidity of fermentation; and if a better quality than farm-house or 'family drink' is sought, cider requires so much care to prevent its being spoiled, that the best and most careful makers frequently have it looked at during each night for some weeks after it is made; and if the bubbling hissing noise, the sign of fermentation, becomes frequent or too loud, the liquor is *immediately* racked off into another cask: this check often requires to be repeated several times; but although at each racking some portion of the strength will be lost, the body, flavour, and sweetness will chiefly be retained. It is not the habit of the farmer to add sugar, treacle, brandy, or any colouring matter to the liquor; it is only adulterated in the hands of cider dealers and publicans, who will not lose a hogshead, and if one has turned sour, or has been otherwise damaged, it must be 'doctored,' in order to render it marketable.

At the beginning of January the cider is moved into cellars, where by large growers it is frequently stored in casks of great capacity, containing 1000, 1500, or even 2000 gallons; these are cheaper in proportion than smaller vessels, and are thought to preserve the cider better. In March the liquor is bunged down; it is then fit for sale, and may be used soon afterwards, though it will greatly improve by keeping. If bottled cider is required, it should be bottled and wired in the September or October after it is made; some persons prefer an earlier time, the end of April or the beginning of May; a greater degree of effervescence is thus attained, but a considerable loss accrues from the number of bottles that will burst.

In 1830 the tax upon cider of ten shillings a barrel was taken off (M'Culloch, *Dic. Com.*), and in the same year an Act was passed allowing any person to sell cider upon the payment of 2*l.* 2*s.* annually for a licence from the Excise. This act was amended in 1834, and a licence for the sale of cider is now (1836) granted by the Excise to an application signed by six ratepayers of the applicant's parish, the payment being 3*l.* 3*s.* if the liquor is to be drunk on the premises, 1*l.* 1*s.* if it is not. These alterations have necessarily added greatly to the consumption; but the increase of orchards during the last twenty years, and the late productive seasons, have fully supplied the demand. During the years 1833-4-5 the price in the hands of the grower may be thus estimated:—Of the best cider, from 1*s.* to 1*s.* 6*d.* per gallon; good, from 10*d.* to 1*s.* per gallon; family cider used by farmers and in public-houses, from 4*d.* to 10*d.* per gallon; 'drink' for labourers, from 2½*d.* to 6*d.* per gallon. These prices amply remunerate the farmer, who, in many instances, might increase his profits by a diminution of the cost of production. It cannot certainly be supposed that small growers can go to the expense of procuring much machinery; nevertheless the extreme clumsiness of the present wasteful system would fully warrant larger owners in erecting suitable buildings and apparatus. It is true that some improvements have been made, that larger mills are used, that in the press an easily worked iron screw has been substituted for an awkward wooden one; but far more remains to be effected. If the mill was placed upon a first floor, which could easily be done in a building erected against a bank, or having an inclined plane, so that horses might enter at that height, all lifting of the cider from the trin might be saved, as a pipe might be carried from the press into casks in the cellars underneath. Again, if the casks in the cellars were placed upon stages, manual labour in racking might be dispensed with, and waste from spilling saved, since a pipe from a hogshead upon a high stage would empty the liquor into a cask on a lower. No use, again, is made of the siphon, a cheap instrument within the reach of any farmer's purse, which would no doubt be serviceable and economical.

The quantity consumed by workmen is very large: two or three quarts a day is the usual allowance given in Herefordshire by masters; and in harvest-time many labourers drink in a day ten or twelve quarts of a liquor that in a stranger's mouth would be mistaken for vinegar; they do not like sweet cider. Notwithstanding so great a quantity is consumed, there do not appear to be any diseases peculiar to or very general in cider countries: idiocy and rheumatism have been stated to be very prevalent in such districts; but even if this is true, cider-drinking has in no way been proved to be the cause. It is remarkable that during the continuance of the cholera in this kingdom, there occurred very few cases in Devonshire, and none in Herefordshire, although the sickness reached the adjoining counties at the time of harvest, when cider is drank to excess.

Cider of good quality is made in Ireland, in the counties of Waterford and Cork; in Normandy, whence we have many of our best apples; in Belgium; and of inferior quality in Germany. It is also made in abundance, and of excellent quality, in many parts of the United States.

CIGAR. [TOBACCO.]

CIGNA'NI, CARLO, was born at Bologna, May 15, 1628. His father was a notary, but claimed his descent from an old Ghibelline family of Florence, who had been driven from their native city by the Guelphs. Carlo, who showed an early taste for painting, was put under Giambatista Cairo for instruction. He soon surpassed his master, and was removed to the care of Albani, under whom he

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[*] This is the process in the Hereford district. In Devonshire a lever press is used, and 'reed,' unthrashed straw, is spread in layers in the place of hairs. The method used in the south of France for expressing oil from olives is identically the same.

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rapidly rose in reputation and success. He subsequently enlarged his style of painting by a careful study of the works of Correggio and Annibal Carracci, from whom he learned the art of giving size and space to his pictures, by means of a powerful and skilful use of *chiaroscuro*. Le Brun is said to have been deceived by a picture of his, and to have taken it for the work of his great countryman. Cignani had a singular degree of prosperity; commissions crowded upon him, he enjoyed the friendship and correspondence of many of the reigning princes of his time, and acquired great wealth. He was also made a count by Ranuzio II., his native sovereign.

Being invited to paint the Duomo of Forli, he removed thither with his family, and resided there for the remainder of his life. While Forli was occupied by some German troops during the war between the pope and the emperor, Cignani presented a picture to the commander of the forces, who in return, besides a handsome gift in money, issued an extraordinary order to his troops to refrain in every way from molesting the good people of the city. The citizens testified their gratitude to Cignani by enrolling him among their nobility. In 1708, when the Clementine Academy was instituted, Cignani was elected president. He died September 6, 1719, leaving two sons, one of whom, Felice, was a painter.

He painted an infinite variety of subjects, sacred, classical, and even comic. His colouring is pleasing and brilliant, and his finish most elaborate. His chief work is the Duomo at Forli, an immense composition, ingeniously disposed, which represents the assumption of the Virgin. (Zanotti; Zanelli.)

CILICÆA. [ISOPODA.]

CILICIA (Κιλικία), a country of Asia Minor, forming part of Anatolia. The antient boundaries were, on the north the Taurus, which separated it from Cappadocia and Lycaonia, on the south the Mediterranean sea, on the east Mount Amanus, which separated it from Syria, and on the west Pamphylia. According to Herodotus (v. 52), the Euphrates was the boundary of Cilicia and Armenia. Cilicia antiently comprised two divisions, the names of which were derived from their physical character. The west division was called mountainous or rough Cilicia (Κιλικία τραχεῖα, or, Herod. ii. 34, ἡ ὀρεινὴ Κιλίκίη, Cilicia aspera), and the east division, level Cilicia (Κιλικία πεδιάς, Cilicia campestris). Many attempts have been made by antient and modern writers to account for the name Cilicia; the Greeks derived it from Cilix, son of Agenor, who was said to have colonized this country (Herod. vii. 91). The inhabitants were formerly called Hypachæi (Ὑπαχαιοί), according to Herodotus (vii. 91). For our information on the geography of Cilicia we are chiefly indebted to Strabo (book xiv.), and Beaufort's survey of the line of coast as far east as the gulf of Issus (Scanderoon). With the interior we are very little acquainted; the principal towns which are known are on the coast. Level Cilicia is described as fertile: mountainous Cilicia has always been famous for a fine breed of horses; and the annual tribute of the Cilicians to Darius consisted of 360 white horses and 500 talents of silver (Herod. iii. 90).

The first town in mountainous Cilicia, on leaving Pamphylia, was Coracesium, according to Strabo (pp. 667, *d*, 670, *a*, Casaubon). The modern name is Alaya; it is a strong natural fortress, situated on a high and almost insulated rock. Coracesium held out against Antiochus (Livy, xxxiii. 20; Beaufort's *Karamania*, pp. 160—168).

The next town of importance is Selinus (Σελινουντ-ος), situate on a steep hill. The emperor Trajan died there, and the town was afterwards called Trajanopolis: the modern name is Selinty. Cape Anemurium (now Anamour) is the most southern point of Asia Minor; and probably from this circumstance (as Captain Beaufort suggests, p. 192) derived its name, which means 'windy point.' The small town and port of Celenderis (now Chelindreh) lies between Anemurium and Seleucia, the modern Selefkeh. The ruins of the antient Seleucia are many miles from the shore, on the west side of the river Calycadnus (Ghiuk Sooyoo), which now at any rate flows into the sea a few miles east of Cape Zephyrium (Beaufort, p. 226). This coast appears to be still as much infested by pirates as it was in the time of Strabo (pp. 671, *b*, 684, *c*). The shore presents a line of noble promontories and white marble cliffs rising perpendicularly from the sea. This rocky character diminishes a few miles west of Selefkeh, where the high lands begin to recede from the coast. Many rare kinds of animals and birds are found on the coast, and almost every district is said to have some peculiar to itself (Beaufort, p. 209). In the time of Cicero, Cilicia was famous for panthers.

There is no town of much importance between Selefkeh and the river Latmus (now Lamas), which was the boundary of mountainous Cilicia (Strabo, p. 671, *c*). Here the rocks and cliffs cease, and are succeeded by a gravelly beach and broad plains, which extend to the mountains. The principal towns in level Cilicia were Soli, Tarsus or Tarsi, and Issus or Issi (Xenoph. *Anab.*, i. 2, 23, 26). Soli was afterwards called Pompeiopolis, because Pompey settled the remains of the pirates there: the modern name is not ascertained; perhaps it is Menetlu (Captain Beaufort, p. 255). This town was the birth-place of Chrysippus, and of the poets Philemon and Aratus (Strabo, p. 671, *d*). Tarsus, antiently one of the most celebrated cities in Asia Minor, still bears a respectable rank: its modern name is Tersoos. Tarsus was the birth-place of the Apostle Paul, and a school for the study of philosophy and the arts. According to Strabo (p. 673, *d*), it was a superior school to Athens and Alexandria.

Tarsus stood in a plain on the banks of the Cydnus, now called the Tersoos river. The water of the Cydnus, as of the other rivers along this coast which carry down the melted snow from the ridges of Taurus, is extremely cold: injudicious bathing in it proved fatal to Frederick Barbarossa, and nearly so to Alexander the Great. The Cydnus has undergone a great change from the deposits carried down from the mountains: formerly it received large ships of war; now none but the smallest boats can enter it (Capt. Beaufort, p. 265). Issus is situated in the extreme eastern part of the plain of Cilicia, at the head of the Issic gulf, called the gulf of Scanderoon: here Alexander defeated Darius, B.C. 333. The river Pyramus (the modern Jyhoon), between Tarsus and the plain of Issus, has brought down such a quantity of sand and earth, that the river has been diverted twenty-three miles from its antient course (Captain Beaufort, p. 275): in Strabo's time the Pyramus entered the sea a little to the east of Cape Megarsus (Karadash); now the mouth is not much west of Ægææ (Ayas). Strabo (book xii., p. 536, *a*) says that it passes under ground for a great distance, and bursts forth again through a cleft of Mount Taurus: he was well aware of the immense deposits which were brought down by the stream.

The origin of the Cilicians is uncertain: they were probably a Phœnician colony (Herod. vii. 91). Their character in historical periods did not stand very high; and in this respect they were commonly classed with the Cappadocians. They were the only nation within the Halys, except the Lycians, whom Crœsus did not reduce (Herod. i. 28). Our earliest information represents them as governed by kings; and when Cilicia became one of the Persian satrapies, it evidently continued to be governed by native kings, subject of course to the Persian empire. The name of one of the Cilician kings, Syennesis, is familiar to the reader of Xenophon's 'Anabasis' (i. 2), and he was not the first of his name. Herodotus (i. 74) mentions one as contemporary with Alyattes; and Æschylus (*Pers.* 326, Dindorf) has immortalized the bravery of another, who joined Xerxes in his expedition against Greece.

Cilicia became a Macedonian province on the downfall of the Persian empire; Seleucus and his descendants, after the death of Alexander, held the sovereignty till Pompey reduced the level country to a Roman province. Cicero was proconsul of Cilicia A.U.C. 702; and for his success against those who had fortified themselves in the mountains, and had held out against his predecessor Appius Claudius Pulcher, he was rewarded on his return with a triumph. Till the reign of Vespasian, mountainous Cilicia appears to have been governed by kings who were appointed by the Romans, but after that time it became a province. (Strabo, xiv., pp. 668—676, Casaub.; and Beaufort's *Karamania*.)

CILI'FERA. [MICROZOARIA.]

CILIO'GRADA, an order of *Acalephans* instituted by De Blainville, and comprising the *Ctenophoræ* of Eschscholtz. The following is De Blainville's definition in his 'Actinologie,' where he admits that the distribution of the species of one of the genera (*Beröe*) adopted by him in the article 'Zoophytes' in the 'Dictionnaire des Sciences Naturelles,' according to the number of ambulacra, depended upon an erroneous observation, and consequently prefers that given by Eschscholtz, founded on the disposition of the *cilia*, at the same time considering Eschscholtz's genera *Pandora* and *Medea* in no other light than as simple divisions of the species.

Body gelatinous, very contractile, free, diversiform, evidently binary or bilateral, sometimes appearing subradiated, provided with a kind of straight ambulacra, formed by the approximation of two series of vibratory cilia.

Intestinal canal complete, or provided with two orifices, a mouth and a vent.

Before we proceed further, it will be necessary to inquire into the nature of the cilia above mentioned, with which, or, at least, with locomotive organs closely resembling them, many of the *Medusæ* are provided, though with certain modifications. Eschscholtz describes these cilia as pectinated or comb-like organs, arranged in longitudinal rows on the external surface of the body with their flat surfaces in contact. Each is made up of many small, flattened, pointed filaments, united by a common base, the points being directed towards the posterior extremity of the body. They are endowed with a motion not unlike the fins of fishes, and are slowly raised but suddenly struck back, whereby the body is carried through the water. In *Beröe* and its congeners the cilia are directed towards the closed extremity of the body, so that the opposite or open end is carried forward. The Ciliograde appears to have the power of enforcing a partial or total action of these organs at pleasure, so as to enjoy other motions besides that of direct progression. When separated from the body with a piece of the skin the cilia continue to move, as is observed in the article Beröe. Under each of the rows runs a longitudinal vessel, which communicates with the rest of the vascular system, and contains a fluid, in which there are yellowish particles. Eschscholtz looks upon these as arteries, and regards the cilia as respiratory organs in addition to their locomotive functions; Schweigger compares the vessels to the canals communicating with the tubular feet of *Echinus* and *Asterias;* and Dr. Grant inclines to think that the motion of the cilia, whose filaments he conjectures to be tubular, is due to their alternate fulness or emptiness of fluid derived from the longitudinal vessel, like the tubular feet of the *Echinodermata*. Whereupon Dr. Sharpey well remarks,

This view of their mode of action, however, is scarcely reconcilable with the observed phenomena. Audouin believed that in the *Idya*, a genus nearly allied to the *Beröe*, the fluid of the longitudinal vessel, which he supposes to be water, is sent into the cilia; he therefore regarded them as respiratory organs. If the vessel under the cilia in this case, as in the *Beröe*, communicate with the rest of the vascular system, and its contained fluid be regarded as blood, then the cilia of the *Idya*, which, according to Audouin, are permeated by the fluid, would bear a certain analogy to the gills of fishes.' But our limits do not permit us to pursue this part of the subject farther, and we must therefore refer the student to the lately published and elaborate works of Professor Purkinje and Dr. Valentin, and of Dr. Sharpey.

De Blainville, who acknowledges that he has never studied the *Ciliograda* in a living state, and that he only knows them from figures and descriptions, or at best from some specimens preserved in spirits of wine, which he owes to MM. Quoy and Gaimard, says that, nevertheless, he has no doubt that they ought to be withdrawn from the class *Arachnodermaires*, wherein they have hitherto been placed by all zoologists. He observes that he cannot venture to assert whether they ought to pass to the type of the *Malacozoaria*, or whether they ought not to remain near the *Holothuriæ*, and adds that it is a subject of research which can only be terminated by investigation in the living subject

De Blainville goes farther:—'A sufficiently great number of persons,' he remarks, 'have spoken of the *Ciliograda*, but voyagers have been nearly salways the persons who have observed them—in a living state, it is true—but incompletely. I do not know even one zoologist who has published 'quelque chose d'un peu rationnel' upon their organization. What we know is limited to some details as to their mode of locomotion. Thus, we learn from those who have seen them in the sea, that the *Ciliograda* are gelatinous transparent animals, continually agitating the cilia with which their very contractile body is provided, organs which possess the phosphorescent faculty in the highest degree. They float thus continually free, and swimming in the waters of the sea at sufficiently great distances from the banks. For the rest, we are ignorant of the nature of their food, of the mode of their generation, and other circumstances of their manners and habits.' The work wherein this passage appears was published in 1834, and though we by no means would have it understood that there is not still a great deal to be done before the whole of the organization of the *Ciliograda* can be satisfactorily elucidated, we cannot agree with M. de Blainville's assertion of the entire state of ignorance which he would have us believe, prevails on the subject. In addition to the interesting labours of other observers, some of whom we have already mentioned, Fabricius had detected minute crustaceans in the digestive organs of *Beröe*, and thus furnished a key to the nature of the nourishment of that genus; and an abstract of Dr. Grant's paper 'On the Nervous System of *Beröe Pileus*' was published in the 'Proceedings of the Zoological Society of London' early in 1833.

Geographical Distribution.—M. de Blainville says that *Ciliograda* exist in all the seas; but that it seems to him that they are most abundant in those of the north, perhaps, he adds, because they have been neglected.

SYSTEMATIC ARRANGEMENT.

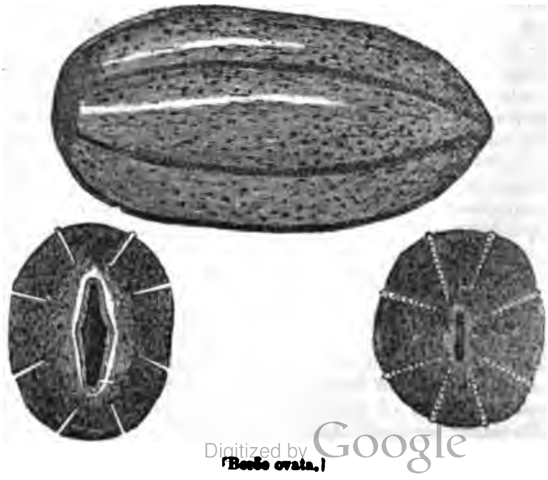
De Blainville, whose amended arrangement we take, observes that systematists have hitherto agreed to imitate Gmelin more or less on the subject of the place of the *Ciliograda* in the animal series, that is to say, in making them a genus approximating to the *Medusæ;* and he instances Lamarck, Cuvier, Latreille, and Oken, as not having expressed any doubts on the subject.

Genera. Beröe.

a.

Species whose cilia are smaller than the interstices which separate them (Genus Beröe of Eschscholtz).

Example, *Beröe ovata*. Those found by Browne seldom exceeded three inches and a half in length, or two and a half in the largest transverse diameter. 'This beautiful creature,' says Browne, *Jamaica*, p. 384, 'is of an oval form, obtusely octangular, hollow, open at the larger extremity, transparent, and of a firm gelatinous consistence; it contracts and widens with great facility, but is always open and expanded when it swims or moves. The longitudinal radii are strongest at the crown or smaller extremity, where they rise from a very beautiful oblong star, and diminish gradually from thence to the margin: but each of them is furnished with a single series of short, delicate, slender appendixes or limbs [the cilia] that move with great celerity either the one way or the other, as the creature pleases to direct its flexions, and in a regular accelerated succession from the top to the margin. It is impossible to express the liveliness of the motions of those delicate organs, or the beautiful variety of colours that rise from them while they play to and fro in the rays of the sun; nor is it more easy to express the speed and regularity with which the motions succeed each other from the one end of the rays to the other.' Dr. Browne frequently met with these animals to the north of the western islands (West Indies).



[Beröe ovata.]

β.

Species whose cilia are twice as long as the interstices. (Genus *Medea*, Eschscholtz.)

Example. *Beröe rufescens*

γ.

Species whose cilia are situated in two ambulacral ridges. (Genus *Pandora*, Eschscholtz.)

Example. *Beröe Flemingii.*

Cydippe.

Body regular, free, gelatinous, divided into eight sections, more or less distinct, by as many double longitudinal rows of vibratory cilia. An internal cavity, with a large buccal (?) aperture, whence issue, and are prolonged more or less below, a pair of long appendages, which are retractile, and also furnished with vibratory cilia.

Example. *Cydippe pileus, Medusa pileus*, Gmelin; *Beröe pileus*, Lamarck; *Pleurobrachia*, Fleming; *Eucharis*, Péron, who really established the genus; but Eschscholtz having transferred the last name to a genus of Ciliobranchians, De Blainville prefers following him, to avoid greater confusion. [BEROË, vol. iv., p. 317.]

Callianira.

See the article, vol. vi., p. 163.

Mnemia.

Body smooth, oval, elongated vertically, very much compressed on one side, and as if lobated on the other. Buccal opening between the prolongation of the sides: conical appendages on which the rows of vibratory cilia are ranged.

Example. *Mnemia heteroptera, Callianyra heteroptera* of Chamisso, thus described by MM. de Chamisso and Eisenhardt:—Body hyaline, cylindrico-tubular, dilated at one extremity, with a transverse mouth, into which it was impossible to penetrate. A large cestoid wing on each side, with vibratory cilia on its edges; six intermediate smaller wings, of which the four inferior (buccal) are lanceolated, ciliated on the edges, and attached to the base of the body; two superior cestoid wings uniting themselves to the two large lateral ones, which Péron, according to the describers, erroneously regarded as branchiæ. It is suggested that the two pairs of appendages of the mouth may be the analogues of the buccal appendages of the Lamellibranchiate Malacozoairians; — the two double bands on each side their branchiæ;—and then the question arises whether the Ciliograda might not be placed under this type and form, a particular class, but little removed from the *Biphores* [SALPACEA], and forming a passage still more marked towards the Actinozoairians. The cilia, which have some analogy with those on the edge of the mantle of the Lamellibranchians, are said to be only coloured by the decomposition of light between their borders.

Calymma.

See the article, vol. vi., p. 173.

Axiotima.

Body a little elevated, a little compressed, or subcircular, prolonged to the right and left into a sort of appendages, bearing the series of cilia towards their terminal half only, and up to their end. Mouth small, entirely deprived of labial appendages.

Example. *Axiotima Gaïdis*, Eschscholtz. Locality, South Seas, near the equator.

Eucharis (Eschscholtz).

Body oval, sufficiently elevated, slightly compressed, or subcircular, covered with papillæ, with the ambulacra of natatory cilia extended from the summit to the base. Mouth small, provided with two rather long pairs of appendages.

Example. *Eucharis Tiedmanni*, Eschscholtz. Locality, seas of Japan. This name had been employed, as we have seen, by Péron, to distinguish another genus of Ciliograda, and should not have been transferred: for in all such cases confusion must be the consequence. The student must now remember that the *Eucharis* of Péron and that of Eschscholtz represent two different generic forms.

Ocyröe.

Body gelatinous, transparent, vertical, cylindrical, provided above with two lateral musculo-membranous, bifid, thick, wide lobes, and with two fleshy ciliated rib-like elevations, with two other ciliated ribs upon the edges between the lobes: aperture provided with four ciliated arms.

Example. *Ocyröe crystallina*, Rang, who founded the genus. De Blainville thinks that it bears much resemblance to the last species of *Callianira*—*Callianira hexagona ?*

Alcynöe.

Body gelatinous, transparent, vertical, cylindrical, with eight ciliated ribs, hidden in part under the vertical natatory lobes. Aperture provided with four ciliated appendages.

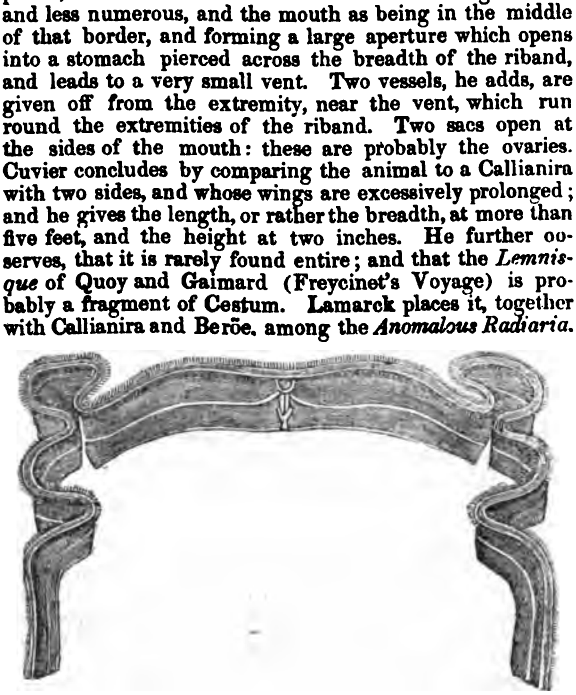
Example. *Alcynöe vermiculata*, Rang, who established the genus. Locality, coasts of Brazil.

Cestum.

Body gelatinous, free, regular, very short, but extended or prolonged on each side into a long riband-like appendage, bordered on each angle with a series of vibratory cilia, thus forming four ambulacra, two on each side. Mouth inferior and mesial, accompanied by a pair of long, ciliferous, retractile and simple appendages.

Example. *Cestum Veneris*, Lesueur.

Upon this singular genus De Blainville remarks, that it was established by Lesueur from an animal living in the Mediterranean Sea, and that he only knows it from the figure and description given by the author, unfortunately from an individual the extremities of whose lateral prolongations were truncated, and which nevertheless was a metre and a half wide. It is, adds De Blainville, evidently a very singular animal, but which may be doubtless considered as a very short Beröe with eight rows of cilia, pinched and drawn out as it were into an enormous riband of little thickness, and bearing upon each angle its ambulacra of cilia. In fact, it would appear, he continues, that the intestinal cavity, which is very short on account of the brevity of the body, is plunged laterally into the appendages; so that it must be believed that the opposite aperture escaped the notice of M. Lesueur, and that it is exactly opposed to the mouth, as in the true Beröes. He further states, that M. Martens had observed a complete individual though of small size, and that M. Martens was positively sure that it is nothing but a true Beröe. This, M. de Blainville says, M. Martens told him when at Paris with the officers of the Russian expedition round the world; and he adds, that, unfortunately, the premature death of that naturalist has left room for fearing that we may be long without the reasons on which he grounded his views. Cuvier, who places the genus among the simple Acalephans, describes the lower band of cilia as being smaller and less numerous, and the mouth as being in the middle of that border, and forming a large aperture which opens into a stomach pierced across the breadth of the riband, and leads to a very small vent. Two vessels, he adds, are given off from the extremity, near the vent, which run round the extremities of the riband. Two sacs open at the sides of the mouth: these are probably the ovaries. Cuvier concludes by comparing the animal to a Callianira with two sides, and whose wings are excessively prolonged; and he gives the length, or rather the breadth, at more than five feet, and the height at two inches. He further observes, that it is rarely found entire; and that the *Lemnisque* of Quoy and Gaimard (Freycinet's Voyage) is probably a fragment of Cestum. Lamarck places it, together with Callianira and Beröe, among the *Anomalous Radiaria.*



[Cestum Veneris.]

CIMABUE, GIOVANNI, was born at Florence, in the year 1240, of a noble family. During his youth he was sent by his father to study letters at the convent of Santa Maria Novella. When some Greek artists came to ornament the convent church with paintings, he abandoned studies to which he was little inclined, and devoted his attention to watching them; and he was ultimately permitted to assist them. Having acquired more knowledge than his instructors possessed, he became noted as one of the best painters of the day, and executed many works for religious persons and communities. His fame having spread abroad, he was invited to adorn the church of St. Francis at Assisi. He painted part of the walls in concert with certain Greek painters; but having far surpassed his assistants, his courage and ambition increased, and he went on with the work alone. He was recalled to Florence by private affairs, and obliged to leave his work uncompleted. It was afterwards finished by Giotto. After his return to Florence, among other pictures he painted a Madonna for the church of Santa Maria Novella, which was of a size so unusual at that time, and was considered so novel and splendid, that it was carried to the church in procession; and according to the tradition, when Charles of Anjou visited the church, multitudes who had not yet obtained a sight of the picture accompanied him with such rejoicing and festivity, that the street was afterwards called Borgo Allegri—literally, 'Merry Borough. Cimabue was engaged as an architect, in conjunction with Arnolfo Lapi, to build the church of Santa Maria del Fiore; but he died shortly after, in the year 1300.

Previously to the time of Cimabue, painting had sunk to a merely mechanical occupation, and was chiefly in the hands of Greeks, who worked after certain fixed patterns, each blindly copying his predecessor. Cimabue's right to be considered as the restorer of the art has been warmly urged, and as warmly contested. It appears probable that a reaction had taken place, and that contemporary or even preceding artists had shown an inclination to abandon the mechanical dryness of the modern Greek artificers, when Cimabue took up the profession. The ardour of his disposition however, and perhaps his rank in society, induced him to venture upon the most notable deviations from the cramped style of the period; and the revival of the art would probably have been delayed some time longer, had it not been for the impulse which it received through him. He put some life into the heads and into the action of his figures, abandoning the cold straight lines of his Greek instructors. He is supposed to have been the first to recur, after a long interval, to the study of nature, and to have drawn from the living model, though but sparingly. Nor is it the least debt which painting owes to Cimabue, that he discovered and fostered the genius of Giotto.

He worked in fresco and distemper, oil painting being a later discovery. Some of his works still exist; the principal are in the church of Santa Maria Novella at Florence, and that of St. Francis at Assisi. (Vasari; Lanzi.)

CIMARO'SA, DOMENI'CO, one of the most celebrated composers of the Italian theatre, was born at Naples in 1754. To Aprile he was indebted for his first instructions in music, but he completed his studies under Durante, at the Conservatorio of Loretto. His general education was also of a superior kind, and he was not only esteemed for his professional ability, but for his well-informed mind and amiable temper. The first work that made him known was 'L'Italiana in Londra,' performed in 1779. But it is 'Il Matrimonio Segreto' which will transmit his name to posterity; for it must be acknowledged, that of his thirty operas, most of which were in their day the admiration of all amateurs, the last mentioned is the only one now ever performed, or likely to be again heard. When this was brought out at Vienna, it so delighted the emperor, Joseph II., that at its conclusion he invited the singers and band to a supper, then sent them back to the theatre, and the whole piece was repeated; the only instance on record of the *encore* of an entire opera. In 1787 Cimarosa was invited by the Empress Catherine to St. Petersburg, where he produced three operas. He returned to Naples, and having shown no little partiality for the French during their occupation of that city, very narrowly escaped the sanguinary proscription which disgraced the restoration of the old royal family. He died at Venice in 1801.

Cimarosa excelled most in comic opera, but his 'Orazi e Curiazi' proves that he could compose well in a different style. He is the link which unites the old and modern schools, his scores exhibiting an instrumentation much stronger than that of Paisiello, though inferior in vigour and richness to that of Mozart. The latter was, by many composers of his day, censured for the fulness of his accompaniments. Grétry, when asked by Napoleon the difference between Cimarosa and Mozart, replied, 'Cimarosa, Sire, placed the statue on the stage and the pedestal in the orchestra, but Mozart put the statue in the orchestra and the pedestal on the stage.'

CIMBEX, a genus of Hymenopterous insects of the section *Terebrantia*, sub-section *Securifera*, and family *Tenthredinidæ*.

The genus Cimbex, as it formerly stood, has been subdivided (principally by Dr. Leach) into the following subgenera: *Cimbex*, *Perga*, *Syzygonia*, *Trichiosoma*, *Clavellaria*, *Zarea*, *Abia*, and *Amasis*. All these subgenera have the antennæ short, and terminated by thickened joints, which are nearly of an oval form; the third joint of the antennæ is long, forming a knob: the superior wings have two marginal and three sub-marginal cells.

The antennæ of these insects generally present six distinct joints, of which the two basal joints are very short, and almost concealed by the hair on the head; the third is long, the fourth and fifth are of moderate length, and the sixth is elongate (or moderate), rounded at the apex, and tapers more or less towards the base; this last joint is, however, evidently composed of two or three joints consolidated. All the joints of the tarsi have a membranous pad attached to their under side, and protruding from their apex.

The genus Cimbex, as now restricted, may be known by the following characters: body slightly hairy; abdomen with the basal segment emarginate above (that is, it appears as if a semicircular piece had been removed); the space thus left unprotected by the horny covering filled up with a membrane.* Thighs of the four posterior legs of the males very thick, those of the females moderate. Tarsi of the males with a tooth-like projection on the under side of the basal segment.

This genus includes the largest species of the family Tenthredinidæ.

Cimbex Griffinii is about an inch in length, and when the wings are expanded its width is about one inch and three quarters. It is of a reddish-brown colour; the abdomen is yellow, and more or less clouded with brown towards the base; the antennæ and tarsi are yellow, the former is brighter towards the apex.

The larva, we have been informed, feeds upon the sallow, and is not uncommon in the neighbourhood of Cambridge. Mr. Stephens enumerates eight British species of this genus, some of which, however, it is thought, will eventually prove to be mere varieties.

CIMBRI, or KIMBRI, the name given by the Roman and Greek historians to a vast multitude of people who came from the northern parts of Germany at the same time as the Teutones, crossed the Rhine, and entered Gaul, where they joined the Ambrones, a Celtic tribe, and, after ravaging and plundering part of Gaul, went into Spain, where they were repulsed by the Celtiberi. (Livy, *Epitome* lxvii.) The Teutones and Ambrones then made an irruption into Italy, where they were defeated by Marius, 102 B.C. Part of the Cimbri, however, had gone into Helvetia, where they were joined by the Tigurini, an Helvetian tribe, with whom they crossed the Pennine Alps, and, after defeating the pro-consul Catulus, entered the plains of Lombardy, where they were defeated by Marius in the year after the Teutones and the Ambrones, 101 B.C. From that time little or no mention is made of the Cimbri in history, but tradition says that the remnant of them settled in the central valleys of Helvetia, and the inhabitants of the Waldstätten and of the Bernese Oberland are supposed to be their descendants. Old Scandinavian words are traced in the dialect of these mountaineers. Of the original residence of the Cimbri we know nothing certain. Strabo (vii. 291—4) places them north of the Elbe beyond the Chauci, and numbers them among the German tribes. Pomponius Mela (iii. 3) places the Cimbri and Teutones in the islands of the Baltic Sea. Pliny speaks of the promontory of the Cimbri; and the peninsula of Jutland has been called Chersonesus Cimbrica, without however it being proved that the Cimbri ever inhabited it. It is probable that the Cimbri who invaded Italy were composed of mixed tribes, both Teutonic and Celtic, for in their war with Marius, the description of their arms, and the name of their chief Bojorix, appear to designate them as Celtæ. (Mannert, *Geographie der Griechen und Römer*.)

CIMEX. [CIMICIDÆ.]

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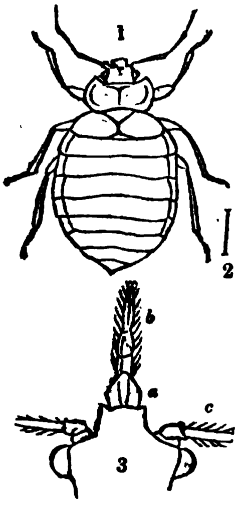
* This structure is very remarkable, and is evidently to allow of a free movement of the abdomen in an upward direction.

CIMI'CIDÆ, a family of Hemipterous insects, the species of which may be distinguished by their having the rostrum short, and consisting of two or three joints only; the labrum also short, and without striæ; the eyes are moderate; the body is generally very much depressed. The principal genera are *Cimex*, *Aneurus*, *Aradus*, *Agramma*, *Tingis*, and *Dictyonota*, all of which are found in England. The genus *Cimex* is distinguished principally by the extreme slenderness of the two terminal joints of the antennæ, which are not thicker than a hair. The body is very much depressed: the thorax is transverse; antennæ four-jointed; basal joint very short, second long, the third of about equal length, the fourth rather shorter. Labrum rather long, somewhat pointed, and, when the proboscis is not in use, recurved under the head; proboscis three-jointed, and, when at rest, lies along the under side of the thorax, its apex being between the two fore-legs at their base.

There are said to be two or three species of this genus. We have however never had an opportunity of examining any but the common bug (*Cimex lectularius*), of which an account is given under the head BUG. We have here added an outline-drawing to show its structure; for although it is *too* common an insect, it is seldom examined except by the entomologist.



1, common bug (*Cimex lectularius*) magnified; 2, natural length of do.; 3, head of do. highly magnified; *a*, the labrum; *b*, the proboscis; *c*, base of the antennæ.

CIMOLITE, a hydrous silicate of alumina found in the island of Cimola. It occurs in amorphous earthy masses, the structure of which is rather slaty. Colour greyish-white. Fracture earthy, uneven. It is soft and opaque, and its specific gravity is 2·0.

It is used for the same purposes as fullers' earth.

CIMON (**Κίμων**), the name of two Athenians, one the father (Herod. vi. 34) and the other the son of Miltiades. The memory of the elder Cimon rests almost entirely on the fame of his son; scarcely any thing is known of him except that he was remarkably stupid. Cimon, the son of Miltiades and Hegesipyle, was born about 502 B.C. Miltiades died in prison, and Cimon had to pay the fine which had been imposed on his father. Without the aid of the opulent Callias, who is said to have assisted him, fifty talents would probably have made a large and inconvenient inroad on his patrimony (Herod. vi. 136). The anecdotes which remain of Cimon's early youth are not creditable either to his morals or to his intellect. The worst excesses are laid to his charge. Although little confidence can be given to the details of these numerous reports, so much seems to be clear, that he did not do as others of his rank did, or as it was expected that the son of Miltiades would do. He even neglected what in Athens were usually deemed the essential branches of a liberal education. On the other hand, the stupidity which is ascribed to him at this period, and the reputation for which fixed on him his grandfather's nickname Coalemus (ὁ κοάλεμος, 'the idiot'), was probably nothing more than a natural reserve, combined with a certain inaptitude to social vivacity or oratorical display, which however may not have at all disqualified him for the services of active life. He seems to have excelled rather in doing, than in talking about doing. Aristides almost alone discerned in him the elements of a great character; and it is probably to his fostering charge and counsels that the glorious results which were afterwards developed are partly due.

Cimon's entrance into public life may be placed at the conquest of Eion, on the Strymon, B.C. 476. This town, which was very important to the Persians, was desperately defended by the garrison under the command of Boges, who at last, rather than surrender, raised a huge pile, placed on it his wife and children, and servants, and all his treasures, and after thowing his gold and silver into the Strymon, cast himself into the flames. (Herod. vii. 107; Thucyd. i. 98.) Cimon's next victory was at the island of Scyros, which he seized under the pretence that it had been guilty of piracy which called for punishment. He planted a colony of Athenians, and divided the land amongst them. (Thucyd. i. 98.) But Cimon's most important victory was at the Eurymedon in Pamphylia, B.C. 466, where he sunk or took 200 Persian ships, and carried away prodigious booty from their tents on the banks of the river. A squadron of Phœnician ships which was coming to the aid of the Persians was met by Cimon, and wholly destroyed. The Persians were still in possession of the coast of Thrace. That Cimon should feel peculiar interest in wresting those possessions from their power is easy to be explained: Olorus, the father of Hegesipyle, had been king of Thrace. (Herod. vi. 39.) Accordingly he sailed with a small force and dislodged them from his patrimony, and from a large extent of adjoining country. Twice he led a force to assist the Lacedæmonians, B.C. 464 and 461, at the siege of Ithome. The insulting manner in which the services of the Athenians were rejected by the Lacedæmonians (Thucyd. i. 101, 2) on the latter occasion, seems to have put the people in ill humour with all the friends of Sparta; and this may have had some effect in bringing about Cimon's exile. Towards the end of the same year (B.C. 461) in which they returned from Ithome, Cimon was banished for ten years by ostracism. (Clinton, *Fast. Hel.*, vol. i., p. 48.) In the year B.C. 457 there was a battle between the Lacedæmonians and Athenians, at Tanagra in Bœotia. Cimon presented himself to fight on the side of the Athenians, and took his stand among those of his own tribe. The council of 500 were consulted, and he was not allowed to remain: he left the army beseeching his friends to act like brave men, and to prove their attachment to their country by their deeds. The Athenians however were signally worsted; and this, with other defeats which they suffered during the exile of Cimon, seems to have led them to wish for his return. In the fifth year of his banishment he was recalled by a decree, of which Pericles himself was the mover. A five years' truce between the Athenians and Lacedæmonians was concluded through the intervention of Cimon B.C. 450. In the following year, 449, he was appointed to the command of a fleet of 200 vessels, which sailed to assist the Egyptian king Amyrtæus. He sent on a squadron of sixty galleys to the aid of Amyrtæus, and with the rest besieged Citium in Cyprus. Here he died, either from illness or from a wound. Just before he died he forbade his men to report his death until they arrived at Athens; and Plutarch preserves the remark of Phanodemus, that the army was as it were conducted by Cimon thirty days after he was dead. Though the Athenians were forced by want of provisions to raise the siege of Citium, they did not return home without a victory: they met with a fleet of Phœnician and Cilician ships near Salamis in Cyprus, and completely defeated them. They afterwards defeated a force on shore.

The slender private fortune to which Cimon succeeded had been considerably augmented by his Persian victories, and especially by the recovery of his patrimonial estates in Thrace. He did not use his acquisitions for personal aggrandizement: his munificence was not only fully equal to his means, but was in many respects judiciously dispensed: he preferred hospitality to luxury, and would rather provide a frugal entertainment for many, than a sumptuous banquet for a few. Many of the splendid improvements which he made in Athens were effected at his own cost. The walls from the city to the harbours of Piræus and Phalerum were commenced, and in great part executed at Cimon's expense. He changed the Academy from a barren uncultivated field to a shady and pleasant grove, and planted the Agora with plane trees. It is probable that his taste in these public decorations was improved by his acquaintance with the painter Polygnotus.

The great object of the policy of Cimon was unceasing war with the Persians, and, in order to prosecute this the more effectually, he strove to maintain the unity of the Greeks. Himself of noble birth, he naturally belonged to the aristocratical party, and was anxious to preserve the old institutions of his country, which time and usage had rendered sacred. He desired to see Sparta independent, an ally, or even a rival, rather than a subject of Athens; and this circumstance exposed him to many odious charges, which, however groundless and often refuted, probably exerted an influence on the estimation in which he was held. While Cimon was engaged in continual expeditions, and was nearly five years in exile, a line of politics, altogether different from his, came into vogue under the auspices of Pericles [PERICLES], who must be considered as Cimon's successor on the political stage. (Plutarch, Nepos, *Life of Cimon*; Thirlwall's *Greece*, vol. iii., pp. 1—36; Heeren's *Pol. Hist. of Greece*, p. 223, *Eng. transl.*)

CI'NCHONA, a genus of monopetalous exogens, the different species of which have a great reputation in medicine. It constitutes the type of a natural order of the same name, and is distinguished by the following characters. Tube of the calyx top-shaped, with a permanent five-cleft limb. Corolla with a taper tube, and a five-parted limb, which is valvate in æstivation. Filaments short, inserted into the middle of the tube; within which the linear anthers are altogether enclosed. Stigma two-cleft, a little clavate. Capsule ovate or oblong, slightly marked on each side by a furrow, two-celled, crowned by the calyx, dividing through its dissepiments into two halves. Placenta long. Seeds numerous, erect, imbricated upwards, compressed, with a broad membranous winged border; albumen fleshy. Trees or shrubs with a bitter aromatic astringent bark. Leaves on short stalks, with flat edges. Stipules ovate or oblong, leafy, separate, deciduous. Flowers in terminal panicled corymbs, white, or of a rosy-purple colour.

By whom the important properties of the various species of this genus were first made known to Europeans is unrecorded; for it is not worth repeating the fables that have been invented upon the subject. The native Peruvians, who call the trees Kina, or Kinken, attach no febrifugal importance to the bark, but are said even to have a prejudice against its employment. Its introduction to Europe took place through the Spaniards in the year 1640, and it is pretended that a certain countess Chinchon, vice-queen of Peru, having experienced the good effects of the bark as a febrifuge, it gained the name of Pulvis Comitissæ, and under that name, or as Pulvis Jesuiticus, was vended by the Jesuits, who derived a considerable part of their wealth from its trade. Humboldt regards a tradition still current in Loxa as a more probable explanation of the discovery of the properties of Cinchona. It is said that the Jesuit missionaries there had endeavoured, according to the custom of the country, to distinguish the different kinds of trees by chewing their bark, and that this had led them to observe the remarkable bitterness of Cinchona. Those who were medical among them were thus led to try an infusion of the bark in tertian agues, which are very common at Loxa, and thus the discovery of its power was made. Little was known of the tree producing this substance till the voyage of La Condamine, who, in 1738, first printed a detailed account of Quinquina, as it was then called. Since that time the attention of botanists has been constantly directed to the subject, and a good deal of information has, upon the whole, been collected; the general facts connected with the habitation, geographical range, modes of preparation, and botanical distinctions of the species, have been ably stated by Humboldt, Ruiz and Pavon, Fée, De Candolle, Lambert, and Pöppig, and will form the basis of the succeeding short account; but in all the minor details regarding the barks themselves, and the species that furnish them, Europeans are still much in the dark.

To this genus botanists have from time to time referred plants which upon a more careful examination have been ascertained not to belong to it; West Indian, Brazilian, and even East Indian Cinchonas, thus have found a place in books, but they are really referable to other genera. Circumscribed within the limits of the preceding character, Cinchona will be found a mountainous genus confined to the Cordilleras, between La Paz, in about 22° S. lat., and Santa Martha, near 10° N. lat.; a line having these northern and southern limits, and bounded by the most eastern part of the Cordilleras on the one hand, and the Pacific on the other, will very nearly define the corner of the globe inhabited by true Cinchonas. Within these limits they occur on the plains, but chiefly on mountain sides as far as 10,000 feet of elevation above the sea, the principal zone being at from 1800 to 6600 feet of elevation. In these places the mean temperature is estimated by Humboldt at from 17° centigrade, or 62·6° Fahrenheit, to 12° centigrade, or 53·6° Fahrenheit.

The manner of collecting the Huanuco bark of commerce is thus described by Pöppig (*Companion to the Botanical Magazine*, vol. i., p. 249). 'In the month of April the preparations for an expedition commence; and in May the people start for the forest, whence the last green bales are transmitted home in November. They fell the trees close to the root, sparing those trunks which appear too young (*palos verdes*), as, till they have attained maturity, the bark is of no value. The next process is to divide (trozar) the stems into pieces of uniform length, rejecting only the very smallest branches. With a peculiar kind of knife, made for the purpose, the bark is cut lengthwise, and a certain degree of practice is necessary to perform this operation properly, so as to remove the rind without injuring the wood or severing any of the fibres. With the same instrument they take off the stripes (longos) of the bark as broad as possible; but this, however, is not done for three or four days after the tree is felled, as before that time the moisture that exists between the cuticle and the wood would prevent the bark from severing into such large pieces as fetch the highest price. A worse consequence ensues from stripping the stems too quickly, as then the thin grey or blackish epidermis shivers off; and from the presence of this outward rind, covered with many cryptogamæ, the value of the bark, in the European market, is mainly estimated. The English purchasers in particular hold the notion that the bark is most powerful according as its epidermis is covered with spots.

'On the celerity with which the article is dried depends the price which it commands; but there are few instances where prejudice is so powerful as in the trade of the Cinchonas. In the dense forests it is impossible to perform this operation properly, and therefore the bundles of green bark are despatched with all speed to the nearest inhabited place, where the person appointed to take the charge of them is stationed. Without any preparation they are laid in a spot exposed to the full action of the sun, the greatest care being requisite to protect them from wet, as even a few hours' dew falling on the half-dried bark will give to the cinnamon-brown interior of the finest sort a blackish appearance, and lessen its value about one-half. The quickness of the drying, and the general excellence of the article, are indicated by the pieces being rolled up into several spiral windings, which form so solid a cylinder as to exhibit no cavity (canuto) within; but such portions are rarely seen unfractured in Europe. The Cinchona barks are no less sensible of atmospheric moisture than the Coca, which I formerly described, so that the collectors always hasten to send them to the dry climate of the Andes, or the principal towns. An unavoidable loss, however, hence accrues however perfectly the bark may have been dried in the woody region, it still loses, in three or four days after its arrival in Huanuco, twelve to fifteen per cent. on its weight. The packages are made up into bales of four or five arrobas each, and with the greatest possible care, in order that the beautiful canes of two feet long, into which the bark was coiled on the Montaña, may not be broken in the carriage. Trailing plants (bejucos) are used to tie up the bundles, and when they arrive in Lima they are undone, and sorted into lengths of different pieces, previously to despatching them in chests to Europe. The trade in Huanuco bark was very brisk twenty years ago at Lima, and the article went to the Spanish market under the name of *Cascarilla roza*, without being confounded with the *Cortex Chinæ ruber*, as it is called by us. The barks from the districts of the Lower Huallaga, of Huambo and Chachapoyas, &c., are, on the other hand, very little prized in Cadiz, and called *Cascarilla arollada*.'

Books and memoirs without end have been written to determine the different species of Cinchona that yield the barks of commerce, but with very little result. There are difficulties in the way of this which persons unacquainted with the bark trade can hardly estimate. For example the bark of the same species may be weak and valueless in warm lowland districts, and of the greatest price in alpine or mountainous regions. The bark of the low country about S. Jaen de Bracamorros has uniformly proved worthless, although the same species which grow there afford a fair bark at Mayobamba, Chacapryas and Lamas in the mountains; and others which at Maynas are perfectly inert, are energetic enough upon the sides of the mountains. It is related by Pöppig, that in ignorance of this, many speculating merchants have been ruined by the purchase of the bad lowland bark of Peru. The rule is, that the best bark always comes from mountain tops, from single trees growing in the coldest and most elevated spots. Some of the finest kinds are procured near the mountain villages of Cayambe and Pillao, and from the mountains of Panataguas and Pampayaco.

To pretend to reduce to their botanical species, in the existing state of knowledge of Cinchona barks, all the varieties that are known in shops or in commerce, would be a vain and hopeless task. Nothing can well be more startling than the discrepancies that exist upon the subject in books and collections; every collector, every writer, has his own set of specimens and opinions, and there is no possibility of reconciling them. There is not a chest of bark which, although called of one sort, has not probably been furnished by many different species; and there is much reason to believe that many of the best known sorts of barks of the shops are in reality furnished by the same species under different circumstances. Fée asserts that grey quinquina passes into yellow by shades that cannot be distinguished; that yellow approaches the red both in colour and flavour; and that nobody knows to this day with any certainty the origin of even the barks of Loxa, Lima, Huanuco, or Carthagena. Pöppig, who has so long lived in the Cinchona countries, seems to be of the same opinion, notwithstanding the details he has given respecting certain species—details of which we have availed ourselves in the following observations. In particular, with reference to this subject, to which a vast deal more importance is attached than it deserves, when speaking of the Huanuco bark of commerce, Pöppig's remarks are highly deserving of attention. He observes, that as to the various species of trees that produce bark, and the different quality of the article itself, much prejudice exists. Without cause one species is rejected, and another prized for its imaginary qualities; and the same species is unmeaningly divided by the bark-collectors into several, upon no known or intelligible principle. *Cinchona glandulifera* has three names, although scarcely the least trace even of varieties can be detected upon the closest botanical examination.

It is doubtful whether the species of any genus of plants are more variable in their appearance than those of Cinchona; and hence those who have been acquainted with them from dried specimens only, or who have not been aware of their tendency to vary, have multiplied the species far beyond their true number, and an inextricable confusion would have been the result in any genus less constantly before the eyes of the botanist. Thus the authors of the 'Flora Peruviana' in that work added thirteen supposed new species, and introduced many more into their Herbarium; Mutis, on the other hand, who had ample means of studying Cinchonas in New Grenada, declares that he was acquainted with seven only. Zea asserts that all the efficacious species of the 'Flora Peruviana' are reducible to four. Fée admits eighteen certain species; and De Candolle reduces the number to fifteen, although he introduces two species unknown to Fée. Humboldt states that he has himself seen *C. pubescens*, the yellow bark, with ovate-oblong, ovate-lanceolate, and ovate-cordate leaves on the same plant; he adds, that some species, such as *C. macrocarpa*, have either leaves entirely smooth or downy on each side, and that even *C. condaminea* has extremely different leaves, according to the elevation at which it grows. These statements alone are sufficient to show how much caution is required in distinguishing species in this genus; but to this it is necessary to add, that there is too much reason to suspect that the authors of the 'Flora Peruviana,' in creating spurious species, were influenced by a wish to please the Spanish court, by appearing to prove that the barks of Peru, from which the Spaniards exclusively derived so large a revenue, were altogether different from those of New Grenada, which other nations could easily procure direct from Carthagena. Humboldt adds, that mercantile cunning with reference to this subject was carried so far, that at the royal command a quantity of the best orange-coloured Cinchona bark from New Grenada, which Mutis had caused to be picked at the expense of the king, was burned, as a decidedly inefficacious remedy, at a time when all the Spanish field hospitals were in the greatest want of this indispensable product of South America. It should however be observed, that some of Ruiz and Pavon's species have been restored by a recent writer upon the authority of dried specimens; but it appears to us safer in such a case as this, to take the opinion of a man like Humboldt, who studied Cinchonas in their native forests, than that of a botanist who can be acquainted with them only from Herbaria.

In the following enumeration of the species, we take De Candolle as our guide in the systematic distinctions of the species, and Humboldt and Pöppig principally for the practical observations upon them. After every specific name, we have added the synonymous names that occur in books, for the information of those of our readers who may possess Materia Medica works whose nomenclature is different from that of De Candolle.

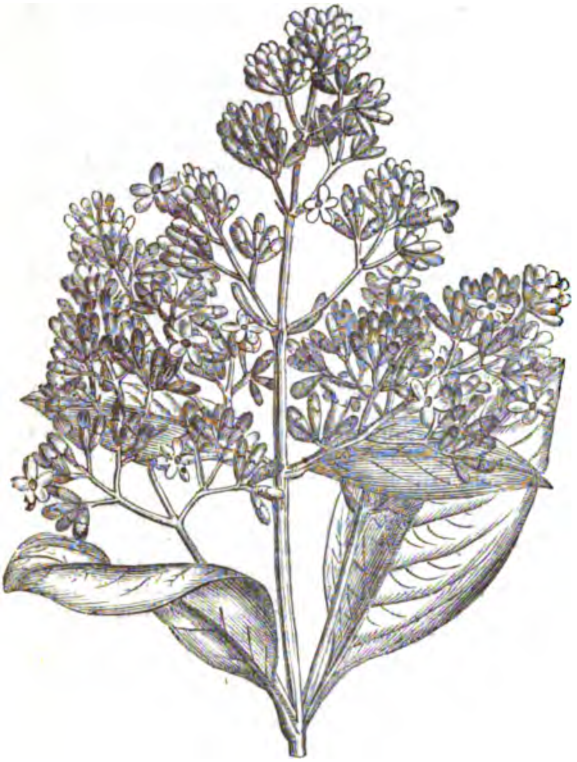
* *Corollas downy on the outside or silky.*

1. *C. Condaminea.* Leaves oblong, tapering to each end, smooth and shining, pitted on the under surface at the axils of the veins. Limb of the corolla woolly. Capsules ovate, twice as long as broad. (*Syn.* C. officinalis, L.) Humboldt states this to be the fine Uritucinga bark originally seen by La Condamine. It is one of the sorts imported in quantity to Europe, and is said to furnish the pale bark of the English apothecaries. It is readily known, notwithstanding the variable figure of its leaves, by their having at the axils of their veins on the under side little pits not bordered with hairs, and secreting a transparent, bitter fluid matter. Grows wild near Loxa, in the mountains of Cajanuma, Uritucinga, Boqueron, Villonaco and Monje. It also occurs near Guancabamba and Ayavaca in Peru. It is always found among micaceous schist, at elevations of from 5400 to 7200 feet; and, according to Humboldt, requires a milder climate than the *C. lancifolia* of Santa Fé. The temperature of the regions which it inhabits is about that of the Canary Islands.

[Cinchona Condaminea.]

2. *C. scrobiculata.* Leaves oval, acute at each end, smooth, shining on the upper side, pitted underneath at the axils of the veins. The tube of the corolla downy on the outside; its limb woolly. Capsule ovate-oblong, three

times as long as broad. This is distinguished from the last not only by the form of its leaves, which never taper to the point, but also by the pits at the under side of the leaves being bordered with inflected hairs; in *C. Condaminea* they are quite hairless. It is also allied to *C. rosea*, but that species has a smooth corolla and glandless leaves. In the quality of its bark, it is not distinguishable from *C. Condaminea*. Immense forests of this species exist in the province of S. Jaen de Bracamorros. It is the commonest of all the quinas in that part of Peru, and the most esteemed; in commerce it has the name of *Quina fina*.



[Cinchona scrobiculata.]

3. *C. lancifolia*. Leaves obovate-lanceolate, very smooth on each side, without glands; panicle large, brachiate; corolla silky on the outside; capsules oblong, smoothish, five times as long as broad. (*Syn.* C. nitida, R. and P.; officinalis, Ruiz; lanceolata, R. and P.; glabra, Ruiz; angustifolia, Ruiz.) Next to C. Condaminea this is accounted the most efficacious of all the species. It furnishes the orange-coloured bark, or the quina naranjanda of Santa Fé de Bogota, and is obviously different from the two former species, in its leaves being destitute of glands. Humboldt states that it prefers an inclement climate, on mountainous declivities, from 4000 to 9000 feet high, where the mean temperature is about that of Rome. In the Alpine forests of the upper limits of the zone inhabited by this species, the thermometer falls for hours as low as the freezing point. The plants are more rare than those of C. pubescens and magnifolia, always growing singly, and not increasing readily by the root. A kind of bark, bearing a high reputation at Cadiz, and called Calisaya, is referred to this species. It derives its name from the province where it grows, which is situated in the most southern part of Peru, in La Paz.

Another variety of this, according to Humboldt, a distinct species according to others, the Cinchona nitida of the 'Flora Peruviana,' is found only upon the coldest parts of the mountains of Peru, where it becomes a tree with a stem scarcely eight feet high. Its flowers are bright red, covered inside with a white down, and do not appear till May. Its bark, the Casc. hoja de Oliva, although of the finest quality, is never seen in commerce.

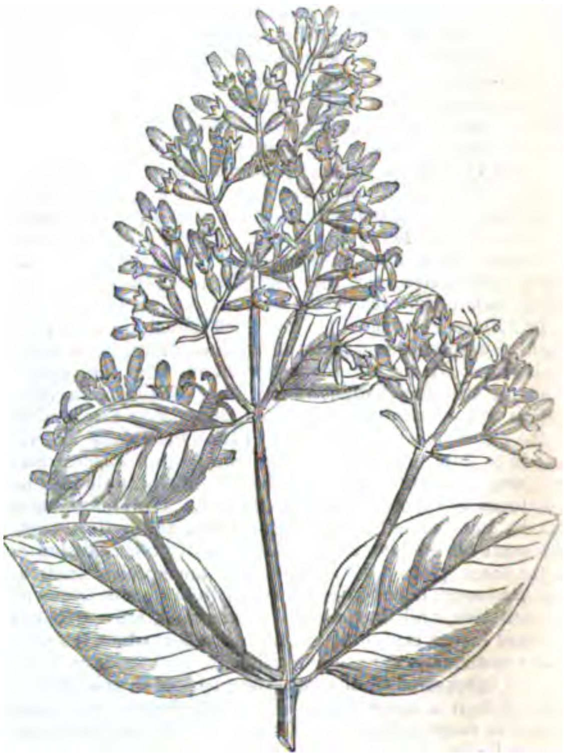
4. *C. pubescens*. Leaves ovate, very seldom subcordate, leathery, downy, or nearly smooth on the upper side, tomentose on the under side; panicle brachiate; corolla downy outside, the limb hairy inside; capsules ovate, oblong, ribbed externally, three times as long as broad. (*Syn.* C. cordifolia; ovata, R. and P.; pallescens, Ruiz; hirsuta, R. and P.) A most variable plant, yielding what is called yellow bark. It is found in the kingdom of New Grenada, in 4° N. lat., at heights between 5400 and 8650 feet; it has the name of *Quina amarilla*.

5. *C. purpurea*. Leaves broadly oval, somewhat wedge-shaped at the base, shortly cuspidate at the point, on the upper side smooth, on the under rather downy upon the principal veins; panicle large, brachiate; flowers somewhat corymbose; corolla slightly downy externally, its limb hairy inside; capsules cylindrical, becoming ovate-oblong, with longitudinal ribs, four times as long as broad. (*Syn.* C. morado.) A native of the Peruvian Andes, in the coldest and deepest part of the forests, about Chinchao, Pati, and elsewhere. It is also apparently one of the wild roots of Santa Fé de Bogota.

The very considerable size of the trees of this species, and its large membranous leaves, covered on the under side with prominent violet-coloured veins, are said by Pöppig to mark it readily. The bark, called *Casc. boba colorada*, is not in much esteem; but as it is readily collected, it can be sold at a low price, and is used for adulterating other sorts. According to Reichel, it is undoubtedly the Huamala bark of trade.

6. *C. macrocalyx*. Leaves ovate, roundish, hardly acute, quite smooth on both sides; their principal veins close together; panicles corymbose; corolla slightly downy externally, with the lobes hairy on the upper side; limb of the calyx smooth, bell-shaped, acutely five-toothed. A species distinguished by De Candolle by the above characters, but only known to him from specimens. It is found on the mountains of Peru: nothing is known of its sensible properties.

7. *C. Humboldtiana*. Leaves oval, rather obtuse, on the upper side shining, on the under between silky and downy; panicle brachiate, four-flowered; corolla silky on the outside, smooth in the throat, with its lobes shaggy inside at the point; capsules ovate, longitudinally ribbed, about twice as long as broad. (*Syn.* C. ovalifolia, Bonpl.) First described by Bonpland as identical with *C. ovalifolia* of the 'Flora Peruviana,' but afterwards recognized by him as distinct. It forms forests in the province of Cuenca, in Peru: in commerce it is called *Cascarilla peluda*, which signifies velvet-leaved quina. Its bark is not in much estimation; it is however a good deal collected for mixing with other sorts, and Bonpland suspects it to be of good quality



Cinchona Humboldtiana.]

8. *C. magnifolia*. Leaves broadly oval, somewhat acuminate, smooth; principal veins of the under side shaggy at the edges; panicle brachiate; corollas silky externally, capsules oblong, tapering, seven times as long as broad.

(*Syn.* C. lutescens, grandifolia, oblongifolia.) According to Ruiz, Humboldt, and De Candolle, the *C. oblongifolia* of Mutis which produces the red bark of Santa Fé, is identical with the *C. magnifolia*, or *Flor de Azahar* of the 'Flora Peruviana.' The former grows in 5° N. lat., at the height of from 3600 to 7800 feet above the sea, and is particularly common about Mariquita; the latter occurs in the hottest parts of the Andes of Peru, about 10° south of the line. *C. oblongifolia* of Santa Fé produces a bark which, although less efficacious than that of *C. Condaminea* and *lancifolia*, is nevertheless better than that of *C. pubescens*; but this is hardly reconcilable with Pöppig's statement, that the *C. magnifolia* has a woody, not very astringent bark, and is chiefly used for purposes of adulteration: he adds, that the bark-peelers do not even reckon it a fever bark, or *Cascarilla*, but name it simply *Corteza del Azahar*. This last-mentioned author describes the tree as very stately, with unusually large white flowers, diffusing a delicious odour like that of orange-blossoms; possibly the differences adverted to are the result of climate.

9. *C. macrocarpa.* Leaves elliptical, leathery, on the upper side perfectly smooth, on the under between hirsute and pubescent; panicle trichotomous; corollas with closely pressed down on the outside; its lobes hairy inside; capsules cylindrical, twice as long as broad. (*Syn.* C. ovalifolia, Mutis.) The white bark of Santa Fé. The tree grows between 3° and 6° N. lat., at heights between 4200 and 8400 feet: a variety of it, with leaves quite smooth on both sides, is common near Santa Martha.

10. *C. crassifolia.* Leaves oblong, rather blunt, tapered to the base, leathery, smooth on each side; when young shaggy in the axils of the veins; stipules membranous, grown together; corymbs terminal, trichotomous; branches two-edged, few-flowered; fruit oval-oblong, three times as long as broad, crowned by the calyx. Found about Quito and Loxa; distinguished from *C. macrocarpa* by its peculiar membranous stipules: nothing is known of its bark.

11. *C. dichotoma.* Leaves oblong-lanceolate, smooth, when first unfolding rather silky; peduncles terminal, dichotomous, in loose few-flowered corymbs; capsules linear, cylindrical, slender, fourteen times longer than broad. Found on the Andes of Peru, in groves near Pueblo-nuevo, in the district of Chicoplaya. Its bark is described as brown, intensely bitter, with a little acidity.

12. *C. acutifolia.* Leaves ovate, acute, smooth, the veins of their under side somewhat shaggy; panicle brachiate, stalked; corolla silky outside, woolly inside; capsules oblong, tapering to the base, four times as long as broad. A native of the lower woods of the Andes of Peru, in Chicoplaya. The bark is stated to be called *Casc. de hoja aguda*; it is moderately bitter.

13. *C. micrantha.* Leaves broadly oval, blunt, smooth, rather downy underneath at the base of the veins; panicle very large, brachiate, many-flowered; corollas densely silky; capsules oblong, three times as long as broad. (*Syn.* C. parviflora.) A species inhabiting the cold elevated parts of the Andes of Peru, especially about the village of San Antonio de Playa Grande; the inhabitants call its bark *Cascarilla fina*. The tree is of considerable circumference, flowers in February, and frequently yields eight to ten arrobas of dry bark, sometimes called *Cascarilla provinciana*, which differs from that of Huanuco by its decided whitish colour and greater roughness of the surface. It is thicker and more woody, the fracture is more fibrous, and the colour is of a bright cinnamon brown. A bark, called *Pata de Gallinazo*, from the numerous specimens of Graphis, a forked sort of Lichen, found on its surface, is yielded by this sort, as well as three others. Reichel considers the samples which Pöppig brought home as undoubtedly belonging to the Huanuco bark of commerce. Its taste, which is at first acid, becomes afterwards a powerful and permanent bitter.

14. *C. glandulifera.* Leaves ovate-lanceolate; on the upper side smooth and shining, with glands at the axils of the veins; on the under side shaggy, especially upon the principal veins; panicles somewhat corymbose; corolla velvety on the tube, woolly in the inside of the limb; capsules oblong, three times as long as broad. (*Syn.* C. glandulosa.) The flowers are three lines long, and of a pale rose colour This tree only inhabits the higher mountains of Peru, and is more scarce than many of the other kinds; its trunk is from 12 to 15 feet high, and its flowers, in the month of February, fill the forests with their perfume; on the colder parts of the mountains it becomes a bush, the greatest produce from which is five or six pounds of bark. It is considered, according to Pöppig, one of the finest sorts of Cinchona; he says that the Peruvians distinguish it by its blackish rind, which is only here and there interrupted by small shagreen spots when in a fresh state. The common people consider these blotches an integral part of the bark, and look upon it as the more valuable if beneath the larger spots there appears a black shining velvety substance dispersed in ovals of some lines broad; this is probably caused by some Byssus. The bark-gatherers hence call it *Cascarilla negrilla;* when broken, it exhibits a glossy, shining, almost rosiny fracture, of a ripe orange colour passing into a fiery brown. A variety of it, called *Casc. provinciana negrilla*, is obtained from the trees growing in warm valleys. According to Mr. Reichel, this bark is equal to the finest sort from Loxa, but it is not known in Europe, except in mixture with other kinds.

* *Corollas smooth externally.*

15. *C. caduciflora.* Leaves oval, smooth, erect, hairy in the axils of the leaves; panicle brachiate, with corymbose branches; corolla smooth, falling off very quickly; capsules oblong, four times as long as broad. (*Syn.* C. magnifolia, Humb.) Found near Jaen de Bracamorros, a hot damp country, where it is called *Cascarilla bora*. The tree is described by Bonpland as being above 100 feet high; its bark is not employed.

16. *C. rosea.* Leaves oval, tapering to the base, bluntly acuminate at the point, smooth on each side; panicles clustered, branches corymbose; corolla smooth on the outside, its limb downy above; capsules oblong, three times as long as broad. (*Syn.* C. fusca.) This occurs not unfrequently about Cuchero, where it forms a highly beautiful tree, which in its size and ramification may be justly compared with the white beech of Europe; in July it is covered with innumerable pale violet flowers, whence it has obtained the name of Palo de San Juan. Its bark is not collected, but Pöppig thinks it would be found to possess good qualities.

Cinchona Barks.—Whatever may be the botanical history of the different kinds of bark, on their arrival in Europe they are known by names which have reference rather to their physical appearance, or the place whence obtained, than to the botanical characters of the trees which furnish them. In England they are classed under three heads—pale, yellow, and red barks. Of each there are several varieties, which comprehend, however, various barks, not the produce of any of the genuine species of Cinchona above enumerated, but obtained from species of Exostemma, Buena, and Strychnos (according to Mr. Burchell). These last, called false or spurious cinchona barks, are all distinguished from the true cinchona barks by the absence of cinchonia, quinia, and aricina (or Cusco-cinchonia, a principle found in the Cusco or Arica bark, referred to the Cinchona rubiginosa, Bergen). Several of these spurious barks are employed in fever and other diseases, but they are chiefly used to adulterate the more valuable kinds of cinchonas. Even when there is no intermixture of these inferior sorts, a variableness in quality occurs in the bark of the same species, according to its place of growth. The finer kinds are known by experienced persons by a glance of the eye; but it is extremely difficult to indicate, by any description, the marks by which they are guided. All kinds arrive in Europe in the same package, either a chest or serone, which is formed of pieces of wood rudely fastened together, and covered with the hides of animals. They are afterwards sorted, and bring very different prices in the markets, according to the degree of estimation in which each kind is held. We shall describe the best kind only of each; but we must remark, that much prejudice exists on this point, and sometimes excellent kinds are rejected, while inferior sorts are prized. To meet these prejudices, the barkers employ various artifices, more or less injurious. The most useful classification of barks is that proposed by Geiger, which has reference to the relative proportions of their alkaloids:—1. Those in which cinchonia predominates: chiefly pale or brown barks.—2. Those in which quinia predominates, of which there is only one—the yellow bark of English commerce, called China regia vera, China calisaya.—3. Those in which cinchonia and quinia exist in nearly equal proportions, red barks, and the yellow bark of continental writers; the China of Carthagena of the French, China flava dura, quina amarilla. This last is also called orange bark (quina aurantiaca of Mutis), which is not the yellow bark of English commerce, though by some it is erroneously so considered; and hence the frequent error in the British pharmacopœias of referring yellow bark to the C. cordifolia (Mutis). Of the *pale* barks, three varieties are known in English commerce:—1. Crown or Loxa bark. 2. Gray, silver, or Huanuco bark. 3. Ash bark. These are always quilled, and never in flat pieces. The powder, which gives the name, varies from grey to fawn colour. The first variety, Loxa or crown bark, called also true Loxa bark, is obtained either exclusively from the C. Condaminea, or from it and C. scrobiculata. It occurs in pieces from 6 to 14 inches long, the quills varying in diameter from the fourth or even smaller part of an inch to nearly half an inch; the rolls are sometimes double, meeting at the centre: the diameter of the bark is from ¼ to 1½ line. The colour of the exterior is marked dark-grey, in some specimens verging to brown. A shining but peculiar appearance is observable upon it, owing to the thallus of the lichens spreading over it. This commonly alternates with the colours of other lichens, greyish-white, yellowish-white, bluish-white, so that the bark acquires an appearance as if it were painted. Numerous transverse cracks, often extending from one side of the bark to the other, with the edges a little raised, are seen, sometimes close to each other, sometimes more remote, especially in the larger pieces, in which also they rarely extend to the whole circumference of the piece. In the larger pieces, longitudinal cracks are observed, and between these warts or knots frequently arise, which give a very rough feel to such specimens. The Usnea florida, and some foliaceous lichens, such as Parmelia perforata (Ach.), often remain attached to it. The inner surface is smooth, except some delicate, irregularly longitudinal fibres: the colour is a cinnamon or darker brown. The fracture of the smaller quills is even, or slightly fibrous; that of the larger pieces more so, the fibres firm, but neither oblique nor vitreous, as in the yellow bark (China regia); but the outer circle presents a resinous aspect. The odour resembles that of tan. The taste at first is slightly astringent, and faintly acid; afterwards very astringent, somewhat bitter, but not acrid.

In respect to its chemical composition, this variety is commonly supposed to contain cinchonia (discovered in pale bark by Dr. Duncan, jun.) only; but this is a mistake, and it is most probable that the specimens which, when analyzed, yielded no quinia, were either very thin quills obtained from young branches or trees, or were specimens of Huanuco bark. Bucholz analyzed sixteen ounces of the Loxa bark of commerce, yet found no quinia, but some error is reasonably suspected: the other constituents were found to be

	Drachms.	Grains.
Fatty matter, with chlorophylle . .	1·	0
Bitter soft resin (Geiger thinks this contained quinia)	2·	0
Hard resin (red insoluble colouring matter)	12·	0
Tannin (with trace of acetic acid) . .	3·	0
Cinchonia	0·	28
Kinic acid	1·	30
Hard resin, with phyteumacolla . .	1·	49
Tannin, with chloride of lime . .	4·	25
Gum	5·	40
Kinate of lime	1·	40
Starch, a trace.		
Woody fibre.		

The cinchonia exists in combination with the kinic acid, in the form of kinate of cinchonia. A prejudice exists in favour of the thin quilled pieces, but they are not so well adapted to form extracts, &c., nor to be employed as medicine. Mutis many years ago stated that the thick pieces obtained from branches of middle-aged trees were the most efficacious; and the analysis of Von Santen (in Von Bergen's 'Versuch einer Monographie der China') confirms the correctness of this statement, as far as the relative amount of quinia yielded by barks of different ages is concerned. From 100 lbs. of Loxa bark, he obtained of quinia

	Ounces.
Thin selected quills . . .	1·042
Moderately thick pieces . . .	4·444
Selected thick heavy pieces, with rough cracked bark	11·104

2. Variety or Huanuco bark, termed from its colour silver or grey Cinchona, has been known in European commerce only since 1799. The majority of writers on the origin of the barks refer it to the *C. glandulifera.* (Ruiz and Pavo, *Fl. Peruv.*) As it is sent from Huanuco to Lima for shipment, it is also called Lima bark, though some apply the term Lima to a bark supposed to come from the *C. lancifolia* (Mutis). It is likewise called Havanna bark. We have the authority of Pöppig, as stated above, for considering it one of the finest sorts of Cinchona. The variety of it termed *Casc. provinciana negrilla* (the *Quinquina Huanuco noirâtre* of the French) is likewise stated by Reichel to be equal to the finest from Loxa, yet it is not known in Europe except in mixture with other kinds. The explanation of which is two-fold: first, that though the trade in this bark was at first very brisk, owing to its excellent quality, the subsequent shipments of it being very inferior, it fell into disrepute; and though it is now again pure and good, still it is necessary to introduce it as crown bark. Farther, as the French give the name Lima bark to another kind as above mentioned, probably the dark ash bark, the dark Ten (China Pseudo-Loxa), the false Loxa bark, confessedly a very bad bark, it has caused the genuine Lima bark to be little esteemed. Farther, as the Huanuco bark is in quills which are larger and coarser than the crown bark, the prejudice in favour of thin quills operates to the disadvantage of this very excellent sort.

The quills are from three to fifteen inches, generally from four to ten inches long, with a diameter from a few lines to one or even two inches. They are in single rolls, or double and enclosed rolls; the enclosed rolls exhibit spiral windings, and frequently traces of a sharp oblique incision of the knife. This incision is not observed in the case of any other kind, and it is probably made by the *cascarilleros* to facilitate the separation of the bark from the trunk of the tree. The diameter of the bark varies from ¼ to 5 lines. The epidermis is seldom absent, but now and then portions of it have been rubbed off, and then the rusty surface of the liber is seen. The epidermis is a whitish-grey, but often covered with numerous lichens, chiefly Glyphis cicatricosa, Graphis duplicata, Porina granulata, Pyrenula discolor, mastoidea, Pupulo, Lecanora punicea, Parmelia perforata, Sticta aurata, and Usnea florida.

The character of the cracks is more variable than in Loxa bark, few extending to the whole circumference of the bark; in the young pieces the cracks are not so deep as in the older, in which also the edges are raised, giving a rough appearance to it. Some specimens also between the large and extensive cracks present spaces very slightly cracked, of a golden-straw or leaden-grey colour. Huanuco bark is distinguished by the brighter colour of its surface, the multitude of its small cracks, and the sharp oblique incisions above mentioned, from the yellow or Calisaya bark (*Quina regia*), and the Loxa bark, to both of which it bears considerable resemblance. The inner surface is of a bright cinnamon, passing into an ochre-yellow or rusty hue, and is generally rough, and, especially in the thicker quills, fibrous, frequently with portions of the wood of the stem adhering to it. Though no satisfactory chemical analysis has been made of it, exhibiting its entire composition, yet the relative proportions of its alkaloids have been stated. It is the richest in Cinchonia of all the barks hitherto examined. Goebel, Kirst, and Von Santen say that it yields this alkaloid only. Michaelis maintains that two specimens analysed by him yielded, in addition, a little quinia. The quantity of cinchonia is very variable. Kirst and Goebel obtained from 1 pound 168 grains; Von Santen from nine different specimens examined by him, from 1 pound a quantity varying from 106⅔ grains to 210 grains. The fracture of the bark is either fibrous or splintery; that of the outer portion resinous. The odour resembles that of clay. The taste acid, astringent, somewhat aromatic; then bitter, acrid, and enduring. The powder is a deep cinnamon-brown.

The third kind of pale bark, called ash, jaen, or by corruption ten-bark, is by Von Bergen referred to *C. ovata* (R. and P.), which he considers synonymous with the *C. pubescens* of Vahl. It is likewise called pale ten-bark to distinguish it from the dark ten-bark, or false Loxa bark.

The quills of this kind are always crooked, frequently also twisted. The epidermis is frequently absent; when present, it presents faint transverse cracks, the edges of which are somewhat raised, and a few longitudinal cracks or warts. The bark itself is of an ash-grey, whitish-grey, or light yellow colour, with brown or blackish spots. It has often a slightly shining aspect. The inner surface varies very much, sometimes smooth, sometimes with long fibres attached to it, sometimes splintery, of a cinnamon or dark brown colour. The fracture is sometimes even, sometimes slightly fibrous, with a faint external resinous circle. The odour is a little like tan, and pleasant. The taste slightly acid and moderately astringent, a pure but not disagreeable bitter. The accounts of its chemical composition differ much. Von Santen says it contains neither cinchonia nor quinia. Goebel and Kirst from 1 pound obtained no cinchonia, but 12 grains of quinia; while Michaelis says in two specimens examined by him, he found both quinia and cinchonia; of the former, even 80 grains; of the latter, 12. Notwithstanding this last statement, this is generally and justly regarded as a very bad sort of pale bark, and was chiefly used to adulterate the true Loxa bark.

The dark ten-bark or China pseudo-Loxa, occurs generally in thin or middle-sized, but seldom thick, quills. The surface exhibits transverse cracks and longitudinal wrinkles, which often form rings a line or more broad. The colour is milk-white, but covered with so many lichens as to have a dark appearance. The under surface is uneven, fibrous or splintery, the fibres often very long: the colour a rusty brown. The fracture is fibrous or splintery: it exhibits a resinous appearance only when cut. Smells strongly like tan. The taste at first enduringly acid, afterwards astringent. This bark is frequently purchased instead of the true Loxa bark, and is at present of frequent occurrence in the market. Bergen considers it to be produced by the *C. nitida* (R. and P.) and the *C. lancifolia*: these are perhaps only varieties the one of the other; but whencesoever obtained, it is very poor in alkaloids, 1 pound yielding only 9 grains of kinia and 12 of cinchonia. It is held to be one of the worst kinds of pale bark.

The lichens and epidermis should be scraped off all pale barks before they are reduced to powder: though they increase the bulk, they diminish the efficiency of the powder.

The yellow barks.—There are only three kinds; the yellow bark of English commerce, which by continental writers is called merely China regia, quina Calisaya (the quinquina royal, Gelbe Königschina), and the yellow or Carthagena bark of the continent comprehending two sorts:—1. China flava fibrosa, China de Carthagena fibrosa, the quina naranjada (of the natives). The quina de Santa Fé fibrosa, or quina de Carthagena lenosa (fibrosa), of the Spanish, quina de Carthagena amarella lenhosa (fibrosa) of the Portuguese, quinquina de Carthagene fibreux, ligneux, quinquina orange (of the French), holzige gelbe china, holzige Carthagenarinde (of the Germans). —2. China flava dura, china lutea, china de Carthagena dura, quina naranjada de Sta. Fé, quina aurantiaca, quina de Santa Fé, or quina de Carthagena dura (Spanish), quina de Cartagena amarilla dura (Portuguese), quinquina de Carthagene, or quinquina flava dura (French), harte gelbe china, harte Carthagenarinde. This is the orange bark of Mutis, which he says is obtained from C. lancifolia. Bergen and Goebel ascribe it to C. cordifolia (Mutis), which some deem synonymous with C. pubescens (Vahl), which species is therefore stated alone to yield the yellow bark; but this only applies to the yellow bark of the continent, for the source of the yellow bark of English commerce must be considered as yet undetermined. We shall limit our description to this last kind, as the best known in this country, and, at the same time, the most valuable. This occurs in two forms—quills and flat pieces; the quills were formerly most prized, but all well-informed persons now prefer the flat pieces as much richer in quinia. The quills are in general in single, seldom in double rolls, the diameter of which is mostly greater than even the largest quills of pale Loxa bark, being from ¼ to 1 inch, the length from 4 to 24, occasionally containing smaller quills inside the larger. The thickness of the bark varies from ⅛ to ¼ of an inch. The external surface is generally grayish brown, inclining to blackish, yellowish, or whitish, according to the kind of lichen by which it is beset. Few pieces are quite free from lichens; many specimens exhibit the wax-yellow thallus of *.epra flava* (Acha.), which appears as if fused upon it: this is a very characteristic mark, when present, of Calisaya bark. The quills seldom have the epidermis removed, which has both transverse and longitudinal cracks, which penetrate down to the bark itself, as their traces can be perceived upon it even when the epidermis has been removed. The transverse cracks frequently extend over the whole circumference of the piece, yet they are much interrupted by longitudinal cracks and furrows (this is more especially the case with the thinnest quills); but all of them have raised edges, resembling those of Loxa bark. Where the epidermis is wanting, the colour of the exposed part is of a cinnamon or rusty-brown hue. The colour of the inner surface varies according to the age of the bark. Generally it is a deep cinnamon, in recent barks verging to reddish; in older specimens it is paler, or a rusty-yellow. The transverse fracture is in the thinner quills smooth, in the larger fibrous, splintery, or vitreous: a resinous circle is under the epidermis. The longitudinal fracture is generally uneven, and delicately fibrous: this kind of bark is easily broken.

The flat yellow bark, or that in splints, occurs either with the epidermis, or divested of it (China regia nuda). Pieces retaining the epidermis are generally from one to five inches broad, generally quite flat, but sometimes slightly curved, from three to fifteen inches long, and from ¼ to ⅜ of an inch thick. The characters of the epidermis correspond with that above described: the uncoated kind is most frequent, and occurs in splints from one to eight lines thick. The colour varies, but is generally a reddish or rusty-brown, and is nearly the same on both surfaces, so that in pieces which have become convex on the inner side, and concave on the outer, as often happens, it is difficult to determine which was the exterior: this is by far the best kind of yellow bark.

Adulteration of yellow bark is not very easy, but a kind of humalia-like bark used to be substituted for it.

The odour of genuine yellow bark is slightly that of tan. The taste is faintly acid, strongly but not unpleasantly bitter, aromatic, stimulating, and slightly astringent.

The analyses of uncoated yellow bark (Calisaya) by Pelletier and Caventou show its composition to be super-kinate of quinia, fatty matter, slightly soluble red colouring matter (red cinchonic acid), soluble red colouring matter (more than in gray bark), tannin, kinate of lime, lignin, amylum. When the uncoated kind is analyzed, some cinchonia is obtained. By a comparative analysis it is found that a pound of flat uncoated yellow bark yields nearly twice as much quinia as the quilled sort, a point of much importance to the preparers of that alkaloid. The Carthagena yellow barks both contain quinia, but in less quantity than the Calisaya bark; the hard Carthagena bark, in addition, yields cinchonia, but not the fibrous kind.

The *red* bark, of which one kind only is known in English trade, is generally referred to C. oblongifolia; though many doubts may be held on this head. Bergen is much more disposed to consider the C. oblongifolia as the source of the China nova, or Surinam bark, which is not officinal in Britain: this also is doubtful. Red bark has been known for 130 years, but was not much used in Europe till 1779. It occurs in quills and flat pieces, most frequently in the latter form. The quills are rolled singly, or doubly, from 4 to 15, but generally from 4 to 6 inches long, and from a few lines to 1 inch in diameter, the bark being from 1 to 4 lines thick. The figure of the flat pieces is variable, being generally very much broken, frequently with the epidermis entire; but this is often partially, seldom or never completely, absent. The length is generally from 4 to 24 inches, the thickness from ¼ to 1 inch, and the breadth 1 to 3 inches. The quills most frequently have the epidermis entire; some of them have a whitish yellow, or grayish white epidermis (interrupted by longitudinal and irregularly transverse cracks), a red hue shining through it. In fact, even in pieces with the epidermis entire, and covered by many lichens, the red hue is seen ever shining through—a characteristic mark of this kind of bark. The flat pieces have generally an amazing number of lichens upon them. In these pieces also what is called the rete mucosum is often very spongy. Warty bodies are found on some varieties. The inner surface is a reddish brown, varying in intensity. The fracture in thin quills is smooth, in those of a moderate thickness fibrous, and in thick quills and flat pieces fibrous and splintery: the epidermis, when penetrated by the resinous principle, exhibits a vitreous shining ring.

Pelletier and Caventou analyzed a specimen of the variety free from warts, and found it to contain

Superkinate of Quinia } in large quantity.
„ „ Cinchonia }
Slightly soluble red colouring matter, or red cinchonic acid.
Soluble red colouring matter (tannin).
Yellow colouring matter; fatty matter.
Kinate of lime. Woody fibre. Starch.

The relative proportions of quinia and cinchonia differ in different specimens; a pound of bark yielding in some instances 70 grains of cinchonia and 77 grains of sulphate of quinia, in others 184 grains of cinchonia and only 9 grains of sulphate of quinia.

The Humalies, or brown bark, is not known in English commerce; its source is not accurately determined.

Several inferior kinds, and others erroneously reputed to be cinchona barks, are met with, either accidentally or fraudulently mixed with or passed for the genuine; but they may be known by not possessing the characters of the best kinds as given above.

(Bergen, *Monographie der China; Fée, Essai sur les Cryptogames des Ecorces exotiques officinales;* Goebel, *Pharmaceutische Waarenkunde.*)

In estimating the action of cinchona bark on the human system, it deserves to be borne in mind that the resin gives it a stimulating power, the kinate of cinchonia or quinia a tonic power, and the tannin an astringent property. By the first of these it approaches the balsamic stimulants and tonics, by the second the mineral tonics, while by the third it approximates to rhatany and catechu. Notwithstanding these resemblances, its action in the aggregate is strictly peculiar, so much so that all attempts to procure a substitute for it, whether among exotic or indigenous plants, have been attended with little success. It appears to act directly upon the nerves, particularly those of organic life, but its influence is speedily extended to the vascular and muscular system.

A moderate dose of cinchona taken into the stomach, and repeated in three or four hours, is followed by increased force and frequency of the pulse, greater firmness and constriction of the arterial tunics, augmented heat of surface, a flow of perspiration, and a universally improved tone of the system. The digestive and assimilating processes are greatly expedited, and the individual feels himself fit for exertions from which he would have shrunk before. This stimulating action does not cause vertigo or unpleasant derangement of the function of the brain. The secretions of all the mucous membranes, however, are diminished, and in most persons the bowels become constipated, but occasionally an opposite state, or diarrhœa, is induced.

It is justly considered the most valuable tonic and febrifugal medicine we possess. The forms of administration are numerous. Powder is objectionable from its bulk, disagreeable taste, and difficult digestibility, owing to the quantity of woody fibre which it contains. Infusion is a good form, but does not possess all the virtues of the bark, which, however, are all taken up by the tincture: the spirit present in this last form is often an obstacle to its being given in a sufficient dose; it is therefore generally added to the infusion or decoction. Decoction, if the process be long continued, dissipates the volatile or aromatic portion, and diminishes its powers. The tincture is often formed by the addition of other substances, as in the compound tincture of bark, which is a valuable adjunct to other remedial means in weak subjects. Acids or ammonia are sometimes given along with it, according to the nature of the complaint.

The ease with which a small dose can be taken of the sulphates of quinia or cinchonia leads to the substitution of these preparations for that of the bark itself; and in many cases they are more eligible, but in others the want of the resinous and astringent principles renders these less proper. Perhaps the best and most convenient form, as it can be administered in a variety of ways, is one in which the bark is separated into its constituent parts, the woody fibre removed, and the other principles again united: this is called the aromatic kinate of kinia. It keeps well in all climates, is not bulky, and retains its efficacy for several years. For long voyages it is the best form into which bark can be put.

CINCHONA'CEÆ, a natural order of monopetalous exogens, with an inferior fruit, a regular corolla, seeds containing a small embryo in the midst of horny albumen, and opposite undivided leaves with stipules placed between their petioles. This brief character distinguishes a most extensive and important assemblage of plants, comprehending many of the most useful species we are acquainted with. The bark of the order is very generally tonic, aromatic, and febrifugal, and its energy is attested by the well-known use of that of Cinchona itself, to say nothing of the numerous other genera fit to be employed as substitutes for Jesuit's bark. The albumen of the seeds when roasted affords, in the case of coffee, a fragrant, stimulating, and agreeable principle; and the roots of many herbaceous kinds possess active emetic properties. True Ipecacuanha is the produce of Cephaelis Ipecacuanha, but many other cinchonaceous plants resemble it in their medicinal qualities, and are perhaps mixed with it in commerce. Cinchonaceæ are the Rubiaceæ of many botanists; but as it appears advisable to separate Rubia and its allies into a distinct order, on account of the absence of stipules, and for other reasons [STELLATÆ], it is necessary to alter the name of the remainder of the group; and as a type of the order, when circumscribed, Cinchona is unexceptionable.

CINCHONIA, a vegetable alkali contained in all the varieties of cinchona, but principally in the Cinchona lancifolia, or pale bark. In the year 1803 Dr. Duncan recognized the existence of a peculiar principle in bark, to which he attributed its antifebrile power. Gomès, in 1811, procured it in a separate state; but its alkaline properties were not discovered till 1820, when Pelletier and Caventou published their experiments upon it; (*An. de Ch. et de Ph.*, xv.) The method by which they obtained it was as follows: Four pounds of bruised pale bark were digested with heat in twelve pounds of alcohol, and this treatment was four times repeated; the spirituous tinctures were mixed, water added to the mixture, and the alcohol distilled. The turbid residue being filtered, it left upon the filter a reddish substance, which was washed with a very dilute solution of potash until it passed through colourless. The matter left in the filter, after being plentifully washed with distilled water, was of a greenish white colour, very fusible, soluble in alcohol, and crystallizable. This was cinchonia, containing however some fatty matter.

In order to purify it, it was dissolved in very dilute hydrochloric acid: a liquor of a golden yellow colour was obtained. The cinchonia was precipitated from the hydrochloric acid by magnesia, a cup of this earth being mixed with it, and the mixture digested in a gentle heat: this, when quite cold, was thrown upon a filter, and washed with water until it came through colourless. The precipitate, dried in a water bath, was treated three times with boiling alcohol, which dissolved the cinchonia; the solutions gave by evaporation crystals of a dirty white colour; these were re-dissolved in alcohol, and this solution yielded pure cinchonia by crystallization.

The properties of cinchonia are, that by slow evaporation of its alcoholic solution it is procured in slender prismatic needles; by rapid evaporation it is deposited in crystalline, translucent, colourless plates, which are not altered by exposure to the air. Cinchonia has a peculiar bitter taste, which is long in being developed, on account of its insolubility, which is so great that it requires 2800 times its weight of cold water for solution, but is rather more soluble in hot water. It is very soluble in alcohol, especially when heated, and when saturated at a boiling heat, crystals are formed on cooling; the alcoholic solution is extremely bitter. It is less soluble in æther than in alcohol, especially when cold: it does not fuse by heat till it begins to decompose. It has the alkaline property of restoring the colour of litmus, which has been reddened by an acid.

Cinchonia is composed of

20 equivalents of	carbon	$6\times20=120$	or 78·43
11 „	hydrogen	. 11	7·18
1 „	oxygen	. . 8	5·23
1 „	azote	. . 14	9·16
	Equivalent . .	153	100

It appears from the experiments of Pelletier and Caventou, that the cinchonia, in all the varieties of bark, is combined with kinic acid; and when this salt is treated with magnesia it is decomposed, the kinate of magnesia remaining dissolved, and the cinchonia being precipitated. Cinchonia is much more abundant in pale than in yellow bark, the latter containing much more quinia; the red bark contains both alkalis also, the quinia being in the larger quantity.

Various other methods of preparing cinchonia have been proposed: by boiling the bark in dilute sulphuric acid, adding lime, and thus precipitating cinchonia in mixture with lime and its sulphate, and dissolving the cinchonia by alcohol, and treating this solution with an acid, and an alkali, &c. (Berzelius, *Traité de Chimie*, v., 152.)

We shall mention the principal salts of cinchonia, premising that they are prepared by saturating the various acids with this base.

Sulphate of Cinchonia is prepared by dissolving the alkali to saturation in dilute sulphuric acid, and evaporating the solution till a pellicle forms; on cooling and standing the salt crystallizes. It is colourless; unalterable in the air at common temperatures; but when the temperature is raised, or the air is very dry, it becomes slightly opaque; it effloresces when exposed to a gentle heat. It is said to crystallize in rhombic octohedrons, which are rarely perfect.

Sulphate of cinchonia is soluble in about half its weight of water at 57°, and in equal weight of absolute alcohol at the same temperature: it is insoluble in æther. It is, like the other salts of cinchonia, decomposed by the alkalis, ammonia, potash, and soda, and by lime-water, all of which precipitate cinchonia. It is composed of

1 equivalent of sulphuric acid	40	or	15·09
1 „ cinchonia .	153		57·73
8 „ water . .	72		27·18
Equivalent . .	265		100

Disulphate of Cinchonia may be prepared by adding the alkali to the acid to supersaturation: this salt crystallizes in rhombic prisms, which are usually short. It is soluble in about 54 times its weight of water at the usual temperature, and more so in alcohol. It consists of

1 equivalent of sulphuric acid	40	or	11
2 „ cinchonia .	306		84
2 „ water . .	18		5
Equivalent . .	364		100

Nitrate of Cinchonia. Prepared by dissolving the alkali in very dilute acid; for it is decomposed by the concentrated acid. After evaporation a portion of the nitrate separates in globules, of an oleaginous appearance; if these be covered with water, they are, after some days, converted into groups of regular crystals.

Dihydrochlorate of Cinchonia. This salt is procured by adding the alkali to the dilute acid. It crystallizes in needles, which are very soluble in water. It is also soluble in alcohol, and but sparingly so in æther. It fuses below a boiling temperature. It is composed of

1 equivalent of hydrochloric acid .	37	or	10·8
2 „ cinchonia . . .	306		89·2
	343		100

According to Leibig, the neutral hydrochlorate obtained by exposing cinchonia to the action of hydrochloric acid gas, is composed of

1 equivalent of hydrochloric acid .	37	or	19·8
1 „ cinchonia . . .	150		80·2
	187		100

Kinate of Cinchonia. This, as already mentioned, is the salt which exists in the cinchona. When the solution is evaporated to the consistence of a syrup, silky acicular crystals are obtained, which are very soluble in water. For an account of some other salts of cinchonia, see Berzelius, vol. v., p. 164.

CINCINNATI, the largest town in Ohio, is situated in Hamilton county, 20 miles east of the south-western corner of the state, upon the north bank of the Ohio, and 20 miles above the mouth of the Great Miami. The town was founded in 1789, but did not become a place of any importance until after the beginning of the present century; its growth since that time has been very rapid. The population in 1800 was 750; in 1810, 2540; in 1820, 9642; in 1826, 16,230; in 1830, 24,831; and in 1831, 28,014. The rapidity of increase in the later periods is attributed to the opening of the Ohio State canals, by which the trade of the town has been greatly facilitated. With the exception of New Orleans, Cincinnati is now the largest town in the United States west of the Alleghany mountains. A great part of the trade of the town is carried on by means of steam-vessels. The number of these vessels plying on the western waters in 1831 was 198, of which 68 were built at Cincinnati. The casualties that attend this river-navigation are considerable. Of 348 steam-vessels built between 1811 and 1831, there were 87 lost by snags, burning, collision, and other accidents: during the same period, 63 steam-vessels were worn out. The registered and licensed tonnage belonging to Cincinnati at the end of 1834 amounted to 7905 tons, all of which was employed in internal navigation: of the above, 6880 tons were steam-vessels, 25 of which, of the burthen of 2459 tons, were built in 1834.

The town is situated partly on the first and partly on the second bank of the river, on a plain which occupies about four square miles, and is surrounded by a range of finely wooded hills. The height of the rising ground is not more than 50 feet from the surface of the plain.

Cincinnati is the seat of numerous manufacturing establishments; among which cotton and woollen mills, steam saw-mills, lead works, distilleries, and breweries are the most important. The Miami canal from the town to Dayton, a distance of 66 miles, has been open since the spring of 1829. A company was incorporated in 1832 for constructing a rail-road from Dayton to Sandusky on lake Erie, which, when completed, will afford communication between Cincinnati and the lake, a distance of 175 miles.

The town contained, in 1830, eighteen places of worship belonging to the episcopal church, Roman Catholics, Jews, Unitarians, Presbyterians, Methodists, Quakers, Baptists, and other denominations. The Lane Seminary, so called from the name of its earliest benefactors, who were merchants in New Orleans, stands on a small eminence called Walnut Hill, two miles from Cincinnati. Its object is principally the promotion of theological knowledge. The building is four stories, 100 feet long, and contains upwards of 100 apartments, besides a preparatory school, which is a separate building. A valuable farm is attached to this seminary, and the manual labour system is introduced: the number of students in 1832 was 88. The medical college of Ohio, founded in 1818, is situated in Cincinnati; it contained, in 1833, 110 students. A law school has recently been established in the town. There are four banking establishments, the aggregate of whose capitals amounts to five millions of dollars. The town also supports eighteen newspapers, four of which are published daily, four thrice a week, and ten weekly.

(Stuart's *Three Years in America; American Almanac and Companion; Papers laid before Congress.*)

CINCINNATI, ORDER OF, an association established at the termination of the revolutionary war by the officers of the American army, which, in reference to the transition made by most of them from the occupation of husbandry to that of arms, took its name from the Roman Cincinnatus. The society was called an 'order,' and an external badge was provided of a character similar to those worn by the knights and other privileged orders of Europe. It was moreover provided that the eldest son of every deceased member should also be a member, and that the privilege should be transmitted by descent for ever. This principle of perpetuating a distinction soon became the object of attack. Judge Burke, of South Carolina, endeavoured, in a pamphlet, to show that it contained the germ of a future privileged aristocracy, and that it should not be allowed to develope itself. The society was publicly censured by the governor of South Carolina in his address to the Assembly, and by the legislatures of three states, Massachusetts, Rhode Island, and Pennsylvania. A correspondence ensued between General Washington and Mr. Jefferson concerning the institution in 1784, and the latter expressed himself altogether opposed to the principle of hereditary descent. The public disapprobation did not run less strongly in the same direction. At a meeting of the society soon afterwards, in Philadelphia, the hereditary principle and the power of adopting honorary members were abolished; but the society, in all other respects, was preserved. According to Mr. Jefferson, General Washington used his influence at the meeting in Philadelphia for its suppression, and the society would probably have been dissolved but for the return of the envoy whom they had despatched to France for the purpose of providing badges for the order, and of inviting the French officers to become members. As they could not well retract, it was determined that the society should retain its existence, its meetings, and its charitable funds. The order was to be no longer hereditary; it was to be communicated to no new members; the general meeting, instead of being annual, was to be triennial only. The badges were never publicly worn in America, but it was wished that the Frenchmen who were enrolled in the order should wear them in their own country. In some of the states the society still exists, and the members hold, or until lately held, triennial meetings. In others it has been allowed silently to expire. That of Virginia met in 1822, and transferred its funds (15,000 dollars) to Washington College. (Tucker's *Life of Jefferson*, vol. i., pp. 184-8.)

CINCINNA'TUS, a celebrated Roman consul. Little is known of him previous to the difficulties of his son Caeso, who, for opposing the tribunes in the performance of their functions, and for ill treating an old ex-tribune, was to be tried by the Icilian law. Sureties however were bound for his appearance. In the mean time he went into voluntary exile, and, according to Livy, the sum in which the sureties were bound was exacted from Cincinnatus. In order to pay it, he was obliged to sell nearly all his estates, and afterwards to retire to a small farm on the banks of the Tiber, where he cultivated the ground with his own hands. Being subsequently chosen consul, the messengers sent to acquaint him with his election found him engaged in the labours of agriculture. It is said that Cincinnatus, on hearing the news which they brought, was less elated by the honour his country had paid him, than grieved for the prospects of his farm during his absence. In the year of his consulship he succeeded in restoring tranquillity to the city, and establishing a partial agreement with the tribunes: the senate wished to continue him in office, but he insisted on resigning it at the close of the year, when he retired to his farm and rural occupations. Soon afterwards (A.U.C. 297) he was chosen dictator, and again received the announcement of his new honour while employed in the cultivation of his field. Conducted into Rome amidst the acclamations of the people, he forthwith marched against the Æqui, and gained a signal victory, after which he entered the city in triumph. He procured the recall of his son Caeso from exile, and then abdicated the dictatorship on the 16th day after he had received it. He afterwards headed an army against the Volsci, and added another to his former victories. In the absence of military tribunes, he was subsequently created interrex for a short time. A second time he was chosen dictator. Cincinnatus was now more than eighty years of age, and nothing but the solicitations of the consuls and senate induced him to accept the office. In all the posts which he filled at different times, his virtue and probity, as well as his patriotism and military success, gained him general admiration. Niebuhr (vol. ii. p. 289) rejects the story of Cincinnatus paying the fine of Caeso, as a mere fiction, fabricated to account for the humble circumstances of so great a man. (Dionysius Halicarnassensis, x.; Livius, iii. 26, 30, 31, &c.; Cicero, *De Fin.*, ii. 4; Niebuhr's *Rome*, vol. ii. p. 286, &c., *Engl. transl.*)

CINCINNU'RUS. [BIRD OF PARADISE.]

CINCLOSO'MA, a group of thrushes, characterized by Dr. Horsfield and Mr. Vigors. [MERULIDÆ.]

CINCLUS. [DIPPER.]

CINNA, LU'CIUS CORNE'LIUS, a Roman patrician, who belonged to the party of Marius. In 86 B.C. he obtained the consulship with Octavius, who made a strenuous opposition to his proposal for recalling Marius and his party from banishment. A dispute followed between the consuls, which was attended with bloodshed. Cinna, unable to make head against his opponents in Rome, withdrew to Tibur, Præneste, and other neighbouring towns, to seek for aid. By thus leaving his post he resigned his office, and the senate took an early opportunity to appoint another consul, L. C. Merula, in his room. Cinna, now in concert with Marius, Carbo, and Sertorius, advanced to Rome, and laying siege to the city, the senate were forced to propose a treaty, which was at last concluded. Cinna was reinstated in the consulship, and Marius was re-admitted as a Roman citizen. Marius however refused to enter the city until the sentence of banishment was formally repealed. Accordingly an assembly of the people was held; but while the votes were taking, Marius entered Rome with armed men, and forthwith proceeded to take vengeance on his opponents. Sulla's house was destroyed, and every quarter of the city was the scene of robbery and murder. Octavius, the colleague of Cinna, with many senators, fell in the massacre. The partisans of Marius were as reckless as their leader. At last Cinna and Marius themselves became desirous of putting an end to these revolting proceedings, and among other measures they seized on the consulship together. Marius died at the age of 70 years, on the first day of his entering on the office Cinna continued the usurpation which he had begun, and chose for his colleague Valerius Flaccus, to whom he assigned the province of Asia.

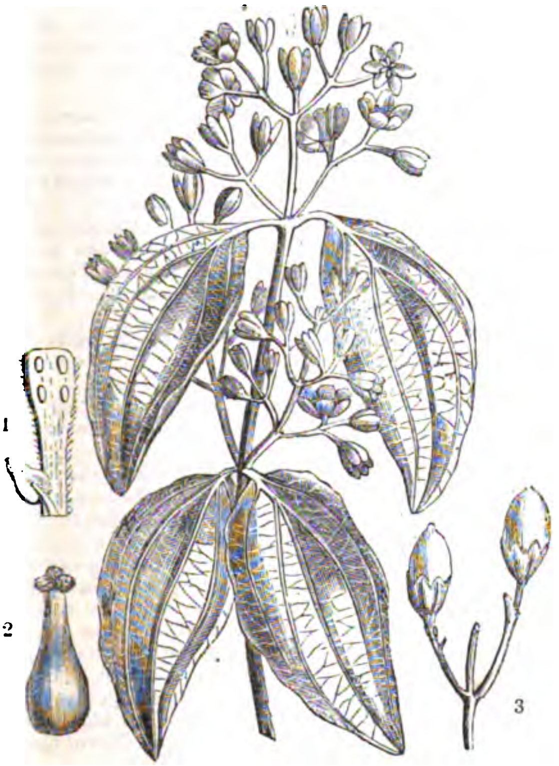
When Sulla had brought the Mithridatic war to a close, he contemplated returning to Italy, in order to punish his enemies. Previously however to setting sail, he sent the senate a statement of the services he had rendered and the wrongs he had suffered, at the same time threatening his enemies with his vengeance. The senate endeavoured to appease Sulla. They also attempted to moderate the fury of Cinna, but he persisted in prosecuting the war. He made himself consul, B.C. 83, with Papirius Carbo [CARBO], to whom he gave the command in Gaul. Cinna now prepared to oppose Sulla, and intended to meet him in Thessaly, by which route it was supposed he would return to Italy. The troops however were reluctant to embark, and an attempt to force them ended in a mutiny, in which Cinna was killed. C. Julius Cæsar married Cinna's daughter Cornelia. (Appian, *de Bell. Civ.*, i., 389—397; Livius, *Epit.* lxxix., lxxx., lxxxiii.; Florus, iii., 21; Velleius Paterculus, ii., 19—24; Dion Cassius *in Fragm.*; Plutarch's *Lives of Marius and Sulla.*)

CORNELIUS CINNA, a grandson of Pompey, headed a conspiracy against Augustus, who however generously pardoned him and made him consul. Their friendship remained afterwards unbroken.

CINNABAR. [MERCURY.]

CINNAMO'MUM, an important genus of *Lauraceæ*, confined to the East Indies, and distinguished from the rest of its natural order by the following technical character:—Flowers hermaphrodite; abortive stamens perfect; anthers with four cells; limb of the perianth articulated; buds of the leaves incomplete; leaves evergreen, often approximated in pairs, three-ribbed or triple-ribbed. It contains several species, some of which yield cinnamon, and others cassia, two aromatic barks which appear to differ from each other in little, except in the degree in which the aromatic principle exists in them. Till lately it was understood that a Ceylon plant called *Laurus cinnamomum* yielded true cinnamon, and another, called *Laurus cassia*, produced the inferior cassia bark on the coast of Malabar; but, according to Nees von Esenbeck, at least two distinct species yield the cinnamon of the shops, and it is altogether uncertain which out of several yields cassia.

Cinnamon has been known to European nations from very high antiquity. The Greeks procured it, together with the name, as Herodotus (iii. 111) remarks, from the Phœnicians, who are by some supposed to have formed the name *Kinnamomon* from *Kagu-manis*, or *Kaschu-manis*, two Malayan words signifying sweet wood (*Annals of Philosophy*, Oct. 1817); and cassia itself may have originated in the same word *Kaschu*, wood. That which is now chiefly consumed in England is the aromatic bark of a small tree found in the island of Ceylon. Its leaves are of an oblong figure, generally more or less heart-shaped at the base: of a thick leathery texture, very smooth and shining on the upper side, glaucous and beautifully marked with prominent netted veins on the under side; they are always blunt, and seldom even tapered to the point; they are nearly opposite on the branches, and are traversed by from three to five ribs, of which the lateral ones run in a curved direction from the base to the point. The flowers are greenish white, and appear in threes, collected in clusters, in small terminal panicles; they are composed of a downy calyx divided into six parts, and containing nine perfect stamens and nine others which are imperfect and resemble yellow triangular-stalked glands. Their pistil is a roundish one-celled body terminating gradually in a style with a white downy capitate triangular stigma. The fruit is an oval berry, not unlike an acorn, seated in the calyx, which is enlarged and converted into an angular six-toothed cup. The tree is supposed to produce a considerable number of varieties to which native names are given, but it is uncertain whether these are not, in part at least, distinct species. In addition to the aromatic oil contained in its bark, the root of the cinnamon tree yields camphor, the liber oil of cinnamon, the leaves oil of cloves, and the fruit a peculiar terebintaceous ethereal oil. When the branches are peeled the finest sticks of cinnamon are said to be obtained from the liber of the middle-sized branches, an inferior sort from the youngest shoots, and that which is produced by the thickest branches is considered of very little value. Of this plant, the *Cinnamomum Zeylanicum* of Nees von Esenbeck, the following is a figure —



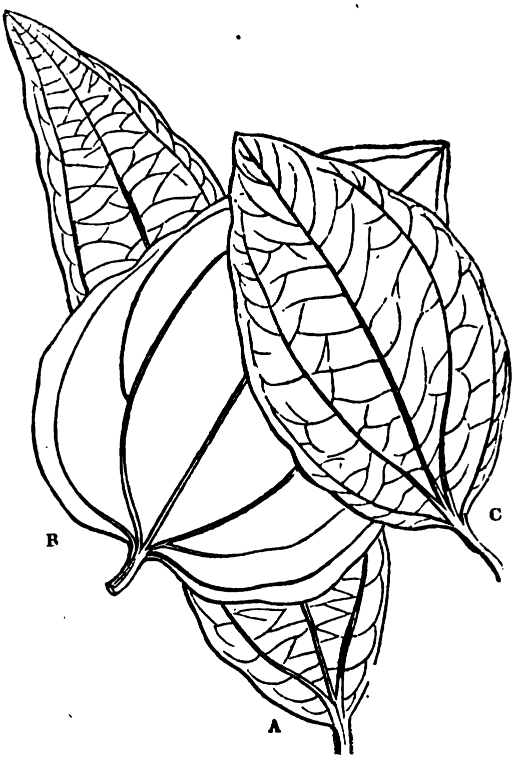
[Cinnamomum Zeylanicum.]

1, a perfect stamen, with one of the abortive stamens at its base; 2, a pistil; 3, ripe fruit.

It is said to require a rich sandy soil mixed with vegetable earth. Some degree of shade is necessary to the young plants, which therefore are not cultivated in open plains, but in spaces in the woods where a few large forest trees are left scattered about to shade them. In about six or seven years from the time they are sown, young cinnamon bushes are from four to six feet high; they are not however generally barked before the ninth year. The cinnamon peeling begins in May, at the end of the rains, and lasts till November; the operation of peeling consists in nothing more than slitting the bark longitudinally and then cutting it across, so that it can be readily turned back from the wood, and it is the more easy in consequence of the shoots which are cut for peeling not being more than three years old.

The cinnamon of China and Cochin China is believed to be the produce of a long-leaved species, called by Nees von Esenbeck *Cinnamomum aromaticum;* this plant, which is not uncommon in the hot-houses of Europe, has long been reputed the kind that yields cassia, but that opinion appears to be altogether unfounded. It is said to grow in the dry sandy districts, lying north-west of the town of Faifoe, between 15° and 16° N. lat. The leaves are very much larger than in the true cinnamon, they usually hang down from the stalks, have never more than three ribs, and never are in any degree cordate at the base; sometimes they are taper-pointed, sometimes blunt. A in the following figure is a leaf of this species; B and C are different forms of the leaf of the *Cinnamomum Zeylanicum.*

The aromatic fruits called *cassia buds* are also yielded by this species.



With regard to *Cassia lignea*, or *Cassia bark*, it seems altogether uncertain what it is that yields it; whether it is some peculiar species, as it has long been supposed to be, or inferior samples of cinnamon gathered in unfavourable seasons, or from trees growing in bad situations. The differences in cassia bark are of such a nature as to render the last the most probable conjecture; it possesses less aromatic oil, a circumstance likely to occur to trees in unfavourable situations; and in proportion as the oil disappears there is an increase in mucilaginous and resinous matter. But on the other hand there are so many inert or comparatively inert species of cinnamomum, that cassia may very well belong to one of them. There is C. dulce in China, obtusifolium, iners, Bazania, and others, any of which may possibly yield such a bark; the question is however one more of curiosity than real consequence. The only important thing about cassia was the supposing it to be furnished by what is really a most valuable species, and that error is now removed.

Cinnamon of the genuine Ceylon kind is cultivated in Guiana, the island of St. Vincent, the Cape de Verd, Brazil, the Isle of France, Pondicherry, Guadaloupe, and elsewhere, and it is said that plants obtained from Paris by the Pasha of Egypt have thriven when transported to Cairo. There is however no probability that the tree will succeed as an article of commerce in any country that has not the hot damp insular climate and bright light of Ceylon.

Cinnamon and Cassia. There are many contradictory statements about cinnamon and cassia. In the following account we chiefly follow Fr. Ludwig Nees von Esenbeck, who has paid great attention to the subject. According to him, the finest or Ceylon cinnamon is procured from the three-year old branches of the Cinnamomum Zeylanicum (Blume), which is found native in the island of Ceylon only; the cultivation however has been extended to Java, and to South America. Though found in various parts of the island, it is most abundant in the south-west part, near Colombo, and yields the best cinnamon when growing in a sandy quartz soil. The time for stripping off the bark is from May to October. The bark, after being removed from the branches, is tied up in bundles for twenty-four hours, during which time a sort of fermentation takes place, which greatly facilitates the separation of the outer part of the bark from the cuticle and epidermis, which is very carefully scraped off the Ceylon cinnamon. It is then rolled up into quills, or pipes, about three feet in length; the thinner or smaller quills being surrounded by larger ones; a mark which always distinguishes cinnamon from cassia. It is then conveyed to Colombo, where it is sorted by government inspectors into three kinds, of which the two finest alone were allowed to be exported to Europe, while the third, or inferior kind, was reserved to be distilled, along with the broken pieces of the other two, for the purpose of obtaining the oil of cinnamon. The select cinnamon is formed into bales of about 92½ lbs. weight, containing some pepper or coffee, and wrapped in double cloths made of hemp, and not, as stated by some writers, of the cocoa tree.

This fine cinnamon occurs in pieces about forty inches in length, generally containing from six to eight rolls or quills in each, one within the other, of the thickness of vellum paper, of a dull golden yellow colour, smooth on both outer and inner surface. It is very fragrant, agreeably aromatic, taste pleasant, warm, aromatic, slightly astringent. Analyzed by Vauquelin, it yielded volatile oil, tannin in large quantity, an azotized colouring matter, a peculiar acid, mucilage, and feculum.

The root of the cinnamon tree yields a kind of camphor, and the leaves yield an oil which resembles oil of cloves, which it is often used to adulterate. This is quite distinct from the oil of cinnamon obtained from the bark. The ripe berries yield by decoction a solid volatile oil, similar to the oil of junipers. Cassia, according to Marshall and others, is the bark of the old branches and trunk of the Cinnamomum Zeylanicum already mentioned, while others assert that it is the bark of an entirely different species, viz., of the Cinnamomum Cassia (Nees Fratres, et Blume), a native of China, but cultivated in Java. This last view is much the most probable; for not only is no cassia exported from Ceylon (except the rejected or third sort of cinnamon, which is introduced into England incorrectly under that name), but almost all the cassia which reaches Europe comes from Canton. Re-agents produce very different effects both on the infusion and oil of these two barks, which is a rational ground for believing them to be obtained from different species [*].

Cassia is easily distinguished from cinnamon. The bales in which it arrives are much smaller, containing only from two to four pounds, bound together by portions of the bark of a tree. The quills are thicker, rolled once or twice only, and never contain thinner pieces within; the diameter of the bark is much thicker than that of cinnamon, and harder, the outer rind less carefully removed (large patches of the cuticle and epidermis often remaining upon it), the colour deeper, of a brownish fawn colour (that raised in Guiana is yellowish), with the odour of cinnamon, but fainter and less grateful, the taste more acridly aromatic, pungent, less sweet, at the same time more powerfully astringent, yet mucilaginous.

Cassia is often substituted for cinnamon, and it is also frequently adulterated with cassia lignea (which is the bark of a degenerate variety of the Cinnamomum Zeylanicum (Blume) growing in Malabar, Penang, and Silhet), with the bark of Cinnamomum Culitlawan, and with portions which by distillation have been deprived of their volatile oil.

Oil of cinnamon is obtained chiefly from the fragments which fall from the quills during the inspection and sorting at Colombo. These fragments are coarsely powdered, and after being immersed for forty-eight hours in sea-water, are distilled, when a milky fluid comes over, which separates into two parts, a light oil which floats, and a heavy one which sinks in the water. Eighty pounds weight of cinnamon yield about two ounces and a half of light oil, and five ounces and a half of heavy oil. About 100 gallons of oil of cinnamon are annually obtained at Colombo. As the oil which is met with in commerce is a mixture of these two, the specific gravity is variable, 1.035 to 1.090. In time a spontaneous separation takes place, and there are formed beautiful transparent crystals of a *stearopten* or cinnamon-camphor. Sometimes benzoic acid is formed. Oil of cassia is also obtained by distillation; at first it is whiter than oil of cinnamon, afterwards it becomes yellow, but never of such a fiery yellow as cinnamon-oil. The odour is agreeable, but not so delicate and cinnamon-like: taste, acrid, burning, but different from cinnamon. Specific gravity 1.0608: it reddens litmus paper. At a low temperature crystals show themselves, which disappear with an increase of heat. Some consider these a camphor, others benzoic acid. Benzoic acid unquestionably exists in this oil. Oil of cinnamon is adulterated with oil of cassia, with the oil of cassia-buds, with the oil of the cerasus lauro-cerasus, or cherry-laurel, and it is also said with oil of bitter-almonds, an exceedingly dangerous intermixture.

Cinnamon is an extremely valuable aromatic stimulant, and influences both the nervous and vascular system, especially of the stomach and intestines. It is of great utility in weakness of the digestive powers, unaccompanied with inflammatory action of the stomach; while in fluxes from atony of the intestines, its astringent properties, due to the tannin, render it a very useful medicine. Even in fevers of an asthenic type it has been advantageously joined with bark, and the compound cinnamon-powder is added to many medicines. Oil of cinnamon, given on sugar, is useful in cramps and other spasmodic diseases. Cassia has the same properties in less degree.

CINNAMOMIC ACID. When oil of cinnamon is exposed to oxygen gas, the gas is absorbed, and the result is the cinnamomic acid. This acid is colourless; it fuses at 248°, and boils at about 560° Fahrenheit. It distils without alteration, and, when heated, sublimes in scales. It is slightly soluble in cold water, but more so in hot: the solution gelatinizes on cooling. It is soluble in alcohol; and water decomposes the solution, precipitating the acid. The salts of cinnamomic acid are similar to the benzotes. It is composed of oxygen, hydrogen, and carbon.

CINNY'RIDÆ, a family of honey-sucking birds of brilliant plumage. [SOUI-MANGA.]

CINNYRIS. [SOUI-MANGA.]

CINQUE PORTS. It has been a subject of controversy, whether this association of the maritime towns on that part of the English coast which approaches nearest to the continent existed in any shape before the Norman conquest of England. In the course of the late municipal inquiry, the corporation of Romney (where the records relating to the Cinque Ports generally are kept) having refused all access to the documents in its possession, the commissioners appear to have been reduced, for historical information as to the chartered privileges of the association at large, to an examination of the printed charter of Charles II., the latest general one which they received, and in which a number of previous charters, from Edward I. downwards, are set forth. This document, in the original Latin, was published in a small volume at Cambridge in 1675, under the title of *Magna et Antiqua Charta Quinque Portuum, &c.*; and in 1728 it appeared in folio, with a translation and a very full and instructive comment, written fifty years before by Mr. Jeake, long an inhabitant of one of the Cinque Ports in question. This latter book is deemed of so good authority, that the municipal commissioners, in default of original documents, have confidently availed themselves of it.

It is stated by Jeake, that in one of the records of the town of Rye is a memorandum that 'the five ports were enfranchised in the time of King Edward the Confessor;' the five ports here intended, the original *Cinque Ports* of the Normans, being the towns of Sandwich, Dover, Hythe, and Romney, on the coast of Kent, and Hastings on that of Sussex. But a stronger presumption that all or some of these towns enjoyed peculiar privileges before the Conquest, arises from the fact, that the first charter of Edward I., the earliest set forth in Charles II.'s charter, in confirming all previous liberties, expressly heads the series of kings by whom they had been granted with the name of Edward the Confessor. Only three of these five ports being mentioned in the Domesday survey, viz. Sandwich, Dover, and Romney, Lord Coke thence infers that at first the privileged ports were these three only. These, it appears from that survey, on consideration of certain services to be performed by their shipping at sea, &c., were exonerated from such contributions and burdens as other towns were generally charged with; and these, it is reasonably thought, might have been enfranchised by the Confessor at one and the same time.

Though some part of the municipal constitution of the individual ports may be anterior to the Norman invasion, yet the organization of the general body, as it has existed in later times, is plainly traceable to the policy of the Conqueror in securing, by every means, his communications with the continent. These ports and their members occupy exactly the tract of sea-coast of which, after the victory of Hastings, he showed most eagerness to possess himself, by sweeping along it with his army before he directed his march towards London; and the surrender into his hands of the castle of Dover, which is the centre of the Cinque Ports' jurisdiction, was one of the stipulations introduced into the famous oath which, in Edward's lifetime, the duke had extorted from Harold. To enable his government to wield the resources of this maritime district with the greater vigour and promptitude, he severed it wholly from the civil and military administrations of the counties of Kent and Sussex, erecting it into a kind of palatine jurisdiction, under a *gardien*, or *warden*, who had the seat of his administration at the castle of Dover, and exercised over the whole district the combined civil, military, and naval authority; uniting in his own hands all the various functions which, to use the terms most intelligible to modern readers, we may describe as those of a sheriff of a county at large, a custos rotulorum, a lord lieutenant, and an admiral of the coast.

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[*] In the article Ceylon, p. 457, the amount of cinnamon exported is much overstated. A gentleman, well acquainted with the trade, informs us that up to 1833 the average annual exports were about 6000 bales, and since that time to the present, about 5000 bales.

To the five ports of the Conqueror's time were added, before the reign of Henry III., with equal privileges, what were called the *antient towns* of Winchelsea and Rye, lying on the Sussex coast, between Hastings and Romney. To each of these seven municipal towns, except Winchelsea, were attached one or more subordinate ports or towns, denominated *members* of the principal port.

The internal constitution of each port, as well as the Norman denominations of *jurats* and *barons*, which, in lieu of *aldermen* and *freemen*, have constantly prevailed in them all since William's time, concur to show the solidity of his plan for rendering this maritime line one of the grand outworks of the conquest. The earliest members of the municipal bodies established under these foreign denominations, at a time when the English municipalities in general were subjected to the most rigorous enslavement, were doubtless trading settlers from William's continental dominions; and the term *barons*, as applied to the cinque ports' representatives, which in the later periods of English parliamentary history has usually been considered as simply synonymous with *burgesses*, did, before the several elements of the Commons' House coalesced into one homogeneous body, imply a political as well as a municipal superiority.

Until the time of Henry VII. the crown appears to have had no permanent navy: the Cinque Ports constantly furnished nearly all the shipping required for the purposes of the state, and their assistance to the king's ships continued long after that time. When ships were wanted, the king issued his summons to the ports to provide their quota. In the time of Edward I. the number they were bound to provide was fifty-seven, fully equipped, at their own cost: the period of gratuitous service was limited to fifteen days. The summons in Edward III.'s time seems to have apportioned the ships among the ports and their members: some of the members had to provide one ship; and in some cases two members had to provide one between them. It is in consideration for these services that, in the preambles of the existing charters, the peculiar privileges and exemptions of the ports are stated to have been granted. These towns, owing to various causes, have long since lost their antient importance. The physical changes that have taken place in the course of ages upon the coast-line may have had some effect. Rye and Romney, once standing on the shore, are now at some distance from it. Sandwich is only accessible for small vessels*; and the antient site of Folkestone, one of the members of Dover, has been almost wholly washed away. But the complete organization of a permanent navy involved the extinction of that description of service on the part of these ports, in consideration of which their privileges were avowedly granted; and their inferiority as ports, and their distance from all the great seats of English manufactures, sufficiently account for their present commercial insignificance. All these circumstances however have not prevented them from sustaining, until the recent measures of general reform, no inconsiderable political part.

Each of the five original ports returned two *barons* to parliament, as early as the 18th of Edward I.; Seaford, a corporate member of Hastings, sent as early as the 26th of the same reign; and the two antient towns, Rye and Winchelsea, sent as early as the 42nd of Edward III. The peculiar nature of the relation between the Cinque Ports and the crown must have given the latter, from the commencement, a very powerful influence in their internal transactions; and, in later times, when the parliamentary relations of the municipal towns came to be the grand object of solicitude to the royal prerogative, these municipalities imbibed an ample share of the prevalent municipal as well as political corruption. In the 20th of Charles II. the first open blow was struck by the crown at the liberties of the Ports in general, in the provision of Charles's charter of that year, by which the elections of all their recorders and common clerks were made subject to the royal approbation. Subsequently, in 1685, all the general charters of the Ports, and most of the particular charters of each individual town, were, by the king's special command, delivered up to Colonel Strode, then constable of Dover Castle, and were never afterwards recovered.

The lord-warden is the general returning officer for all the ports, the writs at every general election being directed to him in the same manner as to sheriffs of counties, whereupon he issues his precept for the election to the proper officer of each port. Before the Revolution of 1688 the lord-wardens assumed the power and the right of nominating one, and sometimes both, of the members for each of the port-towns having parliamentary representation; but this practice was terminated by an act passed in the first year after the Revolution, entitled 'An Act to declare the Right and Freedom of Election of Members to serve in Parliament for the Cinque Ports.' After reciting that 'the election of members to serve in parliament ought to be free,' and that 'the late lord-wardens of the Cinque Ports have pretended unto, and claimed as of right, a power of nominating and recommending to each of the said cinque ports, the two antient towns, and their respective members, one person whom they ought to elect to serve as a baron or member of parliament for such respective port, &c., contrary to the antient usage, right and freedom of elections,' it enacts 'that all such nominations and recommendations were and are contrary to the laws and constitution of this realm, and for the future shall be so deemed and construed, and hereby are declared to have been, and are void, to all intents and purposes whatsoever, any pretence to the contrary notwithstanding.' The necessity for such an enactment proves how firmly the practice must have been established; but although this statute had the effect of taking away the privilege from the lord-warden, the result was, that the Treasury influence was now enabled to return both members.

As regards the original titles to freedom in the ports, it appears, not only from general analogy and from the uniform language of the charters, but from the terms of an antient custumal of the ports received as evidence in a case of *mandamus* against the corporation of Hastings in 1736 before Lord Hardwicke, that the right to, and mode of, obtaining a freedom in each of the ports was originally uniform. The antient titles to freedom as recited in this custumal were these:—1. By birth within the town and port, if the man's father was free at the time of his birth; 2. By a freehold tenement; 3. By purchase, redemption, or gift. But at the time of passing the late Reform Act, the title to the municipal freedom (and consequently to the parliamentary franchise), by virtue of a freehold, was totally obsolete in all the port towns except Dover. Freedom by birth was allowed to all the sons of freemen at Dover, Sandwich and Hythe: at the other ports the claim of the eldest son alone was admitted; and even this, in later times, had been very much narrowed. In general, it was become the practice to admit such persons only to freedom, by election or redemption, as were either advanced in years, or for some other reason were not likely to have legitimate offspring.

Poverty also, and its attendant aptitude to passive submission, were among the principal recommendations to such admission. A freedom of a Cinque Port town was always considered as entitling its possessor to a provision of some sort. Thus at every one of the Cinque Ports there was a large custom-house establishment, including, besides the ordinary servants and retainers, five or six riding officers, and a custom-house boat, the crew of which, though rarely sailors, were always freemen. At three or four of the towns were stationed custom-house cutters, nominally to cruise against smugglers, but really to make provision for the friends of the minister, the whole body of their officers being freemen. As the salaries of the superior officers were very considerable, they had usually, according to the amount of their profits, one, two, or three of the lower class of freemen quartered on them, who were called riders—a practice which was very general as to all the Cinque Ports. Another common mode of binding the lower class of freemen to their political good behaviour was, by lending them small sums of money on bond; which, so long as they conducted themselves to the satisfaction of their superior, were never demanded, but which, if they proved refractory, were exacted with the utmost rigour.

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* In fact Sandwich never could have been accessible to much larger vessels than it receives at present.

The history of the Cinque Ports in later times presents us with some of the most glaring and flagitious instances of the sacrifice of the local well-being of the community to the interests of the various descriptions of traders in political corruption. Down to the period of the late general reform, this municipal depravation was most mischievously apparent in the composition of the local magistracies, contrasted as it was with the ample powers of judicature which they possessed. For all purposes except one or two, each corporate town of the ports possessed all the jurisdiction and arrangements of a separate county, and the circuit judges held no assizes within their liberties; each town too had its distinct rate in the nature and for the purposes of a county rate, and its civil court of record; and most of the duties analogous to those of a sheriff of a county at large were exercised separately and exclusively in each of the port towns. According to the originally uniform Norman constitution of the ports, the number of jurats in each corporation ought always to have been twelve, besides the presiding officer, each of whom was, *ex officio*, a judge both of the civil and criminal court. The mayor or bailiff, and two other jurats, however, constituted a quorum. For the reasons indicated above, it became the practice in most of these towns to keep the number of jurats as low as possible, scarcely ever exceeding four or five.

From the body of jurats in each port, or corporate member, the mayor or bailiff was elected. Before the passing of the statute 9 Anne, c. 20, which enacts that officers having the return of members of parliament (which the head of the corporation has in each of the port towns) shall not be chosen for two successive years, the same person was usually continued in the office of mayor or bailiff for a great length of time, and sometimes in a manner for life; the agent or manager of the Treasury interest in each respective borough being almost uniformly appointed to that office. This statute however had here no considerable effect; it only occasioned the substitution in alternate years of some very near relative or mere dependent of the government agent.

In order to present a distinct view of the alterations effected in the Cinque Ports' jurisdictions by recent enactments, general and local, we give a table of the ports and their detached members (distinguishing among the latter the corporate from the non-corporate) as they existed at the commencement of the present century:

Ports.	Detached Members.
Hastings.	1. Corporate town of Pevensey; distant 12 miles from Hastings.
	2. Corporate town of Seaford; distant 22 miles.
	3. Part of Bexhill parish, in Pevensey Marsh; distant 8 miles.
	4. Small part of St. Leonard's parish, near Winchelsea; distant 9 miles.
	5. Beaksbourne parish, near Canterbury; distant 48 miles.
	6. Vill of Grange, or Grench, near Rochester; distant 50 miles.
Winchelsea.	
Rye.	1. Corporate town of Tenterden; distant 10 miles.
Romney.	1. Corporate town of Lydd; distant 3 miles.
	2. Denge-marsh; distant 5 miles.
	3. Orlestone; distant 10 miles.
Hythe.	
Dover.	1. Corporate town of Folkestone; distant 7 miles.
	2. Corporate town of Faversham; distant 25 miles.
	3. Parish of St. John, containing the town of Margate; distant 21 miles.
	4. Parish of St. Peter; distant 19 miles.
	5. Parish of Birchington; distant 20 miles.
	6. Parish of Ringwould; distant 5 miles.
Sandwich.	1. Corporate town of Fordwich; distant 10 miles.
	2. Corporate town of Deal; distant 6 miles.
	3. Vill of Ramsgate, including the town of that name; distant 4 miles.
	4. Vill of Sarr; distant 5 miles.
	5. Parish of Walmer; distant 8 miles.
	6. Parish of Brightlingsea; distant 40 miles.

It is probable that in very early times all the members were in some measure dependent on, or subject to, their respective ports; but in latter times there has been no connexion between any port and such of its members as have been incorporated, beyond that which exists among all the ports, excepting only the connexion between Sandwich and Deal. Each incorporated member has had within its liberty the same independent jurisdiction and municipal functions as the port itself. The unincorporated members have remained under the municipal jurisdiction of their respective ports; they have been within the jurisdiction of the criminal and civil courts, and of the magistrates and coroners of those ports; they have been summoned on the juries, and have contributed to the rates, in the nature of county rates, imposed by the justices of those ports. Yet none of the municipal franchises could be acquired in these members, nor had they any share in electing any of the officers of their respective ports; residence within them was not considered, for any corporate purpose, as residence within the port. The relation between Sandwich and Deal was peculiar. Deal was incorporated by William III., before which time it was exclusively under the jurisdiction of Sandwich. William's charter gave Deal a jurisdiction of its own; but as it did not interfere with the original jurisdiction of Sandwich, the latter retained a concurrent jurisdiction in Deal.

The jurisdiction of the Cinque Ports collectively extends along the coast, continuously, from Birchington, which is west of Margate, to Seaford in Sussex. But several of the corporate members are quite inland. Tenterden, in the centre of a rich agricultural district, has not even a river near it. Many of the unincorporated members are not only inland, but situated at great distances from their respective ports, some as far as forty to fifty miles. All the unincorporated members being exclusively under the jurisdiction of their own ports, each of those members was obliged to have recourse to the justices and coroner of its own port. Great inconvenience was experienced from this state of things, especially in those towns where the distance from the principal port was considerable.

Some part of the inconveniences above indicated was removed by the statute 51 Geo. III. c. 36, entitled 'An Act to facilitate the Execution of Justice within the Cinque Ports.' By this act three of the most remote unincorporated members, Beaksbourne and Grange (in Kent) belonging to Hastings, and Brightlingsea (in Essex) to Sandwich, were placed under the jurisdiction of the magistrates and coroners of the counties within which they are locally situated, and prisoners there were to be committed to the respective county gaols; but these members were to continue contributing to the liberty rate of their respective ports, excepting only for the maintenance of the gaols of those ports. As to the administration of justice, also, in the other unincorporated members, the act made some important alterations. By the act 54 Geo. III. c. 17, the precinct of Dover Castle was included in the jurisdiction of the town and port of Dover, from which it had formerly been distinct.

The Parliamentary Reform Act of 1832 worked a considerable revolution in the political relations of the Cinque Ports. Three of the towns, Seaford, Winchelsea, and Romney, being placed in Schedule A of that act, and Rye and Hythe in Schedule B, the number of Cinque Ports' representatives is thus reduced from sixteen to eight; Hastings, Dover, and Sandwich, still returning two members each, and Rye and Hythe one each. In the several constituencies of these five remaining parliamentary boroughs, besides the important change effected by the introduction of the household franchise, the new regulation of the parliamentary boundaries made very material alterations. Hastings and Dover have experienced the least change in this latter respect. In the case of Hastings, the two nearest of the detached members have simply been added to the 'home liberty' of the port itself, as before existing; and in that of Dover the most populous part of one of the adjoining parishes has been added to the immediate liberty of the port. But in forming the new parliamentary borough of Rye, not only have the two 'antient towns' of Rye and Winchelsea been thrown together, but six surrounding agricultural parishes are also included within their common boundary. In like manner Folkestone, a corporate member of Dover, is now joined with Hythe, and five adjacent agricultural parishes, in composing the parliamentary borough of Hythe. And to the antient home liberty of Sandwich are added, for parliamentary purposes, the corporate town and parish of Deal, and the contiguous parish of Walmer.

The Municipal Reform Act has operated yet more decisively to break up the antient organization of the ports, and assimilate their internal arrangements to those of the improved English municipalities at large. Of the thirteen corporate port towns, four of the least considerable—Pevensey, Seaford, Winchelsea, and Fordwich—are not included in the Municipal Regulation Act. Of the nine which are included, Dover, Hastings, and Deal, are the most considerable; each of the three, being included in Schedule A of that act, is positively to have a commission of the peace in the mode prescribed for the municipalities in general in the body of the act. The six others—Hythe, Rye, Sandwich, Faversham, Folkestone, and Tenterden—are to have a commission of the peace only on petition of the municipal council, and grant by the crown.

The jurisdiction in capital cases, formerly possessed by the ports, is abolished by the act in common with all similar jurisdictions; and as regards the limits of the authority of the courts and magistrates of the ports, provision is made by section 134 of the same act.

Antiently there were several courts, exercising a general jurisdiction over all the ports and members. The Court of Shepway was the supreme court of the Cinque Ports. The lord warden presided in it, assisted by the mayors and bailiffs and a certain number of jurats summoned from each corporate town. The following offences seem to have been cognizable within the Ports' jurisdiction by this court only: treason, sedition, counterfeiting the king's coin or seal, and concealing treasure found. It was also a court of appeal from the judgments of the several local courts. This court has been so long obsolete that even the site of it is now unknown, except that it was most probably somewhere in that central part of the Ports' jurisdiction about which lies the division of the county of Kent, still denominated 'the lathe of Shepway.' Two other antient courts are still occasionally held, the Court of Brotherhood and the Court of Guestling. The name of the former seems to indicate its purpose to have been the regulating of the affairs of the fraternity or association of the ports in general. The latter court seems to have been only a modification of the former, practised on certain occasions. The Court of Brotherhood is composed of the mayors of the five ports and two antient towns and a certain number of jurats from each of them. The Court of Guestling consists of the same persons, with the addition of the mayors and bailiffs of all the corporate members, and a certain number of jurats from each of them. It is thought that the bodies forming this addition may originally have been merely *invited* by the Court of Brotherhood to give their assistance, and that hence the assembly may have received the name of Guestling. The chairman of the court is called the speaker, and the office is filled in rotation by the mayors of the five ports and two towns, each for one year. The speaker sends a letter every year to each of the corporations composing the two several courts, asking their opinion as to the expediency of holding either of them; and if a majority answer in the affirmative, the speaker convenes the court. One of the more important functions of the Court of Brotherhood antiently was the appointment of the two bailiffs whom the Cinque Ports had the privilege of sending to superintend their affairs at Yarmouth in Norfolk, and the examination of the conduct of those officers. The securing of certain facilities for carrying on the fishery during the herring season, granted to them by charter, and enforced by successive royal ordinances, seems to have been the main object of the residence of these officers of the Ports at Yarmouth, where also, together with the bailiff of that town, they had the keeping of the peace and the care of the prison during the fair, with the power of determining all disputes and complaints. As late as the reign of Elizabeth we find traces of the contentions which were constantly arising between the bailiff of Yarmouth and the bailiffs of the Ports residing there. In the Court of Brotherhood also the arrangements and regulations were made as to the apportioning of the service of ships to the crown. In these general courts, too, assessments were made upon all the ports and members for defraying the general expenses of the association; and in them all disputes between any of the ports, towns, or members were settled, and complaints of misconduct in any of their officers were inquired into and redressed. The necessity for proceedings of this kind no longer exists; and although these courts have been occasionally held of late years, such holding seems to have been mere matter of form, excepting only the Courts of Brotherhood and Guestling, held before each coronation, at which the arrangements have been made respecting the privilege of the *barons* of the ports to hold the canopy over the king's head on that occasion; another mark of the pre-eminence among the municipalities of England given to these towns by the princes of the Norman line.

Many of the privileges set forth in the general charters of the Ports are at this day of little value. The freedom from toll and dues seems to be recognised at several ports, though at others the claim to this exemption has not been allowed, at least without an extract from the charter certified by the corporation, and a certificate from the same body that the person claiming the exemption was a freeman. The only other privileges which the freemen of the Cinque Ports in general seem now to enjoy are, the exemption from serving on county juries by reason of property out of the liberties, and that from service in the militia; both which all the inhabitants of the Cinque Ports enjoy in common with them.

It remains to notice more particularly the nature of the lord warden's jurisdiction as now exercised. One important branch of a sheriff's jurisdiction is exercised by him over all the ports and members, viz., the execution of writs and the custody of debtors. All writs out of the superior courts are directed to the constable of Dover Castle, who is always the lord warden; upon which his warrant is made out, directed to and executed by an officer called the *bodar*. This officer, by a curious anomaly, has also the execution of writs out of the distant civil court at Hastings; and the necessity of having recourse to him has been a source of inconvenience and dissatisfaction to the latter town. The clerk of Dover Castle acts as under-sheriff. The constable's gaol for debtors is within Dover Castle; and by act 54 Geo. III., c. 97, their maintenance is provided for by an annual contribution of 300*l.*, to be levied on the ports and members in proportions fixed by the act. The lord warden has power to diminish this sum if he think it more than sufficient, and to increase it again. The money is paid over to the registrar of the Cinque Ports, who, at the time of the framing of the report of the late municipal commissioners, was the same person as the clerk of Dover Castle.

The admiralty jurisdiction of the Cinque Ports, attached to the office of lord warden, is expressly reserved in that clause of the Municipal Reform Act which abolishes chartered admiralty jurisdictions in general. A branch of this jurisdiction appears in the court of Lodemanage, so called from the old English word *lodeman*, a *lead*-man or steerer, which is held for the licensing and regulating of pilots, by the lord warden and a number of commissioners, of whom the mayors of Dover and Sandwich are officially two. The lord warden seems antiently to have held a court of chancery in one of the churches at Dover, but it has long been obsolete.

For further details, see Jeake's *Charters of the Cinque Ports; the various Statutes relating to the Ports;* Oldfield's *Representative History of Great Britain; the Reports of the Commissioners for settling Parliamentary Boundaries under the Reform Act of* 1832; *those of the Commissioners in the late Municipal Inquiry; the Parliamentary Reform Act of* 1832; *the Municipal Regulation Act of* 1835; and for a fuller view of the various causes which successively operated to vitiate the early popular constitution of these in common with the other English municipalities, as also of the recent measures of general renovation, see BOROUGHS OF ENGLAND AND WALES.

CINQUEFOIL. [POTENTILLA.]

CINTRA, a town in the province of Estremadura in Portugal, in the comarca or district of Alemquer, 12 miles N.W. of Lisbon, on the slope of the Sierra de Cintra, which is the W. extremity of the great central chain that crosses the peninsula from the Ebro to the Atlantic, and of which the Sierra d'Estrella and the Monte Junto in Portugal form part. The neighbourhood of Cintra is celebrated for its mild climate and delightful quintas, or country-houses; the resort of the wealthy inhabitants of Lisbon during summer. The kings of Portugal have a palace at Cintra, with fine gardens ornamented by numerous fountains. Several halls of the palace are adorned with historical paintings. At a short distance to the west of Cintra is the pretty valley of Collares, which opens to the sea, and is also full of country residences. The country abounds with all kinds of fruit, especially oranges and lemons. Several convents are situated among the neighbouring hills. Cintra is known in contemporary history for the convention of 1808, by which, after the defeat of Junot by the English at Vimieira, the French agreed to evacuate Portugal. The town of Cintra has 4300 inhabitants. (Miñano, *Diccionario Geografico*, and Supplement to it.)

CI'ONUS, a genus of Coleopterous insects of the section Rhyncophora and family Curculionidæ.

Schoenherr (in his 'Synonymia Insectorum') links the present genus with the genera *Gymnætron*, *Mecinus*, and *Nanodes*, under the head Cionides, which may be considered as a sub-family: we will therefore briefly state the characters of these genera under this head, first observing that the Cionides may be distinguished from allied groups by their having the antennæ nine or ten-jointed, five of which always compose the funiculus, or that portion between the basal joint and the club which terminates the antenna.

The characters of the genus Cionus are as follows:—Antennæ short, the two basal joints of the funiculus obconic, the remainder short and truncated at the apex; the club long and indistinctly jointed: rostrum elongate, curved, inserted in a groove beneath the thorax: thorax small; elytra nearly spherical, furnished with tufts of a velvet-like nature; femora very thick in the middle; tibiæ simple, truncated at the apex.

Four species of this genus are found in England; they live, both in their larva and imago states, upon plants, more especially those of the genera Scrophularia and Verbascum.

Cionus Verbasci is about one-sixth of an inch in length, and of a deep ash colour, approaching to black; the thorax is furnished on each side with a buff-coloured patch; the elytra have four longitudinal velvet-like bands, which are black, and interrupted with grey spots; there are two velvet-black spots on the suture, one near the base of the elytra and another near the apex; the former has a yellow spot joining it posteriorly, and the latter has a spot of the same colour before and behind.

These little insects are almost spherical: when touched or approached they apply their long proboscis close to the underside of the body (where there is a groove for its reception), and also the legs, and allow themselves to roll to the ground. Their larvæ, which are of a yellowish colour, and resemble small oblong masses of jelly, may be seen in the month of August on the leaves of the Verbascum, Thapsus, and some few other plants which they feed upon. When about to assume the pupa state they enclose themselves in a little brown spherical cocoon (less than an ordinary-sized pea) formed of a glutinous substance, which is attached to the leaves of a plant; in about a week or ten days after this, the perfect insect makes its appearance.

The genus *Gymnætron* differs chiefly from *Cionus* in having the elytra somewhat ovate, sometimes depressed and not covering the apex of the abdomen, and the anterior tibiæ furnished with a minute hook at the apex. *Gymnætron Beccabungæ* is the only species found in this country.

Mecinus may be distinguished from either of the two last mentioned by the rostrum being short and thick; the thorax subcylindrical, the elytra elongate, nearly cylindrical, and covering the body; the tibiæ are armed with a hook at the apex. Three species of this genus are found in England. Mecinus semi-cylindricus is about one-eighth of an inch in length, and of a blackish colour with ash-coloured pubescence.

The genus Nanodes has the antennæ rather long, the club large; rostrum elongate, slightly bent; thorax conical; elytra subovate and humped; the anterior tibiæ unarmed. No species of this genus have yet been found in this country. (See Schoenherr's *Synonymia Insectorum,—Genera et Species Curculionidum.*)

CIOTAT, LA, a town on the south coast of France, in the department of Bouches du Rhône, about ten miles S.E. of Marseille, in 43° 10′ N. lat., and 5° 36′ E. long.

This town is said to owe its origin to two or three towers which the Catalan fishermen, who frequented the coast, built about the year 1200 to protect themselves from the piratical vessels of Barbary: these led to the formation of a hamlet, dependent upon the neighbouring village of Ceireste or Cereste; the hamlet grew to be a town, containing a busy and enterprising population. Of the time when the harbour was first formed, nothing certain is known; the *new mole* was built A.D. 1645, and the place was walled in and forts were raised for its defence a few years afterwards. Expilly estimated the population, about the middle of the last century, at 10,000, but either this statement is inaccurate or the town has declined, for the last census (1832) gives only 4345 inhabitants for the town, or 5427 for the whole commune. The water in the town is brackish, but good water is brought from a short distance by women who gain a livelihood by it.

The neighbouring territory produces abundance of delicious fruits, excellent red and white muscadel wines, and oil; and the port is frequented by numerous vessels, which come for these productions. As there is a supply of wood in the neighbourhood, a number of small vessels are built here, not only for the merchants of the town, but also for those of Toulon and Marseille. The fishermen of this coast appear to be a peculiar race, distinguished by their good sense and their activity, and by various customs: they preserve their peculiarities by their practice of intermarrying among themselves. Their sports are athletic and suitable to the life which they lead. Their disputes are decided before a tribunal of four *prud'hommes* or magistrates, chosen from among the older members of their own class, who are distinguished for good sense and integrity: the brevity and cheapness of the proceedings which take place before them and the wisdom of their decisions render their institution valuable, and it is probably owing to this that it has been maintained during the changes which have occurred in the government of France.

On the opposite side of the little bay of the Mediterranean, on which La Ciotat stands, is a place called Tarento or Taurente which D'Anville considers to be the Ταυρόεις, Tauroeis (accusative Tauroenta, Cæs., *de Bell. Civ.*, ii. 4) of the Greeks and Romans. Roman remains yet exist on this spot, but they are more probably the remains of the villa of some wealthy Roman of the fourth century than of the public buildings of the town. Tauroeis was of Phocean origin, and belonged to Massilia, now Marseille; it never appears to have been of any importance, and was probably only a fort (Castellum Massiliensium, Cæs.) for the protection of the coast. When Trebonius and D. Brutus, the lieutenants of Cæsar, besieged Massilia, the townsmen, after their first naval defeat by Brutus, effected a junction here with the vessels of Nasidius, whom Pompey had sent to their aid.

CIOULE or SIOULE, a river in France, in the mountainous district of Auvergne. It rises on the northern declivity of Mont Dor, and flows N. and N.E. until its junction with the Allier (one of the principal feeders of the Loire) below St. Pourçain. Its whole course is above 80 miles: it is not navigable in any part of its course, except for rafts. Expilly however says that its channel only needs to be cleared of the rocks and stones which now impede the navigation to render it a valuable outlet for the agricultural produce of the district through which it flows.

CIPHER is derived from the Arabic Sifr, which originally signifies 'empty, devoid of,' and is used as a substantive to denote the figure 0.

CIPOLIN. The cipolin from Rome is a green marble with white zones. It gives fire with steel, though with difficulty. One hundred parts of it contain 67·8 of carbonate of lime; 25 of quartz; 8 of schistus; 0·2 of iron besides the iron contained in the schistus. The cipolin from Autun consists of 83 parts carbonate of lime, 12 of green mica, and 1 of iron. (Nicholson's *Chemical Dictionary.*)

CIPRIA'NI, GIOVANNI BATISTA, descended from an antient family of Pistoia, was born at Florence in 1727. He received his first instructions from Heckford, an English artist. He afterwards studied under Gabbiani; or, according to Lanzi, he studied from a collection of drawings by Gabbiani, upon which he formed his style. In 1755 he came to England, and subsequently married an English lady of moderate fortune, by whom he had three children. He was one of the original members of the Royal Academy, and was presented with a silver cup by that body in return for the design for their diploma which he furnished. He died, much esteemed, Dec. 14, 1785, and was buried at Chelsea. Cipriani executed few paintings. Lanzi mentions two, in the Abbey of St. Michael on the Sea. He employed himself chiefly in drawing designs, of which Bartolozzi engraved a great number.

CIRCÆA, a genus of small herbaceous plants, found in woods and shady places. They have little whitish pink flowers having a tubular superior calyx, with a two-parted limb, two petals, two stamens, and an ovary with two cells, each of which contains one erect ovule. The genus constitutes the type of a section of Onagraceæ, in a reduced state. The species are commonly called Enchanter's Nightshade; but whatever supposed properties may have given rise to this name are purely imaginary.

CIR'CAETUS. [FALCONIDÆ.]

CIRCARS, NORTHERN, a large maritime province, lying between 15° and 20° N. lat., and between 80° and 86° E. long., and extending along the western side of the Bay of Bengal, from the Chilka lake on the north to the river Gondegama on the south. It has thus the district of Cuttack for its northern, and the Carnatic province for its southern boundary; on the east it has the Bay of Bengal, along a line of coast extending 470 miles; and on the west are Orissa, Gundwana, the dominions of the Rajah of Berar and of the Nizam, and the ceded Balaghaut districts. The average breadth of the province is about 80 miles, and its area about 38,000 English square miles. A continued range of mountains, impassable by carriages and difficult for horsemen, extends along the whole western frontier, from the Chilka lake on the north to the bank of the Godavery on the south. South of that river the province is separated from the Nizam's territory by a detached range of small hills. The province is watered by several small rivers, which rise among the hills forming the western frontier, and flow into the Bay of Bengal; it receives likewise the waters of the Godavery and Kistna rivers, whose mouths are within the province.

The Circars are politically divided into seven districts—Chicacole, Condapilly, Ellore, Ganjam, Guntoor, Rajamundry, and Vizagapatam. The climate of these districts exhibits a general uniformity. About the middle of June the westerly wind sets in, accompanied by moderate showers, until the end of August, when the harvest of the small grains is secured. From the beginning of September to the end of the following month the rain is more abundant; the wind is generally violent as November approaches, and then changes to the north-east, when the rice harvest, which constitutes the main dependence of the inhabitants through the greater part of the province, is housed. The season is then fair and pleasant, and at the vernal equinox the maize harvest commences. The season between the end of March and the setting in of the rains in the middle of June is hot, but the temperature is somewhat moderated by the sea breeze during the day. The soil towards the south is better than in the north. During the wars by which the Carnatic was formerly ravaged, so much of the country was suffered to be overrun with jungle as a protection from invasion, that it was always necessary to import some part of the grain needed by the inhabitants; but the security which the inhabitants have enjoyed during the last forty years has induced a larger cultivation, and they are no longer dependent upon external supplies. Fruits and garden vegetables are scarce. Sugar, cotton, and tobacco are produced; of the last, the quality of which is excellent, some part is exported. The forests upon the hills to the west contain abundance of teak wood of large growth. At the principal mouths of the Godavery ship-building is carried on, and vessels of 500 tons burthen have been constructed. From the nature of the country a great part of its trade is prosecuted in coasting vessels, the aggregate burthen of which exceeds 50,000 tons.

The district of Chicacole forms the largest portion of the recently created collectorate of Ganjam, including its capital. Exclusive of mountain streams, which are numerous during the rainy season, Chicacole is watered by four rivers, the mouths of which are at the towns of Chicacole, Calingapatam, Bimlipatam, and Vizagapatam: there are but few extensive plains in this district. The town of Chicacole, the Mohammedan name of which is Maphus Bunder, is in 18° 15′ N. lat. and 84° E. long. It is a large town, irregularly built on rising ground, forming the north bank of the Chicacole river, which rises in the mountains of Gundwana and joins the sea three miles below the town, where it is about 1750 feet broad. The centre of the town contains barracks, which are little used; and there are numerous mosques, the principal of which, a building of stone erected in the year 1051 of the Hegira (A.D. 1641), is held to be of considerable sanctity. Condapilly, called by the Mohammedans Mustaphanaghur, is separated from Ellore and Rajahmundry by the salt-water river Ooputair, which is navigable by boats as far as the Colair lake, the surplus waters of which it carries off to the sea; this it joins, after a winding course, between Samaldang and Gollapollam. The town of Condapilly, the capital of this district, stands in 16° 37′ N. lat. and 80° 33′ E. long.: this place was formerly a fortress of some strength, but the works are now in ruins. The district of Ellore, together with Condapilly last described, occupy the whole of the territory of the province comprehended between the Kistna and the Godavery. The town of Ellore, situated in 16° 43′ N. lat. and 81° 15′ E. long., is the residence of the collector of the Masulipatam district, of which collectorate this district forms a part. It is a large town; the houses, not any of which exceed one story in height, are built with some regularity. Guntoor district lies between the Kistna and the Gondegama. The soil is very fertile. From the want of moisture during a great part of the year the cultivation of rice can be but little attended to, but the most luxuriant harvests of maize are raised. There are diamond mines in this district, but it is long since they have been productive. Guntoor, the chief town, is situated in 16° 17′ N. lat., and 80° 32′ E. long.; it is an extensive but irregularly built town, the walls of the houses being of mud, and the roofs of many thatched. It contains a great number of trees, and is divided into two portions by a large reservoir. The district of Rajahmundry lies on both sides of the Godavery, but principally on the north side of that river. The soil is fertile, particularly the island of Nagarum, a triangular space, comprehending an area of 500 square miles; which is formed by two great branches, into which the Godavery divides itself, thirty-five miles from the sea. Besides the two greater branches of the river by which it is enclosed, this island is intersected by five lesser branches; and the means of irrigation thus afforded, together with the slimy mould brought down by the greatest river of the Deccan, render the soil highly productive. The forests produce an abundance of teak timber; and in the plains, sugar, rice, ginger, turmeric, and various leguminous plants are raised. Cotton is also generally cultivated, but the quality is not good. The capital Rajahmundry is on the east bank of the Godavery, about 50 miles from its mouth, in 16° 59′ N. lat. and 81° 53′ E. long. The town is long but narrow, extending along an elevated bank adjoining the river. During the dry season the Godavery is here a clear blue stream, exhibiting many islands and shoals, and the banks on both sides are from twenty to thirty feet high, but in the rainy season the stream is a mile broad and very deep. Vizagapatam district, which lies to the north of Rajahmundry, is mountainous; a lofty ridge runs parallel to the sea-shore, and frequently within a very short distance of it, through nearly its whole extent; to the westward of this ridge is another chain; the intermediate space is a narrow and well-cultivated valley. The town of Vizagapatam lies on the coast in 17° 42′ N. lat., and 83° 24′ E. long., near to a promontory called the 'Dolphin's Nose,' a mountain about 1500 feet high. The town contains a considerable number of well-built houses; but the situation being unhealthy the place has been almost wholly deserted by Europeans, who have retired to the village of Waltier, about 3½ miles from the town, with which it communicates by an excellent road. There is a Hindu temple of great fame and antiquity at Semachillum, near Vizagapatam.

The northern Circars were among the earliest of the territorial possessions of the East India Company; they were granted in August, 1765, by the Mogul Shah Allum, 'by way of free gift, without the least participation of any person whatever in the same;' in November of the following year this grant was recognised by the Nizam or Soubahdar of the Deccan. The district of Guntoor was, at the date of the grant, held as a Jaghire for life by Bazaulet Jung, the Nizam's brother, by an agreement with whom the company rented that district, and it did not come into their actual possession until the death of Bazaulet Jung in 1788. For the whole province the company paid to the Nizam an annual *peshcush* or tribute of seven lacs of rupees (70,000*l.*), which was redeemed in 1823 by the payment of about 1,200,000*l.*, in virtue of which the Circars are now held in full sovereignty by the British. No census of the population of the province has ever been taken; an estimate was made in 1831, according to which the number of inhabitants was a little short of three millions; but it is evident that no great reliance can be placed upon the accuracy of a mere estimate. Mr. Sullivan, who was a resident for many years in the Madras presidency, stated rather loosely before the Committee of the House of Commons, in 1832, that according to his opinion the population of the Northern Circars was 'very little short of four or five millions of people.' The natives are represented as being a much finer class of men, both in appearance and in private character, than the natives of Bengal. The province is settled on the Zamindary system, and the old zamindars are said to be a remarkably fine and noble race of men: as regards the cultivators of the soil, they are very much on the footing of the Scottish chieftains of former days, the attachment between the two classes being continued through succeeding generations. With the exception of a few Mohammedans settled in the towns, the population of the Northern Circars is wholly Hindu. They are composed of two nations, the Telinga and the Ooria or Orissa, who speak and write different dialects, and have distinguishing customs and rites, although both adhere to the fundamental doctrines and discipline of the Hindu faith, and give undisputed preeminence to the Brahmins. The people have lived from time immemorial under the simple form of village government, and have preserved unaltered the names and limits of each of their villages, with its establishment of officers and servants, undisturbed by the changes which have transferred the sovereignty of the land from one set of rulers to another.

When the Circars came into possession of the English, a part of the lands were held by hereditary zamindars, and the remainder was under the immediate management of government officers: in those lands which were called *Havelee lands*, the public revenue was realized through the medium of renters to whom the rents due to government were leased for periods of years. The government has since assimilated the system throughout the province, by collecting different clusters of Havelee villages and forming them into zamindaries, which have been put up to public auction, the purchasers being entitled to hereditary possession upon payment of the revenue fixed in perpetuity upon the entire lands of the zamindary. Although these newly-created zamindars are considered by the government to be in all respects upon an equal footing with the old hereditary landholders, they are not so held by the community, but have received the distinctive title of Mootahdars, while the old zamindars are looked upon as the antient hereditary aristocracy of the country. Some of these have very large possessions, and pay a fixed annual tribute to the government of three lacs of rupees (30,000*l.*); nearly all of them reside on their estates, the management of which they retain in their own hands. The influence which they are thus enabled to exercise over the cultivators is very great, and instances have occurred where, in consequence of the tribute having fallen into arrear, the zamindary has been sold by the government, that the most serious rebellions have arisen, and the government has found it necessary, by private arrangements, to obtain back the estates from the purchasers, and restore them to the antient families. Of late, where any difficulty has occurred in paying the reserved rents, the government has taken temporary possession until its claims have been satisfied.

The revenue collected in the Northern Circars is said by Major Rennell to have amounted, in 1753, to about 43 lacs of rupees per annum. By a statement furnished by the East India Company in 1832, it appears that the revenue had then been augmented to 76,68,018 rupees (766,800*l.*), an augmentation of nearly 80*l.* per cent.

(Rennell's *Memoir of a Map of Hindustan; Mill's History of British India; Report of Committee of House of Commons in* 1832 *on the Affairs of India.*)

CIRCASSIA, or the country of the Circassians, is situated along the northern declivity of Mount Caucasus, and is now understood to comprehend the whole of this tract from the shores of the Black Sea to the vicinity of those of the Caspian, so that not only those portions which were formerly called the Great and Little Kabardia, but also the country of the Midszeges or Tchetchwenzes, who live towards the shores of the Caspian Sea, is included in it. [CAUCASUS.] The rivers Terek and Kooban, as far as their courses lie east and west, are considered as constituting the northern boundary; and the highest part of the Caucasian chain forms the southern.

The whole of this country is a succession of mountain-ridges, which branch off from the northern side of the Caucasus, and terminate near the rivers Terek and Kooban, and of valleys which lie between them. The mountain-ridges lower gradually, but with abrupt declivities as they proceed northward, and are commonly covered with wood in their lower portions. The highest of these collateral branches is that which detaches itself from Mount Elburz [CAUCASUS], runs north between 42° and 43° E. long., and terminates abruptly near 44° N. lat. with Mount Bechtan, which is 4320 feet high. This range is nearly destitute of trees, and contains a great number of warm and other springs, which are much visited, and known under the general name of Alexander's Baths. The valleys are very fertile, and generally of considerable width; but they contain numerous narrow passes, which render the access to them very difficult to an invading enemy, but tend to foster those predatory habits for which the inhabitants are notorious, and which render them the scourge of travellers and of their neighbours in the plain. The Russians, though acknowledged masters of the country, are not able to prevent their hostile excursions. Their generals and other officers have often been made prisoners, and have obtained their liberty only by paying large ransoms. To protect the adjacent plains, the Russian government has established a line of small fortifications along the banks of the Terek, Kooma, and Kooban; but 32,000 Cossacks, who are appointed to guard this line, find abundant opportunities of exercising their activity and military skill. The principal of these fortresses, Constantinogorskoë, lies south-west of Gheorghevsk, on the Podkooma, a branch of the Kooma, about 42° 40′ E. long., and 43° 50′ N. lat. Not far from it is the English missionary station of Karas, established in 1803 by the Scotch Society for Promoting Christianity, which being increased by a colony of Moravian brothers from Sarepta, now constitutes a village of 200 people. Its inhabitants are no less industrious in promoting agricultural and manufacturing industry, than in diffusing Christianity among the Circassians and Tartars; but hitherto they have made little progress.

There are no towns in Circassia, the habits of the people being opposed to the concentration of a great number of houses or of people on one spot. They live in small villages, the site of which is frequently changed. They cultivate the fertile soil of their valleys with little care; they raise millet and barley, and in some places also wheat and rye, with a small number of vegetables. The rearing of cattle is more attended to. Their horses are of a fine breed, and equally strong, swift, and beautiful; the people are proud of them, and, like the Bedouins, preserve the genealogies of their breed. The sheep, which are of the broad-tailed kind, are also much esteemed. The cattle are of a small kind. Milk, with millet, forms their principal food, and they make of it an inebriating beverage, the *koomiss*. As they are Mohammedans, they do not rear swine. Hunting is only followed by the noblemen, as a diversion.

The Circassians, or Cherkess, are the most numerous of the different nations that inhabit this country. They occupy the lower part of the mountains and valleys from the river Sundsha or Sunja on the east, to near the shores of the Black Sea. They consist of eleven tribes, independent of one another, and governed by their own hereditary princes and hereditary nobility. Their internal government resembles the feudal system. The whole population is estimated at 220,000. As the eastern portion of their country is called Kabardia, they are often called Kabardians; and it is certain that the Kabardians and Circassians belong to the same stock and speak the same language. To the east of the river Sunja live the Midszeges, also called Kistes and Tchetchenzes, who are said to be in number about 160,000. They differ entirely from the Circassians in language, but not much in character, being if possible still greater robbers. They seem to occupy the whole of the range to its very summits. The Ossetes, or, as they call themselves, Irones, occupy the higher part of the mountain range east of Mount Kazbeck, and consist of about 40,000 souls. The great road from Mozdock to Tifflis traverses their country. [CAUCASUS.] West of them are some smaller tribes, but the most western portion of the Caucasus is inhabited by the Avkhasas or Abasas, who occupy both the southern and the northern declivity, and are said to be about 240,000 in number. In their country is the small town of Anapa, which is fortified, has a small harbour, and about 3000 inhabitants. (Pallas; Reineggs.)

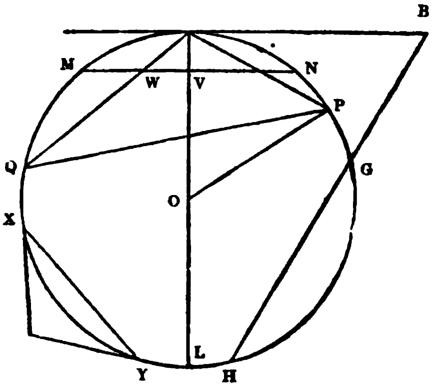
CIRCENSIAN GAMES. [CIRCUS.]

CI'RCINUS, the Compasses, a constellation of Lacaille, below Centaurus, and not very far from the South Pole.

Character.	No. in Catalogue of		Magnitude.
	Lacaille.	Astron. Society.	
α	1225	1655	4
β	1271	1724	5

CIRCLE (*circulus*, a little circle, from *circus*, a ring), the figure formed by a point which revolves in a plane surface, and always preserves the same distance from a given point. The points of view under which this word might be considered are with reference, first, to its properties as a figure of geometry; second, to the history of the researches which were made for centuries, in order to discover the exact ratio of the circumference to the diameter; third, the effect of the properties of the circle upon several branches of mathematics. For the second, we refer to the word QUADRATURE; we shall give a few of the first, and a sketch of the third.

The word circle is sometimes used to denote the *circumference* or boundary line, sometimes the inclosed figure or area. Frequently a point *in* a circle means a point on the circumference; but a point *within* a circle always means a point in the interior. The *centre* is the point from which all the *radii* drawn to the curve are equal; a diameter is a double radius.



Draw a circle with a centre O, and let O A be any radius. Draw A B perpendicular to the radius, and M N also perpendicular to the radius. Take any points, P and Q, &c. Then among the most essential properties of the circle are the following:—

1. A B is a tangent to the circle.
2. M N is bisected (halved) by V.
3. The square on V N is equal to the rectangle (oblong), whose sides are A V and V L.
4. If any two chords (M N and A Q) cut in W, the rectangle, whose sides are M W and W N, is equal to that whose sides are Q W and W A.
5. The square on A B is equal to the rectangle whose sides are B G and B H, if the line B H be any line drawn through B, cutting the circle.
6. If Q move round the circle, and A and P remain fixed, the angle (opening) A Q P preserves the same magnitude throughout, namely, half of the angle A O P, and equal to the angle B A P.

These properties, with several others which are *visibly* true, are in the third book of Euclid. We name one or two others, the verification of which will be a test of correctness in drawing for those who know how to use the compass and ruler.

7. From any point T exterior to a circle, two tangents T X and T Y (of equal lengths) can be drawn. Let T be called the *pole* of X Y. Then if any number of poles be taken on the same straight line (which call the polar line), all their chords pass through the same point; which last point is interior to the circle if the polar line be altogether exterior; and exterior, if the polar line cut the circle.
8. If any hexagon, having no opposite sides parallel, be drawn in a circle, the three points of intersection made by lengthening the opposite sides must be in one straight line.

To find the circumference of a circle (with more than sufficient nearness for practical purposes), take the 113th part of 355 times the diameter (A L) or 3·14159 times the diameter. To find the area in *square* units, multiply the number of units in O A by itself, and take the 113th part of 355 times the result (or multiply by 3·14159). Given the arc A P, and the radius O A, to determine the angle A O P [see ANGLE]. And the same for the inverse question. To find the area of the sector A O P in square units, take half the product of the units in the radius and the arc A P. These are the principal questions which can be solved by a person unacquainted with trigonometry.

The influence of the properties of the circle upon abstract mathematical analysis has been so great, that an attempt to describe the manner in which the means of expression derived from this figure have been used would fill a volume. We can only here give such a description as will help the beginner in trigonometry to extend his notions of the symbols he uses. Originally the sine, cosine, &c. [TRIGONOMETRY] meant certain lines drawn in a circle, with reference to a given angle at the centre. Each angle therefore had a sine, &c. for every different length which the radius might be conceived to have. But this introducing an unnecessary complexity into formulæ, it was thought sufficient always to suppose the radius a unit, which was however always expressed. Thus in the first stage of the science we have this theorem: 'The sine of 30° is half the radius,' which in course of time took this form, 'The radius being 1, sin. 30° is ½.' This method amounted to defining the sine, &c. to be, not the lines which they originally stood for, but the numerical ratios of these lines to the radius. Thus the sine, cosine, &c. became abstract numbers. The next step was to make the angle itself an abstract number, in the manner which [ANGLE] we have called the *theoretical* method of measurement; that is, instead of measuring the angle by an arbitrarily chosen angle, such as a degree or a minute, the numerical ratio of the arc to the radius became the measure of the angle. One extension more completed the subject. Angles of more than four right angles were admitted, conceived to be made by the revolution of a point, which was considered as having made more revolutions than one. Thus any number represented some angle, and had its sine, cosine, &c. And the angles themselves being abstract numbers, and also their sines, &c., it followed that all the propositions of what was trigonometry, an application of geometry, became propositions of trigonometry, a part of pure arithmetic; retaining indeed the old names derived from geometry (names are never changed, witness the use of the term *square* in algebra), but based upon the notion of number, and the symbolic operations of algebra. Thus though it will always perhaps be thought desirable to lead the beginner through the gate of geometry, yet there must come a time, if he continue his studies to the higher branches, when he will consider a sine as a number, a function of a number; for instance, x being a number, the sine of the number x means the series

$$x - \frac{x^3}{2.3} + \frac{x^5}{2.3.4.5} - \text{\&c. } \textit{ad inf.},$$

or any algebraical form which is equivalent to it.

This is the point to which works on trigonometry are rapidly tending; and seeing that the student must end, if he pursue his course, in such considerations, it is most desirable that he should begin in the same manner, to every extent which is consistent with not forcing abstractions upon him too rapidly.

The ratio of the diameter to the circumference of a circle is very near indeed to that of 113 to 355, which numbers this diagram will keep in memory,

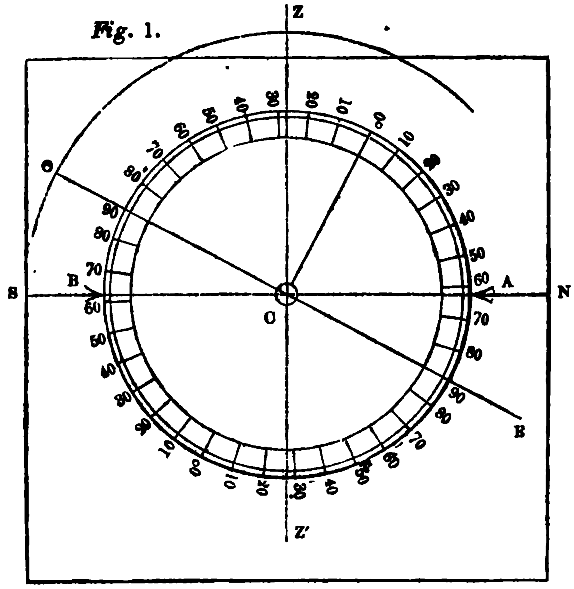
1 1 3 | 3 5 5

This method makes the circumference too great by about twenty-seven hundred-millionths of the diameter, and is therefore abundantly exact. But for common purposes, take the circumference at three times the diameter and one-seventh of the diameter, which does not err more than about one part out of a thousand of the diameter, and still in excess; that is, the circumference is a little less than twenty-two-sevenths of the diameter.

CIRCLE, ASTRONOMICAL. Though almost all the astronomical and geodesical instruments which are at present used in measuring angles, are composed of entire circles, the term *astronomical circle* is ordinarily confined to those instruments of which the sole or principal use is the measurement of angles of altitude or zenith distance. In the present article we shall adopt this limitation, and restrict ourselves still further to a description of the construction and use of those circles which are either fixed in the plane of the meridian, as the *mural* and *transit* circles, or which continue to have the plane of the principal circle vertical, though turning upon an axis, as the *altitude* and *azimuth* circle. For other instruments which might be included under the term circular, the reader must consult the articles Equatorial, Repeating Circle, and Theodolet.

This article will be more intelligible with some preliminary explanations.

Fig. 1.



Let a circular plate, divided into 360°, turn round a concentric axis C, fixed into the block S N, so that the line E O, moving with the circle, and in which direction the observer is supposed to look, can be placed in any direction up or down. A and B are two pointers attached to the block, and in a line passing through the centre. The block and circle are supposed to be upright, the axis C and the line A B horizontal. Also when the line of sight is vertical, or E O coincides with Z′Z, 0° of the divisions ought to be exactly under the pointer A. It is evident when the line of sight is moved through any angle into the direction E O, that C 0° must have moved through an equal angle, and that the ∠ ZCO = ∠ AC 0°, or the arc A 0°. Hence if an object is seen in the direction E O, its *zenith distance* Z C O will be the angle pointed out upon the divided circle by the pointer A. This angle is technically called the *reading* of A. The line E O represents the direction of plain sights, or the line of sight of a telescope, sometimes called the *line of collimation* (from *collimare*, said by Facciolati to be a mistake for *collineare*).

If when E O is vertical, A points a little above or below the 0°, or zero of the divisions, the difference from 0° is called the *error of collimation*, which may be corrected by shifting the position of A; but when the quantity and direction of the error are known, there is no need to make any alteration. For instance, let A point to 2° when the line of sight is vertical, then it is evident that when the line of sight is in the direction E O, the zenith distance will be equal to the arc from 2° to A, or 2° must be *subtracted* from the *reading* of A. If E O be directed anywhere between Z and N, then 2° must be *added* to the readings of A. In fact the pointer may be placed anywhere in the circumference of the circle, and the divisions may commence in any part of the circle without at all affecting the accuracy of the measurement of angles of zenith distance; but a very large error of collimation would be inconvenient in practice. The second pointer B, if exactly in a diameter with A, and the divisions perfect, would evidently give the same result as A. This also may have an error of collimation, which may be treated precisely as that of A; or rather, the error of collimation for the *mean* of two or more pointers is determined once and by the same operation. Two readings have thi advantage over one, that if some of the divisions should b erroneously placed, it is not likely that equal errors in th same direction should fall at the same time under bot pointers; and in any other supposition, the mean of the tw readings will be affected by a less error than one of them Hence the advantage of multiplying the readings for lessening the errors of division; it is evident that what improbable for two, will be all but impossible for six, which the number used in the Greenwich circles. There is howeve another and more sensible advantage in two opposite reading above one. Conceive the whole circle to be moved towards Z or Z′, or pushed sideways towards N, or S; still so long as E O continues to be parallel to itself, which it must be if it continues to be in the direction of a very distant object, th sum of the readings of A and B will remain the same whatever one loses the other will gain. Hence it is no necessary that the axis should be truly circular, or tha the centre of the axis should be exactly concentric with th centre of the divisions, which last requisite is not easil accomplished in the present construction of English dividing engines. In all circles which have readings diametrically opposite to each other, the observer ought t consider each *pair* as only *one* reading of a *diameter*, an not as two unconnected readings. There is another form i which a circular instrument for measuring altitudes ma be constructed; the divided circle may be fixed to th block, and the line of sight, E O, turn upon the axis C. I this case the pointers must be connected with E O, an revolve on the same centre. All the previous remark are equally applicable.

The operation of noting the angles, or of *reading of* has been described in its rudest form, as it seems to hav been practised by the Greeks. We must here explai somewhat more minutely the use of the micrometer microscope. (For other modes of subdivision, see Vernier.)

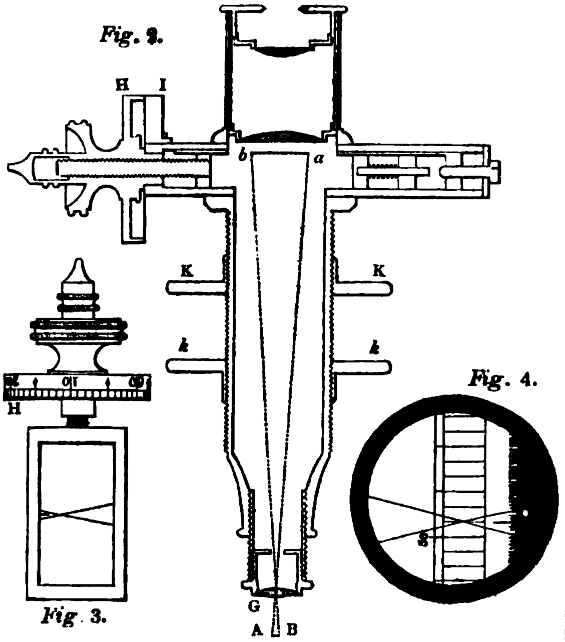


Fig. 2.

Fig. 3.

Fig. 4.

Fig. 2 is a *micrometer microscope*. A B is supposed to be the space between two divisions of the circle which is generally equal to 5′. The object glass G, which is sometimes, and with great benefit, made achromatic, forms at *ab* an inverted image of A B, as *ab*. Within the body of the microscope there is a slide, represented in Fig. 3. This slide is drawn forwards by a fine screw (generally of 100 threads to an inch), while it is held back by a spring to avoid *lost time*; it has two fine wires crossing at an acute angle as in the figure. The image *a b* should fall exactly on this cross, and the two lens eye-piece should be so placed as to give distinct vision of both. Also five revolutions of the screw should move the cross *exactly* from any division of the circle to the neighbouring one. The circular plate H is fixed by friction upon the head, and is divided into 60 parts, which correspond to seconds on the circle, and are read off by a pointer, I. The entire revolutions of the screw are counted by a sort of comb, or indented plate fixed near the wires, but not movable with them. There is a little projecting tongue of metal opposite the cross wires, which is seen between the teeth of the comb at each whole revolution of the screw. This microscope having its parts at the proper distance from each other, and being placed at the proper distance from the divided circle, must be supposed to be substituted for the pointer A, in Fig. 1; the tongue at 0 in the comb, and the zero of the divided head opposite to its index. If a division of the circle seems exactly to cut the cross at the angular points, the observer has only to note what division of the circle it is, and that is the reading, just as with the simple pointer. Generally however one division will appear above, and another below the cross. Since the divisions are seen inverted, the division apparently below the cross is the one really above, which, according to Fig. 1, and the position E O, is the division immediately less than the position of the microscope or pointer. Turn the screw round until the appearance is exactly the same as in Fig. 4, and suppose that the tongue has moved over two teeth, showing two revolutions of the screw, and the index is half way between 33 and 34 on the divided head, then 2′ and 33″·5 are to be added to the degrees and minutes of that division. Now that division is 50° 5′, therefore the true reading is 50° 7′ 33″·5. What has been said as to error of collimation holds good with a microscope as with a pointer. When the line of sight E O falls between Z and N, then the next least division will be really below, but apparently above the cross, and the measurement should be made to it. The screw in this case must be turned the other way, and instead of the divisions of the head shown by the index, their difference from 60 must be taken for the seconds. A little caution and experience will guard the observer against mistake. The length of the microscope can be altered by screwing the tube in which G is fixed, and the microscope can be shifted in its support to and from the circle by the nuts K K, *k k*. It is evident that by these two movements the size of the image can be altered as well as its situation with respect to the cross wires. (See the figure of the altitude and azimuth circle for the mode of mounting the micrometer.) The apparatus of the micrometer microscope, shown at Fig. 3, is frequently attached to the eye-end of a telescope, and is placed in the focus of the object glass. The wires are then placed across the slide and at right angles to it, so as to be parallel with other wires of the telescope. If these points are clearly understood, the reader will find no difficulty in understanding the rest of this article. [See MICROMETER.]

The earliest application of a circle to astronomical purposes is described by Ptolemy (*Almag.* i. 10), who calls it from its use, a solsticial circle. This consists of a smaller circle turning freely within, and in the same plane with a larger and fixed divided vertical circle. Two small projecting prisms are placed in a diameter of the inner circle for a line of sight, and pointers are also fixed on the inner circle which move on the face of the outer circle. The instrument thus formed is to be carefully adjusted by a plumb line and meridian line in the plane of the meridian. In observing the sun, the inner movable circle was turned round until the shadow of the upper prism exactly covered the lower prism, when the pointers marked the corresponding division upon the outer fixed circle. The inner circle seems to have been employed as the most accurate mode of giving a rotatory motion to the *line of collimation*, concentric with the divided circle. If a bar, carrying the line of sight and the pointers, be supposed to revolve on an axis, it is the second case of Fig. 1. The language of Ptolemy does not inform us who was the inventor of this instrument, or even that it was ever made or used. Delambre conjectures with some probability, that it is due to Eratosthenes, though he inclines to think that the celebrated measure of the obliquity of the ecliptic by that astronomer, viz., that the distance between the tropics is equal to $\frac{11}{83}$ of the circumference, was deduced from observations with the gnomon. However that may be, it is certain that the *solsticial circle* was the best-contrived instrument of which we find any account until the time of Roëmer; and it bears, as will be seen, a very close analogy to the modern mural circle of Troughton.

Except the complicated astrolabe of Hipparchus, which consisted of five concentric circles, so contrived as to have one circle in the plane of the ecliptic, and anothe at right angles to it, we do not find the entire circle employed in large instruments before the time of Tych Brahè, and then only for an equatorial. The supposed authority and example of Ptolemy, who proposed a quadrant, and the desire of increasing the sensibility of instruments, by enlarging the scale of the divisions, blinded astronomers to the more solid advantages of the entire circle.

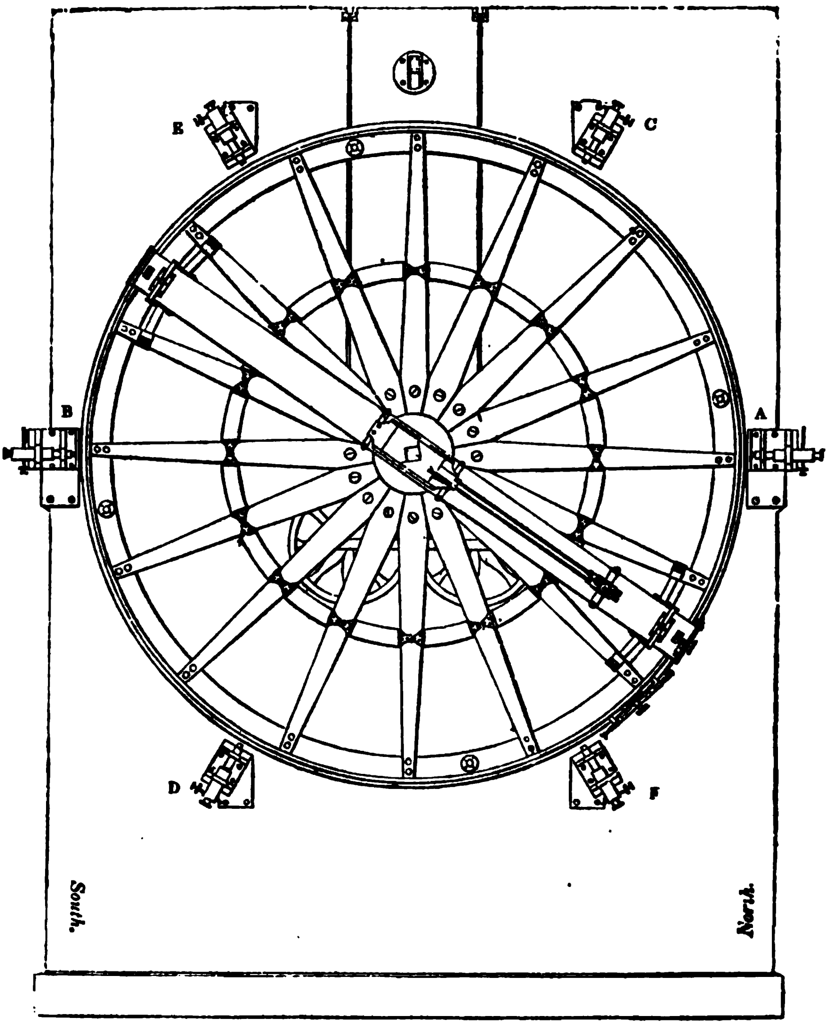
In 1704 Roëmer erected his *Rota meridiana*, or *transit circle*, in his private observatory 1^{m} due west of the astronomical tower of Copenhagen. He had invented the simple transit and the altitude and azimuth circle about fourteen years earlier, and in this new instrument he very happily combined the qualities of a transit telescope with those of a meridian altitude circle. In a letter to Leibnitz, 15th December, 1700, he had already said, 'that the quadrant and sextant ought no longer to be used, and that he would rely more on an entire circle of four feet than on a quadrant of a ten-feet circle.' (*Miscell. Berolin. continuat.* ii. p. 276.) A description and figure of the Rota meridiana are to be found in the *Basis Astronomiæ*, p. 143, Tab. viii., of his pupil Horrebow, *Hafniæ*, 1735, with a specimen of three days' observations. The altitude and azimuth circle is described in p. 43, and figured in Tab. ii. of the same work.

The *Rota meridiana* of Roëmer was a divided circle set upon a hollow double cone, at right angles to the axis of the cones, and concentric with them, the circle being near one end of the axis. The divisions were read by two microscope verniers, fixed in a diameter of the circle on one of the supports of the axis. For general purposes, this is perhaps as well a designed instrument as has ever been constructed, yet it was not imitated till about three or four years ago, when a similar construction was recommended by Mr. Pond, and adopted for the observatory at Paramatta. A second on a much larger scale is just finished for the observatory at Oxford; both these are by Mr. T. Jones. Notwithstanding the advice and practice of Roëmer, it does not appear that the entire circle was used for astronomical purposes until Mayer proposed his *repeating reflecting circle*. His description was published in 1770 (*Tabulæ Solares*, p. 21, plate ii.), but the repeating reflecting circle did not come into use until modified and perfected by Borda about 1787.

In 1784 the Danish astronomer Bugge published his *Observationes Astronomicæ, Hauniæ*, in which he gives a figure and description of a vertical circle of four feet diameter revolving in azimuth, p. liii., Tab. viii. and ix.; it seems a smaller one had been used in the survey of Denmark as early as 1762.

Ramsden undertook an altitude and azimuth circle for the observatory of Palermo in 1788, and completed it 1789. This is described by Piazzi (*Della Specola Astronomica di Palermo*, 1792), with four plates of the instrument and its details. (See too *Pearson's Astronomy*, vol. ii., p. 413, plate xxiii.) It is with this circle that the declinations of Piazzi's celebrated catalogue were determined. In 1792 Troughton perfected his altitude and azimuth circle; and in 1793 Mr. Francis Wollaston published in the *Philosophical Transactions* a description, with a plate, of his transit circle: Borda's repeating circle seems to have been first used about 1787, in connecting the meridians of Paris and Greenwich. The advantages of the circular form were now appreciated; its superior strength and symmetry, the elimination of any error of excentricity by opposite readings, and the diminution of errors of division by increasing the number of readings, or by reversing the instrument, were placed beyond dispute. Various alterations were made in parts of these instruments, and new contrivances and conveniences applied, but nothing very novel in principle was struck out till Troughton erected a six-feet mural circle at Greenwich in 1812. After some controversy this form has been generally adopted in those British observatories which can afford a second observer for the transit.

The limits of the present work will not allow a detailed account of any one instrument, and still less a description of the numerous variations which have been introduced according to the views of astronomers and artists. We shall give a general view of the two most essential forms, the mural meridian circle and the altitude and azimuth circle, as constructed by Troughton and his school.



[Greenwich Mural Circle, by Troughton; diameter six feet.]

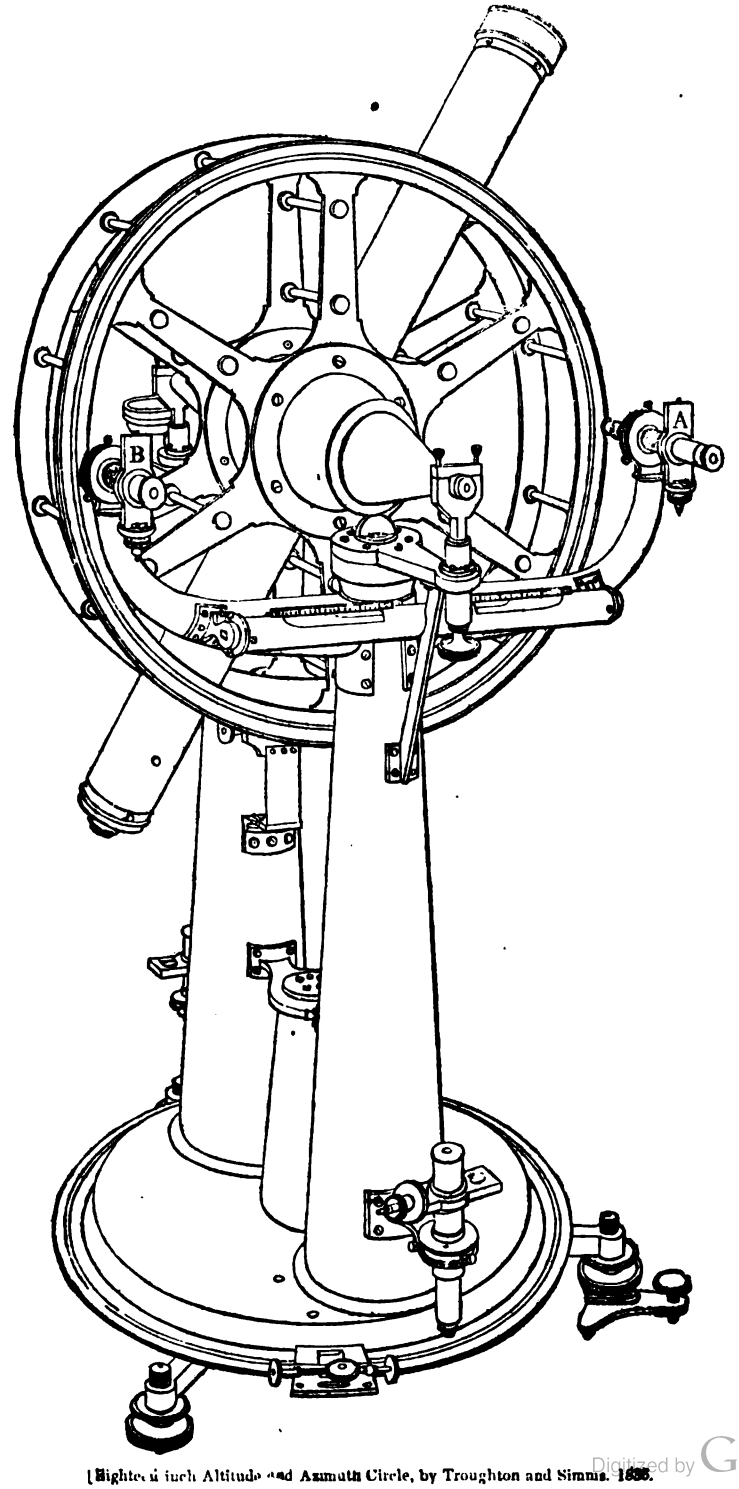
The accompanying figure of the mural circle of Troughton is copied from that prefixed to the Greenwich Observations for 1812, with the subsequent alterations. The circle is framed as strongly as possible (it might, perhaps in some cases, be advantageously cast in one piece), and is fixed at right angles to and concentric with a long, hollow conical axis. This axis rests and turns in two collars, one towards each end of the cone, fixed at the front and back of a stone pier, three or four feet in depth, and there are four screws at the back for adjusting the horizontal axis in inclination or azimuth. The circle is divided on its edge to 5′, upon a narrow ring of gold or other metal let into the rim; the divisions are read by the six micrometer-microscopes at A, B; C, D; E, F. The telescope is fixed at right angles upon an axis which works within the hollow conical axis of the circle, and can be moved upon the circle into any position; it is held fast by clamps towards the object and eye-end. At the eye-end there are three or more vertical, and one horizontal wire, and a micrometer, which carries a second horizontal wire parallel to the fixed wire. To prevent wear, and to give ease and smoothness to the motion of the circle, two large friction wheels are suspended in front of the pier from the arms of two levers, which by counterpoises may be made to support the whole or part of the weight of the instrument. They press upwards upon a ring on the axis, between the circle itself and the pier. There are several small contrivances which need not here be mentioned, as our design is only to give an idea of the nature of the instrument. For a more minute description the reader must consult *Pearson's Astronomy*, vol. ii., pp. 472, 488, plate xx. The above description belongs to the mural circle as constructed by Troughton. In one or two later instances the collars have been exchanged for Y's, that is, angular notches in pieces of metal, in the hope of making the instrument serve for tran ; but this has not, we believe, yet been performed satisfactorily. Dr. Robinson, in the circle made for the observatory at Armagh, preferred having the divisions cut on the back of the instrument, and the microscopes fixed on the edge of a circular pier, with several other alterations (for which see *Mem. Ast. Soc.*, vol. ix.) The divisions of the circle are cut by Troughton's method. [See GRADUATION.]

After the instrument is erected on its pier, the axis must be placed horizontally, or the plane of the circle vertical. This may be done by a plumb-line apparatus, which generally accompanies the instrument; or more accurately by making a star pass the meridian wire at the same time when seen directly, and also when seen reflected in a trough filled with mercury or water, &c. The four screws at the back of the pier supply the means of effecting this. The second adjustment, or placing the line of sight at right angles to the axis, may be performed by two distant marks to the north or south of the circle, which have been previously correctly placed by means of a transit; or by a collimating transit [COLLIMATOR]; and finally, the instrument may be placed in the meridian, either by a mark, or by observations of circumpolar stars above and below pole, or by observations of high and low stars, just as a transit. [TRANSIT.] Or the position of the plane described by the line of sight with respect to the meridian, may be determined by comparing the passages of stars over the meridian, as observed with the circle and with the transit at the same time: when the law of the errors being known, and also the amount of their sum, their respective values are easily ascertained and corrected. It may, however, be remarked, that small errors in any or all these adjustments will not vitiate the results and that the moon is the only celestial body sensibly affected by ordinary variations from the true meridian.

The mural circle is used in measuring angular distances on the meridian, and the observation is performed thus:—The telescope is pointed nearly in the direction of the object, and the circle fixed by the clamp in that position: then the instrument is moved by the slow motion-screw of the clamp, until the horizontal wire exactly cuts the star in two, or *bisects* it, at or near the meridian wire. If the object be the sun or moon, or a planet having a considerable disc, the wire is made a tangent to its illuminated edge. With the sun, a dark glass is put on the eye-end to protect the sight, and at night a lamp placed opposite the centre of the telescope throws light through a glazed aperture, which is again reflected by a polished metal ring placed at an angle of 45° with the axis of the telescope, so as to illuminate the field of view and show the wire distinctly. This light can be modified at the pleasure of the observer, and the apparatus for this purpose is shown on the telescope. The mural circle has been used somewhat differently by different observers. When Troughton proposed a mural circle for Greenwich, he said that all observations should be considered as distances from the pole; and that the place of the pole on the instrument (*i. e.* the reading of the circle when the telescope points to the pole) should be determined from the successive upper and lower culminations of Polaris, and other close circumpolar stars. The north polar distances of stars might thus be measured and registered with the help of a correct table of refraction, without an accurate knowledge of the latitude of the place, which is only wanted for converting polar distances into altitudes or zenith distances, for computing refraction and parallax. The latitude of the observatory might be subsequently deduced by comparing the polar distances of stars near the zenith, for instance, of γ Draconis at Greenwich, with the zenith distance of the same star observed by the zenith sector or the zenith tube. [ZENITH SECTOR.] The observations could be checked by combining them with observations by reflection, when the star is seen reflected from the surface of a trough of quicksilver. In a climate so variable as that of England, Mr. Pond, then astronomer royal, found it advisable to modify the plan thus suggested. He first formed an approximate catalogue of the north polar distances of several stars by these or other means, which he perfected as follows:—Assuming the approximate catalogue to be correct, every future observed place, compared with the place computed from the catalogue, presented a difference, which he called the *index error* of the instrument, and from the observations of several stars he obtained a *mean* index error. This mean index error was then applied to each of the observations, and a corrected catalogue thus produced, which by repeating the process leaves no constant error except such as may be common to all the stars employed; such, for instance, as an original error in assuming all the polar distances too large or too small. Now an error of this nature affects all stars at their superior passage alike, and makes them all equally appear too near to or too far from the pole; but it affects the superior and inferior passages of the circumpolar stars by equal and contrary quantities. Hence the difference between the mean of two sets of observations of Polaris and other circumpolar stars, one set being deduced solely from upper, and the other solely from lower culminations, is clearly equal to twice the mean error in the assumed place of the pole with respect to the stars; and this correction being applied to all the stars, a new and more correct standard catalogue was formed, to be again corrected and improved by future observations. It is evident that the errors of the originally assumed catalogue are now wholly eliminated. By shifting the place of the telescope on the instrument, fresh divisions were brought into use for each star. The accuracy of the tables of refraction employed might have been tested by the agreement of near and distant circumpolar stars, in assigning the same value for this correction to the polar point. The only defect in this method seems to be, that it assumes the accuracy of the instrument or the accuracy of the tables of refraction; and that if either or both be imperfect, the final results are not in a form suited to investigation.

Another mode was adopted by Mr. Pond after 1824, when a second mural circle, made by Mr. T. Jones, of Charing Cross, was erected at Greenwich. Suppose several stars to be observed the same evening in two groups, which call A and B. All the stars in group A are observed by both circles by direct vision; the stars of group B are observed directly by one circle, suppose Jones, and by reflection, by Troughton. Let the mean of the readings of group A, by Jones, exceed the mean of the readings of the same group by Troughton, by m''; then it is clear, the instruments continuing in the same state, that if from the observation of any other star, by Jones, you *subtract* m'', you will have the reading which Troughton would have shown, barring accidental errors, and *vice versâ*, that on *adding* m'' to any observation by Troughton, you will get the corresponding observation, with the same exceptions, which would have been made by Jones. Again, let a star in group B be taken, and let D be the angle read off by Jones, the star being then seen directly, and R the angle by Troughton, the star being seen by reflection. Then according to what has been said above, D — m'' is the angle which Troughton would have given by direct vision, and consequently the angle between the star seen directly and by reflection, which is twice the altitude of the star, $= \mathrm{R} - \mathrm{D} + m''$, or the altitude $= \frac{\mathrm{R} - \mathrm{D}}{2} + \frac{m''}{2}$. Again, as the reading which corresponds to the horizontal position of the telescope is evidently D + altitude of the star by Jones, and R — altitude or depression of the star by Troughton, we shall find for that reading, or the *horizontal point*, as it is called, in Jones, $\frac{\mathrm{R} + \mathrm{D}}{2} + \frac{m''}{2}$, and in Troughton, $\frac{\mathrm{R} + \mathrm{D}}{2} - \frac{m''}{2}$. In this way each of the stars in group B gives a fresh value for the horizontal point in each instrument, and the *mean* of the determinations for each circle is taken as the basis for reducing every observation by that circle. Thus the reading of each direct observation of the stars in group A with Troughton, being *subtracted* from the mean value of its horizontal point, will give the true altitude of the stars in group A, and the same value of the horizontal point being *subtracted* from every reflected observation of group B, by this circle, leaves in like manner the true altitude, which is all the astronomer demands from the circle. This method requires the groups A and B to be sufficiently numerous for eliminating the chance errors of mere observation, and to be distributed over various parts of the circle to destroy faults of form or of division. It is also supposed that the circles are instruments of nearly equal goodness, and that each is as perfect as art can make it. If they should be defective, the discrepancies in the partial determinations of the horizontal point will show it, and the astronomer must then attempt to discover the law and the cause of the defect. The combination of two circles to form, as it were, one instrument, has only been tried at Greenwich, but there it has proved eminently successful; Mr. Pond's opinion, after long experience, being, that *the pair were more than twice as powerful as a single one.* The same astronomer suggested an analogous method for one circle. Observe the groups A and B all *directly* one night, and on a following night observe A *directly*, and B by reflection. A comparison between the groups A on different nights (the change of place in the stars and in the refraction being allowed for) will give you the variation or change of place of the instrument and microscopes; and by applying this to the stars B, observed on either of the nights, you will have observations of the same stars on different nights, by direct and reflected vision, but with an *unchanged* instrument. Hence the double altitudes of B are found, and also the horizontal point for one of the nights which when increased or diminished by the variation above found, is the horizontal point for the other. This method, or one similar to it, is, we believe, followed at Edinburgh and the Cape of Good Hope; and it is found that these instruments are so steady and unfluctuating, that the same value of the horizontal point results from the observations of several days. In this system the observations of one day are made dependent on those of another, when the atmospheric circumstances may be widely different. It has, however, one advantage over the previous method with two circles, that it places more directly in evidence the individual errors of the instrument. The differences which may be found between the partial determinations of the horizontal point on the same night, and on different sides of the zenith, will show what reliance is to be placed on it and on the observer.

When the mural circle was erected at Cambridge, Professor Airy selected the following plan of determining the horizontal or zenith point. The micrometer attached to the eye-end of the telescope has already been mentioned. The value of a revolution of this micrometer having been very exactly measured, and the parallelism of its movable wire with the horizontal wire carefully ascertained, and also the reading of the divided head when the two wires coincide, the telescope is set pretty nearly in the position at which a star by *reflection* would be on the horizontal wire, the circle is then firmly clamped, and the microscopes are read off. When the star is at a convenient distance from the meridian wire, it is bisected by the micrometer wire without stirring the circle. When this is done, and the time noted, the circle is unclamped, and the star bisected by *direct vision* on the fixed horizontal wire, by turning the whole circle round, and the time is again noted. If the star had been observed in both instances upon the meridian and upon the fixed wire, it is clear that the reading corresponding to the horizontal position of the telescope would be half way between the readings of elevation and depression, or $= \frac{R + D}{2}$. The correction to the meridian is easily found and applied, the times being known. Again, if the distance between the fixed and micrometer wire be equal to n'', it is clear that the reading of R is greater or less by n'' than it would have been if the observation had been made with the fixed wire, and that the further correction for the micrometer is made simply by the addition or subtraction of $\frac{n''}{2}$ to the value already found of the horizontal point. In the Cambridge Observations, Professor Airy tabulated the reading corresponding to the zenith position of the telescope. From a mean



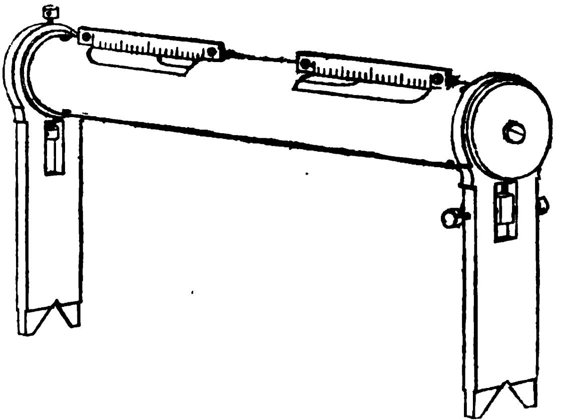
[Eighteen inch Altitude and Azimuth Circle, by Troughton and Simms. 1836.

of such determinations the reading of the zenith point is settled, and all observations made in the ordinary way, reduced to altitudes or zenith distances. For this mode of observing, the micrometer should be exquisitely perfect, and carefully watched. On comparing the zenith points deduced from low and high stars, to the north and south of the zenith, Professor Airy discovered some anomalies, the causes of which have not yet been fully ascertained. (*Cambridge Observations*, 1833, p. 27.) They seem, however, to exist in other mural circles, and possibly in circles of a different construction.

The micrometer microscopes, in what has been said, are supposed to be exactly adjusted, so that five revolutions of the screw carry the cross of the wires precisely over a space of 5′ on the circle. It is not possible to make this adjustment with perfect accuracy, nor would it be permanent; but it is not necessary. By examining the value of the *runs*, as they are called, *i. e.*, the measures in revolutions and parts of the screw of the 5′ spaces in the circle, a mean value of the measure of 5′ by the six microscopes is obtained, from time to time, which may be a little greater or less than five revolutions. In this case, the mean of the micrometer readings, *i. e.*, of the single minutes and parts, must in each observation be altered in the proportion of the value thus ascertained to 5′. If, for instance, the mean value of the 5′ spaces on the circle were apparently 5′ 5″.1 by the microscopes, $\frac{1}{60}$ must be subtracted from the minutes and seconds indicated by the mean of the microscopes. For actual adjustment, the following directions may be useful. A micrometer microscope is adjusted when the image of the divisions of the circle is formed upon the cross wires of the microscopes, and its size is exactly equal to five revolutions of the screw. Suppose the vision of the wires and of the divisions to be perfect, but that the space of 5′ is passed over by four revolutions and fifty parts of the screw. It is evident that the image is too small, and it must be made larger by drawing out by the screw the object glass G, and bringing it nearer the limb. In this case however the image is formed between the wires and the eye-piece, and therefore the whole body of the microscope must be drawn from the circle until the image falls on the cross wires. It will now be found that the image of 5′ is larger than before, and it must be again measured by the screw. In this way by gradual attempts the microscope may be perfectly adjusted, but the operation, if complete accuracy be aimed at, is very fatiguing and troublesome.

The general form of the altitude and azimuth circle will be seen from the woodcut. The lower, horizontal, or azimuth circle, is fixed on three strong radii which have foot screws at their extremities, and a strong vertical steel axis rising from their intersection. On this axis the whole of the upper works move freely and smoothly on a conical cap accurately fitted and ground to the top and bottom of the axis. On the lower part of the cap is fixed a broad circular plate on which the two pillars rest which support the circle and telescope. The microscopes for reading the azimuth circle are fixed on the pillars. Outriggers stand on the top of pillars, each of which carries a notch or Y, which can be raised or depressed by a screw. The vertical, altitude or declination circle is framed with a view to strength and lightness, and its divided face is read by two microscopes placed on the end of the curved tube, which is formed something like a pair of horns, and fixed across the top of one of the pillars. The circles are usually divided to 5′, and subdivided by the micrometer microscopes to seconds. The graduation of the horizontal circle generally runs from 0° to 360°, the vertical circle is differently divided according to the pleasure of the artist or observer. A little consideration will enable any one to apply the rules given for reading microscopes to each particular case. We shall speak indifferently of altitudes and zenith distances, since they are immediately derivable one from the other. The wires of the telescope are illuminated by a lamp which shines in at one end of the cross or transit axis of the vertical circle, and is reflected on the wires by a pierced polished ring set diagonally. There are two sensible ground levels, one of which is attached to the horns supporting the upper microscopes; another, which is free, can be applied through the openings of the circle to the pivots of the cross axis. This cross level and its adjusting screws will be understood by the accompanying figure.

There are clamps and slow moving screws to each circle to fix them, and to give the power of bisecting any object with the telescope.



[Detached or Transit Level.]

The first adjustment is that of setting the vertical axis perpendicular to the horizon. Turn the instrument until the fixed level is nearly parallel to two of the foot-screws, and place the bubble in the middle by the foot-screws. Then moving the instrument half round in azimuth, bring the bubble again to the middle; half by the foot-screws, and the other half by the screws which raise or depress one end of the level. If this is carefully done, and the circle restored to its original position, the bubble will be still in the middle, but if not, it must be brought there, half by the foot-screws, and the rest by the level-screw. Now, turning the instrument a quarter round, through 90°, bring the bubble into the middle of the scale by touching the third foot-screw. This is generally placed in front and towards the observer, and rests on a small lever apparatus, represented in the figure, which supplies a very delicate slow motion, contrived, we believe, by Borda. When the operation is successfully performed, the bubble will remain in the centre, whatever azimuth the instrument is directed to. It is not necessary in practice to touch the screw which adjusts the level if the error be very small. The divisions of the level scale corresponding to both ends of the bubble should be noted before and after reversion, and the mean taken. Let the foot-screws be called E and W, and the ends of the level towards them be distinguished by the same letters, and the scale of the level be numbered from the centre to each end, and suppose the readings be

	E	W	
In the first position .	67″.4	48″.2	
In the reversed position	59″.6	56″.0	
Mean. .	63 . 5	52 .1	difference = 11″.4.

The mean readings would have been the readings of the level, if the level itself had been in adjustment. It is evident that E is too high, or W too low, by half the difference, or by 5″.7, and one of the foot-screws must be turned enough to shift the bubble 5″.7 in the right direction. Troughton always moved both E and W an equal quantity in contrary directions for this adjustment, which in many cases is very much better. If that is carefully done, the E readings will be diminished, and the W readings increased by 5″.7, and they will stand thus:—

	E	W
In the first position . .	61.7	53.9
In the reversed position	53.9	61.7

or the bubble keeps the same position *in its scale* before and after reversing, and the axis is vertical to the line joining the two foot-screws. The bubble must be placed at the same divisions when over the third foot-screw, and the axis is truly vertical. The difference between the last-mentioned readings is 7″.8, and the half of this, or 3″.9, is the quantity through which the bubble should be moved by the level screw to complete its adjustment, if that be desired; but if the true value of the divisions of the scale be known, and it is also known that this does not sensibly vary with the temperature or from other causes, it is useless to adjust very scrupulously, since the ends of the level must always be read and noted, and the difference allowed for by a careful observer. In some larger instruments of this construction, the vertical axis is adjusted by a plumb line, which

Ramsden and Troughton applied in different ways. One of these applications will be described under **Zenith Sector**; but we are inclined to think that the ground level is more accurate, while it is incomparably more convenient than the plumb line, for small circles, which move freely in azimuth, and are used agreeably to their construction. The vertical axis being properly placed, the cross axis of the upper circle is next to be set horizontal. Pass the detached level carefully through the openings in the circle, place its notches on the pivots of the axis, note the ends of the bubble, exactly as before, reverse the level and note the ends again. Suppose the results to be,

	East End.	West End.
First position . .	6.24	8.43
Reversed position .	7.96	6.71
Mean . .	7.10	7.57

hence the difference between the mean readings is 0.47, or the west end is higher than the east by 0.235. The bubble must be moved this quantity towards the east by raising the east, or depressing the west pivot. There is a screw under each pivot for that purpose. It is convenient to have the scale divided into parts, of which the units are 15″ of a degree.

The microscopes should be adjusted, if that be required, in the manner already described, but we recommend amateur observers, at least, to have the body of the microscopes made unalterable, after the maker has settled both the adjustments, by pinning together the body and tube which carries the object-glass. Both adjustments will then be performed by making the 5′ spaces equal to five revolutions of the micrometer screw, simply by shifting the body of the microscope a little nearer to or farther from the instrument. This should be done pretty carefully, but any remaining error may be corrected as in the mural circle. The microscopes (there are generally a pair to each circle) are finally to be placed in a diameter of their respective circles, and nearly in the middle of the concentric lines, which contain the divisions. There are screws in the tubes by which the microscopes are mounted, which allow them a little motion in any direction, and the cross wires are thus brought to bisect divisions 180° apart. This requires no particular exactness, and may be done at once for the azimuth circle. The upper microscopes may be adjusted approximately. The optical part of the instrument must now be put into order. At the eye end of the telescope there are generally five or seven vertical and three or five horizontal wires, *i.e.* fine lines of cobweb, raw silk, or any very delicate and uniform fibre. To place these in the focus of the object-glass, apply the highest magnifying power you have got, bring the wires to distinct vision, and look at a bright star. The wires and eye-piece are fixed on a piece of tube which moves stiffly within the tube of the telescope, and this must be pushed in or drawn out till the star is seen perfectly round and surrounded with rings, the wires being at the same time sharply defined. This adjustment may be completed or verified thus:—The pole star, or any circumpolar star, may be bisected by the vertical wire when near its greatest elongation, or by the horizontal wire when near the meridian. In the former case the eye is to be moved on each side, in the latter up and down; and if the star continues bisected, and there is no dancing of the star on one side or other of the wire, the position is correct. When the star moves contrariwise to the eye of the observer, the tube must be pulled out, as the image of the star is then formed between the wires and the eye, and the wires must be brought to the same place. When they move the same way, the tube is to be pushed in, until the image is formed exactly upon the wire. Any error must be corrected by gradually pushing the tube in or out. When this has been once successfully done, a notch for verification should be made to save all future trouble. The vertical wires are now to be set at right angles to the axis. Take any well-defined object, either a sharp distant terrestrial mark, or the wires of a subsidiary telescope [**Collimator**], or a circumpolar star at its greatest elongation. Bisect this at the centre of the middle wire, and move the telescope up and down until you see the object at the top and bottom of the field. If it is not bisected there, twist the movable tube round, and so bisect it, and repeat the operation until you are satisfied. The middle horizontal wire, if a correct position of that is preferred, must be adjusted, by twisting the tube until a star on the meridian runs along the horizontal wire by its own motion, the azimuth circle being fixed; or by moving the instrument in azimuth after having bisected Polaris or a circumpolar star near the meridian, on that wire. There are screws above and below the tube at the eye end, which should now be tightened. To make the central and vertical wire describe a great circle, bisect a well-defined object, as near the horizon as may be, read the horizontal microscopes, turn the instrument 180° in azimuth, and observe again, reading the same microscopes. If the means of each pair of readings, before and after reversion, differ *exactly* 180°, the wire describes a great circle; if not, move the instrument half way to 180° by the clamp screw, and bisect the object by turning two antagonist and pulling-screws near the eye-piece, which draw the wire plate to either side; repeat the operation until you are satisfied. If the horizontal clamp is strong enough, the circle may be taken out of its axis and reversed as an ordinary transit [**Transit**]. The upper microscopes may now be correctly adjusted. Observe any object which does not alter its altitude on the middle horizontal wire, and read the upper microscopes; turn the instrument through 180° of azimuth, and observe the object again. Move the circle to exactly the middle of these two readings (which will be near either 0° or 90°), when the telescope is in the zenith, and then by the adjusting screws set the crosses of each of the microscopes exactly on 0° or 90°, as the case may be; the microscopes are then in a diameter, and the error of collimation in altitude is also destroyed. As this correction is altered by any alteration of the apparatus for levelling the horizontal axis, and as few observers like to meddle with the adjustments of their microscopes, the microscopes can be brought into a diameter after the axis is made horizontal by raising or lowering each of the levelling screws a small equal quantity; but though it is convenient that the microscopes should read nearly the same angle, it is not at all essential to accuracy, and the error of collimation must always be ascertained or eliminated by the mode of observation.

We shall always suppose every observation to be a *mean* of two, one made face east and the other face west, unless the contrary be said or implied. In this case there is no error of collimation.

The altitude and azimuth circle was, as has been stated, invented by Roëmer, though a quadrant moving freely in azimuth, and with a graduated horizontal circle, was used by Hevelius. It is the most universally useful of all astronomical instruments, and is both portable and accurate. In delicate hands, and with some power of calculation, it is capable of performing a great deal of good work. Besides being an excellent geodesical instrument [**Theodolet**], it is, when placed in the meridian, an accurate, though not very convenient transit. It may be used in this position as a meridian or transit circle, for determining at once the right ascension and zenith distance of any unknown stars. In this case the horizontal point must be got by combining observations taken directly with others by reflection, in the manner already described in the mural circle; or else several standard stars may be observed, and their instrumental places compared with their computed places; the mean of these differences is to be applied as an index error to correct the observations of unknown stars exactly as in Mr. Pond's first method with the mural circle. In this mode of observing there is no reversion.

The principal merit in the altitude and azimuth circle is, that it can be moved in azimuth without injuring its accuracy as a measurer of zenith distance. Let us suppose a navigator in a strange place with such an instrument and a time-keeper, of which the error is unknown. This should mark sidereal time. The instrument must first be nearly adjusted, and the approximate meridian selected. This will be known near enough by shifting the instrument in azimuth till it is found that a star, which is bisected by the horizontal wire, continues to be bisected for a short time. Observe the zenith distance of some known star in this direction, and this will give an approximate latitude. The time and the azimuth of the star should also be noted. Now observe the zenith distance of another known star near the prime vertical, the time deduced from this and the approximate latitude will be a very close approach to the true sidereal time at the place. The original latitude from the first observation may now be corrected by a more accurate knowledge of the time, and the azimuth of the star at the time of observation be deduced, whence the reading corresponding to the meridian position of the instrument is also known. If these observations have been managed with any skill or discretion, the latitude and time are now found near enough for future calculations*.

To ascertain the latitude with the utmost precision, several standard stars are to be observed near the meridian, and, if it may be, at pretty nearly equal distances from the zenith, north and south, to 70° or 80° zenith distance. A few minutes before the star comes to the meridian, bisect it near the centre of the middle horizontal wire, noting the time of bisection. It is perhaps more exact to place the wire close to the star, and then, leaving the vertical circle untouched, to move the whole instrument by the horizontal clamp along with the star until it is bisected upon the wire by its own motion. The ends of the level and the upper microscopes are then read, the instrument is turned gently round 180° in azimuth, and the observation is repeated. The sum of the two angles (when each pair of readings is connected into one zenith distance) is twice the apparent meridian zenith distance of the star, affected by the want of verticality in the axis, which is known from the level, and by a small correction depending on the time of observation. It is clear that if the end of the level towards the eye end of the telescope is too high, that the foot-screw towards the observer should be lowered, in which case the telescope would point above the star, that is, show a less zenith distance than the true zenith distance. Hence the rule is, take the reading of the end of the level towards the object end of the telescope from the reading towards the eye end, halve the difference, and add this, when converted into arc, to the instrumental zenith distance. This may be done in each case, or the mean of the whole applied to the mean of the instrumental zenith distances. For the *correction to the meridian* the formula is,

$$\text{Corr.} = \frac{\text{cos. dec.} * \times \text{cos. lat.}}{\text{sin. zen. dist.} *} \times \frac{2\ \text{sin.}^2 \tfrac{1}{2}\ \text{angle at the Pole}}{\text{sin. } 1''}$$

The first factor must be computed for each star, the latter is taken from a table which may be found in *Schumacher's Hülfstafeln*, or *Baily's Tables*, and in many collections of astronomical tables. The argument is the angle at the pole, that is, the difference between the moment of observation and the transit of the star. This correction is to be *subtracted* from the zenith distance of stars observed *above* the pole, and *added* to those observed *below* the pole. The mode of observing is generally known by the name of *circum-meridian*. We have here detailed the process as it refers to a single pair of observations, but several pairs may be taken, as many as can without hurry be got in a quarter of an hour on each side the meridian. With a good instrument and a careful observer, the latitude thus deduced from several stars will be very near the truth, if the observer employs a correct catalogue, such, for instance, as that of 1112 northern stars, published by Mr. Pond in 1833, or the catalogue of southern stars, by Lieut. Johnson, 1835: if he can observe the same circumpolar stars at their upper and lower culminations, he may obtain a latitude independently of any catalogue. If stars near the pole be observed, it is not necessary that they should be near the time of passing the meridian, but the reduction to the meridian zenith distance must be computed by an exact formula. There are special tables of Polaris for this purpose in the *Nautical Almanac*.

The time may be found by two or three methods. The zenith distances of known stars near the prime vertical, both to the east and west, may be observed, and the horary angle computed from the observed zenith distance and the known colatitude already found. In this case the altitude circle should be kept clamped, while the times of the passage of the star over each of the horizontal wires are noted, the mean is to be taken, and the instrumental zenith distance is to be corrected for the indication of the fixed level. Repeat the operation after reversing the instrument, and take the mean of the zenith distances, which will correspond very nearly with the middle time between the observations. From this zenith distance the error of the time-keeper is found. The mean of the errors deduced from an equal number of stars on the east and on the west prime vertical will be very nearly correct, and depend upon the divisions of the circle and the catalogue employed. Also the altitude circle being clamped, a star may be observed rising near the east prime vertical, and again, by moving the instrument in azimuth, near the west prime vertical when descending. The middle time will be the meridian passage of the star by the time-keeper, which, when compared with the computed right ascension, will show the error of the time-keeper. This method (commonly called that of *equal altitudes*) is not to be recommended, except for stars near the zenith, which pass quickly from one prime vertical to the other. The changes of the level, of the instrument, or of the time-keeper, may occasion greater errors than can well arise from the divisions of the circle, not to mention the greater length of time occupied by the observation and the chance of disappointment from change of weather. Lastly, the time may be derived from this instrument, when the lower circle is clamped, and the telescope is made to move in the meridian like a transit The transit will be explained hereafter, but the adjustment to the meridian is greatly facilitated in this instrument by the divided horizontal circle. Either the azimuths of a star may be observed when it has the same altitude on the east and west of the meridian, in which case the middle reading of the azimuths will be the reading corresponding to the meridian; or the time may be got very nearly from a star near the zenith, and then the error of the time-keeper being known, Polaris or any near circumpolar star may be bisected, by moving the instrument in azimuth, at the time when, by the clock, it should be on the meridian; or Polaris, or any known circumpolar star, may be observed at its greatest elongation, when its azimuth is known by computation; or, generally, a known circumpolar star may be observed anywhere, and its azimuth be computed for the *known* time of the observation, when the instrument can be shifted this quantity. For the mode of correcting errors of level, &c., and of deducing the longitude from the passage of the moon over the meridian, &c., see TRANSIT.

When the direction of the meridian is required with great accuracy, the process used in the *Trigonometrical Survey*, vol. i., p. 242, may be followed. The azimuth of Polaris was observed when at its greatest elongation to the east and to the west of the meridian, and the mean of these was taken for the reading of the north point. The cross level should be applied to the transit axis and the error carefully noted before every observation, and the instrument should be reversed once at least during the series.

Little has been said of the *error of collimation in altitude*, because in truth the determination of this error is scarcely ever required in a separate shape by an accurate observer It may, however, be determined thus. Observe a star with the divided face of the circle to the east, and then with face west, near the meridian, exactly as has been already described, correct each zenith distance to the meridian and for the indication of the fixed level. Then the difference between these zenith distances, if any, shows that the microscopes do not read 0°, when the telescope is in the zenith and the vertical axis is correct: half the difference is to be added to all observations made with the instrument when the face is one way, and to be subtracted from all observations when the face is the other way, as the case may be.

If an observer should wish to use an instrument of this kind for making a catalogue of unknown stars, he may place it accurately in the meridian, and observe transits and zenith distances at once, using an index error for the latter deduced from known or standard stars, as we have described above. Or the zenith distances may be determined by *circum-meridian* observations, which is perhaps a more accurate and certainly a more independent mode. The peculiar advantage of the altitude and azimuth circle is however for observing phenomena when out of the meridian, and therefore not within the reach of the principal instruments: for instance, in determining the place of a comet, &c. Here the time must be noted when the object is bisected by the crossing of the horizontal and vertical wires, and the upper and lower microscopes and fixed level read off. The instrument is now to be reversed and the operation repeated. Then if the object is not near the meridian and the interval is short, the mean of the zenith distances and the mean of the azimuthal readings correspond very nearly to the middle time, and as the azimuthal reading of the meridian is, or easily may be known, the azimuth and zenith distance of the object at a *given* time are known, which, with the colatitude, are two sides, and the included angle of the triangle Z P S, which can therefore be solved, and the polar distance P S, and the horary angle Z P S be found. If the observations should be made near the meridian, the corrections as found in circum-meridian observations must be applied.

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* Let S be the first star observed near the meridian, and σ the second near the prime vertical, P the pole, and Z the zenith; then PZ the colatitude = PS − ZS nearly. Again, the triangle PZσ being solved with this approximate value of PZ will give the angle σPZ, which, if the star is west, being added to, or if east, being subtracted from its right ascension computed from the catalogued place, gives the true sidereal time at the place of observation, and hence the error and correction of the time-keeper. Let this correction be applied to the time of observing S, then the difference between the time so corrected and the computed right ascension of S gives the ∠SPZ, from which the correction of ZS to the meridian may be deduced.

The observer, who is not afraid of working spherical trigonometry, will find the following a very exact method of ascertaining the place of a comet or planet. Observe the altitude and azimuth, noting the time, of a known star, as near the comet as may be, and then the altitude and azimuth, also noting the time, of the comet. The *computed* altitude and azimuth of the star, when compared with that *observed*, will give an index error for the instrument, in altitude and in azimuth; which, when applied to the observed places of the comet, afford correct data for computing its horary angle and polar distance. This method is only an application of the principle of measuring differences, rather than absolute quantities, and admits of great exactness, even with an indifferent instrument, especially if several stars, on different sides of the comet, are used; but the labour is considerable.

An instrument of this kind will show very clearly the effects of refraction and parallax, though it cannot be expected to increase our knowledge on these points. On comparing the observed zenith distance with the zenith distance computed from the polar distance, and the horary or azimuthal angle, the difference will be the effect of refraction, or of refraction and parallax, as the case may be. The determination of the law and quantity of refraction was one of the purposes for which Piazzi's circle was principally designed.

The instrument-maker ought to mark the value of the parts on the scales of the levels, but it is advisable to ascertain these independently. Place the instrument so that the third foot-screw, that with the slow motion apparatus, is in the plane of the altitude circle, raise the foot-screw till the end of the bubble towards the observer is near the end of the scale, bisect a well-defined object with the telescope, and read the upper microscopes and the ends of the bubble. Then lower the foot-screw till the bubble is towards the other end of the scale, bisect the object again, and read off the microscopes (bringing the crosses to the same divisions) and bubble as before. You have thus a given number of parts of the scale, those through which the bubble has travelled, equal to the difference of the readings of the microscopes in the two positions, which is therefore known in seconds of space. This should be done several times and the temperature noted, as it will be found that not only the length of the bubble, but the value of the parts, varies with the temperature. A table may then be made for future use. By attaching the cross level to the altitude circle it may be examined in the same way.

There are several variations in the form of the altitude and azimuth circle. The vertical axis is sometimes depressed below the azimuth circle, which gives the instrument a greater compactness of form. In a few instances, instead of a pair of microscopes upon a fixed support, there are three or more which can be placed anywhere on the circumference of a ring, parallel to and concentric with the vertical circle. This is a very essential improvement, as besides getting rid of eccentricity, three microscopes at 120° distance, or a pair at right angles, destroy the effect of any change of figure corresponding to ellipticity. (See *Monthly Notices of the Astron. Soc.*, vol. ii., p. 96.) The errors of division may also be gradually eliminated by changing the positions of the readings. Three or more microscopes are sometimes applied to the horizontal circle.

The circle here drawn and described is divided by an engine; in instruments of higher pretensions one or both circles are divided by hand, generally according to Troughton's method. Sometimes both faces of the vertical circle are divided. There is a figure and description of a very beautiful circle, generally known by the name of the Westbury Circle, in a paper by Mr. Pond, *Phil. Trans.*, 1806, p. 420, plate xx., and of another in *Pearson's Astronomy*, vol. ii., p. 434, plate xix. A vertical circle, of eight feet diameter, moving freely in azimuth, planned by Ramsden and finished by Berge, is at the Observatory of Dublin, which, so far as we know, has not yet been described, though well known by the deductions of Dr. Brinkley. (See *Trans. Royal Irish Academy*, vol. xii., p. 33.)

The *transit circle* is very shortly described, as it is only the upper circle of the last-mentioned instrument, generally on a larger scale. This, when fixed in the plane of the meridian, may be used both as a transit and as a meridian circle at the same time. The supports should be of stone, to which the reading microscopes should also be attached. A very beautiful transit circle, of four feet diameter, and divided on both faces, was constructed by Mr. Troughton in 1804. This was for many years in the possession of the late Stephen Groombridge, Esq., of Blackheath, and was employed by him in forming a catalogue of stars within 50° of the north pole. It is described and engraved in *Pearson's Astronomy*, vol. ii., p. 402, plate xvii. The artist himself was dissatisfied with the weakness of the axis, a capital fault in an instrument for observing transits, and we conceive that there was a still greater oversight, though one more easily repaired, in the unsteady fixing of the reading microscopes, which are mounted on slender bars of brass instead of stout stone crosses; the consequence was, that the index error was always changing. The meridian circle of Röemer, and those which resemble it, have been already mentioned. This form is perhaps preferable to that of Groombridge's, the axis being less subject to flexure; but its unsymmetrical appearance is disagreeable, and makes some of the ordinary modes of adjustment impracticable. The unequal bearing on the pivots may also require caution. The meridian circle of Reichenbach is like the ordinary transit telescope, with the circle and verniers close to one of the pivots. It is too complicated to be described in a few words, and is not, we believe, to be met with in this country; but most of the continental observatories east of the Rhine are furnished with them. In the hands of Bessel, Gauss, &c., the circle of Reichenbach is undoubtedly a very powerful and accurate instrument, but we think not so perfect, certainly not so fit for ordinary observers, as a closer copy of Röemer's would be, while it is much less simple, and the telescope is more liable to injurious flexure.

The adjustments of the transit circle are those of a mural circle and of a transit combined. A very ingeniously contrived plumb-line was applied to Groombridge's circle, to level the cross axis and adjust the collimation in altitude, but the methods already described were found to be more accurate and much less troublesome. Indeed the plumb-line apparatus of the mural circle is superseded by the use of observations by reflection.

Besides the works we have already referred to, the astronomical reader may consult, as to the mural circle, Pond's *Observations*, 1812, p. 236, and 1825 (where an example is fully worked out), for an account of his two methods, and his memoirs in the *Phil. Trans.* and *Memoirs of the Astronomical Society*; *Cambridge Observations*, vols. vi. and vii., and Johnson's *Catalogue of Southern Stars*, 1835. For the transit circle, Wollaston's *Fasciculus*, Preface and Appendix. For the altitude and azimuth circle, a Paper by Mr. Troughton, *Memoirs of the Astron. Society*, vol. i. p. 33; and generally the article *Circle* of the *Edinburgh Cyclopædia*, by Mr. Troughton, and Dr. Pearson's *Practical Astronomy*. On the mode of dividing circles and the errors to which their divisions are liable, see Graduation, and Troughton's *Memoir*, *Phil. Trans.*, 1809, p. 105; Dr. Robinson's Paper, already cited, and another by the same author, *Memoirs of the Irish Academy*, 1825; two Papers in the *Memoirs of the Astron. Society* on the *Errors of the Cape Circle*, one by Mr. Sheepshanks and Professor Airy, vol. v., p. 320; the other by Mr. Henderson, vol. viii., p. 141.

CIRCLE, MURAL. [Circle, Astronomical.]

CIRCLE, REFLECTING. [Sextant.]

CIRCLE, REPEATING. [Repeating Circle.]

CIRCLE, TRANSIT. [Circle, Astronomical.]

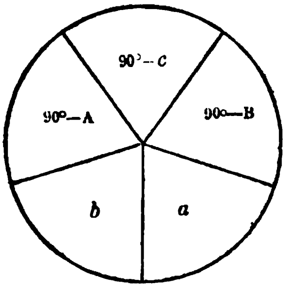
CIRCLE (QUADRATURE of the). [Quadrature.]

CIRCLES OF DECLINATION, ALTITUDE, &c. The use of these terms is not very well settled. According to some, a circle of declination would mean the parallel of any declination, or the small circle all whose points have the same declination; that is, a parallel to the equator. According to others, it would mean the circle on which declination is measured, that is, an *horary* circle passing through the poles. And the same of the other circles. Perhaps the latter sense is the more generally used; but in all cases the student must be aware of the difference when he consults a book on the doctrine of the sphere.

CIRCUITS, in English law, denote the periodical progresses of the judges of the superior courts of common law through the several counties of England and Wales, for the purpose of administering civil and criminal justice. The ordinary circuits take place in the spring and summer of each year; and for several years past one of the judges has made a circuit through the counties of Hertford, Essex, Kent, Sussex, and Surrey, in the month of December, for the trial of criminals. All the circuits take place under the authority of several commissions under the great seal, issued to the judges and others associated with them on each occasion. [ASSIZE.] Most barristers practising in the common law courts in London are attached to one or other of the circuits; and each circuit is constantly attended by a numerous bar. The transaction of judicial business in the presence of a professional audience of this kind, has been justly considered as one of the best securities for the due administration of justice; and in consequence of the system of circuits, this advantage is not confined to the metropolis, but is communicated to the most remote parts of the kingdom.

Since the statute 11 Geo. IV., and 1 Will. IV. c. 70, by which the ancient system of Welsh judicature was abolished, the circuits of the judges are eight in number, and the counties of England and Wales are distributed among them in the following manner. The Northern Circuit comprehends the counties of York, Durham, Northumberland, Cumberland, Westmoreland, and Lancaster; the Western Circuit comprehends the counties of Southampton, Wilts, Dorset, Devon, Cornwall, and Somerset,—and Bristol; the Oxford Circuit comprehends the counties of Berks, Oxford, Worcester, Stafford, Salop, Hereford, Monmouth, and Gloucester; the Midland Circuit comprehends the counties of Northampton, Rutland, Lincoln, Nottingham, Derby, Leicester, and Warwick; the Home Circuit comprehends the counties of Hertford, Essex, Kent, Sussex, and Surrey; the Norfolk Circuit comprehends the counties of Buckingham, Bedford, Huntingdon, Cambridge with the Isle of Ely, Norfolk, and Suffolk; the South Wales Circuit comprehends the counties of Glamorgan, Carmarthen, Pembroke, Cardigan, Brecon, Radnor, and Chester; the North Wales Circuit comprehends the counties of Montgomery, Merioneth, Carnarvon, Anglesey, Denbigh, Flint, and Chester.

CIRCULAR PARTS (NAPIER'S). A proposition which generalizes the relations between the parts of a spherical right-angled triangle into two only; first given (with a demonstration) by Napier in his 'Mirifici Logarithmorum Canonis Descriptio' (ch. iv., 1—8). It is as follows: Let a and b be the sides, c the hypothenuse, and A and B the angles opposite a and b, in a right-angled spherical triangle. Then take the complements of the hypothenuse and of the two angles, and the two sides, and write them in order in a perpetually recurring series, or round a circle, as follows:



Then taking any three parts, one may be made the *middle* part, and the other two either *adjacent* extremes, or *opposite* extremes. Thus 90°—B being the middle part, a and 90°—C are its adjacent extremes, and b and 90°—A its opposite extremes. Napier's rules are

1. Sine of *middle* = product of tangents of *adjacents*.
2. Sine of *middle* = product of cosines of *extremes*.

$$\begin{aligned}\text{Thus sin. } b &= \text{tan. } a \text{ tan. } (90^\circ - \text{A})\\ &= \text{cos. } (90^\circ - \text{B}) \text{ cos. } (90^\circ - c).\end{aligned}$$

But we should strongly recommend the student to have nothing to do with this artificial memory, for it involves a process upon every occasion; and while one person is learning which are the parts, which have complements taken, and the rules, another will master the six results, and will have no occasion for any future process. These results are

1. Cosine of hyp. = product of cosines of sides.
2. Cosine of hyp. = product of cotangents of angles.
3. Sine of *side* = sine of hyp. × sin. *opposite* angle.
4. Tang. of *side* = tang. of hyp. × cos. *adjacent* angle.
5. Tang. of *side* = tang. *opposite* angle × sine of other side.
6. Cos. of *angle* = cos. of *opposite* side × sin other angle.

These pairs present analogies which will help the memory, and we should recommend them in preference to the rules of circular parts.

CIRCULATING DECIMALS. When a common fraction cannot be expressed exactly as a decimal, the attempt leads to a never-ending series of figures, any number of which, with the decimal point properly placed, is an approximation to the common fraction, and the more near the greater the number of figures taken. Thus 1 with ciphers affixed and divided by 7, leads to the recurring or circulating series

142857142857142857......

and ·1428 is nearly $\frac{1}{7}$, but ·14285714 much more nearly. Hence it is said that $\frac{1}{7}$ is a circulating decimal whose period is 142857, and is denoted by $\cdot\dot{1}4285\dot{7}$. Similarly $\cdot 12\dot{9}$ denotes ·129999.... and $\cdot 05\dot{3}\dot{6}$ denotes ·053636.... As a part of practical arithmetic, the rules for converting these fractions into common fractions are useless, though found in most elementary works. One example will be sufficient here.

$$\cdot 14\dot{3}6\dot{2} = \cdot 14362362, \text{\&c.} = \cdot 14 + \tfrac{1}{100} \times \cdot 362362\ldots.$$

If the circulating part continued *ad infinitum* be called S, it is plain that 1000 S = 362 + S, or $\text{S} = \frac{362}{999}$, whence

$$\cdot 14\dot{3}6\dot{2} = \frac{14}{100} + \frac{362}{99900} = \frac{14 \times 999 + 362}{99900}$$

Wallis (*Algebra*, ch. 89), Euler (*Algebra*, ch. 12; book i.), and John Bernoulli the second (*Mem. Acad. Sci.*, 1771), have treated this subject. We shall merely state some theorems to show the remarkable character of the periods.

1. Form the period of a prime number m; its number of figures will be either $m - 1$ or one of its divisors. The period of 7 (being 142857) has six figures; that of 13 (being 769230) has 6, the half of 13 − 1 figures.

2. When the period of a prime number m contains $m - 1$ figures, the last half may be formed from the first by taking each figure in the first from 9. Thus the first and second halves of the period belonging to 47 are—

First half	02127659574468085106382
Second half	97872340425531914893617

3. When the period of a prime number m has $m - 1$ figures, multiplication by any number under m only changes the order of the figures. Thus the period of 7 being 142857, we have here a number which, being multiplied by 2, becomes 285714; by 3, 428571; by 4, 571428; by 5, 714285; and by 6, 857142.

The following work may be useful to those who are curious on the subject: 'A Table of the Circles arising from the division of a Unit, or any other whole number, by all the integers from 1 to 1024, being all the pure decimal quotients that can arise from this source.' London, Richardson, 1823.

CIRCULATION OF THE BLOOD. The constitution of the blood, the nutrient fluid of the animal body, has been already described. Since the blood is necessary to nourish all the tissues of the body and to stimulate all its organs [BLOOD], it must be in motion in order to be borne to them. 'In man and in all the higher animals an apparatus is provided, partly for the purpose of originating an impelling force to put the blood in motion, and partly for the purpose of conveying the blood when put in motion to the different parts of the body.'

The organ that puts the blood in motion is the heart; the pipes or conduits which distribute the blood to the different parts of the body are the great vessels in connexion with the heart. The course of the circulation, which in all the higher animals is double—viz., one through the lungs, called therefore the *pulmonic*, or the *lesser circulation*; the other through the system, called therefore the *systemic*, or the *greater circulation*—cannot be understood until the structure and action of the heart have been explained.

[Heart, and its Great Vessels.] In the mean time it will be sufficient to state in this place the evidence that the blood is really in motion. The author of the 'Philosophy of Health' thus sums up the proofs that the blood is a flowing stream, and that it constantly pursues a regular and determinate course.

'1. With the microscope, in the transparent parts of animals, the blood can be seen in motion; and if its course be attentively observed, its route may be clearly traced.

'2. The membranes, termed valves, are so placed as to allow of the freest passage to the blood in the circle described; while they either altogether prevent, or exceedingly impede its movements in any other direction.

'3. The effect of a ligature placed around a vein and an artery, and of a puncture made above the ligature in the one vessel and below it in the other, demonstrates both the motion of the blood and the course of it. When a ligature is placed round a vein, that part of the vessel which is most distant from the heart becomes full and turgid, on account of the accumulation of blood in it; while the part of the vessel which is between the ligature and the heart becomes empty and flaccid, because it has carried on its contents to the heart and it can receive no fresh supply from the body. When, on the contrary, a ligature is placed round an artery, that portion of the vessel which lies between the ligature and the heart becomes full and turgid, and the other portion empty and flaccid. This can only be because the contents of the two vessels move in opposite directions—from the heart to the artery, from the artery to the vein, and from the vein to the heart. At the same time, if the vein be punctured above the ligature, there will be little or no loss of blood; while if it be punctured below the ligature, the blood will continue to flow until the loss of it occasions death; which could not be unless the blood were in motion, nor unless the direction of its course were from the artery to the vein, and from the vein to the heart.

'4. If fluids be injected into the veins or arteries, whether of the dead or the living body, they readily make their way and fill the vessels, if thrown in the direction stated to be the natural course of the circulation; but they are strongly resisted if forced in the opposite direction.'

The author concludes his account of the structure of the heart and blood vessels, and of the course which the stream of blood is ascertained constantly to pursue, with the following reflections:

'Such is the description, and, with the exception of the first proof, such the evidence of the circulation of the blood in the human body, pretty much as it was given by the discoverer of it, the illustrious Harvey. Before the time of Harvey, a vague and indistinct conception that the blood was not without motion in the body had been formed by several anatomists. It is analogous to the ordinary mode in which the human mind arrives at discovery (chap. iii., p. 103), that many minds should have an imperfect perception of an unknown truth before some one mind sees it in its completeness, and fully discloses it. Having about the year 1620 succeeded in completely tracing the circle in which the blood moves, and having at that time collected all the evidence of the fact, with a rare degree of philosophical forbearance, Harvey still spent no less than eight years in re-examining the subject and in maturing the proof of every point, before he ventured to speak of it in public. The brief tract which at length he published was written with extreme simplicity, clearness, and perspicuity, and has been justly characterized as one of the most admirable examples of a series of arguments deduced from observation and experiment that ever appeared on any subject.

'Contemporaries are seldom grateful to discoverers. More than one instance is on record, in which a man has injured his fortune and lost his happiness through the elucidation and establishment of a truth which has given him immortality. It may be that there are physical truths yet to be brought to light, to say nothing of new applications of old truths, which, if they could be announced and demonstrated to day, would be the ruin of the discoverer. It is certain that there are moral truths to be discovered, expounded, and enforced, which, if any man had now penetration enough to see them, and courage enough to express them, would cause him to be regarded by the present generation with horror and detestation. Perhaps during those eight years of re-examination the discoverer of the circulation sometimes endeavoured in imagination to trace the effect which the stupendous fact at the knowledge of which he had arrived would have on the progress of his favourite science; and, it may be, the hope and the expectation occasionally arose, that the inestimable benefit he was about to confer on his fellow-men would secure to him some portion of their esteem and confidence. What must have been his disappointment when he found, after the publication of his tract, that the little practice he had had as a physician by degrees fell off? He was too speculative, too theoretical, not practical. Such was the view taken even by his friends. His enemies saw in his tract nothing but indications of a presumptuous mind, that dared to call in question the revered authority of the antients; and some of them saw, moreover, indications of a malignant mind, that conceived and defended doctrines which, if not checked, would undermine the very foundations of morality and religion. When the evidence of the truth became irresistible, then these persons suddenly turned round and said that it was all known before, and that the sole merit of this vaunted discoverer consisted in having circulated the circulation. The pun was not fatal to the future fame of this truly great man, nor even to the gradual though slow return of the public confidence even during his own time, for he lived to attain the summit of reputation.'

In the seventh chapter of the *Philosophy of Health*, from which the above extract is taken, will be found a full account of the apparatus of the circulation, of the powers which move the blood, and of the uses which the circulation accomplishes in the living economy. [Heart, and its Great Vessels.]

CIRCUMCISION, the operation of cutting off the prepuce or foreskin, is sometimes performed for a medical purpose; but it is general or universal among some nations as a religious rite, and among others as a national custom. The practice of circumcision appears to be of the highest antiquity. Abraham, as recorded in *Genesis* (xvii. 10-15), by the command of God, circumcised himself and all the males of his household. Abraham himself was ninety-nine years old (*Gen.* xvii. 24) when he was circumcised. The rite of circumcision was ordained to be an everlasting covenant between God and the seed of Abraham; and it was declared that 'the uncircumcised man-child whose flesh of his foreskin is uncircumcised, that soul shall be cut off from his people; he hath broken my covenant.' All the males that left Egypt were circumcised, but during the forty years' wandering in the wilderness the rite was not performed. Joshua, by the express command of God, renewed it by circumcising all the males just after the passage of the Jordan. (*Joshua*, v.) Ever since the circumcision by Joshua, it has been universally observed, both among the Jews and the Ishmaelitish descendants of Abraham. Circumcision is not, properly speaking, a rite of the Mohammedan religion; it is not enjoined in the Koran, but the Arabs and Mohammed himself were circumcised before the religion of the Koran began to be preached, and their descendants have continued the usage as one which had always prevailed among them, and have also communicated it to the Saracens, the Turks, and the other nations who have become associated with them in a common faith. In point of fact, circumcision is as universal among the Mohammedans as it is among the Jews.

A great deal has been written, both on the ceremonial of the Jewish circumcision and on the question as to the sacramentary efficacy which has been sometimes attributed to the rite. On these matters the reader may consult Burder's 'Oriental Literature,' Calmet's 'Dictionary of the Bible,' Simon's 'Dictionary of the Bible,' and especially the able dissertation on circumcision in Michaelis's 'Commentaries on the Laws of Moses,' book iv., chap. iii., part i., articles 184—186, English translation by Dr. Smith, 4 vols. 8vo., 1814, and the authorities there referred to. Michaelis is decidedly of opinion that circumcision was never intended as a sacrament. Among the antient Jews, not only all proselytes were circumcised, but also all bondmen or slaves, and their children (*Gen.* xvii., 12, 13): 'He that is born in thy house, and he that is bought with money of any stranger, which is not of thy seed: he that is born in thy house, and he that is bought with thy money, must needs be circumcised.'

The prevalence of circumcision among various antient nations is mentioned by Herodotus (ii., 36, 37, 104), by Diodorus Siculus (i., 26 and 55, iii., 32), and others. Herodotus says that the Colchi, the Egyptians, and the Ethioptians, were the only nations who had practised it from time immemorial, and that the Phœnicians and the Syrians of Palestine (the Jews) admitted that they had acquired the custom from the Egyptians. This notion, that the Jews had learned circumcision from the Egyptians, has been taken up and maintained in modern times by Sir John Marsham in his 'Chronicus Canon Ægyptiacus,' and others. (See De Pauw's *Recherches Philosophiques sur les Americains*, tom. ii., pp. 117—150; and a note of Gibbon's to the 47th chapter of his history.) But supposing this opinion to be false, it does not follow, on the other hand, as has been contended by some, that all other nations among whom the custom prevails must have derived it from the Jews. It has been supposed by some critics (but in our opinion without good reason), that among the antient Egyptians it was only the priests and those who desired to study the sciences of which they were the teachers, who were obliged to be circumcised. See the notes of Wesseling and Larcher on the passages of Herodotus above referred to, the Commentary of Origen on the 'Epistle to the Romans,' ch. ii., v. 13, and a curious note of M. Huet on Origen's Commentary on Genesis. (Origenis Opera, à Car. de la Rue, 4 vols. fol., Par., 1733, &c.; vol. ii., p. 16.) It is said that Pythagoras submitted to the operation of circumcision in order to obtain instruction in the secret doctrines of the Egyptian priests. (See, upon the origin of circumcision, a note on the 4th sect. of the 22d chapter of Volney's *Revolutions of Empires*.)

Strabo (book xvii., 824) says by mistake that the Jews practised excision on their female children; but, although this was never a custom of the Jews, it has prevailed, and still does, among other nations, particularly the Abyssinians, Nubians, and the modern Egyptians. See Ludolphi, 'Hist. Aethiopica,' iii., 1; Niebuhr's 'Description de l'Arabie,' pp. 67—71, and the 52d of the questions drawn up by Michaelis, pp. 105—109; Sonnini's 'Travels in Egypt,' Hunter's translation, vol. ii., pp. 29—38; 'Description de l'Egypte' (edit. of 1823), vol. xiii., p. 213; and especially Browne's 'Travels in Africa, Egypt, and Syria,' 2nd edit., pp. 394—400.

It is remarkable that circumcision has been found to prevail, and in some cases the excision of females also, among various savage or imperfectly-civilized races. It is said that the rite was practised by the Mexicans when the Spaniards first became acquainted with them. Cook found an imperfect species of circumcision, consisting of the slitting of the prepuce, in use among the natives of the Friendly Islands. (Kerr's *Voyages*, vol. xiii., p. 62.) Long before, many of the old voyagers had met with it among the islands of the Indian Archipelago, among the tribes of the west coast of Africa, and elsewhere. In Purchas's Collection, Edmund Scot gives a long account of the ceremonial of the circumcision of the king of Bantam in Java, at which he was present in 1605. Captain William Keeling, in 1608, states that he found the people at the bay of St. Augustine, on the west coast of Africa, circumcised; and Captain Richard Jobson describes the ceremony as he witnessed it at Batto, on the same coast, in 1621. An abstract of these and other early accounts may be found in Prevost's 'Histoire Générale des Voyages,' iii., 211, &c. See the same work (viii., 601) for a description of the ceremony of circumcision as practised among the people of Madagascar. Dampier, in his graphic manner, describes the mode of circumcision as he witnessed it performed in 1686 at the Philippine Islands. (*Voyages*, i., 339—343.) An account of what he calls the circumcision of females as well as of males by some of the African tribes is given by Bosman in his 'Description of the Coast of Guinea,' English translation, 2nd edit. pp. 179, 180, 329, 414. The principal distinction between circumcision as practised by the Jews and by other nations, is that the former, in obedience to the terms of the command given to Abraham, always when it is practicable circumcise the child on the eighth day after its birth; whereas, among other nations it is usually deferred to a much later period. Among the Mohammedans it is commonly performed in the thirteenth year, because Ishmael, the progenitor of the Arabs, was of that age when he underwent the operation. (*Gen.* xvii., 25.)

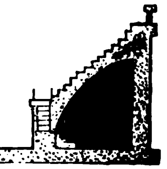
Kolben, in his 'Present State of the Cape of Good Hope' (translated by Medley, 2nd edit., i., pp. 112—119), gives an account of a very singular custom of the Hottentots, which he conjectures may have been derived from the Jewish circumcision.

Besides the authorities already referred to, the reader may consult the articles on circumcision in 'Hofman's Lexicon Universalis,' and in the 'Encyclopédie.' In the latter will be found an account of the opinions of both the Jewish rabbis and the Christian fathers on the doctrinal questions connected with the subject of circumcision. On the medical, including both the physical and moral, part of the subject, see Michaelis and Niebuhr, as already referred to; the *Encyclopédie, Art. Prepuce;* Bartholini's *Comment. de Morbis Biblicis;* and Drake's *New System of Anatomy*, 2nd edit., vol. i., pp. 127, 128.

CIRCUMFERENCE (*circum* and *fero*), the line which goes round a figure. We do not know why, but this word is always applied to a curvilinear figure; while the synonymous Greek word periphery (περί, φέρω) is used for a rectilinear figure.

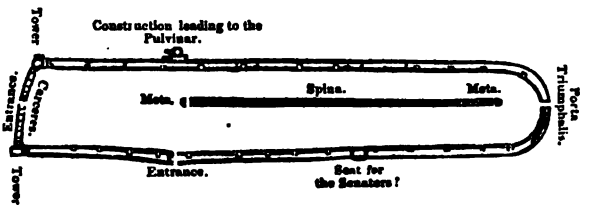
CIRCUMFLEX. [ACCENT.]

CIRCUS, a large enclosed space, adapted for chariot-races, an amusement to which the Romans were passionately attached. The name Circus (of which Circulus, a *circle*, is a diminutive) does not convey an exact idea of the form of this building, which both in its outline and its use very much resembled the Greek Stadium. There were many circi in Rome, of which the Circus Maximus and the Circus Agonalis were perhaps the largest. The former may still be distinctly traced; the latter retains its external form only in the Piazza Navona of Rome. The Circus Aurelianus, or, according to some, of Heliogabalus, stood near the Amphitheatrum Castrense. The ruins of the Flaminian Circus are hid beneath the pavement of the city. The Circus of Nero was begun by Caligula; part of its site is now occupied by the Basilica of St. Peter. This circus is said to have been longer than the cathedral and colonnade in front. (Fontana's *Tempio Vaticano*, p. 245.) Another circus, begun by Nero, and finished by Hadrian, was situated in the gardens of Domitia, near the Mausoleum of Hadrian. Several antiquities and paintings were discovered here a few years ago. In the Gardens of Sallust there was a fine circus, which was also adapted for the exhibition of naumachiæ. The Circus of Flora was on the Quirinal Hill. There is a circus, not far from the Appian Way, near the tomb of Cæcilia Metella, about two miles from Rome, in a high state of preservation. It is probably of a later date than many of those which were constructed within the city; and perhaps to the circumstance of its being at a distance from the city walls, its present state of preservation may principally be owing. Antiquaries have called it the Circus of Caracalla, although no proof, we believe, has been discovered from inscriptions that this is the circus built by, and commemorated on the coins of, that emperor.



Section of Seats.

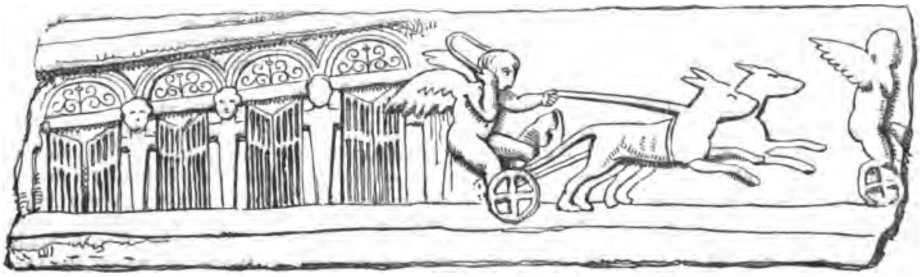
Amphora used in constructing the arch.



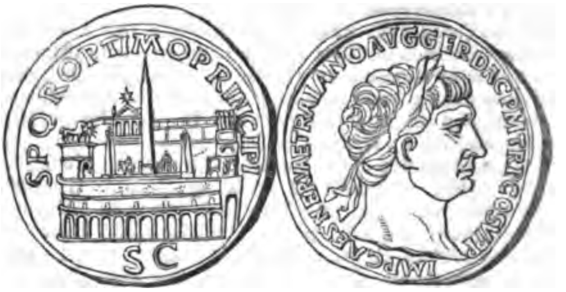
[Plan of the Circus of Caracalla.]

Bianconi makes the Circus of Caracalla 255 French toises long, and 50 toises wide; the spina 142 toises long, and the start from the carceres to the spina 79 toises. The widths of the openings between the spina and the walls of the circus are 21·3 toises at the first goal, 19·3 at the second goal, 17 toises at the turn on the other side of the second goal, and 15·4 toises at the final goal. The width of the vaulting is 4 toises. (A toise is about 6·396 English feet.)

The Circus of Caracalla, of which we have given a plan and a section of the seats, may be considered a perfect model of this kind of building, both in judicious arrangement and ingenious construction. The long sides are not quite parallel: one end is semicircular, and the carceres at the opposite end, from which the chariots started, are formed on a segment of a circle, the chord of which is inclined to the long sides of the circus. The spina, or raised division, which runs along the middle of the circus, is a kind of podium or basement, in appearance like a thick dwarf wall. It is not exactly parallel to either side of the circus. Of the carceres, which are twelve in number, six are placed on each side of the entrance which was intended for the use of the processions, and are so disposed, by the inclination of the chord line of the segment on which they may be said to be set off, that the starting of the twelve chariots was equalized. The carceres were most probably covered; they were also divided by partition walls with terminal figures in front of them, and arched over, with a cornice above the arches: the semicircular opening was filled with a window frame of marble, highly enriched; and they were closed with gates, most probably of bronze. A very tolerable idea of the architectural appearance of a Circus may be formed from the inspection of a bas-relief in the British Museum.

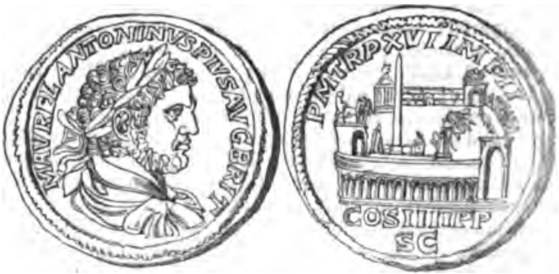


There is also a representation of a marble fragment in Bianconi's work on this circus, in which men are seen opening the bronze gates, in order, as we may judge from their hurried action, to let out the chariots at the given signal. The spina, which was rounded at the two extremities, was decorated with metæ, or goals, each formed of three long cones.* The eggs were placed on the apex of each cone. Dolphins were also employed for this purpose: these cones were sometimes gilt. In the basement of the cones in the Circus of Caracalla there is a small chamber formed; and the basements are separated from the spina. In the centre of the spina there was sometimes one of those enormous obelisks which were brought by the emperors from Egypt. Previous to the time of Augustus, a long pole occupied the centre. Small temples, statues, columns with statues on their summits, and altars, adorned the intermediate spaces between the centre and the goals; so that the spina must have presented a highly decorated and very beautiful appearance. The Porta Triumphalis, or gate by which the victor left the circus, was at the end opposite to the carceres. It is not improbable that the pulvinar, or emperor's seat, which, in the Circus of Caracalla, was a loggia with columns, was constructed at that part of the circus where the emperor, being near the carceres, would have the best view of the start and of the arrival at the goal. At the ends of the carceres of the Circus of Caracalla were two towers, in one of which is a staircase leading to the roofs of the carceres. The people occupied the stone seats along the sides and at the semicircular end of the circus. The Euripus, a canal ten feet wide and ten deep, was formed as a protection to the spectators, when they were not separated from the open space by a high podium or basement. The Circus of Caracalla has the podium and no Euripus. Some notion of the appearance of the circi may be collected from the medals of Caracalla and Trajan. In these medals the metæ and the quadrigæ are discernible, and the obelisk in the centre of the spina.


SPQR OPTIMO PRINCIPI
SC
IMP CAES NERVAE TRAIANO AVG GER DAC P M TR P COS V P

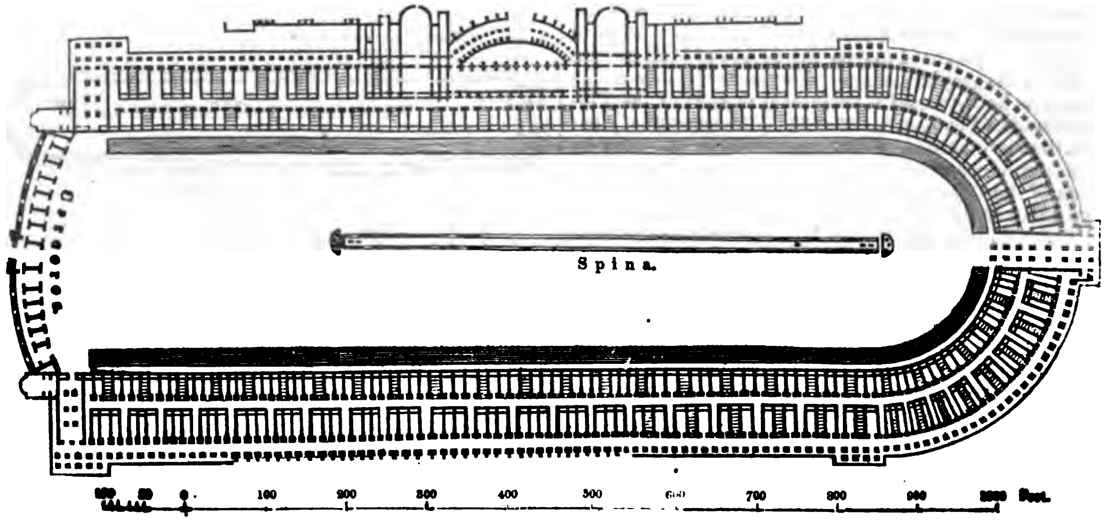
[Coin of Trajan.]

British Museum. Actual size. Bronze. 414¼ grains.


M AVREL ANTONINVS PIVS AVG BRIT
P M TR P XVII IMP
COS IIII P P
SC

[Coin of Caracalla.]

British Museum. Actual size. Bronze. 469 grains.



[Scale for the Circus Maximus, according to Venuti's plan.]

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* See a representation of these cones in the Library of Entertaining Knowledge, Townley Gallery, vol. i., p. 141.

In order to lighten the weight of the materials used in the construction of the arch which supports the seats of the Circus of Caracalla, large amphoræ have been employed in the crown of the arch. Under this archway the people passed to the various openings with steps which led to the seats. The archway formed one great vomitorium. Although there were twelve carceres, the number of chariots varied: in a representation of a chariot-race on a sepulchral monument at Foligno, nine are represented.

The Circus Maximus, which was situated in a valley between the Palatine and Aventine hills, was very similar in form to that of Caracalla. It is stated, in the *Encyclopédie Méthodique*, to be 2345 feet 6 inches in length, by 1029 feet 7 inches wide; but, according to Venuti, it is only 210 French toises long by 85 wide; that is, 1343·160 feet by 543·2. To Tarquinius Priscus tradition assigned the first building of a circus, on the site of which the Circus Maximus was afterwards erected. If ever there was a Circus of Tarquin, it may have been rebuilt after the destruction of the city by the Gauls. This edifice, whatever may have been its origin, was enlarged by Cæsar, and embellished by Augustus and Tiberius. In the time of Nero it was burnt down (Tacit. *Annal.*, xv., 35); Trajan repaired it: and under Antoninus it became partially ruined, but was afterwards restored. The exterior of the circus, except at the carceres, consisted of two stories, adorned with columns, and finished with a terrace. The ground floor was occupied by merchants, except on the days appointed for the games. There were four towers more in the Circus Maximus than in that of Caracalla; one in the centre over the carceres (equidistant from those at each end of the carceres), one over the principal entrance, and one at each end of the semicircle, where it joined the straight sides of the circus: these towers were crowned with quadrigæ. The spina, which was rather more than eight feet high and twelve broad, was decorated with temples in miniature, statues, and obelisks. Augustus brought an obelisk from Egypt, 126 feet high, and placed it in this circus; Constantius also erected in the circus the obelisk now called the Lateran, which is the largest of all the Roman obelisks.

There are traces of a circus at Tarragona, at Merida, at Murviedro (the ancient Saguntum), all in Spain; also at Nismes, Milan, Antioch, at Constantinople, and other places.

For some curious information concerning the Circus of Caracalla, see the Cavaliere Bianconi's work on that building; *Plan of Rome*, published by the Society for the Diffusion of Useful Knowledge; Nardini's *Rome*; *Encyclopédie Méthodique*, 'Architecture;' *Topografia delle Antichità de Roma*, dell'Abate Ridolfino Venuti.

The games, which derived their name, *ludi Circenses*, from the circumstance that, after the time of Tarquinius, they were celebrated in the circus, were, according to tradition, instituted by Romulus under the name of Consualia (Livius, i. 9), in honour of the god Consus (or Neptune). They were exhibited on various occasions and for various purposes; sometimes, for example, by magistrates and sometimes by private citizens; either as rejoicings for success in war, or to avert the anger of some god. A grand procession from the capitol to the circus opened the games, and the images of the gods were taken along in carriages (*thensæ*). The combatants, dancers, musicians, and others followed, and last of all the consuls and priests advanced to perform the sacred rites. The exhibition consisted chiefly of chariot and horse races. The charioteers were divided into four classes, distinguished by the colour of their dress; one was white, another red, another sky-coloured, and another green. Domitian added two more, the golden and the purple. The favour of the people to one class or another was determined quite as much by the dress as by the skill displayed. Serious consequences often followed the disputes on the superiority of one colour above another. The order in which the chariots stood was determined by lot; and the signal for starting was given by dropping a cloth (*mappa*, or *pannus*). The chariot which first ran seven times round the course was victorious, and the driver, after being proclaimed by the herald, was crowned with a palm-wreath, and received a considerable sum of money. There were usually twenty-five such heats in the course of a day. Contests in the five exercises (*quinquertium*, the Greek πένταθλον), running, leaping, boxing, wrestling, and throwing the discus, also formed part of the exhibition. Wrestlers were anointed with ointment by slaves: boxers used gloves strengthened with lead or iron to give force to their blows; all underwent a preparatory training and dieting. These exercises were performed by the combatants almost entirely naked, and hence were called sometimes *certamen gymnicum*; the combatants had only a slight covering round the middle. A mock-fight, called *ludus Trojæ*, was performed by young noblemen on horseback; an exhibition which was revived by Julius Cæsar. (Virgil, *Æn.* v. 561.) A sea-fight (*naumachia*) was sometimes represented: Domitian afterwards built a sea-fight theatre. (Suetonius, *Domit.* c. 5.)

The exhibition of the wild beasts (*venatio*) was one of the most attractive parts of their public entertainments. Wild beasts fought either with one another or with men; and the men were either forced to this combat as a punishment, or were induced to enter it by hire. Great expense was incurred to provide beasts for this exhibition, and they were collected from the most remote parts of the empire. In the days of imperial splendour and profusion, the public exhibitions of Rome contained nearly every rare wild animal that western Asia and northern Africa could produce. The beasts were kept in inclosures (*vivaria*) till the time appointed for the show. The exhibitor of the games (*editor spectaculorum*) presided on a seat (*pulvinar*) at the south side of the building. So passionately fond were the people of these games, that the expression *Panem et Circenses*, 'Bread and the Circensian Games,' was commonly used to signify the two prime necessaries of life to the Roman populace. The crowds brought together by the games naturally attracted such persons as conjurers, jugglers, and fortune-tellers to the place, which is hence called by Horace (Sat. i. 6, 113) *fallax*, 'deceitful.' The splendour of the exhibition increased in the later times of the republic. P. Cornelius Scipio and P. Lentulus once exhibited sixty-three panthers, and forty bears and elephants (Livius, xliv. 18); and Pompey on one occasion is said to have exhibited five hundred lions (a number beyond all belief), which were all dispatched in five days. (Dion. Cass. xxxix. 38.) (Pitiscus, *Lexic. Antiquit. Roman.*; Dr. Adam's *Roman Antiquities*, p. 311, &c.)

CIRCUS. [FALCONIDÆ.]

CIRENCESTER, colloquially called Cicster, is an antient market town and parliamentary borough in the S.E. part of the county of Gloucester, and in the hundreds of Crowthorn and Minety. The town includes five hamlets or tythings, Oakley, Wiggold, Spiringate, Barton, and Chisterton, and is about 84 miles W.N.W. from London in a straight line, and 17 miles S.E. from Gloucester. It is pleasantly situated on the river Churn, antiently the Corin, which joins the Thames at Cricklade; and hence, as a Roman military station, the place was called Corinium or Cornovium, and Corin Castra. Three Roman roads, the Fossway, the Ermin Street, and the Icknield Way, all met at Cirencester. A branch of the Thames and Severn Canal comes to the town. It was a place of considerable importance during the Roman occupation of Britain, when its walls, of which partial traces still exist, were two miles in circumference. During the Heptarchy it was successively included in the kingdoms of Wessex and of Mercia. A great number of Roman and Saxon antiquities have been, and continue to be, found in and near the town. In 879 it was stormed and taken by the Danes, and was the seat of a great council held by Canute. It was again stormed and completely dismantled in the civil war of Henry III. with the barons. Lords Surrey and Salisbury, in the reign of Henry IV., having promoted an insurrection for the restoration of Richard II., these noblemen, with several of their accomplices, were killed at a public-house in the town by the bailiff and a party of the inhabitants. Their heads were sent to London as a present to King Henry. A magnificent abbey for black canons was built in 1117 by Henry I., on the foundation of a college for prebendaries, which was established by the Saxons long before the Conquest. The revenue of this abbey at the dissolution of monasteries under Henry VIII. was 1051*l.* 7*s.* 1*d.* and its mitred abbot had a seat in parliament.

The town government is vested in two constables and fourteen wardsmen, elected annually. It has returned two representatives to parliament since the reign of Elizabeth. The borough is not incorporated: it is a polling place for the east division of the county. The living is a perpetual curacy, in the diocese of Gloucester. Cirencester had once three churches: that which still exists is a fine old structure of the fifteenth century, very elaborately ornamented externally and in the interior. Its embattled tower contains a peal of twelve bells. Cirencester is not a place of much trade; it has however an extensive clothing and a small carpet manufactory. Its appearance is that of a very respectable and opulent country town. Several streets of houses have been recently built, and others are in progress. The town is paved and lighted, and well supplied with water. It has a grammar-school, three endowed hospitals or almshouses, and several charitable institutions for education and other purposes: the total income of these charities is considerable. It has also an agricultural association, and annual races. The Baptists, Friends, Methodists, and Unitarians have chapels. Population of the parliamentary borough in 1831, 5240. Market-days Monday and Friday. Fairs on Easter Tuesday, on July 18, on Monday before and after Michaelmas, and on November 8, chiefly for agricultural stock and produce. In the vicinity is the handsome mansion of Oakley Park, the seat of Earl Bathurst. For a detailed historical and topographical description of Cirencester, see *Hist. of Cirencester*, by Rudder, 1800; Brayley and Britton's *Beauties;* and the *Histories of the County of Gloucester*, by Atkyns, Rudge, and Bigland.

CIRL BUNTING. [EMBERIZIDÆ.]

CIROLANA. [ISOPODA.]

CIRRATULUS. [DORSIBRANCHIATA.]

CIRRHIBA'RBA, a genus of fishes of the family Gobioides, and section Acanthopterygii. But one species of this genus is yet discovered, and this is from India. It has a tentaculum over each eye and nostril, three large tentacula at the end of the muzzle, and eight under the point of the lower jaw. These tentacula constitute the chief distinction between our present genus and that of Clinus, to which it is closely allied.

CIRRHI'GRADA. An order (the second) established by De Blainville for a small number of radiated gelatinous animals of the class *Arachnodermata*. Linnæus placed them among the *Medusæ*, to which they bear some external resemblance, but from which they differ, first, in having a transparent cartilaginous support, which sustains the dorsal disk of the umbrella of these creatures; and secondly, in having the proboscidiform stomach, which occupies the lower disk, accompanied by a great number of highly contractile and extensible tentaculiform cirrhi, very different from the appendages with which the *Medusæ* are supplied. De Blainville says that they have evidently more proximity to the tentacula of the *Actiniæ*, and perhaps even to the tentaculiform cirrhi of *Physalia* and the neighbouring genera; but that not having had an opportunity of studying the species except from individuals preserved in spirit, he is unable positively to decide on their natural position in the system, though he is led to regard them as approximating more to *Actinia* than to any other genus. He throws out a hint that the cartilaginous support may perhaps be regarded as a polyparium, and that it is, in fact, analogous to the calcareous part in *Cyclolites*, &c. Lamarck placed the genera among his *Anomalous Radiaria*, a section of his division of soft radiated animals (*Radiaires Molasses*), and next to the first genera of his *Radiaires Medusaires;* viz., *Eudora*, *Phorcynia*, *Carybdea*, &c. Cuvier arranges them under his *Simple Acalephans*, next to *Cestum*, observing that the two genera (*Porpita* and *Velella*) might form a small family in that order by reason of the internal cartilage which supports the gelatinous substance of their bodies. The following is De Blainville's definition of the order:—

Body, oval or circular, gelatinous, sustained in the interior of the dorsal disk by a solid subcartilaginous part, and provided on the lower surface of the disk with tentaculiform cirrhi, which are very extensible.

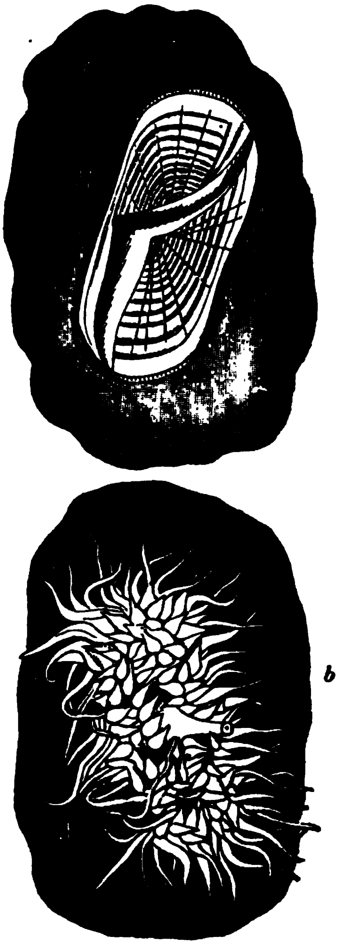
Genera. VELELLA.

Body membranous, oval, very much depressed, convex, swollen, sustained above by a transparent oval subcartilaginous piece, marked with concentric striæ, and surmounted by a vertical and oblique crest, concave below, with a sort of mesial nucleus, offering a central mouth at the extremity of a proboscidiform prolongation, surrounded by tentacular cirrhi of two kinds, the external being much longer than he internal ones.

De Blainville observes that Imperato and Columna would appear to be the authors who first noticed the anima which constitute this genus, established, at first, under th name of *Phyllidoce*, by Patrick Browne, and figured b him in his 'History of Jamaica,' tab. 48, fig. 1. Forskah who gave a very good description of it, arranged it und his genus *Holothuria*. Lœfling made it a *Medusa*, den minating the species known to him *Medusa Velella*, a nam adopted by Linnæus in the *Systema Naturæ*. Dana (*So Roy. de Turin*, 1766) proposed the name of *Armenistar* for it; and Lamarck published it under the generic appe lation of *Velella*, by which it is now generally known naturalists.

Geographical distribution, habits, and use.—This for is widely diffused, and has been found in the seas of Europ America, Asia, and Australasia. The animals are me with far at sea, and often huddled together, young and ol in considerable masses. Sailors are said to fry and ea them.

Species.—The species (so called) are numerous; but D Blainville observes that he is far from admitting that the are sufficiently distinct; and, indeed, he well observes tha he knows not on what characters the specific distinctio should rest. Chamisso and Eisenhardt, apparently wit good reason, were guided principally by the form of th cartilage and body, and the direction of the crest, and re cognized three, confessing however that it had been im possible for them to compare their subjects rigorously wit the species proposed by their predecessors. Eschscholt describes ten, of which half are new, depending upon th form of the crest and the colour of the different parts De Blainville however doubts whether they are reall different. Example, *Velella lata*.



[Velella lata.]

a, upper side; *b*, lower side.

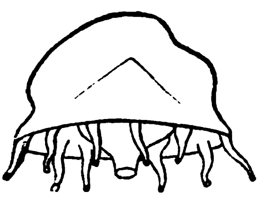
The following description, by Browne, of his *Phyllidoce labris cæruleis*, the *Sally-man*, which appears to be the *Velella cyanea* of Lesson and Garnot, and one at least of the species which gave rise to the *Medusa Velella* of Linnæus and Gmelin (Lamarck quotes the last name as well as Browne's *Phyllidoce*, as synonyms of his *Velella mu* tica) is worth recording as that of an eye-witness. By the help of the cuts the reader will readily understand the portion of his account which relates to the parts; but in Browne's figure there are no letters corresponding with the description: still however the notion of the position and motion intended to be conveyed will be understood without any very active exercise of the imagination.

'This insect,' says Browne, 'though evidently of this class, is more firm and opaque than either of the foregoing.' The Portuguese man of war is the animal whose description immediately precedes, 'and consists of an oblong, cartilaginous, flat body, slightly radiated from the centre, and intersected with small concentric lines: but this is furnished with two thin fleshy or semigelatinous lips *b b*, that extend themselves by short vermiform appendices over the under surface of the cartilaginous part. It is also supplied with a semi-elliptical, dry, transparent membrane E, which stands perpendicularly on the surface of the more firm part A, in the direction of the line D D, furnishing it with a pair of constant standing sails, which answer upon all occasions; for when this body is to move in any particular direction, suppose towards X, the part A D D, 1, of the perpendicular membrane, which arches in the direction of the line A D, 1, fills and pushes the body forwards, while the other part floats in the wind. But when the wind changes, and the body is to move towards Z, the other part answers in the same manner, and all the motions are performed by the same mechanism. It is furnished with a great number of slender tentacula, each about half an inch in length, which rise very thick from the margin of the cartilage underneath, and it seems to have an opening or mouth in the centre of the base.'

RATARIA.

Body oval or circular, sustained by a subcartilaginous, compressed, elevated piece, with a muscular, movable, longitudinal crest above, concave below, and provided in the middle with a free proboscidiform stomach, and with a single row of marginal tentaculiform suckers.

Eschscholtz established this genus for some very small cirrhigrade animals, whose back is sustained by a subcartilaginous piece, not elevating itself in the dorsal cavity, and which only offer marginal cirrhi on the central surface. De Blainville, after observing that Forskahl has figured with his *Holothuria spirans* (*Velella limbosa* of Lamarck) some very small animals, which M. Eschscholtz himself regards as closely approximating to his *Rataria cordata*, says that it seems possible that the *Rataria* may be only degrees of development of *Velella*. Example, *Rataria mitrata*.



[Rataria mitrata, highly magnified.]

PORPITA.

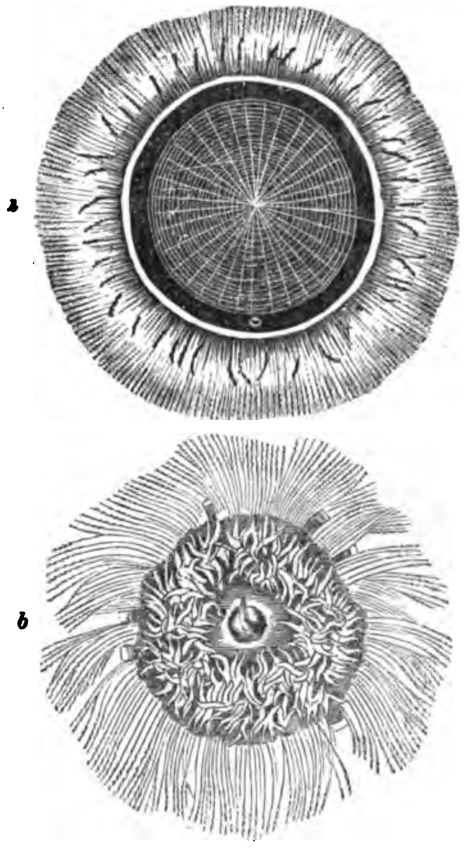
Body membranous, regular, circular, depressed, slightly convex above; internal cartilaginous support, circular, with its surface marked by concentric striæ crossing radiated striæ, covered on its upper surface by a delicate membrane merely. The body is concave below, and the inferior surface is furnished with a great number of tentacula, of which the exterior ones are the longest, and furnished with small cilia, each terminated by a globule: they sometimes contain air, and the internal ones are the shortest, the most simple, and the most fleshy. In the centre of these tentacula is the mouth, in form of a small proboscis, which leads to a simple stomach, surrounded by a somewhat glandular substance.

Cuvier, from whom a great portion of the above description is taken, says, in the last edition of the 'Règne Animal,' that there is but one species (*Porpita gigantea*) of a beautiful blue colour, from the Mediterranean and other warmer seas. Lamarck, who established the genus for an animal which had been placed among the *Medusæ* by Linnæus, gives four species; but De Blainville and MM. Chamisso and Eisenhardt coincide with Cuvier in believing that they are all referrible to one, though the former admits that the fact is still somewhat doubtful. He observes that Bosc's species, *Holothuria appendiculata*, (*Porpita appendiculata*, Lam.) was evidently established on an impaired animal. Eschscholtz, under the name of *Porpita Mediterranea*, conjoins three of Lamarck's species, and describes three new ones, taking for his character the proportion of the cartilaginous disk, and especially that of the marginal cirrhi.

De Blainville, to whose article in the 'Dictionnaire des Sciences Naturelles' we refer the reader for further details, is of opinion that the genera *Velella* and *Porpita* might be united without inconvenience.

There is a very fair figure of a *Porpita* in an early volume of the 'Philosophical Transactions.'

Geographical distribution.—Like that of *Velella*, very wide. Bosc, who met with them at sea, says the animal has the appearance of a 24-sous piece borne along by the waves. Examples, *Porpita gigantea*, and *Por. glandifera*.



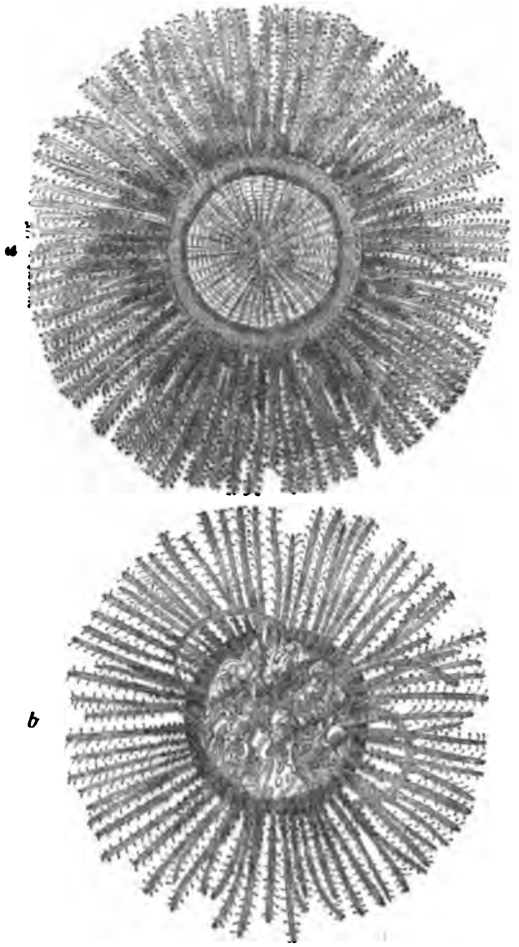
[Porpita gigantea.]
a, upper side; b, lower side.

[Profile of Porpita glandifera.]

The Rev. Lansdown Guilding is of opinion that the genus *Porpita* should be restricted to those species which resemble *Porp. appendiculata*, which have few and broader arms, and establishes a new genus of the family *Porpitidæ* under the name of

POLYBRACHIONIA.

Dorsal support (sustentaculum) cartilaginous, naked, flattened, rounded, radiated, concentrically striated; *mantle* (pallium) narrow, free, surrounding the support; *arms*, numerous, parallel, of various lengths, elongated, affixed beneath, with a power of taking a declining position for the purpose of taking prey; *mouth*, below, central, purse-shaped, extensile; *tentacula* many, varying in form, suctorial, covering the whole ventral surface; *eggs*, very small, innumerable, nestled among the tentacula, (Guilding). Example, *Polybrachionia Linnæana*. Mr. Guilding describes the support as broad and vitreous, the body as cerulean, the tentacula as pallid, and the arms, which are in a triple series, glandulous, the glandules being pedunculated. The diameter of the mantle, exclusive of the arms, is stated to be eleven and a half lines. Mr. Guilding states that the animal is wonderfully beautiful, swimming, or rather floating on the serene surface of the Caribean Sea in calm weather, and embracing its prey by the sudden downward application of some or all of its arms, which are easily broken by attrition.



[Polybrachionia Linnæana, enlarged.[*]]

a, upper side; *b*, lower side.

We think there is hardly enough to warrant a generic separation in this case; the species bears a strong resemblance to the *Porpita cærulea* of Eschscholtz. Mr. Guilding observes that the *Medusa porpita* of the 'Amænitates Academicæ' seems nothing more than the central disk of some species deprived of all the organs of the body.

CIRRHI'NUS, a genus of fishes. [Gobio.]

CIRRHI'PATHES. [Zoophytaria.]

CIRRHOBRANCHIA'TA. [Dentalium.]

CIRRHUS. (Conchology.) [Turbinidæ.]

CIRRI'PEDA, or CIRRHIPEDA.[†] *Lepas* of Linnæus, *Cirrhopodes* of Cuvier and Férussac, *Cirrhipèdes* of Lamarck, *Nematopodes* of De Blainville, *Cirripèdes* of Latreille: a well-defined natural group of marine invertebrate animals, whose place in the system has occasioned much doubt and difference of opinion among zoologists. In the earlier times the most absurd stories were propagated and believed in relation to one of the most common genera, *Pentalasmis anatifera*, *Lepas anatifera* of Linnæus, the common or duck barnacle. To the references on this head given under the article 'Bernicle,' we shall only add the testimony of Sir Robert Moray to show how long the delusion lasted, and in what positive terms a witness can state the thing that is not. 'In every shell that I opened I found a perfect sea-fowl; the little bill like that of a goose, the eyes marked, the head, neck, breast, wings, tail and feet formed, the feathers every where perfectly shaped, and blackish-coloured, and the feet like those of other water-fowl, to my best remembrance.' The Roman Catholics are permitted, in France at least, to eat the bernicle goose upon fast days and during the whole of Lent, in consequence of its supposed marine origin.

Organization, and place in the natural system.—Linnæus placed the *Cirripedia*, with the generic name of *Lepas*, among the *Multivalves* of his *Vermes* (*testacea*), between *Chiton* and *Pholas;* and, supposing that the form existed without a shell, found a situation for it under the name of *Triton*, between *Terebella* and *Lernæa*. Cuvier, in the first and also in the last edition of the 'Règne Animal,' says that the existence of these Tritons is not confirmed, and that we must suppose that Linnæus had only seen the animal of an *Anatifa* (Pentalasmis) which had been taken out of its shell. Rang, however, thinks that he has found the Linnæan genus *Triton* in certain specimens brought home by MM. Lesson and Garnot, Quoy and Gaimard, and has published it under the name of *Alepas*. Bruguières divided the genus *Lepas* into two; the first, *Anatifa*, a barbarous word for *Anatifera*, the Anatifes of the French, comprising the pedunculated cirripeds; and the second, *Balanus*, the sessile species. Cuvier, under the name of *Cirrhopoda*, made these animals the sixth class of his *Mollusks*, which he places between the *Brachiopoda* and the first class (Annélides) of his third great division of the animal kingdom, viz., the articulated animals, and in the 'Règne Animal' they appear between *Orbicula* and *Serpula*. Lamarck, under the name of *Cirrhipeda*, his tenth class of invertebrate animals, arranges them between the sedentary *Annelides* and his *Conchifera*, dividing them into two orders: 1st. The sessile cirripeds; 2nd. The pedunculated cirripeds. In his system they stand between *Magilus* and *Aspergillum*. Latreille, though he does not disturb this arrangement, evidently considers them as related to the *Ostracoda*, among the Branchiopodous crustaceans. He says that the sessile cirripeds seem to represent the animals which terminate the *Acéphales enfermés* of Cuvier. He observes that the two tubular processes of *Otion* represent the two tubes of some of the *Acephala*, though with different uses, the tentacula being converted into jaws. The *cirri* he considers as a kind of feet analogous to the sub-abdominal appendages of many crustaceans, especially those of the *Amphipoda*, and is of opinion that we may also compare them to those of many annelids. The oviduct, he remarks, has some resemblance to that of *Phalangium*. Finally he expresses a conjecture that nature, to form the *Cirripeds*, has borrowed different organs from animals of several classes. Mr. William Sharp MacLeay, in his profound and philosophical work, 'Horæ Entomologicæ,' considers that *Pentalasmis* exhibits the greatest affinity with the *Ostracoda;* but he seems to be of opinion that there exists an affinity between the shell of *Balanus* and that of *Echinus*, and sanctions Latreille's opinion that the articulated *cirri* have their analogues in the arms of the *Radiata*, particularly of *Comatula*. Dr. Leach, who has described several genera unnoticed till his time, divided the class into two orders: 1st. *Campylosomata*, comprising the pedunculated section; and 2nd. *Acamptosomata*, including the sessile species. M. de Blainville makes the cirripeds the first class (*Nematopoda*) of his subtype *Malentozoaria*, a group which corresponds to the Multivalves of Linnæus, after separating from them the genus *Pholas*, so that De Blainville's *Malentozoaria* consist of the *Cirripeds* and *Chitons*. The Cirripeds, he thinks, have an evident relation to the Bivalve Mollusks, by means of their calcareous envelope, in which he recognises the pieces of the shell of the *Pholades*, and even the analogue of the tube of the neighbouring genera. He also considers the relationship further indicated by the recurved position of the animal fixed head downwards (*la tête en bas*): but he also considers that their relations to certain animals of the type *Entomozoaria* are numerous, by means of the horny, locomotive, articulated appendages which are branchial, at least at the root, becoming, towards the mouth, true horny, denticulated jaws. Mr. Thompson, in his 'Zoological Researches,' considers the Cirripeds to be true *Crustacea*, and that in the first state of these animals they not only possess perfect freedom and power of motion, but organs of sight. On the 25th April, 1823, Mr. Thompson states that he took in a small muslin towing net, while crossing the ferry at Passage, among other minute creatures, a small translucent animal, one-tenth of an inch long, of a somewhat elliptical form, but very slightly compressed laterally, and of a brownish tint. When in a state of perfect repose it resembled a very minute muscle, and lay upon one of its sides at the bottom of the vessel of sea-water in which it was placed; at this time all the members of the animal were withdrawn within the shell, which appeared to be composed of two valves, united by a hinge along the upper part of the back, and capable of opening from one end to the other along the front, to give occasional exit to the limbs. These were of two descriptions, viz.: anteriorly a large and very strong pair, provided with a cup-like sucker and hooks, serving solely to attach the animal to rocks, stones, &c., and, posteriorly, six pairs of natatory members, so articulated as to act in concert and to give a very forcible stroke to the water, causing the animal, when swimming, to advance by a succession of bounds after the same manner as the water-flea (*Daphnia*) and other *Monoculi*, but particularly *Cyclops*, whose swimming feet are extremely analogous. [BRANCHIOPODA.] The tail, usually bent up under the belly, is extremely short, composed of two joints, and terminating in four *setæ*, and is employed to assist in progression and in changing the position from a state of repose. The greatest peculiarity however in the structure is in the eyes, which, although constantly shielded by the valves of the shell, are pedunculated as in the crab and lobster, and placed entirely at the sides of the body. Mr. Thompson observes that this animal, but for its pair of pedunculated eyes, would find a place as a new genus of *Ostracoda*; that its members approximate it to *Argulus* on the one hand and to *Cyclops* on the other, genera which are widely separated; while the eyes show its relationship to the *Decapoda* (crabs, lobsters, &c.) The individuals presented no variation indicative of a difference of sex; and this, with their anomalous organization, induced a belief that they were the larvæ or disguised states of some crustaceous animal, or (as it had been previously ascertained that the *Cirripeds* were *Crustacea*) that they were the males of these, Mr. Thompson not being disposed to believe that the two sexes were united in the same individual. What follows being of the last importance, we give in the author's own words: 'Under the foregoing impressions, some of them were collected in the spring of 1826, and, in order to see what changes they might undergo, were kept in a glass vessel, covered by such a depth of sea-water that they could be examined at any time by means of a common magnifying glass; they were taken May 1st, and on the night of the 8th the author had the satisfaction to find that two of them had thrown off their exuvia (exuviæ) and, wonderful to say, were firmly adhering to the bottom of the vessel and changed to young barnacles, such as are usually seen intermixed with grown specimens on rocks and stones at this season of the year. (*Balanus pusillus*, Penn.) In this stage the sutures between the valves of the shell and of the operculum were visible, and the movements of the arms of the animal within, although these last were not yet completely developed; the eyes also were still perceptible, although the principal part of the colouring matter appeared to have been thrown off with the exuvium (exuviæ). On the 10th another individual was seen *in the act of throwing off its shell*, and attaching itself as the others to the bottom of the glass. It only remains to add, that as the secretion of the calcareous matter goes on in the compartments destined for the valves of the shelly covering, the eyes gradually disappear, from the increasing opacity thence produced, and the visual ray is extinguished for the remainder of the animal's life; the arms at the same time acquire their usual ciliated appearance. Thus then an animal originally natatory and locomotive, and provided with a distinct organ of sight, becomes permanently and immovably fixed, and its optic apparatus obliterated, and furnishes not only a new and important physiological fact, but is the only instance in nature of so extraordinary a metamorphosis.'

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[*] From Mr. Guilding's figure, 'Zoological Journal,' vol. iii., p. 404, pl. X.

[†] The terms at the head of the article are those generally used by zoologists; but, correctly, the word should be *Cirripedia*, and Burmeister adopts that mode of writing.

'During the whole of the spring and summer mouths,' says Mr. Thompson, 'the water teems with these exuvia (exuviæ) of Tritones (the animal inhabitant, according to Linnæus, of the barnacles): it is impossible to avoid drawing up numbers every time a towing-net is thrown out, nay the tide is at times discoloured from their abundance; but to be certain that these are really such, let a stone with several barnacles upon it be kept in sea-water, regularly renewed, towards the latter end of April or the beginning of May, and with due attention many of them may be observed *in the act of throwing off exuvia* (exuviæ) in every respect identical; let it be recollected however that these are the casts of the *animal* alone, and not of the valves or the shell, or of the operculum.' Mr. G. B. Sowerby (*Genera of Shells*, 'Scalpellum') thus writes on the subject of Mr. Thompson's discovery:—'Without describing the facts, or entering upon the arguments with which he supports this opinion,' *i. e.* that the *Cirripedia* are *Crustacea*, 'we must be permitted to say that we do not think that he has fully demonstrated it; at the same time, considering that, as far as we hitherto knew, the Cirripedes were all attached, the circumstance of their being free when very young accounts well to our mind for the fact of each species being found attached to peculiar situations, which would only be compatible with the notion of their being at one time free agents, and possessed of an instinctive volition determining their choice of situation.' Mr. Owen, in the 'Catalogue of the Museum of the College of Surgeons' (Cirripeda), speaks of the discovery without expressing any doubt.

But Mr Thompson has since, in a paper read before the Royal Society on the 5th of March, 1835, declared his 'discovery of the metamorphosis in the second type of the Cirripedes; viz., the *Lepades*, completing the natural history of these singular animals, and confirming their affinity with the *Crustacea*.' and the memoir with a plate is published in the second part of the 'Philosophical Transactions for 1835.' The following is the abstract of the paper:—'The discoveries made by the author of the remarkable metamorphoses which the animals composing the first family of the Cirripedes, or *Balani*, undergo in the progress of their development, and which he has published in the third number of his "Zoological Researches" (p. 76), are in the present paper, which is intended as a prize essay for one of the royal medals, followed up by the report of his discovery of similar changes exhibited by three species of two other genera of the second tribe of this family, namely, the *Lepades*. The larvæ of this tribe, like those of the *Balani*, have the external appearance of bivalve monoculi, furnished with locomotive organs, in the form of three pairs of members; the most anterior of which are simple, and the other bifid. The back of the animal is covered by an ample shield, terminating anteriorly in two extended horns, and posteriorly in a single elongated spinous process. Thus they possess considerable powers of locomotion, which, with the assistance of an organ of vision, enable them to seek their future permanent place of residence. The author is led from his researches to the conclusion that the Cirripedes do not constitute, as modern naturalists have considered them, a distinct class of animals, but that they occupy a place intermediate between the *Crustacea decapoda*—with which the *Balani* have a marked affinity—and the *Crustacea entomostraca*, to which the *Lepades* are allied; and that they have no natural affinity with the testaceous mollusca, as was supposed by Linnæus, and all the older systematic writers on zoology.'*

Mr. Thompson does not seem to have been aware of a paper by Dr. J. Martin-Saint-Ange, read at the Academy of Sciences on the 14th July, 1834, and published in the 'Savans Etrangers,' tome vi., and separately by Baillière (1835). The following is the summary of the principal facts stated by him in the course of a very laborious and acute investigation. The mouth of the Pedunculated Cirripeds is composed of pieces entirely comparable to those of the mouth of many *Crustacea*, and especially of the *Phyllostomes*; the upper lip, the palpi, and the mandibles, are so analogous, that the resemblance extends even to the form. The three jaw-feet (*pieds-mâchoires*), which are met with most commonly in the Crustacea, are conjoined in a single jaw-foot which receives the nervous trunks; at its base are always found from two to four branchiæ. The ten ordinary feet of the Crustacea are faithfully represented in the *Anatifes* (Campylosomata); at the base of many among them are found branchiæ disposed like those of certain Crustacea, and the number even is sometimes repeated. There exists in each foot a double canal, fit for establishing a circulating current, and traversing all the articulations of the cirri. The body is composed of a certain number of rings, or of articulations, very distinct, each of which supports a pair of feet. In the interior of the body there are a dorsal vessel (like that in a great number of the articulated animals), and a double series of ganglions; of which the number, according to Dr. Martin-Saint-Ange's researches, is equal to that of the feet: there is besides another pair on the lateral parts of the stomach. The pedicle may be regarded as analogous to the tail of many Crustacea; it is in this cavity, and not, as has been said, on the back, that the eggs are found; these pass afterwards by a conduit, not yet indicated, in the envelope, which, by its resemblance to the mantle of the mollusca, establishes the only possible analogy between the Cirripeds and the last-named animals. The organs placed upon the back, which Cuvier described as eggs, are the generative apparatus of the male, of which the disposition is very remarkable. Finally, the stomach and intestinal canal enclose in the interior a membranous sac of a retort-shape; the disposition and use of which establish, according to the researches of M. Serres, an additional approximation between the Cirripeds and the Annelids. Dr. Martin-Saint-Ange then proposes as the last result of his labours, to place the class *Cirrhipeda* at the end of the *Crustacea*, so as to establish a natural link or passage between the superior articulated animals and the *Annelids*. Such are the conclusions drawn in the Memoir of Dr. Martin-Saint-Ange, who refers with approbation to the discoveries of Mr. Thompson, published in 1830; and before we proceed to the comments made on the Memoir of Dr. Martin-Saint-Ange, we will state Mr. Thompson's view of the ovarial system. 'In the whole of the tribe of the Cirripedes,' observes Mr. Thompson, in his paper in the 'Philosophical Transactions' above quoted, 'the ova, after expulsion from the ovarium, appear to be conveyed by the ovipositor into the cellular texture of the pedicle, just beneath the body of the animal, which they fill to the distance of about an inch. When first placed in this situation, they seem to be amorphous and inseparable from the pulpy substance in which they are imbedded; but as they approach to maturity they become of an oval shape, pointed at both ends, and are easily detached. Sir Everard Home has given a very good representation of them, at this stage of their progress, in his 'Lectures on Comparative Anatomy,' from the elegant pencil of Mr. Bauer. During the stay of the ova in the pedicle, they render this part more opaque and of a bluish tint; the ova themselves, and the cellular texture with which they are surrounded, being of a pale or azure blue colour. It is difficult to conceive in what manner the ova are extricated from the situation above indicated; but it is certainly not by the means suggested by Sir Everard Home in the above-mentioned lecture, viz., by piercing outwards through the membranes of the pedicle, for the ova are subsequently found forming a pair of leaf-like expansions, placed between either side of the body of the animal and the lining membrane of the shells in *Lepas* (Pentalasmis), or of the leathery internal tunic in *Cineras*. These leaves have each a separate attachment at the sides of the animal to the septum, which divides the cavity occupied by the animal from that of the pedicle; they are at first comparatively small, have a rounded outline, and possess the same bluish colour which the ova had in the pedicle; but as the ova advance in progress these leaves extend in every dimension, and lap over each other on the back, passing through various lighter shades of colour into pale pink, and finally, when ready to hatch, become nearly white. These leaves appear to be composed of a layer of ova irregularly placed, and imbedded in a kind of parenchymatous texture, out of which they readily fall when about to hatch, on its substance being torn asunder; indeed it appears at length to become so tender as to fall entirely away, so that after the period of gestation is past no vestige of these leafy conceptacles is to be found. When the larvæ, barely visible to the naked eye, burst forth from the ova, their development goes on with such rapidity that they seem to grow sensibly while under observation. The larva of the *Lepades* then is a tailed *Monoculus*, with three pairs of members, the most anterior of which are simple, the others bifid, having its back covered with an ample shield, terminating anteriorly in two extended horns, and posteriorly in a single elongated spinous process.'

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* M. Straus Durckheim claims the priority of referring the Cirripeds to the *Crustacea*, and would place them next to *Limnadia*.

We now come to the report of MM. Duméril and Serres (drawn up by the latter) upon the Memoir of Dr. Martin-Saint-Ange. After adverting to the labours and views of Poli, Delle Chiaje, Home, Thompson, and Burmeister, the report states that the ganglionary nervous chain, pronounced by Cuvier to be single, has been found by Dr. Martin-Saint-Ange to be completely double: an important fact, more especially when it is compared with the duality of the nervous axis, which one of the reporters pointed out in the larvæ of insects and of certain Annelids, Hérold in the embryo of the Arachnids, Rathke in that of the crawfish, and MM. Audouin and Milne Edwards in many adult *Crustacea*. Thus, observe the reporters, the symmetry of the nervous system becomes a general rule, common to vertebrated and invertebrated animals. The remainder of this report is so interesting, and the reporters are such competent authority, that we find it necessary, for the better illustration of this obscure and long-debated subject, to give a portion of it at least, as nearly as we can in the terms of the reporters:—'The author,' say they, 'has discovered besides in the Cirripedes a small nervous apparatus placed on the side of the head, which had its principal trunk in a tubercle which occupies this region. At first sight we thought that this tubercle might be the remains of the eye observed in the young state by Mr. Thompson, at the period when these animals are free, and that the nervous apparatus might be the remains of that of vision; but a dissection in water and under the microscope has not justified this opinion. Our researches however were made upon subjects which had been a long time in spirit; and it would be important to renew them on fresh individuals of various ages, in order to prove whether the loss of the eyes is complete and absolute, or whether, as Mr. Milne Edwards has observed in *Cymothöe*, the organs are hid in the thickness of the head, where they terminate by withering away and disappearing. After the nervous system, one of the most controverted questions about the organization of the Cirripedes is that relative to their genital apparatus, and the mode in which their generation is carried on. We do not stop at the idea of Home, who makes the Anatifes germinate from their pedicle, nearly like buds from a stem. This hypothesis, which is opposed by the disposition of the parts, is besides destroyed by the fact recently discovered by Mr. Thompson; viz., that of the primitive freedom of the Cirripedes. If at first these animals are free, if they move in all directions by the aid of their feet, which serve them as oars, it is clear that an hypothesis which supposes them to be adherent and fixed at all periods is unworthy of a serious refutation. It is not so with the opinion of Cuvier, which deserves to fix our attention; inasmuch as, if it were well founded, it would constitute a new species of hermaphroditism. On each side of the intestinal canal of the Anatifes is found a substance composed of an infinity of granules; these granules united in a bunch (*en grappe*) enter a hollow pedicle; this pedicle in its turn opens into a larger canal plaited in zigzag, which united to its congener is prolonged into the proboscidiform tube. According to Cuvier these granules and their bunches are the eggs and ovaries, the pedicles deferent canals, and the zigzag canal a sort of *vesicula seminalis*. On this hypothesis, the eggs detach themselves from the bunch and travel the length of the deferent canals and *vesicula seminalis*, becoming fecundated in their passage; they are finally deposited in the cavity of the mantle by the proboscidiform tube which terminates this apparatus: whence it results, according to Cuvier, that the same organic apparatus produces and fecundates the eggs, a condition which would amount to the most simple development of animal generation. But according to M. Martin-Saint-Ange, the whole of this apparatus only constitutes the male organ; the female organ being found enclosed (*renfermé*) in the cavity of the pedicle by which the Anatifes fix themselves to the bodies that support them. This is a renovation of the opinion of Poli and Lamarck, which Cuvier disregarded, because the pedicle appeared to him to be completely closed on the side of the animal. To give to this opinion the positive character which belongs to anatomy, the author ought to have found a passage which would place the interior of the pedicle in communication with the cavity of the mantle where the eggs group themselves, in the form of a rounded plateau. This communication was in fact made known to him by the discovery of a small conduit, which runs from the root of the pedicle along the bottom of the single piece (*pièce impaire*) of the shell, and opens in the interior of the mantle opposite the point where the eggs are assembled. The existence of this oviduct was placed out of doubt in three manners: first, the eggs being of a beautiful azure blue in the living animal, the author found them in the ovarial conduit, passing from the pedicle into the mantle; secondly, on blowing into the pedicle the mantle was raised like a bladder; thirdly, instead of air he injected a coloured size or varnish (*vernis*), and thus made the oviduct stand out, nearly in the same manner as vessels which would, from their minuteness and delicacy, escape the observer without such preparation.' The reporters then enter into a detail of their own experiments, and confirm this opinion of M. Martin-Saint-Ange, as combining in its favour every degree of anatomical certainty. They acknowledge that it may be objected that the ovary, in this case, is isolated from the fecundating apparatus; but observe that in this point the Cirripeds are in the same condition as the *Lophyropoda*, whose eggs are confined in a separate pouch placed at the superior border of the shell. Besides, direct observation proves that the eggs, which are in the state of ovula in the pedicle, present in the mantle the first lineaments of the embryo; a fact which agrees with the modern researches into the ovology of the *vertebrata*. The determination of the ovary and the discovery of the oviduct, then, in the Cirripeds are new facts; which, in extricating these animals from the state of exception in which Cuvier had placed them, subject them to the common law of generation. On the other side they return into a condition of exception by a fact of another description, little resemblance to which is at present known in comparative anatomy; viz., the possession of a second intestine enclosed within the ordinary one.

This second canal, discovered by the author and named by him a cæcum, floats in the alimentary canal and almost equals it in length. It is closed at its lower extremity, while at its upper extremity, which is open and wide, it is dovetailed (enchâssé par des dentelures) into the areolar lacunæ of the anterior of the stomach. In this cæcum the aliments are deposited to undergo the necessary elaboration preparatory to nutrition, so that, according to the opinion of the reporters, this last cannot be performed except by endosmosis, or by a species of rumination which would empty the contents of the second canal into the first. The reporters observe that they know only one animal, the common earth-worm, among the Annelids which has a second intestine enclosed in the alimentary tube; and there is still a difference; for, in that Annelid, the supernumerary intestine is closed at both extremities: it is in fact a double cæcum, which has induced M. Charles Morren (who, after Willis, Home, and Carus, has occupied himself specially with its study) to name it *typhlosole*. The reporters, after some other observations, address themselves to the subject of the approximation which M. Martin-Saint-Ange establishes between the Cirripeds and the Annelids. Agreeing with the majority of zootomists, the author allows that, in the greater part of their characters, the Cirripeds belong to the class *Crustacea*. Discussing then the value of the differential characters, he thinks, with M. Duméril and M. de Blainville, that they ought to serve as a passage from one class to the other. But while M. de Blainville considers the Cirripeds as *Crustaceous mollusks*, the author regards them on the contrary as *Annelidian crustacea*, and founds this decision on the duality of the nervous system, on the rudimentary segmentation of the body, and on the presence of nervous ganglions at the centre of the lineary divisions. The reporters remark that the same dispositions of the nervous system exist partially in *Cymothöe* and in the *wood-louse* (oniscus), and entirely in *Phyllostoma* and *Talitrus*, without a thought on the part of MM. Andouin and Milne Edwards, who made them known, to approximate those Crustacea to the Annelids. The reporters then observe, that although it is very true, as M. Martin-Saint-Ange observes, that in the greatest number of Mollusks the nervous system is united in one or more masses whence the nerves radiate, there are others in which the central nervous system is double, *Hyalœa*, *Aplysia*, *Bulla aperta*, *Tritonia*, *Doris*, *Clio Borealis*, &c., for example, which shows, as remarked by M. Serres, that the nervous system of the *invertebrata* cannot alone furnish a solid basis for the methodical distribution of those animals. Laying aside the nervous system, the secondary characters of the Cirripeds most in accordance with the bases of natural classification are the shell and the mantle: here they would incontestably approach the Mollusks, if these parts were analogous to those which envelop the latter. But according to Professor Burmeister they are entirely different, and bear more resemblance to the external covering of the *Crustacea* than to that of the *Mollusca*. Hence, observe the reporters, it results that the place which the Cirripeds ought to occupy is still undetermined:—they conclude with a eulogy on the multitude of new facts so clearly presented and perfectly illustrated by M. Martin-Saint-Ange in his memoir.

That the paper of Dr. Martin-Saint-Ange is deserving of much praise, and that his illustrations, some of which are here copied, are very good, there is no doubt: but we must be pardoned for saying a word or two as to some of the facts alleged to be new. In the first place we must not forget Professor Burmeister,* whose admirable labours on the subject no one can follow without advantage; and in the next, we do not quite understand the statement in the report that the ganglionary nervous chain pronounced by Cuvier to be single has been found by Dr. Martin-Saint-Ange to be completely double, and we beg to refer to the following passage in Cuvier's 'Mémoire sur les Animaux des Anatifes et des Balanes.' 'The nervous system of the Anatife is entirely similar to that of the articulated animals.' Cuvier then speaks of the brain, composed of four small lobes, placed upon the œsophagus, and giving off four principal nerves which proceed to the muscles and the viscera. 'The *two lateral cords*,' he continues, 'which form, as usual, a collar round the œsophagus, each give off a nerve; they then unite below by means of two ganglions, whence proceed the nerves of the first pair of feet: the *two cords then proceed* in parallel lines (parallélement), the length of the belly, between the bases of the feet, swelling from space to space into double ganglions, as in all the articulated animals, and giving off from each of these ganglions the nerves of the neighbouring parts.' And he gives a figure illustrative of the nervous system, and, among other portions,

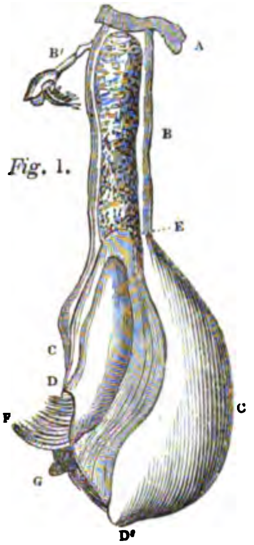
Fig. 1.

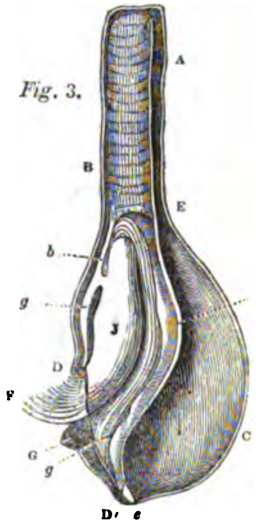
Fig. 3.

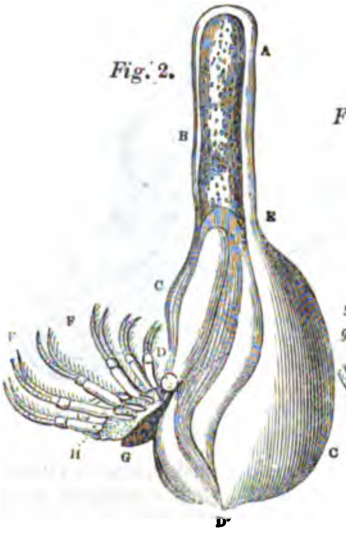
Fig. 2.

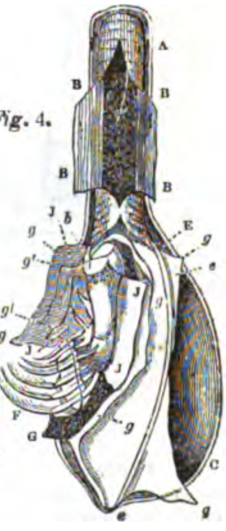
Fig. 4.

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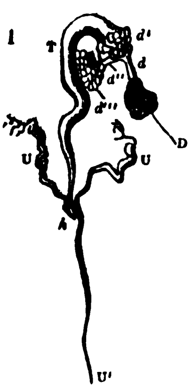
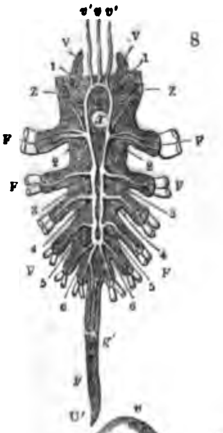
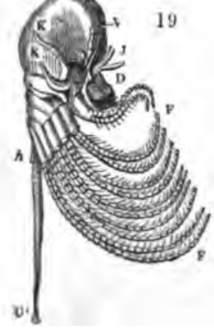
* Beitrage, 'Zur Naturgeschicte der Rankenfüsser,' Berlin, 1834.

of the Réunion des *deux cordons* lateraux, et premier ganglion. With regard to the internal cæcum floating in the alimentary canal, it should be borne in mind that the cuticular lining of the gizzard of the annelids is very easily separated. Among the annulose animals we know that when the common crab moults or changes its skin, it likewise casts the inner coat of the stomach.

1. Anatife jaune sans coquille, (Alepas?) A, a gelatinous production or continuation of the horny envelope which serves to fix the pedicle. B, the first membrane of the pedicle. B, a small anatife of the natural size developed upon the pedicle of the parent. C, the convex and swollen part which contains the body of the animal. D, the fissure of the horny envelope from which issue the feet or cirri, F. The point E indicates the termination of the pedicle and the place where the eggs stop. G, the eggs arrived within the mantle. 2. The same letters refer to the same parts as in figure 1. H, the part of the feet which sustains the cirri F. At the base of the feet (H) are four branchiæ; and between these feet and those placed on the other side is seen the recurved tube which serves to convey the seminal liquor within the mantle. 3. The same anatife, from which the half of the first envelope has been taken so as to expose the interior. The pedicle contains a second cylinder terminated in a cul de sac by its inferior extremity, and covered at the other by a very delicate membrane; the longitudinal and transverse muscular fibres may be observed. *e e* indicate the canal which carries the eggs of the pedicle within the mantle; *b*, that which serves as a nourishing vessel to the pedicle and the eggs; *g, g*, the membrane of the mantle which intercepts all direct communication between the pedicle and the cavity of the mantle. J represents the body of the anatife enclosed in its proper envelope. 4. The same situation as the last, representing all the membranes which envelop the body of the anatife. B B, the muscular cylindrical pipe open, in which the eggs are seen. *e, e*, the course of the oviduct in the thickness of the second envelope. *g, g, g*, the envelope opened and turned back. J, J, J, the proper membrane of the body of the animal; it is with this cavity that the canal *b* communicates, and it is between this proper membrane and that of the second envelope *g, g, g*, that the eggs are found: whence it results that the cavity of the mantle has no communication with the pedicle, except by means of the oviduct *e*.







19. A side view of the common duck barnacle (*Pentalasmis anatifera*) taken out of the shell, enveloped in its proper membrane, under which is found the salivary vesicle. V, the cervical ganglion. *v'*, the nerve which is given off from the brain to go to the muscles of the skin. J, the two levator muscles of the upper lip. K K, branchiæ. *h*, a horny tubercle which is formed on each side of the orifice of the vent. U', the extremity of the tube, bearded with fine hairs. 18. Anterior view of the same, showing the truly articulated disposition of the body, each ring of which corresponds to a pair of feet. S, the adductor muscle of the valves. U', the articulated tube which contains the spermatic canal. 1. The intestinal canal of the same species. (N. B. It is identical with that of the naked species above described.) D, the mouth seen from the side; *d*, the œsophagus; *d'*, the stomach; *d''*, the pedicle which makes this organ communicate with a species of cæcum, *d'''*, of the same structure and form as the stomach. T, the intestinal canal, offering two natural curvatures. *h*, orifice of the rectum. U U, vesiculæ seminales, uniting in a single canal very delicate, and terminated at U' by a small orifice. 8. Disposition of the nervous system. 1. The first, œsophagian ganglion, called the brain: from these united ganglions spring the branches *v*, *v'*, *v''*, destined for all the muscles of the dorsal part, and two extremely delicate threads which go on each side, the first to the salivary vesicle V, the second to a new ganglion Z. 2. The second ganglion, sending two nervous branches to each jaw-foot F, and small branches to the œsophagus. 3, 4, 5, 6 correspond to the other ganglions. 6 furnishes the two last pair of feet. It is from the branches which go to the last feet, and not from the ganglions themselves, that the two threads *y* and *g'*, which go to the extremity, U', of the tube are detached. The point *x* corresponds to the centre of the œsophagus which has been removed.*

For the fruits of Hunter's anatomical investigations in this class, the student is referred to the following numbers in the gallery of the Museum of the Royal College of Surgeons:—63, 64, 65, 582, 1011, 1012, 1013, 1014, 2298, 2299, 2300, 2302, 2303, 2810. Let him consult also Poli, ('Testacea utriusque Siciliæ;') Cuvier, ('Mémoires sur les Mollusques;') Sir E. Home, ('Lectures on Comparative Anatomy;') and Dr Hermann Burmeister's valuable work above quoted.

Geographical Distribution.—The Cirripeds are widely spread, and scarcely any seas are without some of the species. Their habit of fixing themselves so frequently to floating bodies tends to their great diffusion, and, in addition to this propensity, almost every rock and submarine body is studded with some of them.

ARRANGEMENT.

Cirripedia.

Animal marine, more or less conical; sometimes compressed; enveloped in a sacciform mantle, open only on one side, swollen as it were at the anterior part, which, following the natural position of the animal, is the lower portion, terminated above by a certain number of pairs of long, horny, articulated, ciliated cirri, and curved at the summit. No distinct head, no eyes, and no true tentacula; the mouth furnished with lateral, horny, toothed and articulated jaws. Branchiæ situated on each side at the base of the first cirri; orifice of generation at the extremity of a fleshy tube raising itself from the midst of the last cirri; vent at the base of this tube.

Shell variable, but when present always composed of many valves, either soldered or not soldered together; no true shell in one case only, and in that instance a soft envelope in lieu of it; the shell or its representative adhering without intervention, or by the intervention of a fleshy peduncle which issues from the mantle.

Order 1.

Campylosomata.

Anatifa of Bruguières; Cirripèdes pédonculés of Lamarck; Anatifes of Férussac; Gymnodermes and Ostracodermes of Latreille; Lepadiens of De Blainville.

Animal oval, compressed; suspended in its shelly envelope, to which it adheres by a transverse muscle situated near the opening. Mantle open solely on one side, and inferiorly attaching itself to the edge of the shell, and prolonged on the other side into a contractile and fleshy pedicle, adhering by its extremity to submarine bodies; branchiæ pyramidal, adhering on the outside of the base of the cirri.

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* The figures and descriptions are taken from Dr. Martin-Saint-Ange's Memoir.

Shell.—Almost always composed of five principal pieces or valves, rarely without any vestige of these testaceous portions, but in that case replaced by a subcartilaginous and thick envelope; principal valves triangular, delicate, touching or overlapping each other at the edges; sometimes rudimentary, and in that case very much separated. The valves are thus disposed: two large lateral valves receiving the transverse muscle; beyond these two smaller lateral valves, and a mesial valve serving to join all together. There are often a number of accessory pieces fixed at the base.

Habits.—The genera of this order affix themselves by means of their pedicle to submarine bodies, forming numerous groups. They are often found on floating substances far at sea: on ships, on logs of timber, on bottles, on net-corks, on fuci, on floating testaceous mollusks, *Ianthina* for instance, and even on some of the vertebrated animals, on whales, turtles, and even serpents—*Hydrophis*, for example. Other testaceous mollusks might be mentioned, and one species has been found parasitical within the umbrella of a *Medusa*. A large log of timber covered with these animals, twisting and diverging in all directions, and so thick as entirely to hide the surface of the log, is a strange sight. They look like an enormous collection of serpents to the ignorant; and we have heard a living mass of this description casually thrown into shallow water and left by the tide, so termed. Their growth must be extremely rapid. A ship going out with a perfectly clean bottom will often return from a short voyage covered with them below the water line. The Blacks of Goree are said to eat a large species of *Pentalasmis*, which is stated to be delicate.

Genera, Alepas.

Animal oval, compressed, bean-shaped, rounded near the pedicle, which is moderately long. Cirri rather short, and hardly recurved at their summit.

Shell replaced by an entire subgelatinous and somewhat transparent envelope, without any other opening than that which serves for a passage to the cirri, continuing itself with the pedicle, and presenting no trace of testaceous pieces. Such is the description of Mr. Rang, who has given the generic appellation above stated to the *Cineras parasita* of Lesson, and the *Anatifa univalvis* of Quoy and Gaimard. The species on which the genus was founded was detected attached to the umbrella of a *medusa*. Rang considers this to be the *Triton* of Linnæus. Cuvier, in the last edition of the 'Règne Animal,' observes that he has not seen the species, but still adheres to his old opinion; for he says that it ought not, in any case, to be confounded with the *Triton* of Linnæus, which was the animal of an *Anatifa* torn from its mantle and shell. Rang thinks that this and the following genus connect the last family of the *Acephala* with the first of the *Cirripedia*.

[Alepas parasita.]*

Gymnolepas.

Otion and *Cineras*, Leach; *Aurifère*, De Blainville.

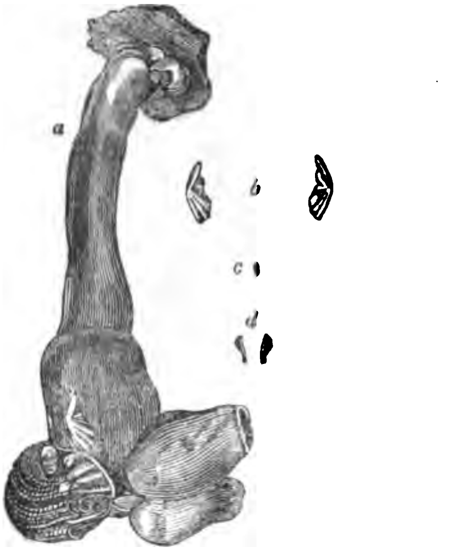
Animal compressed, with the cirri much recurved at their extremity. Mantle nearly entirely naked, thick and subcartilaginous. Pedicle long and thick.

Shell rudimentary, composed of small valves very much separated. Locality, probably warm climates. *Otion Cuvieri* has been received from Senegal; and there is a fine group on *Coronula diadema*, a parasite of the South Sea Whale, in the Museum of the College of Surgeons, Nat. Hist., No. 281.

α.

Two auriform tubes at the summit. (Genus, *Otion*, Leach; *Aurifère*, De Blainville.)

Example. *Gymnolepas Cuvieri*, *Otion Cuvieri*, *Lepas aurita*, Linn.

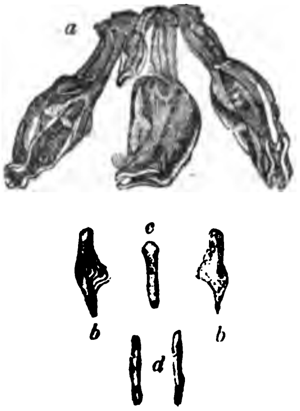


[Gymnolepas Cuvieri.]

a, Gymnolepas Cuvieri; b, the lateral valves; c, the single valve; d, the terminal valves.

β.

No auriform tubes · form more angular. (*Cineras*, Leach.)



[Gymnolepas vittata.]

a, Gymnolepas vittata; b, the lateral valves; c, the single valve; d, the terminal valves.

The small valves in *Otion* were overlooked by Lamarck, but detected by Leach. In the Museum of the Royal College of Surgeons, Nat. Hist., No. 265, there is a species named *Cineras Hunteri*, of which two small groups are attached to the tail of *Hydrophis bicolor*, which is figured in Russell's 'Indian Serpents,' 1, tab. xli., and is called by the natives 'Nalla Wahlagillee Pam.' Russell says, 'This sea-snake, according to the Vizagapatam fishermen, seldom approaches the shore: several of them had never seen one before. They pretended it was of a very dangerous kind, which is contradicted by the want of poisonous organs.' See 'Catalogue of the Museum,' part iv., fasciculus 1; and 'Shaw's Lectures,' which are there quoted also.

Pentalasmis.

Anatifa, Bruguières and Lamarck; *Pentalepas*, De Blainville.

Animal compressed, enveloped in a very delicate mantle. Pedicle often very much elongated. Cirri curled at the summit. Locality, widely spread in most seas. Plentiful on the coast of Africa.

Shell subtriangular, formed of five distinct pieces completely enveloping the animal.

Example. *Pentalasmis anatifera*, *Anatifa lævis*, Lam.; *Lepas anatifera*, Linn. Duck-barnacle.

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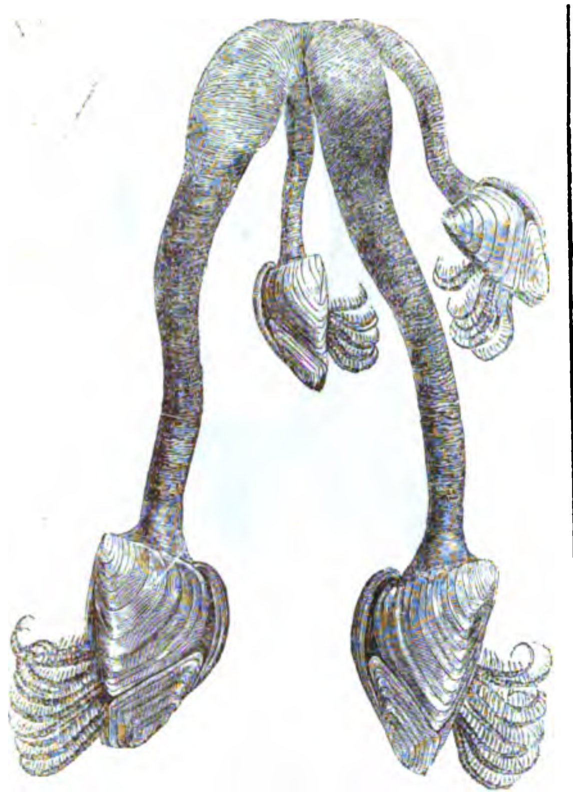
* From M. Rang's figure



[Pentalasmis anatifera.]

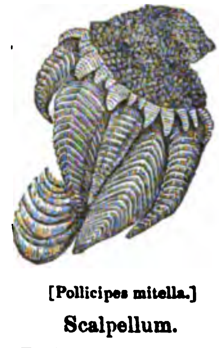
Pollicipes.

Pentalepas of De Blainville.

Animal like that of *Pentalasmis*, but with a shorter pedicle, which is rough, somewhat like shagreen.

Shell triangular, composed, besides the principal side valves, of a number of accessory pieces fixed at their base. Locality. temperate and warm seas.

Example. *Pollicipes mitella*, Lamarck; *Anatifa mitella*, Bruguières; *Lepas mitella*, Linnæus.

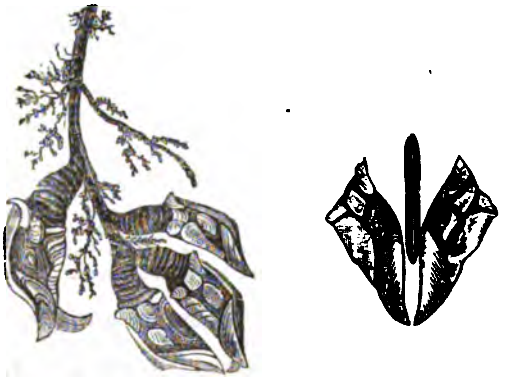


[Pollicipes mitella.]

Scalpellum.

Polylepas of De Blainville.

Animal resembling that of *Pentalasmis*. **Pedicle shorter and scaly.**



[Scalpellum vulgare.]

Shell formed of thirteen pieces, completely covering the animal. Locality. Of the two species known, one is common in the European seas, and the other was found in the Straits of Magalhaens.

Example. *Sculpellum vulgare*, Leach; *Pollicipes scalpellum*, Lamarck; *Anatifa scalpellum*, Bruguières; and *Lepas sculpellum*, Linnæus.

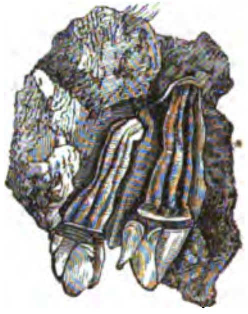
Lithotrya.

Litholepas, De Blainville.

Animal compressed.

Shell irregularly subpyramidal, compressed, supported on a tubular, tendinous pedicle. Valves eight. At the base of the pedicle a shelly appendage, analogous to the testaceous base of *Acasta* and *Balanus*. Mr. G. B. Sowerby, who instituted the genus, considers it as intermediate between the sessile and pedunculated cirripeds; and states that it possesses a peculiarity not to be found in any hitherto described genus of this class, viz., that of penetrating stones for its habitation. Rang says, that De Blainville is of opinion that the genus is only a true *Anatifa* which had affixed itself upon the valve of a *Venerupis* at the bottom of one of the cavities which that bivalve hollows out for itself. De Blainville, in his 'Malacologie,' describes it under the name of Litholepas, sinking Sowerby's name altogether, though he says the genus was newly established by him, quotes his description, and merely states that he has never seen the cirriped. Whether it bores holes for itself or occupies those already hollowed out is doubtful.

Example. *Lithotrya dorsalis*, Sowerby. Locality, Montserrat, one of the Antilles.



[Lithotrya dorsalis.]

N.B. Cuvier gives a genus, *Tetralasmis*, which he describes as having but four valves surrounding the opening, two of which are longest. He says that the animal is in part contained in the pedicle, which is large and covered with hair. He considers these as a sort of Balani without a tube, and gives as an example *Tetralasmis hirsutus*. Cuv. 'Moll. Anatif.,' f. 14.

Order 2.

Acamptosomata.

Les Balanides of De Blainville; Cirripèdes sessiles of Lamarck; Balanes of Férussac; Quadrifères and Biferes of Latreille.

Animal conical, sometimes very much depressed, and sometimes nearly cylindrical; for the rest, similar to that of the preceding family, but without a pedicle, and having the branchiæ in form of two fringed wings attached to the internal surface of the mantle.

Shell thick, solid, variable in form, but nevertheless always conical or sub-cylindrical, adhering by its base to the surface of foreign bodies or penetrating within them, composed of a cone formed of one or more pieces united laterally, open at its base, or closed by a membranous or calcareous piece, serving for adhesion; always open at the summit, but furnished at this part with a pyramidal operculum, consisting of two or four valves.

This order was well known to the antients. The genera seem to have been all confounded under the name of Βάλανος (Balanus) by the Greeks. (Aristotle, 'Hist. Anim.,' book iv., ch. 8, and book v., ch. 15.) Athenæus mentions them more than once; and (Deipnos, book iii., ch. 11, p. 88) speaks of the large ones with approbation as an article of food. They are the *Balani* of the Latins; nor did Lucullus disdain them. The Chinese eat the soft parts of one of the species (*Balanus tintinnabulum*), which has the reputation of being like the flesh of the lobster when cooked; and the delicious qualities of another species, and its high estimation for the table, will be found under the article BALANUS.

M. Rang, whose arrangement we for the most part adopt, observes that many genera have been formed, some of which it may be necessary to disallow. The longitudinal tubular cavities with which the cone is pierced, and which open at the base, where they are said to be very sensible, are a distinguishing character of the order.

a. Cone univalve.

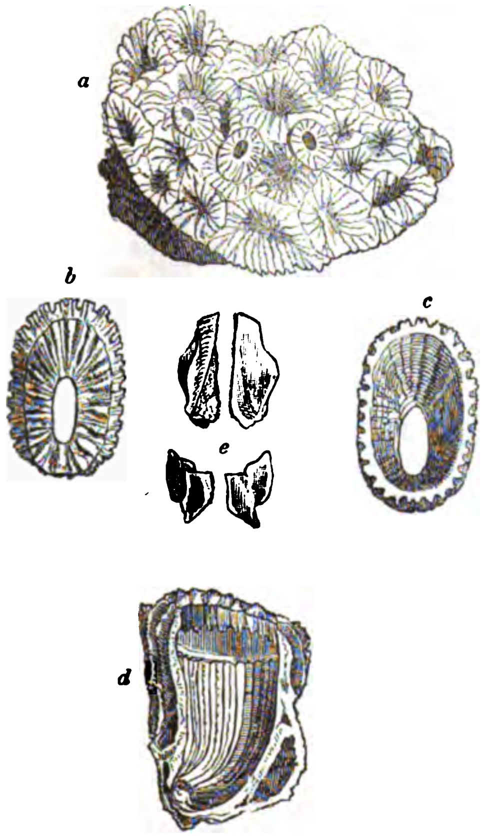
Genera, Pyrgoma. (Boscia of Férussac.)

Shell thick, generally compressed and somewhat conical, but sometimes regularly conical, open at the apex, and closed at the base by a deeply cup-shaped testaceous valve, striated or grooved perpendicularly in the inside; the operculum bipartite, each part composed of two valves, which are variable in form, the posterior one being in some species very much elongated (Sowerby).

Savigny appears to have instituted the genus, and Leach and Lamarck have adopted it: the former subsequently subdivided it into *Pyrgoma*, *Megatrema*, *Savignium* and *Adna*.

Habits. Either adherent on or penetrating into corals: in some cases entirely overgrown by them.

Example. *Pyrgoma crenatum.*



a, specimens of the natural size in Astræa favosa; *b*, *c*, *d*, different views and section of the cone; *e*, the opercular valves*; *b*, *c*, *d* and *e*, are magnified.

β. Cone quadrivalve.

* Operculum bivalve.

Clitia, Leach. (Verruca, Schum.? Ochthosia, Ranzani?)

Shell consisting of four irregular pieces, two larger and two smaller, dovetailed together by their dentated edges. Operculum bivalve, one piece irregularly quadrate, the other nearly triangular.

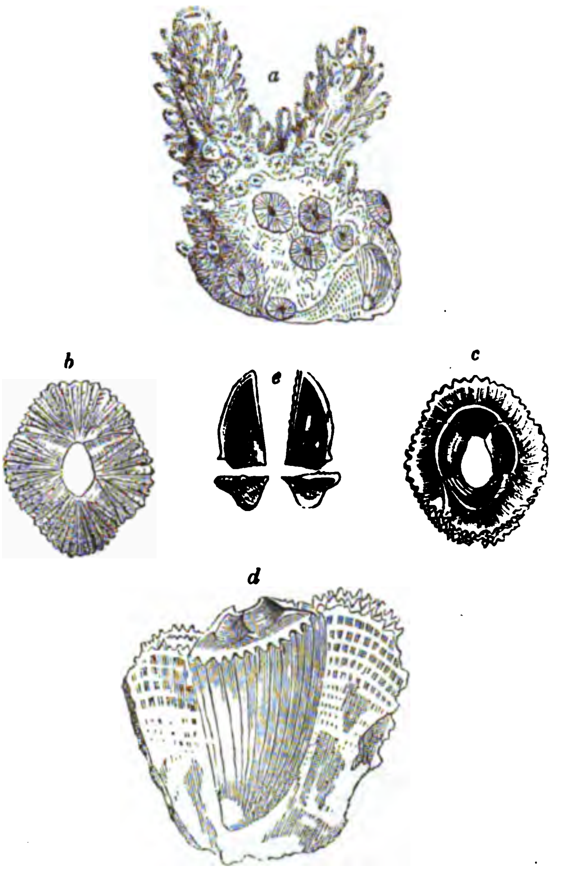
Example. *Clitia verruca*, *Lepas striata* of Pennant; *Lepas verruca* of Gmelin. Locality, British coasts

[Clitia verruca, enlarged.]

Creusia, Leach.

Shell somewhat flat, slightly conical, composed of four unequal valves; base deeply cup-shaped. Example, *Creusia gregarea*, Sowerby.

Habits. Like *Pyrgoma*, affixed to, or buried in, madrepores and other corals.



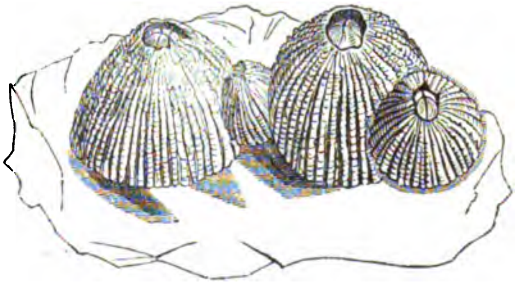
[Creusia gregarea.]

a, natural size in a madrepore; *b*, *c*, *d*, cone and section magnified; *e*, opercular valves magnified.

Conia, Leach.

(Azemus, or Asemus, Ranzani; Polytrema, Férussac.)

Shell subconical, composed of four subtriangular sub equal valves; longitudinal tubes highly developed. Example, *Conia porosa*. Locality, Mediterranean, West Indian, and other seas.



[Conia porosa.]

γ. Cone with six valves.

* Operculum composed of separate pieces, not articulated

Tubicinella.

Shell subcylindrical; the cylinder, which is truncated at both ends, formed of six ligulate pieces, smooth within, but longitudinally striated and transversely ringed without, affording no bad representation of a portion of the windpipe in the vertebrata, closed beneath by a membrane.

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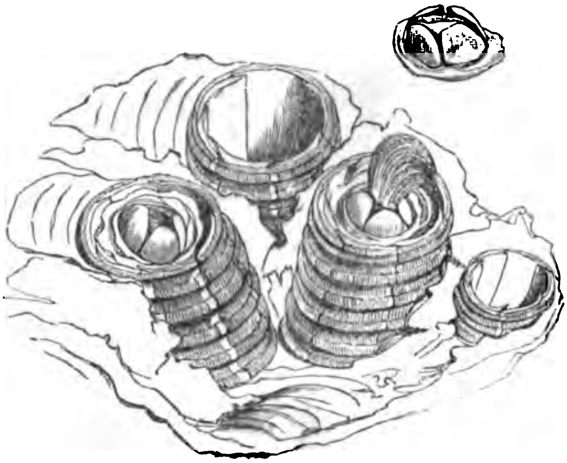
* The cuts of Pyrgoma, Clitia, Creusia, Catophragmus, and Octomeria, together with those of some of the detached valves of the Campylosomata, are taken from Mr. G. B. Sowerby's 'Genera of Recent and Fossil Shells, where the reader will find much valuable information illustrated by engravings of great accuracy.

Example, *Tubicinella balænarum*, Lamarck. The only species known.

Habits. **Buried nearly up to the summit of the aperture in the skin and fat of whales, which are sometimes infested with it to an enormous extent.**

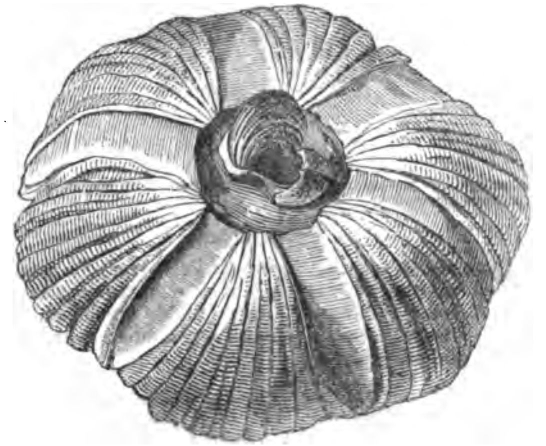


[Tubicinella balænarum.]

Coronula.

(Chelonobia, Leach; Cetopirus, Ranzani; Diadema, Schumacher.)

Shell suborbicular, subcylindrical, but generally obtusely, not to say flatly conical, constituted of six unequal ribbed pieces, so completely soldered as to bear the appearance of one; the lower side instead of longitudinal tubes presenting radiated cells in those species which infest the *Cetacea*. Example, *Coronula balænaris*. Locality, South Seas, imbedded in the skin and fat of whales. *Coronula testudinaria* (*Chelonobia* of Leach, &c.) adheres to the backs of turtles (*Cheloniæ*).



[Coronula balænaris.]*

* * Operculum quadrivalve, articulated.

Chthamalus.

A genus instituted by Ranzani; described as having a very depressed shell, with six pieces or valves, very thick at their base, and forming very regular rays; support membranous; aperture tetragonal, with almost equal sides; operculum subpyramidal. Locality, Mediterranean: most probably a part of Leach's Coniæ.

[Chthamalus stellatus.]

Balanus.

(See the article, vol. iii., p. 310.)

Acasta.

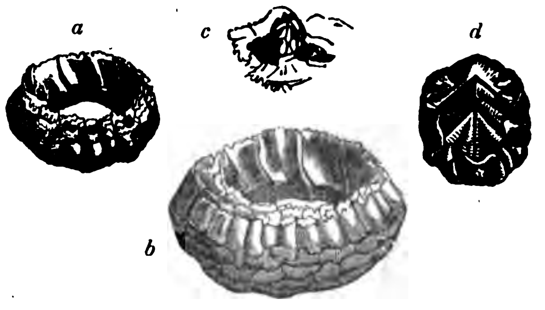
(See Balanus.)

δ Cone with eight valve

* Operculum bivalve.

Catophragmus, Sowerby

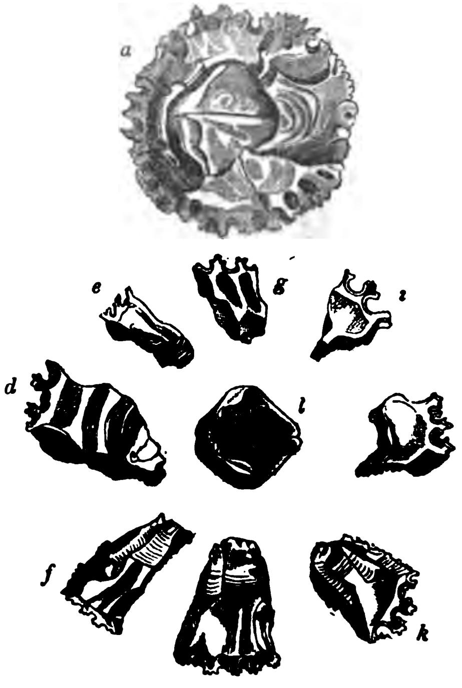
Shell subconical, composed of eight unequal valves. There is a curious peculiarity about the genus. 'This,' says Mr. G. B. Sowerby, 'consists in a number of narrow perpendicular valves arranged around the shelly cone, and in rows, like pales, the first row of which consists of eight pieces, placed so as exactly to cover the sutures of the shelly cone immediately surrounding the animal; around this are then placed several sets of more and more numerous pieces gradually decreasing in size, so that the outer row, which is the most numerous, consists also of the smallest pieces. Additional rows seem to be produced as the animal increases in age; for a young specimen in our possession has only one row of eight pieces covering the sutures of the first cone, while a much larger and older specimen still retains part of three rows, and has evidently lost some of the external rows. The young individual also shows that the whole of the pieces are pointed at their superior extremities, whereas in the old shell these extremities are so worn or eroded as to become very irregular and obtuse.' Example, *Catophragmus imbricatus*, Sowerby. Locality, West Indies.



[Catophragmus imbricatus.]

a, the old shell, natural size; *b*, the same magnified; *c*, the young shell natural size; *d*, the same magnified.

Octomeris, Sowerby



[Octomeris angulosa.]

a, the outside; below, an internal view of the eight divisions; *c*, the anterior piece; *d*, the posterior piece; *e* to *h*, the lateral pieces; *l*, the operculum, consisting of four pieces, of which the two anterior are the larger.

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* The cirri are here represented as exserted; but they are capable of being withdrawn into the hood or collar formed by the opercular valves and intervening membrane for their protection. A most elaborate and beautiful illustration of the anatomy of the animal (Coronula Diadema) is given by Dr. Burmeister in the work above quoted, p. 34, pl. 2. There is a noble specimen (Coronula diadema), with a group of Gymnolepas Cuvieri attached to it, in the Museum of the College of Surgeons (Nat. Hist., in spirit, No. 281), and alluded to under 'Gymnolepas.'

The genus rests on the following characters. Cone of eight pieces; internal sutures of the pieces or valves angular; shelly parts foliaceous; no internal plate; a thin epidermis. Example, *Octomeris angulosa*, Sowerby.

The student should examine the fine collection of Cirripeds in the British Museum, and he will find some good examples of the soft parts both of the Campylosomata and Acamptosomata in the Museum of the College of Surgeons, in the Natural History department (subjects preserved in spirit), numbers 258 to 282, both inclusive.

FOSSIL CIRRIPEDIA.

Pentalasmis. Mr. G. B. Sowerby says that fossil specimens of this genus are exceedingly uncommon; and adds, that he has never seen anything but fragments from two beds; viz., the Calcaire grossier of Grignon, and the Suffolk crag. [BALANUS.]

CIS, a genus of Coleopterous insects of the family Ptinidæ (Leach). They are minute beetles which infest the various species of Boleti. They are of an oblong, nearly cylindrical form, and generally of a brown colour: their tarsi are four-jointed, and the antennæ have the basal joint large, and the three apical joints forming a club. Fourteen species have been discovered in this country, the largest of which is scarcely one-eighth of an inch in length.

CISALPINE REPUBLIC. [BONAPARTE, p. 122.]

CISNEROS[*], **FRANCIS XIMENEZ DE**, a celebrated statesman and patron of literature, a cardinal and primate of Spain, was born in 1437 at Torrelaguna in New Castile. He studied at a school at Alcala de Henares and at the university of Salamanca, and afterwards went to Rome, where he acquired such reputation, that Sixtus IV. promised him the first vacant prebend in the cathedral of Toledo; but the Archbishop of Toledo, vexed at this inroad on his patronage, and at the firmness with which Cisneros demanded it as his right, threw him into a dungeon. Being released at the end of six years, Cisneros went to Siguenza, where Cardinal Mendoza appointed him his grand vicar. In 1482, abandoning his brilliant prospects, he embraced the Franciscan rule. In 1492 Queen Isabella took him for her confessor, and in 1495 nominated him Archbishop of Toledo. This honour he declined with a firmness which nothing but the commands of the pope could overcome. In this exalted station he retained all his monastic severity. He constantly wore under the pontifical robes the coarse frock of St. Francis. In his travels he always endeavoured to lodge at some convent of his order, and he conformed to all the rules like an ordinary member. He set apart half of his enormous revenue (at that time amounting to 200,000 ducats) for the relief of the necessitous; and he made a daily distribution of provisions to thirty poor. He also expended considerable sums in the ransom of captives.

In 1498 Cisneros founded the University of Alcala de Henares, in which he provided for poor students, appointed a fund for prizes, and invited distinguished men from Paris, Bologna, Salamanca, and Valladolid. He instituted also a seminary for young ladies of respectable families who were destitute of fortune. Adjoining it he established a nunnery for those among them who chose to retire from the world: to the rest he allotted portions, and disposed of them in marriage suitably to their condition.

In 1502 he undertook, assisted by eminent scholars, his Complutensian Polyglot, the type and the model of all subsequent ones. He sent to every quarter for MSS., and Leo X. obliged him with a communication of what he possessed. He collected seven copies in Hebrew at the expense of 4000 ducats, besides procuring from Rome a Greek MS., and from other quarters many Latin MSS.: not a single manuscript of this collection was of less antiquity than 800 years. The whole charge of the undertaking, which was completed in fifteen years, amounted to the immense sum of 50,000 ducats.

On the death of Queen Isabella in 1504, as all parties strove to attach Cisneros to their interest, he became the arbitrator between King Ferdinand and the Archduke Philip, the husband of Joanna, heiress of the crown. On the death of Philip, two years after, Cisneros was appointed regent on account of the incapacity of Joanna and the absence of Ferdinand. This was a critical moment for him, but his prudence overcame all difficulties, and kept all parties in check. He levied troops at the public expense, totally independent of the grandees, from whose hands he succeeded at last in rescuing the crown. He thus began, perhaps unconsciously, to vindicate the rights of the people against the nobility in Europe. By the feudal system, the military power was lodged in the hands of the nobles, and men of inferior condition were called into the field as their vassals. A king with scanty revenues therefore depended on them in all his operations. In 1507 Julius II. gave him the cardinal's hat. In 1508 the septuagenarian cardinal set off from Malaga at the head of 10,000 foot and 4000 horse for the conquest of Oran, a splendid city on the coast of Africa, which he added to the Spanish dominions at his own expense.

When Leo X., in order to raise money to complete the church of St. Peter, proposed to sell dispensations, Cisneros opposed the introduction of the pope's bulls into his diocese. On another occasion, as a primate of Spain, he prevailed on the king to exclude all bulls but what had received the sanction of the royal council; and ever since that time this salutary advice has been acted upon in Spain. At another time he opposed a claim of the same pope to the tenth of ecclesiastical benefices, and obliged him to be content with a tax of a tenth upon the clergy of the States of the Church.

Ferdinand at his death, 23rd January, 1516, left Cardinal Cisneros regent till the arrival of his grandson, Charles I. of Spain, afterwards Charles V. of Germany. The Dean of Louvain (afterwards Pope Adrian VI.) opposed this nomination. Cisneros however consented to admit him into the administration, and chose Madrid for his residence, that he might be more independent of the nobility, and better able to control their factions. He viewed with contempt the libels which were published against him, and always refused to inquire after the authors. The grandees objected to the power of Ferdinand to confer the regency, himself being only a regent, as the widower of Isabella; and the letter of Charles, which Cisneros showed them in ratification of Ferdinand's will, they treated as a mere matter of form. To satisfy their objections at once, the cardinal coolly requested them to wait upon him. From a balcony he showed them 2000 men in array, with a formidable train of artillery, which he ordered to be discharged. 'There,' said he, raising his voice, 'are the powers which I have received from his Majesty, and in a word *hæc est ultima ratio regum*.'

John Albret, the dispossessed king of Navarre, supported by some of the grandees, was forming a scheme to recover his kingdom. Cisneros, who had foreseen the danger long before, ordered a powerful body of troops to enter Navarre, and completely frustrated the attempt. To secure Navarre, he caused its numerous and expensive fortresses to be demolished, except Pampeluna, which he strengthened. To this precaution Spain is indebted for the preservation of Navarre. The French since that time have often overrun the open country, but not finding the former places of retreat and defence, they have been obliged to abandon it. In order to pay the debts of Ferdinand and the officers of his new militia, and to establish numerous and well-furnished magazines, Cisneros boldly undertook the abolition of unnecessary pensions, and enforced the restitution of many extensive crown demesnes, which had been alienated chiefly to the nobility in the late reign. He did not spare his dearest friends, nor even men of learning. The historian Peter Martyr of Anghierra and Gonsales Oviedo suffered with the rest, and in revenge have defamed the cardinal's character.

While Charles remained in Flanders, every pretender to favour resorted thither, but nothing could be obtained without pecuniary application to his favourite Chièvres Great sums were drawn out of Spain, and everything was disposed of to the highest bidder. The inferior officers followed the example of their head, and this infamous traffic became general. On the other hand, seeing Flanders on the eve of becoming a distant province of a vast monarchy, the Flemish ministers detained the king as long as they could, spreading all the time delusive reports of his instant departure, and cheating the cardinal under the pretext of defraying the expense of the king's voyage. When after twenty months of entreaties Cisneros prevailed on Charles to embark for Spain, and was himself proceeding towards the coast to meet him, he was seized with a violent disorder, at the convent of Bozeguillas, near Aranda de Duero, which was attributed to poison. The Spanish grandees and Flemish courtiers now regulated the advance of the court by the probable extent of the cardinal's life. Weakened by disease, fatigue, and austerities, he still directed, to the great vexation of the courtiers, the helm of state, and seemed to survive only to evince his greatness of soul unimpaired by bodily suffering. Under pretext of giving time to the towns for preparing the honours due to the king, they succeeded in deferring his entry into Castile till the cardinal's death, which happened on the 8th of November, 1517, but not before Charles, whose pride was worked upon by his flatterers, had written, to his eternal shame, a letter to the great Cisneros signifying to him his dismissal. Thus was a virtuous man, upon the verge of finishing his mortal career, after having governed Spain for twenty years, and accomplished all that could be done for her greatness and tranquillity, and for the increase too of the royal prerogative—thus was an illustrious statesman rewarded by a prince who was indebted to him for the very foundation of his future power. Among the great men who have admired Cisneros, the name of Leibnitz should be mentioned. The rare union of calmness, firmness and decision in Cisneros, is well shown in Gometius (Gomez de Castro), 'De Rebus gestis à Francisco Ximenio;' in Marsollier, Flechier, Moreri, and Robertson.

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[*] He derived this surname from his family having been long established at Cisneros, in the province of Leon. The Spaniards generally call him Cardinal Cisneros; but in biographical and other works he goes under the name of Ximenes. He must not be confounded with Roderic Ximenez, a previous archbishop of Toledo, who is the author of 'Rerum in Hispania gestarum Chronicon;' and of 'Hispania Arabum.'

CISS'AMPELOS PAREIRA, the Pareira-brava, a native of several of the West Indian Islands, of New Spain, and of Brazil. The root of this plant arrives in Europe in pieces from two to three feet long, varying in thickness from that of a finger to an arm, curved, furrowed, and warty, with a thin closely-adhering bark of a greyish-brown colour. The woody part is tough, but so porous that air can be blown from one end to the other of a long piece; the concentric circles are very conspicuous; the axis is not in the centre. The odour is very faint, but the taste is at first sweetish or liquorice-like, afterwards nauseous and bitter. Analysed by Feneuille it was found to consist of—

Soft resin; a yellow bitter principle (tonic); a brown principle; animalized matter, starch, malate of lime, nitrate of potash, and other salts.

The juice of the fresh plant in its native country is said to be a very efficacious application to the bites of serpents; but in Europe the root is employed only as a tonic diuretic. It is particularly valuable in cases where there is a copious discharge of urine with a ropy alkaline mucus. (Brodie's *Lectures on Diseases of the Urinary Organs.*) It is also serviceable in catarrhus vesicæ, and other affections of the urino-genital organs.

There is great reason to believe that the roots of several different species of this or closely-allied genera are confounded under the name of Pareira-brava, especially the root of Cissampelos Caapeba, also of C. Mauritanica (Aubl.), C. parroides (Decand.), which is much esteemed in the East Indies given along with aromatics in diseases of the intestines. Two species of Aleuta, A. rufescens (Aub.) and A. candicans (Decand.), are used in Guyana.

The Pareira-brava contains so much mucilage that it coagulates water in which it is put to infuse. A syrup of this plant is a valuable demulcent in phthisis pulmonalis, or consumption.

CISSOID (κισσο-ειδης, resembling ivy), a name given to a curve first considered by Diocles (an Alexandrian, and posterior to Pappus, as is supposed from the latter not mentioning the name of Diocles among those who invented methods for inserting two mean proportionals (*Math. Coll.*, book iii. prop. 5), which rises towards an asymptote, and then obtained its fanciful name. It was one of the curves employed by the Greeks in the celebrated problem of finding two mean proportionals, and is described as follows:—Let two points (A) and (B) move with equal velocities round a circle, setting out from the ends of a diameter in opposite directions of rotation. Let a straight line (P) always pass through the starting point of (A), and through (B) as it moves; and let an ordinate (Q) perpendicular to the line joining the two starting points always pass through (A) as it moves. Then the intersection of (P) and (Q) traces out the cissoid, which has the line joining the starting points for its tangent at the commencement, and the tangent to the circle passing through the starting point of (B) for its asymptote.

But the term cissoid has been applied in later times to all curves described in a similar manner, and where the generating curve is not a circle. The cissoid of the Greeks should then be called either the cissoid of Diocles or the circular cissoid. The starting point of (A) being the origin, the line joining the starting points the axis of x, and a the radius of the circle, the equation of the cissoid of Diocles is—

$$y^2 = x^3 \div (2a - x)$$

CISSOPIS. [BETHYLUS.]

CISTA'CEÆ, a natural order of Polypetalous exogens, belonging to the Calycose group; among which they are known by their opposite or alternate undivided leaves, generally strongly impregnated with a fragrant resinous secretion, regular flowers having crumpled petals and indefinite stamens, and fruit with parietal placentæ; a simple style, and a large number of seeds containing in the midst of albumen an embryo with the radicle remote from the hilum. They are remarkable for the beauty of their fugitive flowers in the genera Cistus and Helianthemum. The species of the genus Cistus are all natives of the southern countries of Europe, where the summers are hot and dry, however severe the winters may be. They flourish upon rocky places, which they perfume with their fragrant leaves. Cistus creticus and some other purple-flowered species produce the substance called Gum Labdanum.

[Cistus creticus.]

CISTE'LIDES, a family of Coleopterous insects of the section Heteromera and subsection Stenelytra. Technical characters:—Claws of the tarsi pectinated beneath; antennæ with the basal joint free, *i. e.*, not covered by a projecting portion of the head; mandibles with the apex entire.

This family includes the genera *Lystronichus*, *Cistela*, *Mycetocharus*, *Allecula*, and some others.

Lystronichus.—Of this genus there are upwards of thirty species known; their colouring is for the most part brilliant and metallic; by far the greater portion of them are found in South America. They have the thorax depressed, and with the posterior part as wide as the elytra, or nearly so; the antennæ are filiform, sometimes growing slightly thicker towards the apex.

Cistela.—The characters of this genus are:—Head long and somewhat pointed in front; labrum in width and length nearly equal; antennæ rather long, sometimes serrated, or with most of the joints triangular; body elongate-ovate; thorax broader behind than before.

Nearly forty species of this genus are known, most of which inhabit Europe, and four or five are found in this country.

Cistela Ceramboides is nearly half an inch in length; black with ochre-coloured elytra, and, like most of the insects of this section, is found in flowers.

Cistela sulphurea (Allecula sulphurea of some authors) is about one-third of an inch in length, and its colour is pale-yellow throughout. This species is more common in this country than the last, and appears to be confined chiefly to the sea coast, where, like the one above mentioned, it is found in flowers.

Mycetocharus.—In this genus the head is short and rounded, and the labrum is transverse; the antennæ are shorter, and the body is more elongate than in Cistela. About ten species are known, most of which inhabit Europe and North America; but one is found in England (Mycetocharus scapularis); this is about three-sixteenths of an inch in length; black; the elytra with two orange-coloured spots at the base; the base of the antennæ and the tibiæ and tarsi are yellow.

The larva of this insect, together with those of one or two other species of the Cistelides, are figured in the first volume of the Entomological Society's Transactions, where an account of their habits will also be found.

The genus *Allecula* (Latreille) may be distinguished from either of the foregoing genera by the species having the penultimate joint of the tarsi bilobed, and the terminal joint of the palpi securiform.

Upwards of thirty species of Allecula have been discovered, most of which inhabit South America.

CISTERCIANS. [BERNARDINES.]

CITADEL (remotely from the Latin *civitas*, and immediately from the Italian *cittadillo*), a fortified post within or adjoining a town. It serves either to keep the inhabitants in subjection, or as a place of retreat for the garrison when compelled to abandon the town to an enemy. A citadel should be constructed in a situation where it may be easily succoured; its fortifications should be stronger than those of the town, in order that the enemy may be induced to attack the latter first; and it should be separated from the buildings of the town by an esplanade.

CITEAUX, or, as it was formerly written, CISTEAUX (in Latin, CISTERCIUM), the site of a celebrated abbey in the department of Côte d'Or, in France: it is about four miles E. from the town of Nuys, which lies on the road from Dijon to Châlons sur Saône. This abbey owed its origin to Robert, Abbot of Molême, of the order of St. Benedict, who, wishing to lead a stricter life, obtained permission of the pope to break the vows which he had made as a Benedictine, and to take upon himself others of a severer character. Accompanied by twenty-one monks, he retired to the forest of Citeaux, in the diocese of Châlons, and having obtained a grant of land of Reynard, viscount of Beaune (or, according to some, of the bishop of Châlons), and cleared the ground, he laid the foundations of the abbey and church. The abbey is said to have been of wood. Robert was elected abbot of the new community, which had not at first any new rule, but strictly observed that of the Benedictines. After a time, Robert was directed by the pope to return to his charge at Molême, where the disorders which had probably caused his retirement had proceeded to a great length. The third abbot of Cîteaux was Etienne or Stephen Harding, an Englishman (canonized as St. Etienne), who may be regarded as the real founder of the Cistercian order (les Cîteaux), as until his time no establishment had sprung from this monastery: in 1113-1115 were founded the first four establishments of which this can be regarded as the parent.

The monks of this order have been sometimes called Bernardines, from St. Bernard, one of the promoters of the order, and sometimes White Monks, from their habit, a white cassock with a white gown for attending the church, but a black one when they went abroad. The abbey of Cîteaux was a very rich establishment previous to the Revolution; their revenue, according to Expilly, was about 110,000 livres or francs (above 4000*l.*), and the extent and imposing appearance of the buildings were indicative of its rank as the chief house of a monastic order. The community consisted usually of about 80 monks, beside 40 domestics. The church and a chapel under the portico contained the tombs of about 60 princes of the ducal house of Bourgogne, who made this their chief burial-place. Among those who have been inmates of this house, are St. Bernard and the four popes, Eugenius III., Gregory VIII., Celestine IV., and Benedict XII. The church and monastery have been destroyed, and there are now but few remains.

CI'THARA, an antient stringed instrument of the lyre kind. That the names of the comparatively modern instruments, the gittern, or cittern, and guitar, are derived from the name of the Greek instrument (κιθάρα), we can have no doubt; and it is reasonable to infer, not only from similarity of appellation, but from the remains of antique art, that the modern instruments in many respects resemble that of the antients.

CITHARI'NUS, a genus of fishes of the salmon tribe (*Salmonidæ*), which inhabit the Nile. These fishes are chiefly distinguished from their allies by the depressed muzzle, the upper margin of the mouth being formed of the intermaxillary bones, the maxillaries being very small. The tongue and palate are smooth; the adipose fin is covered with small scales as well as the greater portion of the caudal fin.

CITOLE, a musical instrument mentioned in the *Confessio Amantis* of Gower, which was, Sir John Hawkins conjectures, a dulcimer.

CITRENE. The volatile oil of lemons consists almost entirely of a peculiar carburetted hydrogen, to which the name of citrené has been given.

CITRIC ACID. This acid is contained in several fruits, but in the largest quantity in limes and lemons. It was first procured in the state of crystals by Scheele. It may be obtained by the following process: to a gallon of lemon-juice made hot, add gradually 10oz. of chalk reduced to fine powder; set the mixture aside, that the precipitate, which consists of citric acid and lime, or citrate of lime, may subside. Wash this frequently with warm water, and then mix with it 10 ounces by weight of sulphuric acid previously diluted with 7 pints of water; boil the mixture for a quarter of an hour; press the residue strongly in a cloth, and evaporate the strained liquor with a gentle heat so that crystals may be formed. These crystals are to be rendered pure by repeated solution in water and recrystallization.

In this process the malic acid, gum, and extractive matter of the lemon juice, which prevent the acid from being obtained pure by mere evaporation, remain in solution, while the citrate of lime is precipitated, which being decomposed by the sulphuric acid, sulphate of lime is formed, and remains insoluble, while the citric acid, nearly pure, remains in solution and crystallizes by evaporation.

The properties of citric acid are, that it is colourless, inodorous, extremely sour; the primary form of the crystal is a right rhombic prism, subject to numerous variations. These crystals suffer no change by exposure to air under common circumstances; when heated to little below 212° they melt in their water of crystallization, and without losing any weight they concrete on cooling into a hard transparent mass. At a little greater heat they decompose. One hundred parts of the crystals are dissolved by 75 of cold and 50 of hot water: the solution reddens litmus strongly; decomposes by keeping; they are slightly soluble in alcohol.

Citric acid consists of

4 equivalents of	oxygen	32	or	55·18
2 „	hydrogen	2		3·44
4 „	carbon	24		41·38
	Equivalent	58		100

The crystals, obtained as above mentioned by the cooling of a saturated solution, consist of

1 equivalent of	dry acid	58
2 „	water	9
		67

When the solution from which the above-described crystals have been obtained by cooling is subjected to spontaneous evaporation, the acid is procured in a different crystalline form, the crystals consisting of 3 equivalents of dry acid and 4 of water, half of which is expelled at a temperature of about 80° Fahrenheit.

When citric acid is decomposed by heat it yields a peculiar acid, called pyrocitric acid, a spirituous liquor analogous to pyroxylic spirit, and an oily matter, which by the long contact of water is converted into the two preceding substances, acetic acid, water, carbonic acid, carburetted hydrogen, and a coaly residue.

Citric acid is used as a discharge in calico printing, and as a substitute for lemon juice in making saline draughts, and in making effervescing lemonade with the sesquicarbonate of soda: tartaric acid, sometimes substituted for it on account of its cheapness, is less agreeable, and has the inconvenience of forming a purgative salt with the soda.

Citric acid combines with different bases to form citrates, but during its combination with them it is very apt to undergo change of composition.

Citrate of Ammonia is a very soluble salt, and does not crystallize till the solution is evaporated almost to the consistence of honey.

Citrate of Potash is a deliquescent salt.

Citrate of Soda crystallizes in prisms; it is slightly efflorescent, and soluble in three-fourths its weight of water: it fuses before decomposition.

Citrate of Lime, as already mentioned, is very slightly soluble in water, requiring about 500 times its weight; it is rendered more soluble by excess of acid. Citrate of magnesia is soluble, but the citrates of barytes and strontia are insoluble.

Of the metallic citrates, those of iron are soluble, that of zinc slightly so; those of copper, silver, and lead, are insoluble: no citrate whatever is applied to any use, except the solution of citrate of potash, extemporaneously prepared as antifebrile medicine.

CITRON. [CITRUS.]

CITRUS, a genus of Aurantiaceous plants, one of whose species yields the orange, another the lemon, and others the citron, shaddock, lime, and similar fruits. Among the other genera of the natural order to which it belongs, it is known by its stamens being numerous and irregularly combined into several parcels, and by its fruit having a leathery rind which can be easily separated from the pulpy part that lies beneath.

It is a common opinion that the golden apples of the Hesperides were the fruit of some species of this genus, but as the gardens of these fabulous personages were stationed, according to the most approved opinions, either among the mountains of Atlas or to the west of them, there is no probability that the opinion alluded to is correct; for independently of the historical facts that citrons and lemons at least were obtained from the Persians, it is certain from the researches of Wallich and other Indian botanists that it is among the lower ranges of hills in Nepal, and most probably in China also, that the wild states of the Citrus genus find a home. It is added that the sweet orange itself comes from the southern provinces of China and the Malayan Archipelago, but it is by no means clear that the plant in those countries is really wild; it is however beyond all question also of eastern origin.

Eight species are enumerated by Risso, whom we follow in the present article; we regard it however as a matter of great doubt how far they are really distinct. The orange, the lemon, the lime, and the citron were all that could be distinguished amongst the mass of specimens collected for the East India Company in Nepal; and there is no great difficulty in believing that all the numerous varieties now cultivated in every part of the temperate and tropical zones, both of the old and new world, have in reality sprung from those four original sources: part of them being natural varieties obtained by long cultivation, and part being hybrids created by accidental circumstances or artificial means.

1. *Citrus Aurantium*, the sweet orange. (*Oranger* of the French, *Arancio* of the Italians.) Stem arborescent. Leaves ovate-oblong, acute, a little serrulated, with the stalk more or less winged. Flowers white. Fruit many-celled, roundish, very seldom pointed, golden-yellow or tawny. Cysts in the rind convex. Pulp very sweet. The principal varieties of this are:—

a. The China orange, with ovate-oblong leaves; round, smooth, rather flattened fruit; and a thin golden-yellow rind. This is the common orange of the markets, and of the Portuguese.

b. The pear-shaped orange, with elliptical, acute leaves, and great top-shaped fruit, with a deep yellow smooth rind; a rare and curious sort not known in the market; it is one of the most capable of resisting cold.

c. The orange of Nice, with ovate-acute leaves, and large, thick-skinned, rough, dark yellow, round fruit. This is considered one of the finest of the whole genus, both in regard to beauty, size, productiveness, and quality. It is a good deal cultivated about the town whose name it bears.

d. The tiny-fruited orange, with ovate-oblong acute leaves, tiny globose fruit, and a thin, smooth, golden-yellow rind. Supposed to have been brought from the Philippines. The fruit is more curious than beautiful or good.

e. The fingered orange, with little stiff leaves, and ovate fruit, some one at least of whose lobes is separate from the remainder, and horned; rind pretty thick. This must not be confounded with the fingered citron hereafter to be mentioned.

f. The blood-red orange, with ovate-oblong pellucid leaves, and middle-sized, round, rough, reddish-yellow fruit; with a pulp irregularly mottled with crimson. This, which is said to have come from the Philippines, was once looked upon as a great curiosity, and living plants were purchased at a considerable price; it was thought to be produced by grafting an orange upon a pomegranate. Now that it is known to be a variety of indifferent quality, and that its fabulous history is forgotten, it has ceased to attract much notice. A trifling variety of it is the Arancio di Sugo rosso of the Italians, who call the real blood-red variety Arancio di Malta sanguigno. Another variety, with small fruit, is the Arancio a Foglia stretta of Nice.

g. The ribbed orange, with oblong acute leaves, and a flattened ribbed deep orange fruit. This is one of the most tender of the varieties; its fruit is spongy, and of no value.

h. The sweet-skinned orange, with broad taper-pointed leaves, roundish, rather ovate heavy fruit, and a deep yellow, smooth, thick, sweet, soft rind. This is the Pomme d'Adam or forbidden fruit of the shops of Paris. Its pulp is subacid and pleasant, and as deep a yellow as the rind, which is soft and melting like the flesh of a cling-stone peach; the acidity of the pulp is agreeably mixed with sweetness, and renders the fruit extremely pleasant. This is very different from the forbidden fruit of the London shops; see C. decumana further on.

i. The Mandarin orange, with flattened, rough, deep orange fruit, and a thin rind, which separates spontaneously from the pulp. This sort has been raised in China, where its fruit is chiefly consumed in presents to the great officers of state, whence its name. It is now cultivated in Malta, where it arrives at perfection. Its singularity consists in the rind so completely separating from the pulp when quite ripe that the latter may be shaken about in the inside. In quality this yields to no known kind. There are two sub-varieties.

k. The Saint Michael's orange, with small, round, pale yellow, seedless fruit, having a thin rind and an extremely sweet pulp. This, when in a state of perfection, is perhaps the most delicious of all the oranges, and it is by far the most productive. Great quantities are imported from the Azores, where it appears to be exclusively cultivated as an object of trade. It is said that 20,000 of these oranges have been packed from a single tree, exclusively of the large quantity which were blown down or rejected as unfit for sale.

Besides these, there are numerous other sorts to be found in the gardens of the curious, and in commerce are many kinds about which little is known. Among these may be mentioned the egg-oranges of Malta, which are sometimes sent to England as presents; they are not however equal in quality to the China or the St. Michael's varieties.

2. *Citrus Bigaradia*; the Bigarade, or bitter orange (*Bigaradier* of the French, *Melangolo* of the Italians). Branches spiny. Leaves elliptical, acute, with a winged stalk. Flowers very white. Fruit middle-sized, uneven, more or less globose, deep yellow, with an acid and bitter pulp. It differs moreover from the sweet orange in forming a smaller tree, having broader leaves, and larger and sweeter flowers, on which account it is always selected in preference for the purposes of the perfumer. Its fruit is much more uneven. Numerous varieties of it are known, among which are all those cultivated for the sake of their flowers; especially the horned Bigarade, a variegated variety of it, and the curled-leaved Bigarade. The

following are a few of the most striking forms of this species :—

a. The horned Bigarade, with a large pale yellow ribbed fruit, whose sides project into horns. This variety, which is of the same nature as the fingered sweet orange (var *e.*), its horned appearance being caused by the separation of the carpels or fruit-lobes, is in great estimation on account of the powerful and delicious perfume of its flowers. It is the *Melangolo a frutto cornuto* of the Italians.

b. The Female Bigarade, with a deep yellow large coarse fruit, containing orange within orange. The circumstance from which this variety derives its name is not at all uncommon in the genus Citrus, but it exists here in perhaps the most strongly-marked manner. An orange, in its natural state, consists of one whorl of carpels, which are consolidated into a round fruit, each of whose lobes is one carpel. But it sometimes happens that two whorls of carpels combine to form the same fruit; in that case the inner whorl is consolidated into a central orange, and the outer whorl grows over it. Or, it may happen that three whorls of carpels constitute the fruit; in that case the innermost whorl will combine into an orange in the centre; the second whorl will form a coating over it; and the most exterior whorl will enclose the whole. Finally the carpels may separate wholly, as in the fingered citron, or in part, as in the fingered orange and Bigarade, and then the fruit consists of a number of lobes more or less distinct. Until the discovery made by Göthe of the real nature of compound fruit, oranges of this kind were looked upon as something wondrous, and many idle speculations existed as to their cause. A figure of this may be found in Risso's *Histoire Naturelle des Orangers*, t. 33, without however any explanation of the cause of the monstrosity.

c. The curled-leaved Bigarade; with very compact, blunt, small, curled leaves, and flowers growing in thick clusters at the ends of the branches. No variety is more generally cultivated than this for the sake of its flowers, which are large, sweet, and produced in extraordinary profusion. The French gardeners call it *Le Bouquetier*, or Nosegay plant, and *Bigaradier riche dépouille;* the Italians *Mélangolo riccio*. The fruit is coarse, very light, uneven, and with a large conspicuous scar at the point. The plant itself is far more dwarf than the other varieties, and is one of the most robust of its race. It is a common object of cultivation all over the south of Europe.

d. The purple Bigarade; with leaves, flowers and fruit stained more or less with a dull purple, especially the young leaves. *Hermaphrodite* and *Bigarade violette* of the French, *Melangolo Pavonezzo* of the Italians.

e. The double-flowered Bigarade; with rather thick leaves, double flowers, round granulated fruit, and a thick rind; the common double orange of the nurseries. It is a great favourite in gardens, because of its multitudes of fragrant double flowers, which do not fall in pieces so quickly as those which are single; it loses its quality of producing double flowers if the soil in which it grows is not kept in a very rich state.

f. The Seville Bigarade or orange; with round dark fruit, having an uneven, rugged, extremely bitter rind. Commonly brought to the English market, where it is consumed in the manufacture of bitter tinctures and in the preparation of candied orange-peel. The bitter aromatic principle is a powerful tonic; it gives its flavour to the liqueur called Curaçoa.

g. The myrtle-leaved Bigarade; with small, very compact, ovate, sharp-pointed leaves, and small round fruit. Generally both in flower and fruit at the same time, if well cultivated. On this account and because of its dwarf habit, it is a very common object in gardens. It is said to be a Chinese production, and that it is employed by the Chinese gardeners as an edging of flower beds, in the same way as the dwarf box in this country.

h. The Bizarre Bigarade; with curled, rather deformed leaves, purplish or white flowers, and fruit of different sorts, some being round and of the common appearance, others half bigarades and half lemons or citrons, the pulp of some being sweet, that of others acid and bitter. A curious lusus naturæ, which was once thought to be the greatest prodigy in all the vegetable kingdom. It is however merely one of those sports, as they are technically called by gardeners, in which, owing to some unknown cause, some one individual assumes the appearance of two or more others in particular parts. Analogous instances are the grape called the variegated chasselas, some of whose fruit is black, some white, and some striped with both colours; the camellia, which bears red, white, and party-coloured flowers on the same stem: and the chrysanthemum, some of whose flowers are purple and others yellow. This Bigarade was raised from seed by a gardener at Florence in 1644, and has since been multiplied by grafting, and so has been preserved to the present day. It may be procured from the nurserymen of France and Italy, and it fruits annually in the orangery at Versailles.

3. *Citrus Bergamia*, the Bergamot Orange. Leaves oblong, flowers small, very sweet. Fruit pearshaped or flattened, rugged, with a greenish-yellow smooth rind filled with concave receptacles of oil. Pulp subacid, very fragrant. The trees of this species are rather variable in appearance. The fragrance of both flowers and fruit is peculiar. From each of them the perfumer procures an essence of a delicious quality. The rind, deprived of the pulp, first dried, and then moistened with water, is pressed in moulds into fancy boxes for holding lozenges and other sweetmeats, and these boxes retain much of their recent odour. The Mellarosa of the Italians is a variety with ribbed fruit, having a broad scar at the summit; it is much esteemed on account of the abundance of its flowers.

4. *Citrus Limetta*, the Lime. Leaves ovate, obovate, and oblong, placed upon a wingless stalk. Flowers small and white. Fruit ovate or roundish, pale yellow, with a boss at the point; the cysts in the rind concave; pulp subacid. In foliage this resembles the lemon, but its fruit differs in the pulp never having the sharp and powerful acid of the lemon; it is on the contrary flat and slightly bitter: it is principally employed for flavouring punch, sherbet, and similar drinks. The varieties are of no importance; they principally differ in the thickness of their rind and in form. Here is to be arranged the round very uneven fruit called Pomo d'Adamo by the Italians, because they fancy that the depressions upon its surface look as if they still bore the marks of our universal father's teeth.

5. *Citrus decumana*, the Shaddock. Leaves large, with a winged stalk. Flowers very large and white. Fruit usually very large, roundish, pale yellow, smooth, with flat or convex cysts in the rind. Rind white, spongy, very thick; pulp juicy, sweetish, rather insipid. Shaddocks are among the largest fruits which are known, and are commonly cultivated in both the East and West Indies for the sake of the delicate subacid juicy pulp in which they abound. When they arrive at their greatest size they are called Pompoleons, or Pompelmousses; when at the smallest they form the Forbidden Fruit of the English markets. Another small variety, with the shaddocks growing in clusters, forms a larger tree than any other citrus; the fruit is about as large as the fist; it is what the West Indians call the Grape-fruit.

6. *Citrus Lumia*, the sweet Lemon. Leaves like those of the lemon. Flowers red externally. Fruit with the flesh and rind of a lemon, but with the pulp sweet, and the cysts in the rind both convex and concave. There can be no doubt that this is a mere variety of the next species, from which it only differs in the want of acidity in the pulp. Many sorts are known in orange countries, of which one, the *Commander's Pear*, resembles very much a large Beurré Pear; their fruit is seldom seen in England.

7. *Citrus Limonum*, the true Lemon. (*Citronnier* of the French.) Leaves ovate-oblong, usually serrulated, pale green, with a winged stalk. Flowers middle-sized, red externally. Fruit oblong, very uneven, now and then almost round, with a pale yellow fragrant rind, dotted with concave cysts. Pulp juicy, and very acid. Of this species the cultivators take little pains to distinguish the varieties. When young plants are wanted they are generally raised from seeds in the orange countries, and hence the samples of fruit sent to market consist at all times of numerous sorts, differing very much in quality. Some of them have their rind so thick and insipid that they approach the citron in quality; one, with roundish rugged ribbed fruit, is called *Vignette* upon the Continent, where it is common; another, with oblong

extremely rugged fruit, is one of the *Poncires* of the French. The most distinct race is that which comprehends the *Perettes*, or little pears; they are very small in the fruit, which is a pale greenish yellow, and has almost the shape of an egg: their rind is more delicately perfumed than that of common lemons.

8. *Citrus Medica*, the Citron. (*Cedratier* of the French, *Cedro*, *Cedrato* of the Italians.) Branches short and stiff. Leaves oblong, toothed. Flowers purple externally. Fruit usually large, warted, and furrowed, with an extremely thick spongy rind, and a subacid pulp. This is an exceedingly variable species, chiefly valued for the fragrance of the rind of the fruit, from which a delicate sweetmeat is prepared. The Citron, supposed to be the Median, Assyrian, or Persian apple of the Greeks, is probably the most beautiful species of the genus. It is described by Risso as having a majestic port, shining leaves, and rosy flowers, which are succeeded by fruit whose beauty and size astonish the observer at the same time that their sweet odour gratifies his senses. The trees are constantly in vegetation, the flowers appear even in midwinter, and there is so continual a succession of them that flowers, young fruit, and ripe fruit, may always be seen together at the same moment. The Poncire Citrons are eight or nine inches long, and are the largest of the race known in Europe.

In China there is an enormous variety, with its lobes all separating into fingers of different shapes and sizes, whence its name of fingered Citron. The Chinese esteem it very much, both for its rarity and for the grateful odour of its rind. They place the monstrous fruits upon porcelain dishes, and have them in their apartments to fill the air with fragrance. Those who would study this genus in detail will find excellent figures of above 100 varieties in Risso's *Histoire Naturelle des Orangers*. A good commercial account of this interesting genus has still to be written.

For cultivation see [Orange.]

CITRUS AURA'NTIUM, ORANGE, of which there are two varieties, the sweet, or China orange, and the bitter, or Seville. The fruit of the latter, while small and unripe, is collected and dried; the smallest, which are of the size of a pea, are used for keeping issues open, and the larger for the preparation of the liqueur called Curaçoa. Of the ripe fruit every part is used either medicinally or dietetically. The rind, called flavedo, contains a bitter principle and much volatile oil; and either used at dessert, or reduced to powder and added to magnesia and rhubarb, furnishes a grateful tonic to the stomach in some forms of dyspepsia and gout. The pulp and juice are exceedingly agreeable to persons affected with inflammatory complaints, or a drink prepared from it (orangeade) is of great utility in bilious and gastric fevers, dysentery, &c. The roasted pulp forms an excellent application to fetid ulcers.

The peel of lemons is likewise employed, but it is not so warm and grateful as that of oranges, from containing less volatile oil. The powers of lemon juice are much increased by saturating it with chloride of sodium (common table-salt). It is then of great efficacy in the treatment of dysentery, remittent fever, the dry belly-ache, putrid sore throat, and other diseases occurring in the West Indies. Dr. Wright also recommends it in diabetes and lientery.

Citric acid exists in numerous fruits, particularly those of the orange tribe, such as the lemon and lime, either alone, or with malic and other acids; sugar, mucilage, and extractive are also present. The citric acid is separated and purified on a large scale, in the way before mentioned. [Citric Acid.] It is frequently adulterated with other acids, such as tartaric, sulphuric, muriatic, and oxalic, which may be detected by appropriate tests. Citric acid, when crystallized, has scarcely any odour, but a very distinct acid taste. It is soluble in cold, but more abundantly in warm water. Citric acid has the power of curdling the milk of most animals, but not the human milk.

As it is impossible to treat of citric acid apart from lemon juice, we class them together. The impression of both on the organ of taste is the same in kind, but different in degree. Concentrated citric acid is somewhat caustic, but lemon juice is gratefully acid. To imitate the natural state, citric acid is only given largely diluted. In this state it proves a pleasant drink in fevers and diseases where the temperature of the body rises above the natural standard. According to Broussais, it agrees better than any other acid with the stomach when affected with acute inflammation. It is not so pleasant as lemonade prepared from new fresh lemons, and according to the statement of Sir G. Blane, the solution of citric acid is not so efficacious in the prevention and cure of sea-scurvy as the recent lemon juice. This is attributable to the absence of the volatile oil and the bitter principle of the rind, which are valuable adjuncts to the citric acid in its action on the stomach. The utility of lemon juice in promoting the digestion of gelatinous meats, such as veal and turtle, is well known. Fresh lemon juice may be preserved in bottles in the same way as ripe fruits, by boiling the bottles in which it is contained for half an hour, first placing them in cold water, and gradually heating it, and as soon as the contents of the bottles have fallen to the temperature of the air, closing them hermetically. Where lemon juice so preserved, or fresh lemons, cannot be obtained by ships on long voyages, the dissolved citric acid, to which a portion of an alcoholic extract of lemon peel may be added at the time of using, must serve as a substitute, should any apprehensions of scurvy be entertained.

Lemon-juice is often a means of correcting acidity in the stomach, since, like most vegetable acids, it elevates the vitality of that organ, and prevents the formation of an excess of acid. On the same principle it is found to be a useful agent in elevating the powers of the stomach in the intermittent, remittent, and bilious fevers of America, many cases of which have yielded to a combination of lemon-juice, cinchona bark, and port wine. Lemon juice is often employed to rouse the stomach and nervous system after narcotic poisoning; but neither it nor vinegar should be used till all the poisonous substance is evacuated from the stomach, otherwise it increases the power of the poison.

Citric acid, as well as lemon juice, is much employed to decompose alkaline carbonates, forming therewith pleasant effervescing solutions. These taken in the act of effervescence are often of great utility in checking vomiting, and in reducing the temperature in inflammatory complaints. But in all cases of debility the employment of citric, or any other vegetable acid, for this purpose, is decidedly improper. The amount of injury done by the indiscriminate use of effervescing draughts made with a vegetable acid is incalculable. 'Were I required,' says Dr. Prout, 'to name the medicine calculated to do the most mischief, I should name the common saline draught formed of potash or soda and some vegetable acid.'

Citric acid alone is very useful in the phosphatic diathesis; it is the alkaline base in this combination which does harm. [Carbonic Acid.]

Externally citric acid largely diluted has been beneficially employed as a refrigerating wash, in the same way as vinegar. Slices of lemon form useful applications to scorbutic and other sores, and also at the commencement of hospital gangrene.

CITTA' VE'CHIA. [Malta.]

CITTERN (or *gittern*, or *guittern*), a musical instrument of the lute kind, mentioned by our old dramatists. [Cithara.]

CITY. Certain large and antient towns both in England and in other countries are called cities, and they are supposed to rank before other towns. On what the distinction is founded is not well ascertained. The word seems to be one of common parlance, or at most to be used in the letters and charters of sovereigns as a complimentary or honorary compellation, rather than as betokening the possession of any social privileges which may not and in fact do not belong to other antient and incorporated places which are still known only by the name of towns or boroughs.

Sir William Blackstone is unfortunate in his attempt to define. 'A city,' he says, 'is a town incorporated, which is or hath been the see of a bishop.' (*Comm. Introd.*, section iv.) But Westminster is a city, though it is not incorporated. Thetford is but a town, though incorporated, and once the seat of a bishop. Whether Westminster owes its designation to the circumstance that it had a bishop for a few years of the reign of Henry VIII., and in the reign of Edward VI., may be doubted. But there are, besides Thetford, many places which were once the seats of bishops, as Sherburn, and Dorchester in Oxfordshire, which are never called cities. On the whole we can rather say that certain of our antient towns are called cities, and their inhabitants citizens, than show why this distinction prevails and what are the criteria by which they are distinguished from other towns. These antient towns are those in which the cathedral of a bishop is found; to which are to be added Bath and Coventry, which, jointly with Wells and Lichfield, occur in the designation of the bishop in whose diocese they are situated; and Westminster, which in this respect stands alone.

A question may arise whether Manchester and Ripon will become cities, if the scheme for placing a bishop at each of them shall be carried into effect.

CIUDA'D, in Spanish, means a town, and forms a component part of several names of towns in Spain, such as Ciudad Real, the principal town of La Mancha. [CASTILLA.] Ciudadela, 'little town,' at the N.W. end of the island of Minorca, is a well-built town, with a small harbour and 7300 inhabitants. (Miñano.) [BALEARES.]

CIUDAD RODRI'GO, a town in the province of Salamanca, built on an eminence, on the right bank of the Agueda, in a fertile plain. It is fortified with a substantial wall and a ditch, and has a citadel, being a frontier fortress on the side of Portugal, from which it is about 16 miles distant. It is 55 miles S.W. of Salamanca, and on the high road to Coimbra and Lisbon. Ciudad Rodrigo is a bishop's see, and has a cathedral, which was built in 1170, and a seminary for clerical students. It is the residence of a military and political governor, and of an alcalde mayor for the administration of justice, and has 6000 inhabitants. (Miñano.) It was taken by the French under Massena in July, 1810, and retaken by Lord Wellington in January, 1812, after a siege, on which occasion he received the title of Duke of Ciudad Rodrigo.

CIVET. [VIVERRIDÆ.]

CIVIC CROWN. Among the Romans the civic was considered more honourable than any other crown. It was the recompense for the life of a citizen saved, either in battle or assault. A civic crown was conferred on Cicero for detecting Catiline's conspiracy; and afterwards upon Augustus, the reverse of many of whose coins bear the representation of it, with the inscription OB CIVES SERVATOS. This crown, which was in fact a wreath, was at first of elm, afterwards beech was used, and lastly, and most generally, oak. (Rasche's *Lexicon Rei Numariæ*.) Plutarch, in the Life of Caius Marius Coriolanus, has given what he considers to be the reasons for the choice of the oak. Pliny informs us that the civic crown was the foundation of many privileges. He who had once obtained it had a right to wear it always. When he appeared at any of the public shows, the senators rose to do him honour; and he was placed near their bench. He was excused from all troublesome duties and services; and his crown procured the same immunity for his father and his grandfather on his own side. (The reader may consult for further information, Polyb. lib. vi. c. 37; Plin. *Hist. Nat.* lib. xvi. c. 4; Tacitus, *Ann.* lib. iii. § 21; xv. § 12.)

CIVIL ARCHITECTURE. Although this term appears to imply no more than a particular branch of architecture in contradistinction to that called military, which was formerly more important than it now is in the modern system of warfare, it in reality comprises the whole of architecture considered in regard to design or as a fine art, since mere building, to whatever purpose it be applied, can never with strict propriety be so termed. Architecture includes construction, but it aims at something more—at grandeur or beauty, at exhibiting qualities and effects to which building and construction are no more than the means. Needless as this distinction may appear to be to many, persons in general, we apprehend, confound the *art* with what belongs to the science, and consequently imagine that the study of architecture concerns those only who follow it as a profession, or that it demands a knowledge of various dry and mechanical details, by which they are deterred from even approaching what they would soon discover to be attended with no more difficulty than what just serves to give excitement and to enhance the pleasure of the pursuit. Neither is its interest confined to criticism or the gratification derived from contemplating any particular building, but expands itself over the almost boundless tracts of historical research in all ages and countries wherever art has existed. It is a study, in fact, which is so intimately connected with nearly all the other arts, both ornamental and mechanical, and with the state of society, that it imperceptibly leads us to trace the progress or decline of civilization. Architecture therefore has many claims on the attention of those who can have no other inducement to study it than what it holds out in its character of a fine art and a pleasing intellectual pursuit, a character properly recognised and discriminated by the German term *Schöne Baukunst* (fine architecture), which, if adopted into our language, would at once remove that prejudice and misconception now so prevalent in regard to it.

So wide a field does the history alone of the art and its various styles embrace, that we cannot attempt to give anything like a general view of it, however rapid. Accordingly we shall confine ourselves chiefly to the Grecian style, as being that whence the Roman and Italian orders are derived, and which, so modified, prevails more or less throughout the whole of Europe, at the present day, except in those buildings, and they are comparatively few, where the Gothic is avowedly imitated. As to the question of the origin of Grecian architecture and its supposed derivation from the Egyptian style, we consider it unnecessary to make any remarks here, our object being only to explain the Grecian style and those styles which are undoubtedly derived from it.

Before we commence our remarks on Grecian architecture, it is necessary to explain that what is termed an Order consists of two principal divisions, the *Column* and the *Entablature*—*i.e.*, the upright support and the horizontal mass supported by it; the former being again divided into *Base*, *Shaft*, and *Capital* (except in the Doric order, where the shaft rests immediately upon the flooring); the latter also into three parts—*Architrave*, or Epistylium, *Frieze*, and *Cornice*. These together constitute an Order; which is further distinguished as belonging either to the Doric, or Ionic, or the Corinthian style, according to certain general proportions and characteristic embellishments. The scale for the proportions—that is, not the actual but the relative dimensions of the different parts compared with each other—is taken from the lower diameter of the shaft of the column, which is divided into two modules or sixty minutes. Modern systematizers, who have laid great stress upon proportions, have, contrary to the practice of the Greeks themselves, attempted to fix certain invariable proportions for each order; and some have maintained that by them, quite as much as by peculiarities of detail and embellishment, the character of an order is determined. In regard to proportions, however, even greater discrepancy is found between different examples of the same order, than between two distinct orders. We must therefore attend to certain indicial features and marks by which the particular order may be immediately recognized; thus the absence of base or mouldings at the bottom of the column, the plain capital composed of merely an echinus and abacus, and a triglyphed frieze, enable us to pronounce at once that the order is the Doric. In like manner the voluted capital, or the foliaged one, as distinctly denotes that it is either Ionic or Corinthian. In regard to the two last-mentioned, the principal distinction between them is confined to the capital; there being no other determinate difference between the columns of the one or the other, or in the entablatures, if we except the modillions peculiar to the Corinthian, as we find it in Roman examples. Were we to see only the shaft of the column, we should be able to decide from that alone whether it were Doric or not; the flutings peculiar to that order being broad and shallow, and forming sharp ridges or arrises on the circumference of the shafts; whereas in the other two they are narrower and deeper, rounded at their extremities, and divided from each other by fillets or spaces left between the channels on the surface of the shaft. In like manner were we to see the fragment of an architrave, we could pronounce with tolerable certainty whether it was Doric or not; although in the latter case not quite so clearly whether it was Ionic or Corinthian. The Doric architrave consists of a single plain face surmounted by a broad fillet, here termed the tænia, to which another fillet with small cylindrical guttæ or drops is attached beneath each triglyph; but the architraves of the other two orders are divided into (generally) three faces or faciæ, slightly projecting one above the other, and crowned by curved mouldings, sometimes plain, but more frequently enriched. By attending to these few simple and obvious distinctions, no one can feel any difficulty in ascertaining the particular order to which a building belongs.

Strictly speaking, only two orders were employed by the

Greeks, the Doric and Ionic; for although we have a most florid and beautiful specimen of the foliaged capital in the small structure called the choragic monument of Lysicrates, and one or two other examples, partaking more or less of the general character of what is called the Corinthian capital, yet these scanty and imperfect remains do not go far towards proving that a distinct order of the kind—of which they appear to have been only the first essays and rudiments—was recognised in their practice by the Greeks. If such had been the case, we should doubtless have found the character now marked by the capital alone more fully developed throughout.

The earliest examples of the Grecian Doric—as, for instance, that of the temple at Corinth—are marked by a massiveness of proportions approaching to heaviness, if not to rudeness; which circumstance, together with the narrowness of the intercolumns (spaces between one column and another), favours the supposition that the Greeks borrowed their first ideas of architecture from Egypt; and if this be admitted, the hypothesis of the different parts of a Grecian structure being derived from a primitive timber hut, falls at once to the ground. The following considerations also are urged against this hypothesis. Unless the aim had been to make the hut itself in the first instance resemble as nearly as possible an erection in stone, such timber model would have given rise to a much lighter style of architecture. If single pieces of timber of sufficient thickness and length for the columns could have been procured, so could they also for the architraves; nor could there have been the slightest occasion for putting the columns so close together. It will be said that we do not see the first essays in stone, which undoubtedly retained more of the character of the timber prototype, but structures wherein greater solidity had been introduced so as to render their character and proportions more conformable with the nature of the material employed. Yet as far as extant examples themselves afford any proof, the reverse of this took place; since in them we observe a progressive change from heaviness to lightness—from columns less than four diameters in height to those of nearly seven. The chief circumstance that favours the idea of the Grecian style being derived from timber construction is, that the columns are round and tapering like the stems of trees; a form not likely to have been adopted had stone been employed from the first, it being more natural that the pillars should have been square. But, it is urged, that this circumstance ought to lead us to adopt the same hypothesis in regard to Egyptian architecture; whereas by supposing that the Greeks took their first ideas from that source, perhaps all the difficulties attending the other hypothesis are removed. 'The entire character of Grecian architecture,' says Wolff, in his 'Beyträge zur Æsthetik der Baukunst,' 'as well as of Egyptian, is essentially connected with construction in stone, which alone is capable of accounting for the architectonic principles it exhibits.' In stating these opinions as to Grecian being borrowed from Egyptian architecture, it must be observed that many strong reasons are urged on the other side; and so far as there is any direct historical evidence either on one side or the other, it is in favour of the hypothesis against which we here contend. [Architecture.]

In attentively examining the Grecian Doric, we can hardly fail to note what admirable taste and study of effect it exhibits throughout, and how every part is made to conduce to the character of the whole. The columns are of short proportions, the entablature deep; the former have no bases, which, owing to the narrowness of the intercolumns, would have proved highly inconvenient, and instead of producing an air of finish would rather have occasioned heaviness. The proportions themselves are such as to reject any addition of that kind at the lower extremity of the column, because the difference between the upper and lower diameter—which, owing to the shortness of the shaft, occasions so visible an inclination as to produce the effect of tapering upwards—causes it also to appear to spread out below in such manner that the lower extremity becomes a sufficiently wide basis. This inclination is furthe rendered more apparent than it would be by the outline alone of the column, owing to the lines being repeated in the fluting. The fluting, while it diminishes the heaviness, produces great variety of light and shade in every direction; and the mode of fluting peculiar to this order is admirably in unison with the expression of all the rest, the channels being wide and shallow, and separated from each other by mere ridges on the surface; both which circumstances contribute to that breadth and simplicity which pervade the other parts. No less appropriate and well imagined is the capital, which consists of little more than an echinus and deep square abacus above it; the former expanding itself out from the neck, or upper part of the column, until its diameter becomes equal to that of the foot of the column: in reality, it is something greater, but not more so than is requisite to counteract the apparent diminution caused by the greater distance from the eye. Thus harmony is kept up between both extremities of the column, verticality is restored, the projection above (as in the case of the sloping wall and coved cornice of Egyptian structures) is made to restore perpendicularity by adding just as much as had been taken away by the diminution of the shaft upwards, and a play, variety, and contrast are produced, unattainable by any other mode.

The architrave is plain and deep, well proportioned both as to the weight which it has to bear and to the column below, its average height being equal to the upper diameter or narrowest part of the column. The width of its *soffit*, or under side, is about a medium between the two extreme diameters, so that it overhangs the upper part of the shaft; yet it is not so broad as the abacus of the capital, which by opposing a greater surface to it appears better calculated to support its pressure. In Roman and Italian Doric, on the contrary, this division of the entablature is much slenderer, both as compared with the column itself and the frieze above it, and is frequently made to appear still weaker by being divided into *faciæ*, the lowermost of which is made the narrowest. In the Grecian Doric the frieze is generally of the same dimensions as the architrave, very rarely deeper, in some examples not so deep; wherein again it differs materially from the styles just mentioned. The *triglyphs* which decorate it, and are peculiar to the order itself, are upright, slightly projecting tablets (in width rather more than half the lower diameter), channelled with two grooves or glyphs (γλυφαί), and with a half groove chamfering off each of its outer edges. The spaces between these ornaments, which were originally intended to represent the extremities of the beams (whether stone or timber) resting upon the architrave and forming the inner roof or ceiling are square, or nearly so, and are distinguished by the name of *metopes* (μετοπαί): *i. e.* openings or intervals. They are in fact so many small pannels, and were generally filled with sculpture in bas-relief, although there is hardly an instance of the kind in any of the numerous modern imitations of the Greek Doric. Beneath each triglyph is a series of small *guttæ*, or cylindrical drops, attached to a fillet, just under the moulding of the architrave, to which division of the entablature they may be said to belong, although evidently a continuation of the ornaments on the frieze. Some suppose them to have been intended to represent nails, others drops of water running down the channels of the triglyphs and settling beneath them; yet be that as it may, they certainly contribute in no small degree to architectonic expression and effect, inasmuch as they break the monotony of line, and by extending some ornament to the architrave bring it into harmony with the frieze. The space between one triglyph and another being regulated by the height of the frieze, since each interval or metope forms a square, this circumstance also regulates the *intercolumniation*, or distances at which the columns are placed; because as there must be a triglyph over every column, there cannot be more than one triglyph over each intercolumn, unless the latter be increased to the extent of another triglyph and metope; that is, made half as wide again. Consequently there are hardly any instances of more than *monotriglyphic* intercolumniation (that is, with more than a single triglyph over each intercolumn) in Grecian buildings, except when the centre intercolumn is made wider than the others, as in the Propylæa at Athens, where a ditriglyphic arrangement is employed.

Like every other part of the order, the Grecian Doric cornice is composed of few and bold parts; it consists of little more than a corona (the projecting and principal member in every cornice), finished above by one or two simple mouldings, and having attached to its soffit a series of shallow plates or tablets, studded with guttæ. These are termed *mutules*, and are the peculiar distinctive marks of the Doric cornice; in like manner as dentils are of the Ionic, and modillions of the Corinthian. They may be considered as being to the cornice what the triglyphs are to the frieze, and there is one corresponding to each metope as well as each triglyph; which produces a beautiful gradation of parts, for as there is an additional triglyph between every column, so is there an additional mutule between every triglyph; whereas, were there no more triglyphs than columns, and no more mutules than triglyphs, the effect would be both monotonous and poor, and these different features would be confined to distinct lines from top to bottom. The average height of the entablature is about two diameters, or one-fourth of the whole order, taking the height of the column at six diameters.

The sloping or *raking cornices* of the pediment resemble the horizontal one, except that there the mutules are omitted, although not in Roman or Italian Doric. In order, however, to give increased depth and importance to the pediment, as the finish of the whole structure, its cornices have an additional member. termed by some the *epitithedas*, consisting of an ovolo or convex moulding, or a cymatium; sometimes deeper, sometimes shallower. This *epitithedas* was continued a little way at the angles, where it usually terminated against a block, carved with a lion's head, or some other ornament. The face of the pediment itself, termed the *tympanum*, (called by the Greeks ἀετός, ἀέτωμα) was almost always filled with sculpture. The pediment was invariably of a low pitch, but not always of the same pitch; on the contrary, whatever the span might be, its height continued nearly the same, it being more or less acute, in proportion as the portico was narrow or broad: its average height was equal to that of the entablature, and either a little diminished or increased according to circumstances, but hardly ever so much as to render the tympanum deeper than the entablature.

For practical examples of this order, where the reader may study its character, and learn to distinguish, in actual buildings, the various members and particulars here pointed out, we refer to the portico of Covent Garden Theatre and the new Corn-Market, Mark Lane, in which latter the frieze is decorated with wreaths instead of triglyphs—as in the monument of Thrasyllus at Athens—and consequently the spaces between them cannot be called metopes; and the new galleries in the west wing of the British Museum.

In the Ionic order the column differs widely from that of the Doric, not only in the form of its capital, and in having a base, but in the contour of its shaft and the mode of fluting, it being more slender and not tapering so suddenly. All these differences, it appears to us, arose entirely from the form of the capital itself. Whatever may in the first instance have led to the adoption of volutes as ornaments to capitals, it is obvious that the flowing luxuriant character thus given to that part of the column required that the severity of all the rest should be mitigated, for what was graceful simplicity in the Doric would appear only offensive harshness when the capital itself was altered. In order, therefore, to restore consistency and harmony, it became necessary to reduce the bulk of the lower part of the shaft, yet at the same time to leave it sufficiently thick at bottom to prevent it from appearing top-heavy, as it must have done, had the capital expanded so much more than the foot. Consequently, in paring away the shaft, it was necessary to leave the footing of it as thick as before. Yet, had no more than this been done, the effect would have been unsightly; accordingly, the portion left as the footing of the column was formed into mouldings, termed the base, which base therefore was not, strictly speaking, added to the column, but shaped out of what remained after the part above it had been pared away. If there be any merit in this idea, we may claim it for ourselves; and although it may be deemed fanciful, not only does it appear a natural and rational process, but if we take the first or under torus of the base for the lower or prime diameter, we shall find that the Ionic column agrees very nearly with the standard Grecian Doric, of six diameters in height. The base is generally that termed the Attic-base, composed of two tori, or convex rings, with a concave moulding, the scotia, between them; for as the Doric character demands plane surfaces and lines, so does the Ionic require curved mouldings and contours, as harmonizing with the curved forms of the volutes of the capitals. To prevent the harshness which would result, if the mouldings forming the base jutted out abruptly from the lower end of the shaft, the latter is made to spread itself out immediately above the base in a sweeping curve, termed the apophyge. The number of the flutings of the shaft is increased from twenty to twenty four; besides which there are spaces left between them (fillets); for the mere arrises or sharp edges, peculiar to the Doric or earliest mode of fluting, would be utterly at variance with the rounded contours of the base and capital. The channels themselves being thus multiplied and set apart from each other, are consequently much narrower than those of the other order, and considerably deeper in proportion to their breadth; and instead of terminating in flattish curves, their extremities are made the half of a circle, or an ellipse: all which circumstances contribute to uniform delicacy of expression. It should be observed, too, that the upper torus of the base was generally fluted horizontally, thereby producing uniformity of decoration between that and the shaft, with contrast as to the mode of applying it. When not so fluted, that torus was sometimes enriched with a *guilloche*, a beautiful sort of chain-like ornament sculptured on its surface.

The capital may be described generally as consisting of two faces, about as wide, measured across the volutes, as the base—that is, a diameter and a half, or 90 minutes; which breadth is divided into three equal parts (more or less), 30 minutes being allowed for each volute. These volutes are composed of spiral mouldings, which make several revolutions, and gradually become narrower as they approach what is termed the eye or cathetus: in the richer capitals of this class there are intermediate spirals, following the course of the other; the spaces or interspirals, forming slightly concave surfaces. In all the Athenian examples there is also a flowing or festoon hem forming the lower edge of the face between the volutes, whose curve harmonizes most beautifully with the outline of the volutes themselves; whereas, in the capital of the Asiatic Ionic, as well as the Roman and modern Italian, the volutes are here connected by a straight line. Immediately beneath this part of the capital is a carved convex moulding, to which succeeds the echinus or ovolo (so called because invariably cut into the form of eggs), and lesser mouldings. The idea of an Ionic capital therefore seems to have been that of introducing an ornamental mass between the echinus and abacus of the earlier shaped capital, and rolling up its deep projecting extremities into volutes. Besides the capital (properly so speaking, where additional richness was required, and also increased height for the column, without much increasing that of the shaft), a necking, enriched with sculpture, and separated from the shaft by a carved convex moulding, was introduced. The abacus is square in plan, and its sides form a cyma reversa, or ogee moulding, either carved or plain, according as the capital itself is more or less enriched. But the capital itself, at least that portion of it occupied by the volutes, is not so deep on its sides as on the two faces; the reason for which is obvious, because either those faces must have been much narrower, or if this part formed a perfectly square mass of a diameter and a half, it would overhang the upper parts of the shaft, and project beyond the architrave in a most unsightly manner. The baluster sides of the volutes, as they are termed, are, for the sake of elegance and lightness, hollowed out so as to assume something of the appearance of two tubes or horns, whose broader extremities or mouths come against the back of the volutes. The capitals at the angles of a portico are frequently differently arranged, since, in order to obtain a face on the return similar to that in front, the outer volute is turned diagonally, so as to serve for both faces; a mode adopted for all the capitals, without distinction, by many Italian architects. The architrave is divided into three nearly equal faciæ, projecting very slightly one over the other, and crowned by a cyma recta moulding, carved or plain, as the rest happens to be more or less enriched. There being no particular members appropriated to the frieze, as in the Doric order, unless enriched with sculpture, it is a mere plain surface; but although generally so decorated by the Greeks, there is hardly an instance of it among ourselves, except in the portico of the East-India House. Examples have been found in Sicily of triglyphed friezes above columns of this order; which seems to show that the change from Doric to Ionic was progressive, and that some of the features now considered peculiar to the entablature of the former were not discarded till some time after columns with bases and voluted capitals had been employed.

The cornice in Athenian examples is exceedingly simple, consisting only of two mouldings beneath the corona, the uppermost being within the hollowed soffit of that memner; nor do dentils, which are generally reckoned the distinguishing marks of the Ionic cornice, appear to have been used, except by the Asiatic Greeks. Consequently, unless the frieze is enriched with sculpture, so as along with the cornice to produce a rich ornamental mass above the architrave, not only is the cornice apt to appear meagre, but the whole entablature to look cold and naked, even plainer than that of the Doric order, and to offer anything but a pleasing contrast to the elegant richness of the capitals below it. Accordingly, when the frieze is left plain, it becomes almost indispensably necessary to give greater depth to, and bestow more ornament on, the cornice itself; which has been done, by Mr. Gandy Deering, on the front of the beautiful little church in North Audley Street, where, besides dentils and additional mouldings, there is an epithetidas or cymatium above the corona, enriched with panthers' heads.

What has already been said in regard to the pediment will suffice for this order likewise, there being no other difference than what is occasioned by the cornices themselves. But having thus far explained the two chief Greek orders or styles of columns, in regard to columns and entablatures, we now proceed to notice what in certain situations are employed as adequate to, or substitutes for, columns, namely, *antæ*, or pilasters. In Italian architecture, pilasters are very frequently employed in lieu of columns, or are placed against a wall to correspond with a range of columns in front of it; their bases and capitals, too, are made to correspond with those of the columns, as far as the difference between a square and circular plan will allow. The Greeks, on the contrary, never employed antæ, except at an angle or the extremity of a wall; and instead of aiming at perfect similarity, they purposely gave to such pilasters, bases and antæ-caps, dissimilar from those of the columns; neither did they diminish them, but made them of the same width above and below, which width was determined by that of the soffit of the architrave, and was therefore something less than the lower diameter of the column, but greater than the upper one, since both in the Doric and Ionic the architrave overhangs the upper part of the column. Thus they kept the antæ and columns quite distinct in character, thereby producing variety and contrast without injury to consistency. Sometimes the Doric anta has a simple kind of moulding and groove at its foot, which seems requisite to detach it from the wall, whereas the plain foot of the column resting on the pavement or steps defines itself to the eye quite sufficiently. The Doric anta-cap is very simple, and its abacus and other mouldings much narrower than those of the column-capital. If such were not the case, the mouldings under the abacus being square like that member, whose angles do not overhang them as they do the circular echinus, the whole would look exceedingly clumsy and coarse, and the capital be enormously wide in comparison with the anta itself; because that being no broader at bottom than above, such capital would extend very preposterously far beyond the line of the base.

Although more ornate than those of the Doric, Ionic antæ-caps differ still more than the others do from the capitals of their respective columns, inasmuch as they have nothing whatever answering to those exceedingly characteristic features, the volutes; nevertheless they are so strongly marked by the same style as to render it impossible to mistake them, or attribute them to any other order. Between the bases of the antæ and those of the columns there are very slight differences; the chief is that besides the upper torus being fluted like that to the base of the column, the under one is also enriched, but by reeding or convex mouldings. There is also an additional concave sweep moulding placed beneath the torus. It is further to be observed that antæ are never fluted, as is generally the case with Roman and Italian pilasters whenever the columns are so, and consequently a stronger distinction is kept up between the antæ and the columns; and in fact the plane faces of the former are very ill suited for such channelling, which would only produce monotony by so many parallel lines and hollows all casting the same shadow; and least of all is the Doric mode of fluting adapted to such purpose.

In the above sketch of this order we have merely pointed out in a general manner the leading characteristics, without taking notice of the very numerous varieties, since hardly any two examples are perfectly alike, and some are strikingly dissimilar from any other. One of the most remarkable is that of the internal order of the Temple of Apollo at Bassæ, near Phigaleia, in Arcadia. The base which is altogether different from the Attic one, is of great diameter compared with the shaft, which spreads down to it with a sudden sweep; hardly less peculiar is the style of the fluting, the channels being very broad and shallow, and the fillets very narrow, while the extremities of the channel are hardly curved at all, so that it seems but the first remove from Doric fluting. The capital is still more extraordinary, inasmuch as there are four voluted faces; at least there would be, if the columns were not attached to projecting piers. In order to effect this the faces are made concave, so that the volutes turn out towards the angles, and are placed at only half the usual distance from each other, so as to reduce still more the width of each face, else, as has already been remarked, the capital being square, it would be too bulky for the column. In its detail this capital is so plain that it looks very much like one of the earliest essays at a voluted capital; nor is it improbable that at first the design was to make such capitals perfectly square like the Doric abacus and to produce four uniform voluted faces.

Another unusual variety is that of an Ionic capital, met with by Mr. Inwood among some fragments on the banks of the Ilissus, near Athens, in which the eye of the volute is remarkably large, and carved into a rosette. He has given capitals of this sort to the columns in the portico of the church in Regent-square, London; and also very singular bases. As far as the columns alone go, that portico is exceedingly well worth notice. But the finest modern specimen of Athenian Ionic is the portico of St. Pancras' church, London (also by Mr. Inwood), an exquisitely finished copy of one of the most florid specimens of the order, that of the Erechtheion. On the lateral porches at the eastern end he has given an application of Caryatides or female columnar statues supporting an entablature [CARYATIDES], after the small building called the Pandrosium, attached to one angle of the Erechtheion. Other modern examples of the Ionic order in the metropolis are, the India House, which is more Asiatic Ionic than Athenian; the portico of Hanover Chapel, Regent-street, also Asiatic, being after the order of Minerva Polias at Priene, and which exhibits also the singularly formed Ionic base; the New Post-office; the University Club-house; the Law Institution, Chancery-lane; and particularly the portico of the College of Surgeons, Lincoln's-inn-fields, as lately perfected by Mr. Barry. This last mentioned is after the small temple on the Ilissus, so deservedly admired for the bold and graceful simplicity of its contours and proportions.

In regard to *intercolumniation*, or the distances at which columns are placed from each other, and upon which so much of their effect depends, it has already been mentioned that in the Doric order this is regulated by the triglyphs, and that monotriglyphic intercolumniation may be considered as the extreme of pycnostyle (thickly set), as it will sometimes occasion the columns to be less than a diameter and a half apart, the limits assigned to pycnostyle. But this of course depends upon the proportion which the metopes and triglyphs bear to the lower diameter of the columns. That such very close arrangement should be employed for the most solid of the orders, would almost appear an incongruity; yet it should be observed that in reality this arrangement is not so close as it appears to be when expressed by the proportion which the foot of the column bears to the intercolumn, because the shafts taper so much that what would be an inter-column of less than a diameter and a half below, would be two of the upper diameters, or more, above. The second mode is termed *systyle*, or two diameters apart; the third *eustyle*, or two and a quarter; the fourth *diastyle*, or three diameters; and, lastly, *aræostyle*, or four or more diameters. But the precise spaces thus laid down do not seem to have been adhered to; and the Greeks, who seem never to have worked according to fixed rules, although precise rules have been since laid down from their works, seem to have allowed themselves any intermediate interval from a diameter and a quarter to two diameters, which they rarely exceeded, except when particular circumstances required it, and when the columns themselves were so small, that had they not been more than two diameters apart, the intercolumns would have been inconveniently narrow. When the columns are pycnostyle or less than two diameters apart, they produce richness not only by their increased number in a given space, but also owing to their being forcibly relieved by the increased depth of shadow behind them.

Simple as are the plans of Grecian temples, there are many terms required to express their varieties in regard to the application of columns, besides those denoting the number of columns in front, that is, beneath the pediment. Thus, if there were columns only in front, the building was termed *prostyle;* if at each end, *amphiprostyle;* if there were also colonnades along the sides, it was said to be *peripteral*, that is, with wings (aisles) or colonnades quite round it. When there were two rows of columns, one behind the other, it was termed *dipteral.* Again, where a range of columns was placed between antæ, forming the extremities of walls at right angles with such colonnade, it was said to be *in antis.* This was generally the case with the pronaos, the vestibule or inner portico behind the columns in front. According to the number of columns in front, porticos are said to be *tetrastyle*, that is, with four columns; *hexastyle*, with six; *octastyle*, with eight; *decastyle*, with ten; and *dodecastyle*, with twelve, the greatest number that can very well be brought beneath a pediment; and even of these two last the examples are exceedingly rare. If instead of columns at the angles there were antæ, then the number of columns alone was reckoned as before, and would denominate what would be equivalent to a portico containing two more: thus a *distyle in antis, i. e.,* two columns between two antæ, would be equal to a tetrastyle, as in both there would be three intercolumns; a *tetrastyle in antis* would be equal to a hexastyle, and so on. By means of this simple mode of numerical notation, a couple of words suffice to explain in the concisest manner what even a long description may leave doubtful: for instance, when we say that a portico is hexastyle Ionic, we clearly specify the order, and the number of columns in front; and it is upon this latter circumstance that so much of particular character depends. By way of example, we instance the following structures: distyle in antis, the church in North Audley-street; tetrastyle, portico of Covent-garden theatre, and Hanover Chapel, Regent-street; tetrastyle in antis, Law Institution; hexastyle, the porticos of St. Martin's; St. George's, Hanover-square; ditto, Bloomsbury; St. Pancras; Post-office; College of Surgeons; Colosseum, Regent's-park, &c. Octastyle, portico of the National Gallery; and decastyle, that of the London University: of which two latter classes these are the only instances at present in the metropolis; unless we choose to reckon the centre of the south front of the Bank as an octastyle; yet although it is a range of eight columns, they are so very little advanced from the wall behind them, that they cannot be said to constitute a portico of any kind. This example might therefore not improperly be designated a pseudo-portico. In like manner the ranges of columns in the wings of the Bank might be distinguished as screen, or pseudo-colonnades.

With us the use of the term portico is technically restricted to a range of columns crowned by a pediment, and forming an outer vestibule at the chief entrance to a building. It is not however absolutely necessary that there should be a pediment in order to entitle them to such appellation: for instance, the portico of the College of Surgeons has no pediment. When the portico advances beyond the main body of the edifice it is described as prostyle, and may be further distinguished according as the projection is made by one or more intercolumns at its sides: thus we should say that the portico of Surgeons' College is hexastyle, Ionic, unpedimented, prostyle of one intercolumn (*i. e.*, is only one intercolumn in depth); St. Martin's Church, Corinthian, hexastyle, prostyle of two intercolumns. When the columns are in antis, the portico is inclosed, though not necessarily recessed; a distinction that should be attended to if we would avoid ambiguity. For instance, St. Paul's, Covent Garden, is inclosed at its sides, but not recessed within a general line of front extending on each side of it, as is the case with the portico of the India House; which, besides being recessed, may also be taken as an example of pseudoprostyle, inasmuch as the columns are advanced beyond the line of the rest of the front, but not so much as to constitute an intercolumn. A recessed portico is sometimes, by way of distinction, termed a loggia. We have instances also of porticos partly recessed, and partly prostyle, as that of the Post Office, which, besides advancing before the building, retires within it. Lastly may be mentioned the prostyle in antis, that is, a portico in antis enclosed at its sides, but attached and projecting from a larger mass of building, as the entrance to the Athenæum Club-house. Colonnade, on the contrary, is a general term for any range of columns. The term peristyle is often applied in the same sense, yet very inaccurately, since it denotes a colonnade continued quite round a building, as in the new Town Hall at Birmingham (at least columns are there continued along the two sides as well as the front), and the Bourse at Paris; we may also very properly speak of the peristyle of the dome of St. Paul's.

So far from employing pedestals to columns, which some have considered as forming as essential a part of an order as the entablature, the Greeks placed their columns immediately on the floor, or uppermost step; the whole temple being generally raised on a low platform, to which the ascent was usually by three deep steps, or gradini, serving as a base to the edifice; the depth of the steps was not accommodated to the human stature, but regulated so as to accord with the dimensions of the column. It is, therefore, conjectured that either a sloping platform of wood, or lesser steps of the same material, were employed as the real ascent to the temple. There are gradini of the above description to the portico of the Glyptotheca, at Munich, where a flight of steps is cut out of them, leading up to the centre intercolumn. The Greeks invariably placed their columns singly, never in pairs, as has frequently been done by modern architects, and which, if not utterly indefensible, ought never to be resorted to, unless required by positive necessity; for instance, where wider intercolumns than the scale of the order will properly admit, are required, in which case, by affording additional support to the entablature, coupled columns not only excuse the width of the intervals, but take away the air of poverty that would result from single columns placed at the same distance from each other. Coupled columns are most of all offensive when forming a prostyle colonnade, especially if it be one with a pediment, since that disposition approximates so closely to that of the front of an antient temple, as to render any incongruity the more striking. Were it, therefore, on this account alone, the portico of the new palace, St. James's Park, must be pronounced unsatisfactory: and we may remark that although it has eight columns in front, we did not cite it as an octastyle example, because the columns being in pairs, there are only three intercolumns; it may therefore be termed a double tetrastyle.

Of engaged columns, that is, columns half or three quarters of a circle in plan, and placed against a wall as if built into it, there are so very few instances in Grecian architecture, that they are to be considered merely as exceptions. One such authority for the use of half-columns occurs in the west front of the triple temple, or Erechtheion, at Athens. In the Italian, or Palladian school, they prevail almost to the exclusion of insulated columns. Yet not only is much of the effect of the columns themselves lost, but also that of light and shade. At present, columns are seldom attached, but left disengaged from the wall even when placed almost in contact with it. Attached columns have however been adopted in the Ionic hexastyle of the river front of the new Fishmongers' Hall, London, where, being surmounted by a pediment, they may be said to form a pseudo-portico. But if something like the authority of the Greeks themselves can be pleaded in support of engaged columns, it cannot be adduced as countenancing a barbarism to which that practice and the employment of wide intercolumns gave rise, namely, that of making a break in the entablature above every column, and thereby destroying the continuous horizontal line of that part of the order, and carrying the vertical ones up into it. Another practice, not observed in any extant Greek building,* is that of supercolumniation, or the placing one order upon another, sometimes even to the extent of three or more; the diameter of the columns decreasing, and of course the width of the intercolumns increasing as they ascend. Inigo Jones's building called the Banqueting-house, at Whitehall, affords an example of super-columniation, together with one of engaged columns and broken entablatures. There is also an instance of it in the New Palace, London, where a Corinthian order is placed above a spurious Grecian Doric, without triglyphs, or any division of architrave and frieze; there is still another in the recently erected Atlas Assurance Office, Cheapside.

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* The temple of Athena Alea, at Tegea, built about B.C. 383, by Scopas, had, in the interior, a Corinthian (*κόσμος Κορίνθιος*) imposed upon a Doric order. The exterior columns were Ionic. (Pausan., *Arcad.*, c. 45.) In this passage the word *κόσμος* (cosmus) corresponds to the modern word Order.

Although the name itself would seem to show the contrary, Grecian architecture affords no precedent for what is termed an Attic order, that is, a series of dwarf pilasters crowned by a cornice; and balustrades also are of modern invention. The only thing of the kind in ancient examples, and that of exceedingly rare occurrence, is a low and plain unbroken podium, or parapet, that is, without pilasters or other projections, above the cornice of a building. Far from attempting to conceal the roofs of their temples, the Greeks not only made them very conspicuous in the outline of the pediments, but bestowed much decoration on them, ornamenting the ridges and tiles, and placing a series of *antefixæ*, or enriched front tiles, above the cornice along the sides of the building. This species of embellishment has been adopted in the church of St. Pancras; which structure also affords beautiful and correct specimens of Grecian doors and windows. The latter, which are copied from those of the Temple of Minerva Polias, forming the western portion of the Erechtheion, are almost the sole extant type in Grecian architecture for such apertures. They are surrounded by a moulded architrave, and the jambs incline towards each other, so that the aperture of the window is somewhat narrower at the top than at bottom. This peculiarity may have arisen from the difficulty of procuring single stones for the lintel or upper architrave, wide enough to extend over an aperture equal to the sill of the window; yet it may also have been adopted entirely as a matter of taste, with the view of both producing a contrast between the sloping outline of the windows, and the vertical lines of the walls and antæ; and an accordance with the tapering form of the columns. What serves to countenance this last idea is, that we find the same principle observed here as in the column itself, namely, that of restoring at the summit what had been lost by diminution upwards; for as the capital spreads out as wide as the base of the column, so is the upper horizontal lintel made as wide as the sill of the window, by means of a break towards the top of the side architraves (technically called a knee), so that the architrave expands there to the width of the sill. These remarks may perhaps be thought to partake of a minuteness inconsistent with so brief a sketch as this, where many things generally noticed in similar articles are entirely passed over; yet although it is not professed here to teach much, we are anxious to teach that little well, and to lead the reader to examine and reason upon what he sees. By doing this at the outset of his studies, he will be far better prepared to pursue them with satisfaction, than he would be by having presented to him a dry statement of more numerous particulars, which would tend only to confuse, and may therefore very well be reserved until he shall have obtained such general insight into the subject as it is our object here to supply him with.

The doorways of Grecian temples were made lofty and spacious, not only for the sake of rendering them important architectural features, but also because the light was admitted into the cella, or interior fane, usually of small dimensions compared with the general structure, through the entrance. Almost the only instance of windows in such structures is that above mentioned, and consequently the interior was imperfectly lighted, unless the temple itself was of the kind denominated hypæthral, that is, exposed to the sky (as was the Parthenon), the centre portion being left unroofed, with merely a covered colonnade, or portico around it, above whose columns were others forming a smaller order; for, as such inner peristyle consisted of columns less in diameter and height than those of the exterior one, the additional tier was necessary to fill up the greater altitude occasioned by the slope of the external roof above them. Like the windows, Grecian doorways were sometimes narrower at top than at bottom, and were embellished conformably to the character of the building. One of the most elegant specimens is that of the division of the Erechtheion, called the Temple of Minerva Polias, copied in the central doorway of St. Pancras. Besides the architrave around the aperture, there is an outer border decorated with circular ornaments termed pateræ; and the whole is crowned by a beautiful corona and highly enriched cymatium, forming together a cornice supported on consoles (scroll-like brackets).

There was never more than one doorway within the portico, or pronaos, of a temple; of course, unaccompanied by windows, which, in such a situation, should be carefully avoided. If there is more than a single large aperture behind the columns, it produces not only confusion, but a crowded appearance on a surface where breadth and repose are especially requisite. How superior the effect is of a single doorway within a portico, or at most a principal doorway and a smaller one on each side of it, must be felt by every one who compares the porticos of the London University, the Post Office, St. Pancras Church, and the Colosseum, with those of St. Martin's, the College of Physicians, the Law Institution, and, indeed, almost every other.

Though the small structure at Athens, called the Choragic Monument of Lysicrates (copied in the belfry of St. Philip's Chapel, Regent Street), furnishes one of the most exquisitely designed examples of the Corinthian or foliaged-capital order that have been preserved to us, it is almost a solitary extant instance of the application of it by the Greeks; unless we choose to reckon as such the capitals of the small columns supposed to be those of the porch of the Tower of the Winds, and which have merely a single row of leaves at bottom. It is true that some magnificent edifices belonging to this order, such as the Temple of Jupiter Olympius at Athens, were erected in Greece; but they belong to a later period, after the order had been extensively employed by the Romans, who, whether its originators or not, brought it to perfection as a distinct style; for although various single capitals ornamented with foliage have been discovered among Grecian remains, they are as dissimilar from the Corinthian style as are the degenerate imitations of such capitals which occur in Lombardic and Norman architecture. That the Romans, with whose taste for magnificence this florid species of capital well accorded, succeeded in establishing a style comprehending many varieties of it, expressive of different degrees of character up to the most luxuriant richness, is evident from the examples they have left, almost every one of which is distinguished by some peculiarity, although they all agree in certain leading points. The average height of the column is ten diameters; yet the capitals and bases being proportionably deeper, the shaft itself is not much more than eight diameters. The capital is composed of two rows of leaves (generally those termed acanthus), those of the upper row springing up from between the lower ones. There are eight leaves in each row, so arranged that one of the upper ones accords with the centre of each side of the abacus; and from the sides of this centre-leaf spring out other leaves, whence emerge the helices or spirals, placed diagonally to support the extremities of the abacus, besides lesser spirals which meet, and sometimes intertwine each other above each middle leaf. The abacus itself, which is peculiar to this order, may be described as square in its general plan, but having its sides made somewhat concave, so as to curve out towards the angles, yet not overhang the body of the capital. Thus not only is extent given without heaviness, but a most pleasing contrast is produced between the convex surface of the column and the concave sides of the abacus. The angular helices were sometimes so enlarged as to assume the form of Ionic volutes placed diagonally. This kind of capital is termed Composite, and has been reckoned to constitute a distinct order, yet very improperly, since it does not affect the general character and proportions of the whole ordinance; and if a specific name is to be assigned to each variety, which is to entitle it to be considered a class by itself, we shall have almost as many orders as there are antient examples. Even the circumstance of the shaft being fluted or plain, which occasions a more obvious dissimilarity than that observable between the Corinthian and Composite capitals, ought to occasion a formal distinction.

The Corinthian entablature differs little from that of the Ionic, except in the cornice being made richer and deeper, and the number of its members increased, in order to harmonize with the deeper capital of the columns. One of the features peculiar to it is the series of modillions or small brackets supporting the corona, besides which there are frequently dentils also; sometimes again both are omitted, although there is much ornament in other respects. Indeed, the examples of this order vary so much, not in their cornices alone, but numerous other particulars, that we cannot refer to them here, and shall therefore mention only the three principal ones, viz., the Corinthian of the Pantheon at Rome, of Jupiter Stator and the Temple at Tivoli. The first of these has been copied in the portico of St. Martin's, which, with its elevated pediment and wide intercolumns, conveys sufficient idea of the Roman style as contrasted with that of the Greeks, which is shown in the adjacent portico of the National Gallery. The second, which is one of the very richest specimens known to us, may be seen in the 'Board of Trade,' at the corner of Downing Street, London; and the third, which is an exceedingly remarkable variety, is that employed in the Bank of England, where it was first introduced. Since then it has been employed by different architects, as in the new building of St. Paul's School; and what is called the Kemble Tavern, at the north end of Bow Street: in both which instances it is fully enriched according to the original.

The Roman Doric and Ionic, of which there are but few examples extant, are both so decidedly inferior to their Grecian originals, that they may well be termed depravations of them. Such as they are, however, they have been adopted and systematized by the Italians, who have limited difference of character almost entirely to difference of ornament, there being very little distinction between them in regard to the form of the column, and the relative proportion between that and the entablature. Compared with the Grecian, the Roman or Italian Doric looks attenuated; the capital is reduced in bulk, and its ovalo is but an insignificant substitute for the Greek echinus. The character and proportions of the entablature are as much altered as those of the column, and the cornice made considerably lighter, a shallow corona being substituted for the Greek one, and additional mouldings introduced beneath it. The Ionic has been equally deteriorated by the Romans and their Italian followers; especially in the capital, the volutes of which are exceedingly small, and not only insignificant in size, but harsh and devoid of grace, harmony, and variety, in their forms. Scamozzi and many other modern architects have placed the volutes diagonally, after the manner of the angular volute in the extreme columns of a portico; but the contours themselves are so inelegant, that the effect is very different in one case from what it is in the other. Modern architects have, again, very frequently employed for this order a convex or pulvinated frieze, as it is called, which has no propriety, and little more of beauty to recommend it: an instance of such frieze, as well of the Italian Ionic generally, and its defects above noticed, occurs in the Banqueting House, Whitehall, a work once extolled as a chef-d'œuvre of architecture, but now regarded rather as a curiosity.

Of what is called the Tuscan order, there are no authentic examples to enable us to decide what it really was; but as laid down by writers of the Italian architectural schools, it is no more than a simpler variety of the Doric, with unfluted columns, and without triglyphs. The absence of the latter distinguishes, not very favourably, the entablature of the lower order in the New Buckingham Palace; consequently, if any distinction is to be made at all, that example may as justly be termed Tuscan as Doric. The portico of St. Paul's, Covent Garden, professes to be Tuscan, and answers very well to the idea of not only a plainer, but a more rude and unpolished Doric, not otherwise distinct from that style than as being less mature and complete. Or, if the degree of dissimilarity observable between the two justifies the distinction claimed for the Tuscan, or untriglyphed Doric, we ought in consistency to invent some specific appellation for the Italian voluted order with a pulvinated frieze, which bears no more than a nominal affinity to that of the Erechtheion.

If the Romans deteriorated the two Greek orders, and brought to perfection a third, of which we meet with little more than the rudiments (as contained in foliaged capitals) among Grecian remains, they likewise, by their extensive application of the arch, materially altered the system of building, and obtained greater variety, though generally at the expense of consistency. Columns frequently became no more than ornaments attached to the face of piers which support arches; while the introduction of successive tiers of arches led to the practice of *supercolumniation* (or placing order over order). The arch, again, was employed, not merely to cover apertures in walls, but was used continuously between two walls, so as to form a vaulted ceiling, whether groined or semicircular. If the area to be so covered was large and of square proportions, the walls and vault were then made circular in plan, whereby the latter became a dome. Whether the Romans invented or borrowed the arch is a point we have not room to examine, and one which, even if it could be settled beyond all doubt, would be only barren information; but it is certain that the use of it enabled them to erect works on a larger scale, and that too chiefly with brick; and it likewise led to the adoption of circular forms in plans, combined with square ones, thereby giving rise to a variety and complexity in which Greek structures are utterly deficient.

The arch, if at all decorated, springs from a kind or capital crowning the piers, termed impost mouldings; and its archivolt or external facing is fashioned like that of the architrave of the order itself, if there be any. The vertex of the arch has usually a projecting key-stone, which is frequently in the form of a large console supporting the horizontal architrave resting upon, and is so far to be considered as performing the office of a column. Instead of piers, columns alone are sometimes employed, the arch springing either immediately from their capitals, or from a square block made to resemble a detached piece of entablature (as in the interior of St. Martin's, and many of Wren's churches); which latter mode is of the two by far the more objectionable, because, in addition to the incongruity of turning arches upon columns, it renders the misapplication more evident by showing in a mutilated and disconnected form what should be the proper horizontal portion of the order. Besides which, whatever is thus placed between the spring of the arch and the column is necessarily so much taken from the height of the latter, and operates again disadvantageously by reducing the diameter of the columns, and widening the space between them.

Roman domes were generally hemispherical, and made to appear much less than that externally; whereas the Italians and other moderns have not only affected greater loftiness of contour, but have usually elevated the whole dome upon a circular basis termed its tambour, sometimes of greater altitude than the dome itself. The tambour of that of St. Paul's consists of a Corinthian peristyle, surmounted by a balustrade, besides which there is a lofty attic with windows.

In themselves both the dome and arch are beautiful features, and if discreetly and tastefully applied, do not at all contravene with the character of Greek architecture, unless that style is to be confined to the mere temple form, instead of being extended by what it is to be presumed the Greeks themselves would have availed themselves of had they been acquainted with them. The exceedingly beautiful dome of the London University proves that such feature may be made to harmonize with a pure Greek style. In regard to the arch, it is certainly inapplicable to mere doorways and windows: and the two tiers of arches behind the columns greatly impair the effect of the Bourse at Paris; yet where unusually spacious openings are required, it may be applied so as to be at once beautiful and appropriate.

In adopting the Roman orders, the Italians reduced them to strict mechanical rules, making a merit of adhering to one invariable set of proportions for each; yet this has not prevented them from innovating without scruple. Notwithstanding, too, their professed abhorrence of the caprices and anomalies of the Gothic style, they have frequently indulged in fancies the most grotesque, such as curvilinear, broken or twisted pediments, clustered pilasters, broken entablatures, lofty pedestals, columns with square blocks on their shafts, &c., together with much tasteless ornament so applied as either to be insignificant or to produce only confusion. As a sample of such vitiated taste, we may refer to Gibbs's Church in the Strand, near Somerset House, and also to Temple Bar. Somerset House itself, on the contrary, exhibits some of the best features of the Italian style, tolerably free from its alloy; nor can it be denied that where a number of windows are required, that they necessarily characterize the composition full as much as anything else. The Italian style has much to recommend it, if, while we reject its solecisms and vices, we not merely adopt what is good in it, but improve its detail from the best Greek and Roman sources. What it is capable of effecting without employing any of the orders, is shown by the Travellers' Club House, Pall-Mall, which is stamped by a simple and unpretending elegance, far preferable to many bald and insipid imitations of Greek architecture, where the resemblance extends no farther than to the columns. Having thus far explained the scheme of columnar architecture as originally practised by the Greeks, and afterwards successively altered by the Romans and modern Italians, we must leave the reader who is desirous of fuller information, to consult such works as those of Stuart, and the edition of Chambers, by Gwilt. The two small volumes on Pompeii in the Library of Entertaining Knowledge will also supply much information relative to the public and private architecture of the antients; and there is much also, both artistical and practical, in Loudon's 'Encyclopædia of Architecture.' We have not attempted to give any sketch of the history of the art, and for that reason we have not even mentioned Gothic architecture, which is reserved for a separate article. For representations and other details of the orders, the reader is referred to COLUMN, and other terms are explained as they occur in alphabetical order.

CIVIL LAW. This term is used in different senses. The Romans understood by the expression, 'jus civile,' the law, 'quod quisque populus sibi constituit.' Therefore in this Roman sense civil law may be defined to be the law of any particular nation or state. In place of this original and proper signification of the term, the expression 'municipal law' has very inappropriately been used by some English writers; and civil law, in a more restrained sense, now signifies the law of the antient Romans. [ROMAN LAW.] The term Civil law (the French *droit civil*, the German *Civil-Recht*) is still used, particularly in Germany and France, in another and limited sense, to denote the law given by the competent power of the state for regulating the mutual rights and obligations of the citizens or subjects as private persons; hence the expression 'Civil Code' (*code civil*), and among the Germans, *civil*, or *bürgerliches Gesetzbuch*. [CODIFICATION.] German lawyers therefore say that civil law is a part of private law (*privat-recht*). In this sense civil law is opposed to other branches of law, as for example, to criminal law, ecclesiastical law, &c.

CIVIL LIST, as the words imply, was formerly the name given to the list of all the expenses of the civil government of the country, or of all the heads of public expenditure, excepting those of the army, the navy, and the other military departments. Originally in this country all the expenses of the government, the military expenses not excepted, were comprehended in one general list, and defrayed out of what was called the royal revenue. For a considerable period after the Conquest the royal revenue was derived from the rents of the crown-lands, and from other sources which were at the command of the crown through the exercise of the prerogative. Both the collection and the expenditure of the whole were under the uncontrolled management of the king. Even when at a later period the greater portion of the expenses of the government came to be granted by parliament in the form of supplies, the entire expenditure was still left with the crown, the supplies being either voted for no specific purpose, or when it was otherwise, no responsibility as to the application of them being enforced.

This state of things continued to the Restoration. A distinction was then made between the military expenses of the government, or those occasioned by the wars in which the country might be involved, and which were considered of the nature of extraordinary expenses, and those incurred in the maintenance of the ordinary establishments of the country. The revenues appropriated to the latter were called the hereditary or civil-list revenues, and were provided for partly from the crown lands that remained unalienated, and partly from certain taxes imposed by parliament expressly for that purpose during the life of the reigning king. The civil list thus obtained amounted, during the reign of William III., on an average of years, to the annual sum of about 680,000*l.* Out of this sum were paid the expenses of the royal household, of the privy purse, of the maintenance and repairs of the royal palaces, the salaries of the lord-chancellor, of the judges, of the great officers of state, and of the ambassadors at foreign courts; the incomes of the members of the royal family, and many other pensions, the secret service money, and a long list of other claims. The interest of the national debt however was never defrayed from the sum allotted for the civil list. In the reign of Queen Anne the civil list remained of nearly the same amount as in that of King William, the principal taxes appropriated to it being an excise of 2*s.* 6*d.* on the barrel of beer, which produced about 286,000*l.* per annum, a tonnage and poundage duty which produced about 257,000*l.*, and the profits of the post-office, from which about 100,000*l.* was derived. At the commencement of the reign of George I., 700,000*l.* a year was voted by parliament for the civil list, and certain taxes, as usual, were appropriated to that branch of the public expenditure. The same duties were, on the accession of George II., continued for that reign, it being provided that if they did not produce 800,000*l.* per annum, the deficiency should be made up by parliament, and that any surplus beyond that sum should be retained by the crown. At the accession of George III. the sum of 800,000*l.* was again voted by parliament for the civil list, but no particular taxes were set apart to provide that revenue. In the course of a few years however a large amount of debt had accumulated in this department, and to pay it off, two sums amounting together to considerably above 1,000,000*l.* were voted by parliament in 1769 and 1777. In the latter year also the civil-list revenue was permanently raised to 900,000*l.* This however did not prevent further deficiencies, which were again made good by parliament in 1784 and 1786, to the extent of about 270,000*l.* In 1780 Mr. Burke brought in his bill for the better regulation of the civil list, which, although it was greatly mutilated before it passed into a law (in 1782), abolished several useless offices, and effected some reduction of expenditure. According to the report of a committee of the House of Commons which sat upon the subject of the civil list in 1802, the total average annual expenditure in that branch since 1786 had been 1,000,167*l.*, under the following heads:—royal family in all its branches, 209,988*l.*; great officers of state, 33,279*l.*; foreign ministers, 80,526*l.*; tradesmen's bills, 174,697*l.*; menial servants of the household, 92,424*l.*; pensions, 114,817*l.*; salaries to various officers, 76,013*l.*; commissioners of the treasury, 14,455*l.*; occasional payments, 203,964*l.* At this time another sum of above 990,000*l.* was voted by parliament to pay the debts on the civil list; and in 1804 the civil-list revenue was raised to 960,000*l.* In 1812 it was further augmented to 1,080,000*l.*; besides which, annuities to the amount of 260,000*l.* were then paid to the different branches of the royal family out of the consolidated fund. Another committee of the House of Commons inquired into the subject of the civil list in 1815, and it was upon the report made by this committee that the amount of the civil list was settled, on the accession of George IV., at 850,000*l.* per annum, 255,000*l.* of annual charge being at the same time transferred from this branch to other funds. It was calculated that the distribution of this sum would be under the following heads. 1. His Majesty's privy purse, 60,000*l.* 2. Allowances to the lord-chancellor, judges, and speaker of the House of Commons, 32,956*l.* 3. Salaries, &c., of his Majesty's ambassadors and other ministers, salaries to consuls, and pensions to retired ambassadors and ministers, 226,950*l.* 4. Expenses, except salaries, of his Majesty's household in the departments of the lord steward, lord chamberlain, master of the horse, master of the robes, and surveyor-general of works, 209,000*l.* 5. Salaries in the above departments, 140,700*l.* 6. Pensions limited by Act 22 Geo. III., c. 82, 95,000*l.* 7. Salaries to certain officers of state, and various other allowances, 41,306*l.* 8. Salaries to the commissioners of the treasury and chancellor of the exchequer, 13,822*l.* 9. Occasional payments not comprised in any of the aforesaid classes, 26,000*l.* The crown was left besides in the enjoyment of the hereditary revenues in Scotland, amounting to about 110,000*l.* per annum; and also of a civil list for Ireland, of 207,000*l.* On the 15th of November, 1830, immediately after the accession of his present Majesty, William IV., Sir Henry Parnell carried in the House of Commons a motion for appointing a select committee to inquire into the civil list. The chief object proposed was the separation of the proper expenses of the crown from all those other charges which still continued to be mixed up with them under that title. The consequence of the success of this motion (besides the overthrow of the Wellington administration and the introduction of the Reform Bill) was another report, upon which was founded the Act 1 Will. IV., c. 25, by which the present civil list was settled. The committee having recommended that the civil-list charges should be confined to expenses proper for the maintenance of their Majesties' household, it is enacted that the sum of 510,000*l.* be granted to his Majesty, under the following classes. 1. For their Majesties' privy purse, 110,000*l.* 2. Salaries of his Majesty's household, 130,300*l.* 3. Expenses of his Majesty's household, 171,500*l.* 4. Special and secret service, 23,200*l.* 5. Pensions, 75,000*l.* The Irish separate civil list is also discontinued; and it is ordered that the Scotch hereditary revenues, as well as the droits of admiralty, and the 4½ per cent. duties, shall be paid into the exchequer for the use of the public. His Majesty also retains the revenues of the duchies of Lancaster and Cornwall, which are considered to be the hereditary revenues, not of the crown, but of the dukedoms of Lancaster and of Cornwall; the former of which is permanently annexed to the crown, and the latter belongs to the crown when there is no Prince of Wales. No account of the amount of these revenues has ever been laid before Parliament; but it is understood not to be considerable. In his speech on the Economical Reform in 1780, Mr. Burke said, 'Every one of those principalities has the appearance of a kingdom, for the jurisdiction over a few private estates; and the formality and charge of the Exchequer of Great Britain, for collecting the rents of a country squire. Cornwall is the best of them; but when you compare the charge with the receipt, you will find that it furnishes no exception to the general rule. The Duchy and County Palatine of Lancaster do not yield, as I have reason to believe, on an average of twenty years, 4000*l.* a year clear, to the crown. As to Wales, and the county palatine of Chester, I have my doubts whether their productive exchequer yields any returns at all.' 'There is no real reduction in this arrangement,' says Sir Henry Parnell ('on Financial Reform,' 4th edit., p. 205), 'below the grant to his late Majesty; for whatever appears to be a reduction, has been produced by a transfer of charge from one head to another of the old civil list. The chief difference in this arrangement from the former consists in the transfer of about 460,000*l.* a year from the civil-list to the consolidated fund, and in providing for the gradual reduction of the pensions to 75,000*l.* a year.' It is evident from this account, that what is now called the civil-list has no proper claim to that title. (See Sir John Sinclair's *History of the Revenue;* Colquhoun's *Wealth, &c. of the British Empire;* Sir H. Parnell on *Financial Reform;* and *Reports of Committees of the House of Commons in* 1802, 1803, 1804, 1808, 1812, 1813, 1815, 1819, and 1831.)

CIVILIZATION. The majority of mankind pay an habitual veneration to words, and this species of adoration is not exempt from fanaticism. It would not be difficult to find men who would willingly suffer any privations and tortures, and even death, for the sake of certain words. If you tell them (what indeed few people seem to comprehend) that words are but signs which give consistency and permanence to our ideas, and if you ask them what the ideas are which these words of such frequent occurrence in their conversation or writings are designed to express, you may be convinced that the art of speaking with propriety is, as it has been well remarked, inseparable from the art of thinking correctly, and that it is almost always for want of attaching the same ideas to the same words that men misunderstand each other, dispute, and sometimes come to blows.

The words civilization, education, and religion, with a multitude of others, are among those expressions which are so often used without any clear, definite, or precise ideas being attached to them; yet there are no words that require to be more thoroughly analyzed.

The meaning of a word is often formed by degrees, and in connexion with facts and observation. As soon as a particular fact presents itself to our notice which appears to have a specific relation to a known term, it becomes immediately incorporated with it; and hence the meaning of every term gradually extends itself, and finally embraces all the various facts and ideas which seem properly to belong to it. On this account, there is more depth as well as correctness and accuracy in the usual and ordinary meaning of complex terms than in any definitions which can be given of them, notwithstanding the latter may appear at first sight to be more strict and precise. In the majority of instances scientific definitions are much too narrow, and owing to this circumstance they are in reality frequently less exact than the popular meaning which is given to terms; it is therefore in its popular and ordinary signification that we must seek for the various ideas that are included in the term Civilization.

Now, the first fact which this word seems to carry with it (and many proofs of it could easily be given) is that of a progressive movement, of a gradual development, and a tendency to amelioration or perfection. It always suggests the idea of a community which is advancing, not in disorder or without design, rule, or guide, but cautiously, methodically, and with distinct and clear views of the objects which it seeks to attain; progress, continual improvement, advancement towards perfection (although the latter is obviously unattainable by man), is therefore the fundamental idea contained in our notion of the term Civilization.

Then as to this progress, improvement, and gradual advancement, to what do they apply? The very etymology of the word answers the question in the clearest and most satisfactory manner. From this we learn that it does not contemplate the actual number, power, or wealth of a people, but their *civil* condition, their social relations, and intercourse with each other. Such then is the first impression which arises in our mind when we pronounce the word *Civilization*. It seems to represent to us at once the greatest activity and the best possible organization of society; so as to be productive of a continual increase, and of a more equable distribution of its wealth and power among its members, whereby their absolute and relative condition is kept in a state of constant improvement.

But is this all? Does this explanation exhaust the entire and full meaning of the word? Does it contain nothing beyond this? It is as though we were to ask whether the human race were no more than a vast ant-hill, a community bent upon nothing but mere order and the supply of its physical wants; and where, in proportion as the labours were great and the results of them fairly apportioned, the desired end was fully accomplished.

Now great as is the influence which a well-planned organization of civil society must necessarily have upon the happiness of the human race, the term Civilization seems to convey something still more extensive, more full and complete, and of a more elevated and dignified character, than the mere perfection of the social relations, as a matter of order and arrangement. In this other aspect of the word it embraces the development of the intellectual and moral faculties of man, of his feelings, his propensities, his natural capacities, his tastes, and his ideas.

But here we touch upon the question of education, which is the very soul of civilization, which is talked of and lauded by all, though in reality understood by few.

Education, which is the result of a well-ordered social arrangement, and also its perfector and conservator, an education which shall give to every member of the community the best opportunities for developing the whole of his faculties, is the end which civilization, or a society in a state of continued progress, must always have in view. But this subject requires a separate and a much more extensive investigation.

The fundamental ideas, then, contained in the word Civilization are—the continual advancement of the society in wealth and prosperity, and the improvement of the man in his individual capacity.

When the one proceeds without the other, it is immediately felt that there is something incomplete and wanting. The mere increase of national wealth, unaccompanied by a corresponding knowledge and intelligence on the part of the people, seems to be a state of things premature as to its existence, uncertain in its duration, and insecure as to its stability. We are unacquainted with the causes of its origin, the principles to which it can be traced, and what hopes we may form of its continuance. We wish to persuade ourselves that this prosperity will not be limited to a few generations, or to a particular people or country, but that it will gradually spread, and finally become the inheritance of all the people of the earth. And yet what rational expectation can we entertain of such a state of things becoming universal? It is only by means of education, conducted upon right principles, that we can ever hope to see true national prosperity attained, and rendered permanent. The development of the moral and intellectual faculties must go hand in hand with the cultivation of the industrious arts; united, they form the great engine for civilizing the world.

In fact, without the union of these two elements, civilization would stop half way; mere external advantages are liable to be lost or abused without the aid of those more refined and exalted studies which tend to improve the mind, and call forth the feelings and affections of the heart. In a word, civilization consists in the progressive improvement of the society considered as a whole, and of all the individual members of which it is composed.

CI'VITA, an Italian appellation derived from the Latin civitas, 'a town,' forms part of the name of several Italian towns, such as Civita Castellana, a town in the province of Viterbo, near Rome, with a citadel and a bishop's see, and 1800 inhabitants; also Civita Ducale and Civita di Penne in the Abruzzo, &c. There are several places called Civitella or little town, the most known of which is Civitella on the Tronto, a fortified place on the frontiers of Abruzzo, towards the papal province of the Marches. There is also Cividal (a corruption of Cività) in the Friuli.

CI'VITA VE'CCHIA, a town and sea-port in the Papal State, in the Delegazione, or province of Viterbo. Its harbour is formed by two piers of marble blocks first raised by Trajan, who had a country residence here called Centum Cellæ, and afterwards restored under the popes. At the entrance between the extremities of the two piers is a small island or breakwater formed of large pieces of rock thrown into the sea, under the reign of the same emperor. Pliny the younger (*Epist.* 31) describes the manner in which the breakwater and the piers were made. There is from 14 to 18 feet depth of water in the harbour, which is the only safe one on the south coast of the Papal State, and is frequented by about 1000 vessels of various sizes, most of them coasting vessels, in the course of the year. There is a lazzaretto for ships coming from infected countries. There are also docks and a prison for galley-slaves. The lighthouse and the citadel were built by Michel Angelo. The present town of Civita Vecchia was built by Pope Leo IV., and is regularly fortified. The streets are regular and the houses well built. The town has a cleanly and bustling appearance. The air, although not very good in summer, is not altogether unwholesome, but the country around is subject to the malaria, and has a desolate appearance like the rest of the lowlands on this coast. The population of Civita Vecchia is about 8000 (Calindri, *Saggio Statistico*). It has a military governor, and is subject in civil matters to the delegate residing at Viterbo. Civita Vecchia is 36 miles north-west of Rome.

CLACKMANNAN, a very small county in the eastern part of Scotland; bounded on the south by the river Forth, on the north and west by Perthshire, and on the east by Perthshire and Fifeshire. Its greatest length from N.W. to S.E. is about nine miles, and its width from N.E. to S.W. about eight miles. The area is 48 square miles, or 30,720 acres, which is divided into four parishes. The surface in the southern part, adjacent to the Forth, consists of level alluvial tracts, which are very productive in corn, and contain good pastures. Towards the northern extremity the land rises gradually into the Ochill Hills, which traverse the county from S.W. to N.E., and furnish some pasturage for sheep. The woodlands cover about 500 acres, and at least 2000 acres are laid out in plantations. Agriculture is in a state of continual improvement; lime manure and thrashing machines are used on almost every farm. The highlands in the N.E. of the county yield an abundant supply of several valuable minerals. The annual produce of coal is about 130,000 tons. There are also quarries of freestone, granite, and iron-stone which contains from 20 to 30 per cent. of iron. Silver, lead, copper, cobalt, antimony, arsenic, agates, pebbles, and topazes, have been found, but not in sufficient quantities to defray the expense of working. Several excellent roads intersect the county, and there are numerous creeks along the Forth which are used by the fishermen. The chief harbours are those of the two principal towns of the county, Alloa and Clackmannan. The population in 1831 was 14,729. Clackmannan and Kinross together send one member to the House of Commons.

CLA'DIUS, a genus of Hymenopterous insects of the family Tenthredinidæ. Technical characters:—Antennæ about the same length as the body, ciliated beneath, and nine-jointed; the two basal joints short, the third joint with a protuberance beneath at the base, and a branch thrown out from the upper side at the apex; the fourth and fifth have likewise the last-mentioned process; and in the sixth and seventh it is rudimentary. In the female all these processes are wanting, excepting the one on the underside of the third joint. Wings with one marginal and three sub-marginal cells; tarsi simple.

Cladius difformis, when the wings are expanded, measures in width about one third of an inch: it is black, with the tibiæ and tarsi pale yellow. This species may be considered the type of the genus, it inhabits this country, but is not common.

CLADOBATES. [Tupaia.]

CLAGENFURTH, a circle in the eastern division of the Austrian duchy of Carinthia (formerly Lower Carinthia), and in the north-east part of the kingdom of Illyria, is bounded on the north and east by Styria, and contains about 1500 square miles, 9 towns, 14 market-towns, 1616 villages, and 27,000 houses. Although very mountainous, and traversed by the Alps both in the interior and along the frontiers, its valleys are extremely fertile, and produce corn, fruits, and flax. The declivities of the mountains are clothed with rich woods. There are above 732,121 yochs (about 488,000 acres) of arable land. The Drave in its course through this circle receives the Glan, Gurk, Lavant, Fella, Wiesbach, and many smaller mountain streams. The largest lake is the Wörth, or Lake of Clagenfurth, which is about ten miles in length, and supplies the canal leading to the chief town, Clagenfurth. The principal mountains of the southern chain are the high Loibel (4300 feet) and the Great Predl of the northern chains, the Eisenhut, and the Gruftkogel. The air is pure and salubrious, but in the mountaineus districts Cretins, or as they are here called Fexes, are frequently met with. Minerals are very abundant, especially silver, lead, and iron. According to an average return of ten years, the annual produce of silver is 155 marks; lead, 982 cwt.; litharge, 165 cwt.; iron, 9730 tons; alum, 339 cwt.; quicksilver, 33,600 lbs. (according to others as much as 168,000 lbs.) Next to agriculture, mining and smelting are the most important resources of the inhabitants; there are in this circle 1 silver, 1 copper, 3 lead, 4 iron mines, 2 quarries of marble, and 2 coal-pits, besides numerous smelting houses, &c. The population in 1813 was 162,759: at present it amounts to about 180,000 inhabitants.

CLAGENFURTH (in Carinthian, Zelany), the capital of the duchy of Carinthia, in the circle of Clagenfurth, is situated on the river Glan, in an extensive plain, bounded on the south by the snow-topped mountains of Carinthia, and at an elevation of 1554 feet above the sea. It is the residence of the bishop of Gurk, and the seat of the court of appeal for the province of Laibach. Its modern name has been sometimes derived from Claudia or Claudisorum, from the emperor Claudius—hence Cladenfort, then Clagenfort, and subsequently its present designation. The town was the property of the crown till 1518, when the emperor, Maximilian I., gave it to the state of Carinthia for the purpose of erecting a fortress for the defence of the country. Soon afterwards the canal from the lake Wörth, or lake of Clagenfurth, to the town (nearly three miles in length) was opened at the expense of the citizens, and the fortifications extended as the town was enlarged—especially after the great conflagrations in 1535, 1723, and 1796, to which the town is indebted for its present fine and regular appearance. The ramparts, gates, and ditches were levelled in 1809. It is in the form of a square, and is adorned with many handsome public buildings, the palaces of Princes Rosenberg and Porçia, and of the prince bishop of Gurk; which last contains fine collections of paintings, minerals, &c. There are five public squares, three of which are embellished with monuments—one a statue in lead of Maria Theresa, and an obelisk erected by the bishop of Gurk in honour of the Emperor Francis I., on occasion of the peace of Presburg. The other buildings of note are the Burg and the house of assembly, the law courts, the lycæum and library, a gymnasium, and one theatre. There is also an Ursuline convent, a normal school, an agricultural society, two hospitals, infirmaries, a lunatic asylum, a house of industry, a workhouse, and house of correction. Of the seven churches in the town, the civic church is remarkable for its fine bold tower, the gallery of which commands an extensive prospect over the town and its picturesque environs. The population is about 9300; many of whom are engaged in manufactures, particularly fine woollens, silks, and white lead. There is also a considerable transit trade. 46° 36′ N. lat., 14° 20′ E. long. In the vicinity are the baths of St. Leonhard, 3540 feet above the sea, at the foot of the chain which separates the circle of Clagenfurth from that of Villach: they are cold, and excite an appetite.

CLAIRAUT, ALEXIS CLAUDE (sometimes spelt Clairault; we have taken the spelling from the title of his own works), was born at Paris, May 7, 1713. His father, John Baptist Clairaut, was a teacher of mathematics. The early proficiency of the son in mathematics is better attested than in any other similar case, by the actual appearance of his celebrated treatise on Curves of Double Curvature, in 1731, when he was eighteen years of age, accompanied by the usual official recommendations, which prove that it was ready for the press two years before: it is said to have been begun when he was only thirteen years old. He read the Conic Sections of De L'Hôpital, and also the 'Infiniments Petits' of the same author, when he was only ten years old; a fact which we should have forborn to state, had it not been for the evidence contained in the treatise just cited, and in this fact, of public notoriety, that at the age of twelve years he presented a memoir on some remarkable curves to the Academy of Sciences, and removed all doubts as to its authorship by his personal explanations.

In 1731, being then under the legal age, Clairaut was admitted into the Academy of Sciences. He formed an intimate acquaintance with Maupertuis, and commenced at this period his researches on the figure of the earth. In 1735 he accompanied Maupertuis, Camus, Lemonnier, &c., in their expedition to Lapland, for the purpose of measuring a degree of the meridian. (See the articles connected with the Figure of the Earth.) This measure has frequently been considered as of little value: it must however be remarked, that such an opinion has been formed on the strength of discrepancies which were sufficiently apparent to the measurers themselves, and which caused them to review all their operations; as also, that circumstances connected with local attractions are fully sufficient to explain the whole difficulty. The work of Clairaut on the Figure of the Earth appeared in 1743, and was reprinted in 1808. It contains the remarkable discovery which is usually called Clairaut's Theorem. Considering the earth as an elliptic spheroid, it should seem that the variation of gravity on the surface would depend upon the law of density of the interior strata. But Clairaut showed that this variation is altogether independent of the law of density, and may be deduced from a knowledge of the form of the exterior surface. In this theorem, the second and higher powers of the eccentricity are rejected. Mr. Airy (in an early volume of the 'Cambridge Transactions') has shown that it remains true when the higher powers are taken into account.

In 1750 Clairaut gained the prize of the Petersburg Academy for his paper on the Theory of the Moon. It is more essential for us here to state the position which he occupies among the successors of Newton, than to enter into details which are better suited to other articles. Newton had left one prominent point of the lunar theory altogether unexplained by his theory of gravitation, namely, the motion of the lunar apogee, of which, though able to assign a sufficient reason for the phenomenon of progression, he was not able to deduce more than half the quantity of the phenomenon. Clairaut at first concluded that the law of gravitation was incompletely expressed; but further consideration, and more extensive application of analysis, showed that the whole motion was a necessary consequence of the Newtonian supposition of mutual attraction. In two points of view, therefore, as the first who applied what is now called the modern analysis to the problem of the lunar motion, and as the first who added an unexplained phenomenon to the theory which Newton had left, Clairaut stands in a conspicuous position.

Clairaut was the first who applied the Newtonian theory to the motion of comets, in reference to the perturbation of their motions by the attraction of the planets. In 1757 astronomers began to expect the fulfilment of Halley's prediction relative to the comet whose appearance has now once more excited public curiosity. Lalande proposed to Clairaut to undertake the actual computation of the quantity of Jupiter's action on the comet during a revolution, and offered his assistance in the drudgery of the work. For the manner in which this enormous labour was executed the reader may consult the article 'Halley's Comet,' in the 'Companion to the Almanac for 1835.' The result was that Clairaut's prediction came very near the truth; the return of the comet was at first placed in November, 1758; in that month Clairaut predicted that it would arrive at its nearest point to the sun about April 13, 1759, stating that he might possibly be wrong by a month. The observed perihelion of the comet was on the 13th of March. The error would have been considerably less if the existence of Uranus, and a more correct value of the mass of Saturn, had been known.

The figure of the earth, the theory of the moon, and Halley's comet, are the three prominent points on which the fame of Clairaut rests. We might mention his work on Geometry, drawn up, it is said, for the use of Madame du Chastellet: his Elements of Algebra, remarkable at the time for the abandonment of the dogmatical form in which it was customary to write elementary works; and many papers in the Memoirs of the Academy, containing several remarkable discoveries in pure mathematics. But we shall pass on to some notice of his career in connexion with that of D'Alembert. These two great men were rivals in their scientific labours, and though their disputes never passed the bounds of courtesy, the life of each, with respect to the other, was either armed truce or open war. The characters of the two were essentially opposite: Clairaut was a man of the world, of high polish, and who took great care never to offend the self-love of any one: D'Alembert was blunt and rude, though essentially well-meaning and kind; if we may use such a colloquial phrase, he 'stood no nonsense;' *j'aime mieux être incivil qu'ennuyé* was his avowed maxim. Clairaut was always in the world, desirous to shine, and to unite the man of fashion with the philosopher, of all which D'Alembert was the reverse. The attacks usually came from the latter, confined entirely to the writings of his opponent: and he was frequently right, being a thinker of a more safe and cautious order than Clairaut, who was more than once too hasty. For instance, when Clairaut took the whole revolution of Halley's comet, or more than fifty years, as the unit of which the error committed by him should be considered as a fraction, D'Alembert asserted that the magnitude of the latter should be compared, in the estimation of precision, with the difference between two successive revolutions, or about a year and a half. Later analysts, and Laplace in particular, have considered that D'Alembert was right. The preceding comparison is drawn from Bossut (*Hist. des Math.*), who was the personal friend and the decided eulogist of both. He adds that the polished character of Clairaut procured him an *existence* and a consideration in the great world which talent alone would not have sufficed to gain; and more than insinuates that dissipation destroyed his constitution. However this may be, Clairaut died at Paris, May 17, 1765, at the age of fifty-two. He was never married: his father (who survived him a short time) had a very numerous family, of whom only one daughter survived. (See the Eloge in the Memoirs of the Academy; the Life, by Lacroix, in the *Biog. Univ.;* and the work of Bossut, above cited.)

The works of Clairaut, independently of Memoirs presented to the Academy, are—1. 'Recherches sur les Courbes à double Courbure;' Paris, 1731. 2. 'Elémens de Géométrie;' Paris, 1741; and various editions up to 1765. 3. 'La Figure de la Terre déterminée' &c. (Account of the Lapland Measure, by Maupertuis, Clairaut, &c.); Paris, 1738; in Latin, by Zeller; Leipzig, 1742. 4. 'La Théorie de la Figure de la Terre;' Paris, 1743; again in 1808. 5. 'Elémens d'Algèbre;' Paris, 1746; again in 1760 ('très estimée,' Lacroix); again in 1797 and 1801 (marked sixth edition), by Garnier, with a Preliminary Treatise on Arithmetic. 6. 'Théorie de la Lune;' St. Petersburg, 1752, (prize essay) second edition, 1765. 7. 'Tables de la Lune,' &c.; Paris, 1754, republished with (6.) in 1765. 8. 'Théorie du Mouvement des Comètes;' Paris, 1760; the account of the great process relative to Halley's comet. D'Alembert wrote against this in the 'Journ. Encycl.,' February, 1761; Clairaut replied in the 'Journ. des Sav.,' June, 1761. 9. 'Recherches sur la Comète,' &c., St. Petersburg, 1762, (Supplement to 8). 10. 'Explication des Principaux Phénomènes, &c.;' compiled by Madame du Chastellet from Clairaut's instructions, and printed at the end of her translation of Newton; Paris, 1759. [CHASTELLET, MADAME DU.]

CLAIRVAUX, a small town in France, in the department of Aube, and on the left bank of the river Aube. It is surrounded by woods and mountains, which were once the property of the Cistertian abbey, one of the most antient and renowned of that order. This abbey was founded, A.D. 1115, by a detachment of the religious of the abbey of Cîteaux, the chief establishment of the order, under St. Bernard. The possessions of the abbey, which comprehended the wild and once uncultivated valley of Absinthe, in which it was situated, were originally due to the liberality of Hugues, count of Troyes, the first benefactor of the establishment. They were augmented by others to such an extent, that at the time of St. Bernard's death (A.D. 1153) the abbey of

Clairvaux contained five hundred monks, or, according to other statements, seven hundred. In the middle of the last century there were only about fifty or sixty monks, twenty lay brethren, and forty servants, or thereabouts. The abbey had depending upon it, previous to the French revolution, eighteen regular abbeys of men and twenty-eight of women, and forty-one abbeys held in commendam, all in France; besides forty abbeys, whether of monks or nuns, in foreign countries. The revenue of the monastery was 90,000 livres, or about 3750*l.* The church was deemed a chef-d'œuvre, and there was a gallery with some good paintings. The abbey is now used as a house of correction, in which 2000 prisoners are employed in the manufacture of different stuffs. A famous tun, 'the tun of St. Bernard,' said to contain eight hundred tons of wine, is still preserved.

Glass and paper are made in the town of Clairvaux, beer is brewed, and iron is wrought. (Expilly; Reichard; *Dictionnaire Universel de la France.*)

CLAKIS. [Bernicle Goose.]

CLAMECY, or CLAMENCY, a town in France, in the department of Nièvre, at the junction of the Beuvron with the Yonne, 110 miles S.S.E. of Paris in a direct line, in 47° 27′ N. lat., and 3° 30′ E. long. The population of Clamecy amounted in 1832 to 4926 for the town itself, or 5539 for the whole commune. Considerable trade is carried on, and the town is considered wealthy in proportion to its size. Earthenware and woollen cloth are the chief manufactures; to which we may add leather, paper, and gloves. The woollens are manufactured of the wool grown in the neighbourhood, mingled with that of Bourgogne. The surrounding country is fertile in grain and pasturage. Clamecy is the place from which the Yonne is employed for floating timber down to Paris; the navigation does not commence till near Auxerre, which is many miles lower down the stream.

Clamecy is the capital of an arrondissement, which contained, in 1832, 70,381 inhabitants.

CLAN, in Gaelic *Clann*, which is said to signify children or descendants. The word has been long adopted as English. Milton says,

> '.They around the flag
> Of each his faction, in their several clans,' &c.
> *Par. Lost*, ii. 901.

The clans of the Highlands of Scotland are families, or rather tribes, all the members of which bear the same surname, and are supposed to be descended from a common ancestor, of whom the chief of the clan is the lineal representative. 'Being divided,' says Camden, speaking of the Scotch Highlanders, 'into families, which they call clans, what with plundering and murdering, they commit such barbarous outrages, that their savage cruelty hath made the law necessary which enacts, that if one of any clan hath committed a trespass the rest shall repair the damage, or whoever of them is taken shall suffer death.' Some clans however are divided into several branches, each of which has its particular surname. According to Colonel Stewart, in his 'Sketches of the Character, Manners, and Present State of the Highlanders of Scotland' (2 vols. 8vo. Edinb. 1822), p. 24, this surname, peculiar to the branch, is called the *bun sloine*, that is, the genealogical surname, being derived from the Christian name or other designation of the ancestor of the branch. It is the name generally used in common conversation; but every Highlander in writing his signature, and also for the most part when he has to mention another person in writing, uses the name which is common to the whole clan. Most of the Highland noblemen and gentlemen have designations peculiar to them as chiefs of their clans, which in their own country no feudal titles or distinctions, however exalted, are allowed to efface. 'Besides his ordinary name and surname,' says Sir Walter Scott (note to *Lady of the Lake*, canto ii.), 'which were chiefly used in the intercourse with the lowlands, every Highland chief had an epithet expressive of his patriarchal dignity as head of the clan, and which was common to all his predecessors and successors, as Pharaoh to the kings of Egypt, or Arsaces to those of Parthia. This name was usually a patronymic, expressive of his descent from the founder of the family. Thus the duke of Argyle is called Mac Callum More, or the *Son of Colin the Great*. Sometimes however it is derived from armorial distinctions, or the memory of some great feat: thus Lord Seaforth, as chief of the Mackenzies, or Clan-Kennet, bears the epithet of Caber-Fae, or *Buck's-Head*, as representative of Colin Fitzgerald, founder of the family, who saved the Scottish king when endangered by a stag.'

Although the chieftainship of the clan now descends regularly from father to son or other heir male, there can be little doubt that in antient times the custom of tanistry prevailed among the Scottish Highlanders, as it did down to a comparatively recent date among the Irish. [Brehon Laws, p. 383.]

The common prefix of the Scottish patronymics of clans, as every body knows, is *Mac*, that of the Irish *O'*—both signifying son, or at least descendant. But many Irish names also begin with Mac, and some with the synonymous Norman Fitz, the same word with the modern French *Fils* and the *vitz* or *witz* used as an affix in the same sense by the Russians. Several of the Scottish clans however have surnames in which the common prefix does not appear—as, for instance, the Stewarts, the Gordons, the Robertsons, the Camerons, the Campbells, the Chisholms. Several of these are generally understood not to be of Celtic descent. Indeed the tribes inhabiting the southern borders of Scotland, whose connexion with and dependence upon their chiefs used to be nearly the same with what prevailed in the Highlands (see the *Introduction to Scott' Minstrelsy of the Scottish Border)*, are often also familiarly spoken of as clans. Scott, in the battle canto of Marmion, says,

> 'Against them come,
> Of gallant Gordons many a one,
> And many a stubborn Badenoch man,
> And many a rugged Border clan,
> With Huntley and with Home.'

And the old Scottish statutes, passed in the sixteenth century for regulating the Borders, speak of 'clans having captains and chieftains, whom on they depend, oft-times against the wills of their landlords.' 'Of course,' says Scott, referring to acts passed in 1574 and 1587, 'these laws looked less to the feudal superior than to the chieftain of the name, for the restraint of the disorderly tribes; and it is repeatedly enacted, that the head of the clan should be first called upon to deliver those of his sept who should commit any trespass, and that on his failure to do so he should be liable to the injured party in full redress.' (*Introduction to Border Minstrelsy.*)

According to Colonel Stewart (*Sketches*, &c., vol. i.), the Gaelic clans of Scotland occupy the counties of Sutherland, Caithness, Ross, Inverness, Cromarty, Nairn, Argyle, Bute, and the Hebrides, with part of Moray, Banff, Stirling, Perth, Dumbarton, Aberdeen, and Angus. He has given a map of Scotland, in which the locality of each clan is marked; and in the second and third sections of his work he describes and examines the system of clanship and its consequences. In his second volume, Appendix Q is on the Distinctive Patronymics of the Clans. In Robert Patten's 'History of the Rebellion of 1715' (3rd edit. 8vo. Lond. 1745), pp. 191—199, is given 'A List of the most considerable Chiefs in Scotland, and the number of men they can raise, with an account of their disposition for or against the government,' which includes the clans. 'Note,' says Patten, 'that all the chiefs in Scotland are chiefs of clans, properly so speaking, whether noblemen or gentlemen; but commonly the last only are called the clans, and particularly those of them who live in the north and west Highlands and Isles.' Patten's list may be compared with a 'Memorial on the Military Strength of the Clans,' which Colonel Stewart has printed in his Appendix C, and which he conceives to have been drawn up a short time before the rebellion of 1745 by President Forbes. Bishop Nicolson has printed in his 'Scottish Historical Library' from Bell's MS. 'Introduction to the History of Cumberland,' a catalogue of the chiefs and clans of what was called the west border of the south of Scotland, that in 1547 submitted and gave pledges to Lord Wharton, who had overrun the country, that they would serve the king of England, with the number of followers they could command annexed to the name of each. It has been transferred by Scott to a note on his 'Introduction to the Border Minstrelsy,' along with a list of the east border chiefs who did homage the same year to the duke of Somerset, from William Patten's Diary of the duke's expedition, originally printed in 1548, and reprinted in Dalyell's 'Fragments of Scottish History.'

In Chambers's 'Popular Rhymes of Scotland' (12mo., Edinb. 1826, pp. 246—256) may be found a collection, which the writer, however, admits to be very meagre and defective, of the slogans, or war-cries, of various clans both of the Highlands and the Borders. On this subject see also Colonel Stewart's Appendix D. In Mr. Chambers's curious volume (pp. 197—246) are collected and illustrated the characteristic epithets proverbially applied to many of the clans and other Scottish families; such as the Gay Gordons, the Greedy Campbells, the Dirty Dalrymples, the Gallant Grahams, the Light Lindsays, the Manly Morisons, the Haughty Hamiltons, the Sturdy Armstrongs, the Saucy Scots, the Gentle Johnsons, the Lucky Duffs, the Setons Tall and Proud, the Wild Macraws, the Handsome Hays, the Trusty Boyds, the Muckle-mow'd Murrays, &c.

No complete history of the Scottish Clans, as far as we are aware, has been compiled. But there are several histories of particular clans, both printed and manuscript. The second part of William Buchanan of Auchmar's 'History of the Antient Surname of Buchanan' (12mo., Glasgow, 1793) consists of a 'Brief Enquiry into the Genealogy and Present State of Ancient Scottish Surnames,' and contains the legendary or traditional history of most of the principal clans. There is also a work entitled 'Antiquity of the Macs, Clans, and Bodotria,' by the Reverend John Lane Buchanan, A.M., missionary minister to the Isles from the church of Scotland, of which we have not been able to find a copy. In a newly established periodical publication, entitled 'Transactions of the Iona Club,' 8vo., Edinb., 1834, &c., consisting of 'Collectanea de Rebus Albanicis,' there is printed (vol. i., pp. 50—63), with a translation and notes, a Gaelic account of the genealogies of the Highland clans, from a MS. which appears to have been written about the year 1440. In his concluding note the editor observes, 'It would occupy too much space here to enter into any detail of the very important effects which this MS. must produce upon the question of the origin of the Highland clans; it will be sufficient to state that it seems to establish three very remarkable facts:—1. The existence at a very early period of a tradition in the Highlands of the common origin of all the Highland clans;—2. The comparatively late invention of many of the traditionary origins of the different clans at present believed;—and 3. The natural relationship of various clans which have hitherto been supposed to be altogether unconnected.'

The system of clanship as it still subsists in the Highlands of Scotland, making allowance for the modifications it has received from the feudalism, in respect to the tenure of property superinduced upon its original purely patriarchal character, is essentially the same state of society that has always prevailed among the wandering Arabs and Tartars of the East. Gibbon's description of the social condition of the Tartars, or, as he calls them, Scythian hordes, in his 26th chapter, would, in great part, suit the state of things in the Highlands, at least as it remained down to the rebellion of 1745. Since that attempt, and the measures which the government was induced to take in consequence of it, the old spirit of clanship has considerably declined.

CLAPPERTON, HUGH, was born in 1788, at Annan, in Dumfriesshire, N.B., where his father was settled as a surgeon and country practitioner. After receiving the rudiments of a plain education, with some instruction in mathematics, he went to sea at the age of thirteen, being bound apprentice in a merchant-ship that sailed between Liverpool and America. After making several voyages he was impressed and sent on board a man-of-war as a common seaman. Fortunately Clapperton had an uncle, a captain of marines, through whose interest with the naval commanders then in commission in the Mediterranean, he was put on the quarter-deck and made a midshipman. In this capacity he gave splendid proofs both of fortitude and courage. In 1814 he went to Upper Canada, and some time after his arrival he was promoted to the rank of lieutenant, and appointed to the command of a schooner belonging to the British flotilla on the lakes. In 1817, this flotilla having been dismantled, Lieutenant Clapperton returned home on half-pay. He amused himself in his native district with shooting and fishing, until 1820, when he removed to Edinburgh and became acquainted with the late Dr. Oudney, whose mind was absorbed by the subject of African discovery. In 1823 he was employed by Lord Bathurst, in conjunction with Dr. Oudney and the late Major Denham, to make a journey to Timbuctoo, in central Africa. The doctor died at an early stage of the journey in January, 1824. Proceeding south from Tripoli, on the Mediterranean, by Musfeia, and by Zangalia, on the east of the great lake Tchad, Clapperton, after great sufferings, reached Saccatoo, where he was obliged to turn back. He and Denham determined the positions of the kingdoms of Mandara, Bournou, and Houssa, and of their chief towns, but they were not able to ascertain the course and termination of the Niger—the main object of the expedition. From their experience they gave rather a favourable notion of the civilization and hospitality of some of the nations in the interior of Africa, who had been previously set down as ferocious savages. Their description of lake Tchad, with the huge hippopotami in it, and the elephants and other wild animals on its shores, is exceedingly interesting. On the 22d June, 1825, soon after his return to England, Clapperton was raised to the rank of commander, and engaged almost immediately to start afresh on the same perilous journey. His companions were Captain Pearce, R.N., Mr. Dickson, and Dr. Morrison, a navy surgeon and naturalist; the party was attended by Richard Lander, Dawson, and two or three other servants. This time Clapperton penetrated into Africa from the coast of the Atlantic. The party landed in the Bight of Benin on the 28th of November, 1825, and proceeded inland from Badagry, December 7; but they had scarcely moved from the shore when they were attacked by the usual maladies of the country. Dawson died at Tshow, not far from Badagry, and Captain Pearce soon after, at Engwâ. Dr. Morrison, who had returned towards the coast, expired at Jannah. The survivors, meeting with great kindness and hospitality from the natives, reached Katunga, the capital of Yariba, on the 15th of January, 1826. They proceeded to the great commercial city of Kano, and thence, bearing to the west, went to Saccatoo, which Clapperton had reached from the side of the Mediterranean on his former journey. [AFRICA.] Here Bello, the king or chief of the country, detained his old acquaintance on account of wars carrying on, and (it is said) at the jealous suggestions of the Dey of Tripoli, who represented the English as aiming at the possession of all Africa. Clapperton's vigorous constitution gave way under the effects of the climate and privation, and he died of dysentery on the 13th of April, 1827, at Chungary, a village four miles from Saccatoo.

(*Narrative of Travels and Discoveries in Northern and Central Africa in the years* 1822, 1823, 1824, by Major Denham, Commander Clapperton, and the late Dr. Oudney, 4to., Lond., 1826.—*Journal of a Second Expedition into the Interior of Africa*, &c., by the late Commander Clapperton. 4to., Lond. 1829. To this volume a Memoir of his Life is prefixed.—*Records of Captain Clapperton's Last Expedition to Africa*, by Richard Lander, his faithful servant, and only surviving member of the Expedition. 2 vols., small 8vo., Lond. 1830.)

CLARE, a maritime county of the province of Munster, in Ireland: bounded on the north by the county of Galway, on the east and south by the Shannon, which separates it from the counties of Tipperary, Limerick, and Kerry; and on the west by the Atlantic Ocean. The greatest length, from Loop Head on the south-west to the Galway boundary on the north-east, is 67½ miles; greatest breadth, from Black Head on the north-west to Bunratty on the south-east, is 38½ miles. The area is estimated by Beaufort at 1195 English square miles, or 765,042 statute acres.* Gross population, in 1821, 208,089; do. in 1831, 258,322.

The surface of this county is extremely irregular. The high lands occupy about 150 square miles, included between the Shannon on the east and the Galway boundary on the north. Here the Slieve Baughta mountains attain an elevation of from 2000 to 2500 feet. This group stretches into the adjoining county, and contains three principal connected lakes: Loch Teroig, on the boundary of Clare and Galway; Loch Graney, farther south in the centre of the group; and Loch O'Grady, between Loch Graney and that expansion of the Shannon called Loch Derg in the east, into which the waters of the district discharge themselves by the Scariff river at the village and creek of the same name. Southward from the Slieve Baughta group extends a mountainous tract of less elevation, which runs with little interruption from Scariff on the north to Bunratty on the south, where the waters of Loch Breedy, Loch Doon, Loch Cloonlea, and several other lakes, lying along the western border of the range, discharge themselves by the Ougarnee river into the Shannon. The chief drain of the eastern part of this district is the Blackwater, which falls into the Shannon a little above Limerick. West of these groups, and occupying the central district of Clare, there is a comparatively level country stretching north and south, the waters of which, collected from Lochs Inchiquin, Tedane, Inchicronane, Dromore, Ballyally, and several others, unite about the centre of the county and form the Fergus, a fine navigable river, which, augmented by the Clareen at Ennis, the county town, flows due south by Clare, and, after forming a large æstuary with numerous islands and excellent anchorages, unites with the Shannon about eight miles west of Bunratty. The junction of these rivers forms a very noble expanse of water. The remainder of the county, from Loch Buneah in the north to Clanderalangh in the south, and thence westward to the ocean, is occupied by high lands, the waters from which flow chiefly into the Atlantic by the Dunbeg and Ennistymond rivers. Of these heights the principal is Callan mountain, rising westward from Ennis, over Milltown, a small but flourishing coast town situated about midway on the western line of sea coast. Clare has a much greater extent of coast line than any other county in Ireland. From Scariff, on the Shannon, to Curranrue, on Galway bay, the whole length of coast line is 230 English miles, of which about 140 lie along the Shannon, and 80 on the coast of the Atlantic. This coast, from Black Head on the north to Loop Head on the south, a direct line of nearly 60 English miles, has only two harbours, and these not capable of sheltering vessels of more than 50 to 100 tons. With the exception of the small bays or fishing stations of Kilkea, Dunbeg, Milltown and Liscanor, the whole coast is iron-bound. The Reverend James Kenny, in his statistical account of the union of Kilmanaheen, states that the cliff on which the signal tower of Moher is erected was found by measurement to be 909 feet high, and that the rock somewhat to the eastward proved upon the same measurement to be 1009 feet high. The cliffs average 100 feet in height, and in some places, as at Baltard and Moher, present a face of rock of 500, and even, it is said, of 1000 feet, against which, during a gale, the waves of the Atlantic beat with astonishing fury. Numerous islands and detached stacks of rock mark the devastating effects of these storms, which have disconnected them from the main land. During a storm from the Atlantic the waves have been driven from the bay to the top of the cliff at Kilkea, a height of more than 100 feet, and, rushing down the green fields which back the precipice, have fallen into the little river at the inland foot of the hill. (*Two Months at Kilkea, &c.* Dublin, 1836.)* Where there is a beach, as at Moore Bay and Dunbeg, the swell causes a constant surf. As boats built in the usual manner could not live in such a sea, the people of the coast employ a sort of canoe, formed of tarred canvass spread on a wicker frame, called a *corragh*, similar to the rude vessel used by the antient Britons. In these they frequently go 50 or 100 miles out to sea, and venture with little danger among rocks and shoals where any vessel less pliable would go to pieces. A rent in the canvass is repaired by drying the edges and applying a fresh piece of cloth, spread with hot pitch, to the outside. From the dangerous character of the coast some derive the appellation of Malbay, by which the indentation extending from Dunbeg to Liscanor is known.

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* This estimate is uncertain until the completion of the Ordnance Survey of Ireland.

The shore of the Shannon, commencing from Loop Head, has numerous creeks, which might be rendered useful either as asylum harbours or stations of trade; but at present there is no security for vessels of heavy tonnage in hard weather nearer to Loop Head than the anchorages of the Fergus. At Carrigaholt, a small village immediately under Loop, is a fishing pier, and at Kilrush, a very prosperous place, about half way between Carrigaholt and the Fergus, is a pier with a quay on a good scale, and every facility for the construction of an excellent harbour; but, until the pier is carried farther forward towards a neighbouring island, so as to screen shipping from the southerly winds, the roadstead cannot be counted secure. 'I will here observe,' says Captain Mudge, in his report (1831-2), 'that this part of the Shanon is exposed to the whole ocean swell; the sea, which sets in such a continuance of southerly or westerly winds, baffles all description, especially when accompanied by the "rollers," a periodical visitation; at such times the swell will break in 12 and 13 fathoms water, or wherever there may happen to be any foul ground.' Eastward from Kilrush the Shannon, which at its entrance is ten English miles in width, begins to contract; but after sweeping in a comparatively narrow and very deep channel round the peninsula of Clanderaulagh, between which and the shore of Limerick is the race of Tarbert, it expands again to a width of several miles at its confluence with the Fergus, about ten miles farther inland. The entrance of the Fergus lies between Innismurry island on the west, and Rinana point on the east. The æstuary is here five miles wide. Towards the western side it is encumbered by islands, of which there are eight considerable ones covering about four square miles. These islands are surrounded with weed and sandbanks, and contract the ship channel to a breadth of about three-quarters of a mile. The channel is safe for vessels drawing sixteen feet of water: and on the mud banks at either side a ship may at all times ground with safety. The tide here seldom runs more than 2½ miles per hour. In the channel there are good anchorages in from three to six fathoms water. The existing dangers and drawbacks are so trifling that a very small expenditure of money would render the Fergus, from its junction with the Shannon to the bridge of Clare, one of the safest and best navigations in Ireland. From the Shannon to Clare the river is called the Lower Fergus, and from Clare to Ennis the Upper Fergus. The Upper is a deep and quiet piece of water, more like a large canal than a river. It is separated from the Lower Fergus by a ledge of rock on which the butments of the bridge of Clare are built. This natural dam keeps the upper part of the river constantly full and navigable to Ennis, the county town, three miles distant. The least water in any part of the Upper Fergus during summer is 13 to 14 feet, and generally 18 to 25, and the average width of the river 150 feet. By connecting the navigations of these two natural canals, Ennis would be brought into an easy and cheap communication with Limerick, and the immense expense hitherto incurred by the farmers of Clare in transporting their goods overland to a market would be most materially reduced. It is affirmed that an outlay of 400*l.* to 500*l.* would give the merchants of Ennis the means of avoiding 12*s.* 6*d.* per ton carriage on grain which they now export from Limerick. So great was the expense of land carriage in this district, in 1830, that coals, burned in Limerick at 22*s.* per ton, cost in Ennis 35*s.*, while all the iron brought overland to this, the assize town of a large county, incurred the enormous charge of 8*d.* per hundred for carriage alone. The subject of the navigation of the Fergus has however been taken up with great spirit by many of the influential resident gentry, and a final report is now in course of being made on this branch as well as on all the other branches of the navigation of the Shannon by commissioners appointed by Government. Eight miles east from Rinana point is the Ougarnee, up which the tide flows to Six-mile Bridge, but the vicinity of Limerick renders its navigable capabilities of little importance. One suburb of Limerick lies in the county of Clare, as well as the chief lines of canal by which the navigation of the Shannon is continued from that city to Killaloe. The whole of the shore of Loch Derg from Killaloe to Scariff might be rendered available for stations of commerce; but the present trade on the Shannon, although latterly much increased, is not yet sufficiently extensive to bring these capabilities into use. It has been proposed to cut a canal from Scariff by Loch Graney through the valleys of the Slieve Baughta mountains and the flat country beyond to the bay of Galway, and also from Poolanisherry bay, near Kilrush, through the flat tract of bog that extends northward to Dunbeg on the Atlantic, so as to give access to the Shannon to vessels embayed in Malbay, without doubling the dangerous promontory of Loop Head; but no attempt has yet been made to carry either scheme into effect.

The roads of this county are perhaps worse than in any other county of Ireland, which is chiefly attributable to the corrupt system under which the grand jury assessments were formerly applied. The evils of this system are now removed by the appointment of a county surveyor, who superintends the application of the public money, and without whose sanction no presentment can be levied. Considerable sums have latterly been advanced by the Commissioners of Public Works for the construction of roads and bridges in this county; the sums advanced being repaid by instalments presented by the Grand Jury.

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* 'Some faint idea may be formed of the force with which the waves of the sea are impelled by western storms, when it is known that cubes of limestone rock, 10 or 12 feet in diameter, are thrown upon ledges of rock several feet high near Doolen; and at the same place may be seen a barrier of water-worn stones, some of them many tons in weight, thrown up above 20 feet high across a small bay, into which fishermen used to land from their boats, and where their former quay, surrounded with huts, remains many yards from the sea: this has occurred within the memory of many living at present.' (Dutton's *Survey of Clare.* Dublin, 1808.)

The climate is remarkably healthy. Instances of longevity are very frequent. In 1821 there were in the single barony of Bunratty eight individuals, four males and four females, each upwards of 100 years of age. The county is in general much exposed, particularly to violent gales from the Atlantic. Frost and snow seldom continue long. In the sheltered portions of the eastern district, the climate is moist and very mild. Myrtles, both broad and narrow-leafed, have been known to attain a height of upwards of eighteen feet in the open air at Bunratty.

With regard to the geology of Clare, no map exhibiting more than the limits of the limestone district has yet appeared. The Slieve Baughta mountains consist of a nucleus of clay-slate, supporting flanks of sandstone, intruded through a break in the surrounding limestone plain, in the same manner as the Slieve Bloom range on the opposite bank of the Shannon. The limestone, which insulates this mountainous district, spreads westward over the more level basin of the Fergus, and rises into very rugged elevations towards the Galway boundary on the north-west. Beyond the basin of the Fergus commences an extensive clay-slate and trap formation, which stretches westward from the limestone field to the waters of the Atlantic, to which it presents those precipitous escarpments of the coast-line. The whole of this coast abounds in phenomena of the greatest interest, but hitherto they have not been described.

Beds of ironstone and several strata of coal occur upon Mount Callan; a seam of coal, three feet thick, appears in the face of the rock a little above high-water mark over Liscanor Bay, near Ennistymond; and again, near Mutton Island, both inland and on the shore of Malbay; another seam appears in the bed of a river near Carrigaholt, as also at Fieragh Bay, Lemaduff, and Longhill Ferry. Iron ore is found at several places, and in considerable quantities on the Malbay coast, on the banks of the Ardsallas, a feeder of the Fergus flowing from the east, on the shore of Liscanor Bay adjacent to the coal tract, between Corrofin and Ennis in the centre of the county, and in several other places. Rich lead ore abounds in the limestone district, particularly in the mountainous parts of the barony of Birren in the north of the county. Copper pyrites is plentiful in the same barony. Manganese is found at Ennistymond, Carrigaholt, Cross, and other places on the sea-coast. Chalybeate waters abound in the district westward from the sources of the Fergus. Very fine black marble has been raised at Craggliath, near Ennis; it takes a high polish, and is free from spots. On the shore of Loch Graney is found a hard crystalline sand, much used for scythe boards, which are greatly superior to those brought from England. The coast from Kilrush to Carrigaholt abounds with excellent slate and flag quarries. There are also quarries of flag of a good quality at Ennistymond. The Broadford slates from this county have long been celebrated, and are considered nearly equal to the best Welsh; an inferior article is obtained from the slate quarries at Killaloe.

The characters of the different soils correspond to the characteristic geological division. In the schistose and trachyte districts the soil is cold and moory; in the calcareous region warm and friable, though light; on the borders of the different tracts, especially of the slaty and calcareous, deep and loamy. The extent of poor soil is much greater than that of even middling quality; but in some districts there are detached spots of very remarkable richness. These are usually situated along the banks of the large rivers, and are liable to periodical inundations. They are called coraghs or corcasses, a word nearly synonymous with the English provincial term bottoms. Six tons of prime hay are frequently produced from the Irish acre on these rich levels, and eight tons per acre have been occasionally mowed. The substratum is either a black or a blue alluvial clay, resting on limestone gravel: the black corcass is preferred for tillage, as being drier; the blue for meadow and pasture. They lie chiefly along the Shannon and Fergus from Limerick westward, in some places extending inland to a considerable distance. They are computed at about 20,000 acres in all. One tract of uncommon richness, called Tradree, or the King's Land, is said to have been the private patrimony of the famous Brian Boroimh. The rent of corcasses varies from 3 to 7½ guineas per Irish acre. Another species of rich grazing land of frequent occurrence here as well as in Galway, is the turlogh, or periodical lake, an accumulation of water either forced upward by subterranean channels, or formed by surface-waters which have no outlet. These floods lie in the turlogh during the winter, and leave it prepared for the most abundant vegetation in the spring. In one of these turloghs, 48 Irish acres in extent, near Kilfenora, on the north-western boundary of the limestone district, the proprietor has fattened in one year 42 large oxen and 44 sheep, besides grazing 17 horses and a number of swine; and in the following year has sold off it, in fine condition, 100 two-year old bullocks, and 16 or 17 horses. The whole of this calcareous tract abounds with subterraneous communications through which the water passes from lake to lake, as at the sources of the Fergus, or rises to the surface and forms temporary pools and turloghs. The barony of Burrin, which comprises the north-western portion of the limestone field of Clare, is perhaps the most remarkable district in Ireland. Here the bare limestone rock rises to the surface in all directions, so as to give the whole district the appearance of being covered with a white cement. The country is everywhere very rugged and hilly, and the worst supplied with water of any in Ireland. In an area of twenty English miles by ten, there is but one stream running to the sea, and that has a course of barely eight miles. Another rivulet near it disappears under the crust of limestone after a course of three miles. The only supply of water in the interior is by turloghs. One of these at Kilcorney, a place remote from any river, is fed by a periodical stream issuing each winter from a cave in the vicinity. In the last century this curious cave attracted the attention of Dr. Lucas, who has given an interesting account of it in the 'Philosophical Transactions' for January, 1740, No. 456, p. 360. Notwithstanding its sterile appearance, this county is far from being unproductive. In the crevices of the limestone rock sprouts a very sweet and nutritious grass, particularly well suited for fattening sheep. Yarrow, white clover, trefoil, cinquefoil, virga aurea, juniper, and yew, grow spontaneously and in abundance, although in patches. Some portions of the grazing land set for 3*l.* per Irish acre; and on a few farms store bullocks are fattened for the Limerick and Cork markets. In general however the land is set for very low rents, and by the bulk; and is almost solely devoted to the grazing of sheep, as this stock does not require a copious supply of water like black cattle. The prime sheep-walks here are estimated at above 10,000 acres: some of the rocky pastures are however so poor that it is said four acres will not feed a sheep. The supply of fuel is equally scanty, there being little or no bog; yet from the numerous remains of castles in all parts of the barony, it is evident that it must have been thickly inhabited during its possession by the old Irish. The present inhabitants of the coast procure their supply of turf in boats from the opposite shores of Galway. In all other parts of the county there is abundance of fuel, particularly towards the south-west, where a tract of bog, containing 14,950 Irish, or about 24,000 English acres, extends from the Shannon at Kilrush to the shores of the Atlantic at Moore Bay and Dunbeg. Large quantities of turf are annually exported from the Kilrush side to Limerick. This is the tract through which it was proposed to cut a canal. It is estimated to be reclaimable at an expense of 31,728*l.* There is no limestone in this part of the county, but an inexhaustible supply of sea-sand can be had at Dunbeg. Notwithstanding these inducements to reclaim the portion of this great tract not necessary for purposes of turbary, it still remains an unprofitable waste. The bog of Douragh, eastward from the Fergus, affords the principal supply of turbary to Ennis and Clare. The turf is ricked on the banks of the Upper Fergus, and thence boated to market. Although the county is at present very bare of trees, the bogs abound in timber. A fir-tree measuring 38 to 39 inches in diameter by 68 feet in length was some time since raised from a bog near Kilrush; and it had lost much of its original bulk by decay. The mode of finding bog-timber as practised here is rather remarkable. It is found that the dew does not lie on the part of the bog immediately above a tree, as it does elsewhere. The position of a piece of timber can thus be easily ascertained before the dews rise in the morning; when the finder, after probing with a bog-auger, called in Irish tharagher, to ascertain whether the wood be sound, marks the spot with a spade, and proceeds to raise the timber at his leisure. Fir, oak, and yew, are the chief sorts of bog-wood found.

Agriculture, although rapidly improving, is still in a backward state. Green crops and artificial grasses have been only lately introduced to any considerable extent. The breed of sheep remains in many districts unimproved, from a prejudice against the mutton of the finer-woolled kinds. The general breed of swine is very inferior. The custom of fattening choice heifers for slaughtering has prevented the attention that ought to have been paid to providing superior breeders. The improved breed is however extending; and to meet with stock of the old Irish kind is now unusual. Bulls have been imported by many of the resident gentry from Leicester, Warwickshire, and other grazing districts in England; and the black cattle now sent to market from their prime grazing-lands are of a very improving breed. In the grazing districts along the western coast it is usual to stall the cattle during the greater part of the winter months, as the pasture is completely withered by the violence of the sea-storms that beat on these exposed uplands; but this expedient is very different from any regular system of stall-feeding. The bad state of the roads still renders the employment of asses and panniers not unusual, and in general the small farmers' horses are badly fed and worse appointed.

There is an excellent opening for the establishment of fisheries along the whole of the coast from Kilrush to the bay of Galway. Salmon are taken in great quantities at the mouth of the Shragh or Dunbeg river. The banks of Baltard afford excellent turbot, cod, haddock, ling, dory, mackerel, whiting, and pollock, in great abundance. In the mouth of the Shannon is a regular station for the herring fishery. The oyster-beds of Burrin are celebrated in the Dublin market. Crabs, lobsters, and shrimps are caught in all the creeks; and the cliffs along the whole western coast abound with samphire, dilisk, sloak, and Carrigeen moss. Vast quantities of sea-weed, which forms the best manure for the slaty soil adjacent, are thrown up by every tide on the different beaches and creeks.

There are no manufactures, except of home-made frieze for the use of the peasantry; and the commerce consists chiefly in the export of provisions. Grain and pigs are the articles usually shipped from Carrigaholt, Kilrush, and Clare, which are the only exporting towns in the county.

The exports of the county at large, in the year 1831, as estimated by Captain Mudge, are as follows:—

Wheat .	24,000	barrels, or	3000	tons.
Oats . .	96,000	„	8000	„
Barley .	10,000	„	2000	„
Beans . . .	„	„	300	„

Butter, bacon, and cattle, not known.

Large quantities of grain are sent over land to Limerick; pigs also are driven over land in great numbers.

Imports for 831.

	Tons.	
Timber . .	1000	
Iron . . .	500	
Salt . . .	500	
Coals . . .	2500	
Slate . . .	500	
Flags . . .	500	
Bricks . . .	1000	
Whisky . .	500	
Earthenware . .	500	(by measurement)
Glass . . .	100	
Sugar . . .	300	
Tobacco . .	200	
Mercantile goods and sundries . .	1500	(by measurement)

and about 200 tons per month of turf, brought to market in boats by the Fergus.

There are branches of the provincial and agricultural and commercial banks at Ennis, and a branch of the latter, and of the Limerick national bank, at Kilrush.

Clare is divided into nine baronies: Tullagh and Bunratty on the east; Inchiquin and Islands in the Centre, the latter so called from the islands of the Fergus embraced by it; Burrin, Corermore, Ibrickan, and Moyferta, extending along the western coast from Black Head on the north to Loop on the south, and Clanderlaw east of Moyferta, between it and the barony of Islands. The county contains the entire diocese of Kilfenora, the greater portion of the diocese of Killaloe, and a small portion of the diocese of Limerick. It contains 74 parishes, forming 28 benefices. The only corporate town is Ennis, which formerly returned two members to the Irish, and now returns one member to the imperial parliament. Kilrush is the place of next importance. Corrofin (population 900), Ennistymond (population 1430) Six-mile-bridge (population 1491), and Killaloe (population 1411), are inconsiderable places. The county returns two members to the imperial parliament. The newspapers which circulate in Clare are chiefly printed in Limerick. The number of stamps issued to the Clare Journal for the year ending January, 1836, was 11,484.

The assizes for the county are held twice a year at Ennis, where is a new and good county gaol. There are also bridewells at Ennistymond, Kilrush, Six-mile-bridge, and Tulla. The district lunatic asylum at Limerick comprises this county, which pays a quota of the annual expense proportioned to the number of patients sent from it. For the year 1835 the expense was 1034*l.* 2*s.* 7*d.*, the number of patients being 63. The proportion of the original cost of building the asylum paid by the county was 8955*l.* 8*s.* 1*d.*, the gross cost being 30,200*l.* 17*s.* 2*d.* Of the constabulary and peace-preservation forces, 417 are employed in Clare, at a total expense of 15,987*l.* 9*s.* 4*d.* for the year 1835. Of the expense of maintaining the constabulary department, 5479*l.* 2*s.* 3*d.* is chargeable against the county

POPULATION.

Date.	How ascertained.	Houses.	Families.	Families chiefly employed in agriculture.	Families chiefly employed in trade, manufactures, and commerce.	All other families not comprised in the preceding classes.	Males.	Females.	Total.
1792	Estimated by Dr. Beaufort .	17,396	..	..	..	..	..	..	96,000
1813	Under Pop. Act of 1812 .	29,301	..	..	..	..	..	..	160,603
1821	Under Act 55 Geo. III., c. 120	36,273	39,212	..	..	..	105,056	103,033	208,089
1831	Under Act 1 Will. IV., c. 19	41,630	43,374	32,580	4537	6527	128,446	129,876	258,322

The civil history of the county of Clare abounds with interest, but we can only glance at the chief events. Originally it formed part of Connaught, but in the year 298, Lugad or Lewy, surnamed Meann, one of the Dal-Cassian successors to the monarchy of Leath Mogh, finally settled the bounds of his kingdom to the limits fixed between Owen More and Conn, about the close of the second century, and thus included it in Munster. The territory corresponding with the present county of Clare, together with the original patrimony of the tribe of Cas, east of the Shannon, was then called Tuaidh Muin or Thomond, that is, North Munster, a name which afterwards distinguished it from Jar Muin, or Ormond, and Des Muin or Desmond, two other divisions of Munster to the east and south. This antient Thomond comprehended the present counties of Clare, Tipperary, and Limerick nearly,* and was ever after accounted the especial patrimony of the tribe of Cas, who are distinguished in Irish history as the Dal-gais, in opposition to the descendants of Oeven, who are known as the Esganacht of Cashel.

Before the year 1168, antient Thomond had been di vided into modern Thomond on the west, and Ormond on the east; and of this latter portion his younger brother Brian, surnamed 'of the Mountain,' was king at the accession of Donnell the Great. Donnell, on his accession, inhumanly put out his brother's eyes, and had himself proclaimed king of all North Munster. He married the daughter of Dermot Mac Murrogh, king of Leinster, the inviter of the adventurers under Strongbow; and being also at war with Roderick O'Connor, king of Connaught, an hereditary enemy, he readily availed himself of the proffered assistance of Robert Fitz-Stephen, when sent as an ally by his father-in-law Dermot. By this means the English gained their first footing in Munster, A.D. 1171. Next year, to secure so effectual an assistance against his great enemy, Donnell did homage to Henry the Second soon after his landing at Waterford, upon which an English garrison was planted in Limerick; but the year after, repenting of his allegiance on some provocation received from his new allies, he assailed the castle of Kilkenny, which he destroyed, and defeated the English of that part of the country in several engagements.

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* The boundaries of antient Thomond, as determined by the treaty of Dioma, were, from Sligbe Dala in Ossory on the east to the Atlantic on the west, and from the isles of Arran on the north to Cashe Knockaine and the river Feal on the south.

In the year 1543 Morrogh O'Brien, after a fruitless attempt at raising a general rebellion with O'Neill, O'Donnell, and O'Connor, came in and made his allegiance to King Henry the Eighth, renouncing the name of O'Brien, and taking the title of Earl of Thomond, with the style of Baron of Inchiquin for his eldest son. At the same time he surrendered all his possessions to the king, and received them back by an English tenure, as also did O'Neill and Mac William Burke, who were at the same time, and on similar terms, created earls of Tyrone and Clanrickard. By the articles of this submission, the earl agreed to abjure the Irish language, to bring up his people in the practice of husbandry and tillage, and to pay none but legal rents, &c. From him descended in a direct line the family of Inchiquin, several of whom were distinguished leaders in the subsequent wars, particularly Murrogh, the first earl and fifth baron Inchiquin, a celebrated parliamentary and royalist general in the wars from 1641 to the Restoration. Soon after the first earl's submission, Thomond was made shire-ground. An act for the division of Connaught into counties having passed (11 Eliz., c. 9), Sir Henry Sidney (others say Thomas earl of Sussex) plotted out six counties beyond the Shannon, of which Clare was one. Its first division was into eight baronies, different both in names and boundaries from the present. They were laid down in accordance with the possessions of the then principal families, namely, the Macnamaras and O'Gradys on the east, the O'Loughlins on the north, the Mahons and Mac Mahons and O'Deas on the west and south, and the O'Briens of the earl's immediate connexion in the central baronies. One hundred and seventy-two castles are enumerated in this early survey, of which twenty belonged to different gentlemen of the family of O'Loughlin, in the barony of Burrin or Gragans alone. Upon the petition of the second earl of Thomond, 1601, the county of Clare was again made part of the province of Munster, although for convenience sake it continued on the Connaught circuit until the latter end of the last century. The adhesion of Lord Inchiquin, the most influential person in Clare, to the British interest during the wars from 1641 to the Restoration, prevented this part of the county from being the scene of any military operations of importance. Such as did occur were in connexion with the history of Limerick. Pursuant to an ordinance made for the satisfaction of adventurers and soldiers, by the English parliament, in 1653, a district was laid out along the sea-coast of all Connaught, including this county, called the *mile-line*, from its being in breadth nowhere less than four miles from the sea, beyond which in the interior the dispossessed Irish were to be located, and in which, as a barrier between the insulated Irish and the sea, the adventurers and others were to have their portions. This plan of wholesale transplantation was never fully carried into effect. The property of the county cannot be looked on as at all settled until after the Revolution of 1688, when the disposal of the new forfeitures, amounting to 72,246 profitable acres, Irish measure, valued at 12,060*l.* 17*s.* per annum, introduced a new and permanent proprietary. This great tract of country was principally the estate of Daniel Lord Clare, of Carrigaholt, who had raised a regiment of dragoons, and fought in the service of James the Second from the commencement of the war till after the battle of Aughrim. He was grandson of Sir Daniel O'Brien, who had forfeited the same estates in 1641, and had afterwards been restored and created baron of Mogarta and Viscount Clare by Charles the Second in 1662. The other principal forfeiters, in 1688, were Donogh Mac Namara, Donogh and Tiege O'Brien, and Redmond Magrath. The rebellion of 1798 scarcely extended to this county. During the present century Clare was for a time remarkable for agrarian disturbances, now happily at an end. The Clare election of 1828, in which a Roman Catholic was returned to the imperial parliament previous to the removal of the disabilities affecting that part of the population, will form an important epoch in Irish history.

Antiquities.—There are round towers at Scattery Island, off Kilrush (120 feet high, a known landmark in the navigation of the Shannon), at Drumcliff in the barony of Islands, at Dysert (the antient Dysert S'Dea) and Kilnaboy in the barony of Inchiquin, and at Innis Cailtre, an island in the creek of Scariff, on Loch Derg. The abbey of Ennis, which the famous Tenlogh O'Brien enriched in 1306 with bells, crosses, rich embroidery, and painted glass windows (*Annals of Innisfallen and Caithercim Foirdelbach*), is still standing. The abbey of Quin, in the barony of Bunratty, about five miles east of Ennis, is a noble pile of black marble, for the building of which, in the thirteenth century, Comea More Macnamara, the founder, is said to have been created a prince by the pope. Bishop Pococke describes it as 'the finest and most entire monastery in Ireland.' The ruins on the islands of Innis Scattery and Innis Cailtre are also of great interest to the antiquary. Cromlechs are numerous, and the tomb of Conan on Mount Callan, with its Ogham inscription, is still the subject of inquiry and dispute. There are still standing 118 castles, and raths in all directions. The original documents by which different contracts were made here under the Brehon law are extant, particularly the rentals of Macnamara and O'Brien. Numerous Irish MSS. relating to this county are in existence, still untranslated. There is no portion of Ireland so well calculated to afford materials for a county history; yet the only work hitherto published on the subject is the meagre 'Statistical Survey,' by the agent of the Royal Dublin Society.

The character of the people is like that of the Irish peasantry in other counties, with this unfortunate distinction, that almost all authorities concur in representing the peasantry of Clare as addicted to giving untrue testimony in courts of justice.

Education.—The dioceses in which this county is comprehended stand only 24th and 25th among the 32 dioceses of Ireland. The number of schools in 1820 was 215; in 1821 there were 8159 males and 3794 females under instruction. As the returns of the Commissioners of Public Instruction for 1834 have reference to ecclesiastical divisions, see KILLFENORA and KILLALOE, within which dioceses Clare is comprehended.

The county expenses are levied by grand jury assessments. The annual amount levied averages, on a return of twenty years to 1829, about 28,000*l.* The mode of applotment is liable to many objections, which the Ordnance Survey now in progress is expected to remove. A map of the county, on a scale of one inch and a fourth to an Irish mile, was executed in 1787 by Mr. Henry Pelham: it is not accurate.

(*Statistical Survey of the County of Clare; Parochial Survey of Ireland;* Beaufort's *Memoir of a Map of Ireland;* Cox's *History of Ireland;* Vallancey's *Collectanea;* Inglis's *Ireland in* 1834; *Reports of the Record Commission for Ireland; Parliamentary Reports and Papers; MSS. in British Museum and in Library of Royal Irish Academy; Original Communications.*)

CLARE ISLAND, six miles in length, by two and a half in breadth, lies off the coast of the county of Mayo in Ireland. It is situated about midway between Achill island on the north, and barony of Morisk on the south, and in the offing of Clew Bay, which it partially shelters from the swell of the Atlantic. The island rises to the height of 2400 feet towards the west, where its shores are very precipitous. It is included in the parish of Kilgever and barony of Morisk, and in 1821 contained 257 houses and 1395 inhabitants. In 1831 the numbers were—houses, 303; inhabitants, 1616. In 1834 there were on the island two schools in connexion with the Board of National Education, educating from 80 to 120 young persons. This island has been beautifully modelled, on a scale of four inches to the mile, by Mr. Bald. The model is in the possession of the Royal Dublin Society. (*Reports &c.*, Bald's *Map of Mayo.*)

CLARE, ST., NUNS OF THE ORDER OF, otherwise called Poor Clares. The Nuns of the Order of St. Clare were instituted by that person at Assisi, in Italy, according to Newcourt, about A. D. 1212. This Order was confirmed by Pope Innocent III., and, after him, by Pope Honorius III., A. D. 1223, and was subsequently divided into a stricter and a looser sort. (Newc. *Repert. Ecclesiast.*, vol. i. p. 562.) 'St. Clare,' says Tanner, 'was born in the same town and lived at the same time with St. Francis, and her nuns observing St. Francis's rule, and wearing the same coloured habit with the Franciscan Friars, were often called Minoresses, and their house without Aldgate (London), the Minories.' They were probably called Poor Clares from their scanty endowments. They were brought into England by Blanch, queen of Navarre, who was wife to Edmund earl of Lancaster, Leicester, and Derby, under a licence from King Edward I., A. D. 1293, and were seated in the house already mentioned, without Aldgate. Besides this, there were only three other houses of this order in England, viz., Waterbeche and Denny in Cambridgeshire, and Brusyard in Suffolk. The total of the clear revenues of this order in England, at the suppression of religious houses, amounted to no more than 548*l.* 10*s.* 6*d.* (*Monasticon Anglic.* new edit., vol. vi., p. 1549; Tanner's *Notit. Monast.* Pref. p. 12—56; Dr. Fly's *Account of the Abbey called the Minories, Archæolog.* vol. xv. p. 92—113.)

CLARENCEUX, the name of one of the provincial kings-at-arms in the Heralds' College. It is uncertain when this office was first created. Anstis and Edmondson think it probable that it was by Edward III., but Noble thinks it was by Henry V., who, preferring the herald of his brother Thomas, Duke of Clarence, constable of the army, created him a King of Arms, by the title of Clarenceux, and placed the south part of England under his care. William Horseley was so created by Henry V., and Roger Lygh by Henry VI. Afterwards it sunk into the office of a herald only, but was again revived in the reign of Edward IV. in favour of William Hawkeslow, who had however the west of England only allotted to him as a province. Sir Thomas Holme, knight, who succeeded to the office in 1476, appears to have had first the west, and then the south of England, as the district in which he was to give armorial bearings.

The Arms of Clarenceux are, Argent, St. George's Cross, upon a chief gules a lion of England crowned with an open crown. The Badge is the same, in an escocheon, crowned with a crown of a king of arms, upon a green ground on one side; and on the other, the royal arms crowned upon a white ground, pendent to a gold chain, or simple riband.

(Noble's *History of the College of Arms*, 4to., London, 1804, p. 61 et seq.)

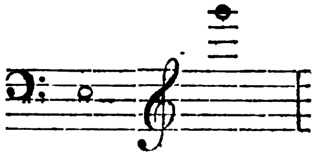
CLARENDON, LORD. [Hyde.]

CLARENDON, THE CONSTITUTIONS OF, were certain declaratory ordinances agreed to at a general council of the nobility and prelates assembled by Henry II. at his palace or manor of Clarendon, in Wiltshire, in the year 1164. These ordinances were sixteen in number, and were intended to define the limits between civil and ecclesiastical jurisdictions, to prevent the further encroachments of the clergy, and to abolish the abuses which had arisen from the gradual and increasing usurpations of the pope. (Howell's *State Trials*, vol. ii., p. 646.)

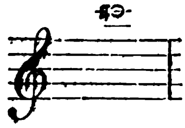
CLARET, a name used in England to denote the red wine of Medoc, or, more correctly, a mixture of that wine and some other description, generally either the wine of Benecarlo, in Spain, or some full-bodied wine, the growth of the southern departments of France, in order to suit the taste of English consumers. The word *clairet*, from which the name is derived, is used in France to signify those wines which are red or rose-coloured, and the name, as understood by us, is not known in that country.

CLARIFICATION, the process of rendering a fluid clear by separating the substances which, being suspended in it, render it turbid. A distinction has been made between filtration and clarification, on the ground that filtration is a mere mechanical operation, while clarification is dependent upon chemical action. In most cases however clarification hardly sustains this character. In clarifying, or as it is termed, fining, beer, a solution of isinglass or gelatine in stale beer is employed, which carries down the matters that render the beer turbid. Bullocks' blood is used as a clarifier, but more formerly than at present: when mixed with syrup, as the solution of sugar is called, it is coagulated, and carries the impurities along with it; and when they rise to the surface of the fluid they are skimmed off together. White of eggs is also a powerful coagulating clarifier. Sand or clay will in some cases mechanically carry down the impurities of liquors, and render them clear.

CLARINET, a musical instrument made of wood, similar in shape to the oboe, but of rather larger dimensions, and having a fixed mouth-piece containing a reed, which forms the upper joint of the instrument. It was invented at the commencement of the last century by Denner of Nuremberg, though it has not been in general use more than fifty years. The clarinet gives all the sounds of the diatonico-chromatic scale, but the same instrument cannot be used in all the modes, or keys; hence in the orchestra three instruments are employed, of different dimensions, namely, a C, a B, and an A clarinet: that of B is preferred by performers, because more mellow in tone, and more manageable as regards fingering. The compass of the clarinet is from E, the third space in the base, to G in altissimo.



But in the orchestra it is seldom required to go higher than C♯ in alt.



The sounds between the lowest note (E) and B ♭, the third treble line, are called *Chalumeau* notes, or notes resembling an antient rustic instrument so named, which was formed of reed.

Base Clarinet. This was invented, in 1828, by Streitwolf, an instrument-maker of Göttingen. It is made of wood, and played on in the same manner as the common clarinet. Its compass is four octaves, and it descends to B ♭ below the base staff. In length it is two feet eight inches.

Contra-Base Clarinet. The same ingenious artist subsequently produced a *double-base* clarinet, which stands in the same relation to wind instruments of wood that the *contra-basso* (double-base) does to stringed instruments, and promises to become very useful in the orchestra. Its form and manner of fingering differ but little from those of the base clarinet: in size it is not larger than the bassoon, and in compass is four notes lower.

CLARION, a kind of trumpet, very shrill, and not now in use.

CLARKE, DR. SAMUEL, was born in October, 1675, at Norwich, where, at the free school, he was distinguished for his progress in classical studies. He entered, in 1691, at Caius College, Cambridge, and applied with great success to the mathematics, under an able tutor, Mr., afterwards Sir John Ellis. The text-book then used in the university was a rugged Latin version of the treatise of Rohault, an implicit follower of the Cartesian theory. Clarke, at the age of 21, after closely studying and justly appreciating the reasonings of Newton's 'Principia,' which had then just appeared, published a more classical version of the text of Rohault, with numerous critical notes, added with the view of bringing the Cartesian system into disrepute by exposing its fallacies. After passing through four editions as the university text-book, it gave place, as Clarke desired, to the adoption of undisguised Newtonian treatises. He now went through a diligent course of biblical reading, in the original languages, in the course of which he carefully studied the early Christian fathers. On his ordination he was introduced to Dr. More, bishop of Norwich, by Whiston, whom he succeeded as domestic chaplain to that bishop for twelve years. In 1699 he published three essays on Confirmation, Baptism, and Repentance, together with Reflections on Toland's 'Amyntor,' concerning the uncanonical Gospels

Two years afterwards followed his 'Paraphrase of the Four Gospels,' which induced Bishop More to present him with the living of Drayton, near Norwich. In 1704 he was appointed to preach the Boylean lecture at Oxford, when he chose for his subject 'The Being and Attributes of God.' The satisfaction which he gave on this occasion led to his re-election the following year, when he read a series of lectures on the evidences of natural and revealed religion. These discourses were arranged and published as a continuous argument, and passed through several editions with successive improvements. Clarke's mode of demonstrating the existence of God by a process of reasoning from an *à priori axiom*, is precisely that of Spinoza, against whom the argument of Clarke is especially directed. Both take the same point of departure, and agree that, since something does exist, something always has existed. They assert that eternity and immensity, time and space, or duration and extent (for each of these pairs of terms is used without distinction), have always existed, the conception of their non-existence being impossible. It is then considered that, as these are only attributes or qualities, they must necessarily imply a co-existent substance whose attributes they are: a necessary and eternal Being is therefore acknowledged by both, but as to the nature of this Being they differ entirely. Spinoza, like some of the Greek philosophers, concludes this eternal and necessary substance to be the universe itself, material and mental (*τὸ πᾶν*), which he declares to be the great and only God in whom we live, and move, and have our being. (Compare the passage of Pope's 'Essay,' 'All are but parts of one stupendous whole,' &c.) Clarke asserts that this substance, of which duration and extent are the attributes, is an immaterial and spiritual Being: this metaphysical notion is evidently derived from a passage in a scholium of Newton's 'Principia,' where it is said, 'Durat (Deus) semper et adest ubique; et, existendo semper et ubique, *durationem et spatium constituit*,' &c., a notion very different from that of Bishop Watson, who speaks of God as having no relation to space or time (*Apol.*, p. 135). Spinoza takes no notice of design as evidence of intelligence; and Clarke, in assigning to his personification of eternity and immensity certain moral attributes in accordance with his metaphysical hypothesis, admits that intelligence, in which lies all the difference between the Theists and Atheists, cannot be demonstrated by any reasoning *à priori*, but must depend for proof on the *à posteriori* evidence from observation and induction (prop. 8). According to his premises, he cannot, by logical sequence, avoid landing himself on the same ground with Spinoza. 'It must be owned,' says Sir James Mackintosh (*Dissert. Ency. Brit.*), 'that he is compelled to assume what the laws of reasoning required him to prove,' that is, the existence of a Being extraneous to the constituent parts of the universe. (See *Edinburgh Review*, vol. lii., p. 113, 114). Numerous replies and objections to this *à priori* argument appeared at the time of its first publication. (See a list in Kippis's *Biog. Brit.*, and the correspondence between Butler, afterwards bishop of Durham, and Clarke, printed at the end of Bishop Butler's Works.) One of the principal was 'An Inquiry into the Ideas of Space, Time,' &c., by Bishop Law. The most subtle scholastics, Albert, Aquinas, and Scotus, rejected the *à priori* proof as an obvious *petitio principii*, and many modern writers regard the performance of Clarke as a failure. Pope, who on several occasions says sarcastic things of Clarke, alludes to it in the following passage of the 'Dunciad,' b. iv., l. 455:—

> We nobly take the high priori road,
> And reason downward till we doubt of God.'

The 'Evidences' met with equal opposition. The foundation of morality, according to Clarke, consists in the immutable differences, relations, and eternal fitness of things. The last expression being of frequent occurrence in this discourse acquired a fashionable usage in the ethical vocabularies of the day. Regardless of moral sentiment, so fully developed since by Shaftesbury, Hutcheson, and Adam Smith, Clarke insists solely upon the principle that the criterion of moral rectitude is in the conformity to, or deviation from, the natural and eternal fitness of things: in other words, that an immoral act is an irrational act, that is, an act in violation of the actual ratios of existent things. The endeavour to reduce moral philosophy to mathematical certainty was characteristic of that age, and led to the formation of theories remarkable more for their ingenuity than utility. Dr. Price is an apologist for the moral theory of Clarke, and among its oppugners we may instance Sir James Mackintosh. (*Dissertat. Encyc. Brit.*)

In 1706 Clarke obtained, through Bishop More, the rectory of St. Bennett's in London. He published in the same year an answer to the treatise of Dr. Dodwell 'On the Soul,' in which that divine contends that it is not immortal until made so by baptism. Several rejoinders followed on each side. (See Kippis, *Biog. Brit.*) [COLLINS, ANTHONY.] Clarke at this time published a Latin translation of the treatise 'On Optics,' by his friend Sir Isaac Newton, who in acknowledgment presented him with 500*l.* for his five children. His patron, Dr. More, next procured for him the rectorship of St. James's, and a chaplaincy to Queen Anne, which induced him to take his degree of D.D.; and it is said that no such logical conflict was ever heard in the schools of Cambridge as that which occurred on this occasion between Clarke and Professor James, who, in concluding, exclaimed, 'Profectò me probe exercuisti!' The theses sustained by Clarke were, that 'no scriptural article of Christianity is contrary to reason,' and that 'free agency is indispensably essential to all moral and religious conduct.' In 1712 he published his edition of Cæsar's 'Commentaries,' in folio, with notes, and some fine engravings. The same year appeared his treatise on 'The Scripture Doctrine of the Trinity;' a work which involved him for the remainder of his life in a controversy, in which his principal adversary was Dr. Waterland. The Lower House of Convocation, in 1714, complained to the bishops of the heterodox and dangerous tendency of its Arian tenets, and Clarke was prevailed upon to declare that he was sorry for his offence, and hoped that his future conduct would occasion no further cause of complaint; an act for which he was sternly reproached by his more courageous friend Whiston. A circumstantial account of this proceeding is given in the 'Apology for Dr. Clarke,' 1714. His favourite subject was the doctrine of philosophical liberty and necessity; on which he began, in 1715, to carry on an amicable controversy with Leibnitz. The papers written on each side were printed, in 1717, in English and French, and dedicated to Queen Caroline, who is said to have carefully examined each MS. previous to publication. In advocating the doctrine of free will, Dr. Clarke had constantly in view the subversion of the writings of Spinoza, which contain, says Dr. Reid, in his 'Essays,' 'the genuine and most tenable system of necessity.' The death of Leibnitz left the controversy undecided, and Clarke soon afterwards resumed his argument in reply to the 'Philosophical Inquiry concerning Liberty,' by the friend of Locke, Anthony Collins. Dugald Stewart, having himself adopted the anti-necessarian doctrine, insists upon Clarke's having gained a great victory over Leibnitz and Collins, and that his arguments on this subject are the most important and powerful of all his metaphysical writings; but many competent judges are of a different opinion.

In 1718 he occasioned a zealous controversy about the primitive doxologies. Dr. Robinson, bishop of London, put forth a pastoral letter, in which he strictly prohibited his clergy from adopting the Arian modifications of Dr. Clarke; charging them, as they hoped to obtain God's mercy, to hold them in great abhorrence, as emanating from a strong delusion of pride and self-conceit. Several pamphlets by Whiston and others appeared on this occasion. In 1724 Clarke obtained the mastership of Wigston Hospital, and published a volume of seventeen sermons. On the death of Newton he declined the offer of the mastership of the Mint. At this time he published in the 'Philosophical Transactions' (401) a paper on the velocity and force of bodies in motion. In 1729 appeared his edition of Homer, with Latin version and notes, which is still used in schools. The last nine books were not prepared by Dr. Clarke. He died rather suddenly in May, 1729. His 'Exposition of the Church Catechism,' and ten volumes of sermons, were published after his death. That he retained to the last his Unitarian views, is proved by his emendations of the Liturgy shortly before his death —the MS. of which is in the British Museum—and by the statements of his friend and biographer Bishop Hoadley The moral character of Clarke is admired by all his biographers: his temper was remarkably mild, and his manners modest and unassuming. As a writer he is plain and unaffected; very accurate, but monotonous, tame, and jejune. Voltaire, not without propriety, calls him a *moulin à raisonnement*. He was a wary and very skilful disputant, well disciplined in the scholastic logic. Inferior to

Locke in comprehensiveness and originality, he was greatly superior to him in acquirements, being eminent as a divine, a mathematician, a metaphysician, and a philologist. Dr. Hare, in his 'Difficulties and Discouragements in Studying the Scriptures,' says that Clarke possessed every possible good quality.

(Kippis's *Biog. Brit.*; *Life* by Bishop Hoadley; *Historical Memoirs* by Whiston; *Dissertations* by D. Stewart and Mackintosh, in *Ency. Brit.*)

CLARKE, EDWARD DANIEL, LL.D., &c., was descended from a literary family, and born at Willingdon, in Sussex, on the 5th of June, 1769. He received part of his early education in the grammar-school of Tunbridge, at that time conducted by Dr. Vicesimus Knox. At this early age he showed a fondness for experimental philosophy and physics, but was otherwise an indolent student. In 1786 he went to Jesus College, Cambridge, where, as the orphan of a poor clergyman, he was for some time in very straitened circumstances. Having taken his degree he was engaged by the duke of Dorset, in 1790, as tutor to his nephew, Mr H. Tufton, with whom, in the course of the following year, he made the tour of Great Britain. Clarke had always been fond of books of travel, and this journey confirmed his passion, and led to his first essay in travel-writing. He published his journal, but without his name, and was very soon ashamed of it. The edition, which was in 2 vols., 8vo., with plates in aquatinta, is now extremely scarce. In 1791 he made a trip to Calais, and seems to have been delighted beyond measure at putting his feet on foreign land. In the course of the following year he engaged as a travelling companion to Lord Berwick, with whom he went through France, Switzerland, and Italy. He returned to England at the end of 1793. In the course of the following year he went again to Italy by the Rhine and the Tyrol, and returning again to England he was chosen fellow-elect of his college, a barren honour without any emolument. For want of a better occupation, he for some time thought seriously of joining the Shropshire militia, in which he was offered a lieutenancy; but in September, 1794, he became tutor in a distinguished Welsh family (that of Sir Thomas Mostyn), with whom he resided some time in Wales, where he made the improving acquaintance of Mr. Pennant. He was afterwards connected in the same manner with the family of Lord Uxbridge, with a member of which he made the tour of Scotland and the Western Isles in 1797. In all these excursions he kept journals, and practised himself in the art of observing scenes and objects, and describing them. About this time he was elected fellow of his college, and being, in addition, appointed bursar, he took up his residence at Cambridge at Easter, 1798. In the spring of the following year he set out with Mr. Cripps, a young man of fortune, on a tour to the countries north of the Baltic. This journey, which was at first intended to occupy only six months, was continued through more than three years and a half, during which master and pupil traversed Denmark, Norway, Sweden, Lapland, Finland, Russia, Tartary, Circassia, Asia Minor, Syria, Palestine, part of Egypt, Greece, Turkey in Europe, and finally returned from Constantinople, across the Balkan mountains, through Germany, France, &c., to England. In consequence of their donations to the University of Cambridge, and other merits, Clarke received the degree of LL.D., and Cripps that of M.A. Among their valuable donations was a fragment of a colossal statue of the Eleusinian Ceres, of the best period of Grecian art. Clarke was also the means of securing for his country the antient sarcophagus, generally but incorrectly called that of Alexander the Great, now in the British Museum. He made considerable collections of medals, minerals, and rare plants: many of the latter he procured from Professor Pallas, in the Crimea. The valuable collection of MSS. which he had made during his travels, he sold to the Bodleian Library, Oxford. In 1807 he began, at Cambridge, a course of lectures on mineralogy, which had become his favourite subject; and at the end of the following year the University established a regular professorship of mineralogy in his favour. Having been ordained in 1805, he received the college living of Harlton, and about four years later he obtained the living of Yeldham from Sir William Rush, whose daughter he had married in 1806. From this time his life was almost entirely passed at Cambridge or in its immediate neighbourhood. In 1810 he published the first volume of his Travels; the second volume appeared in 1812, the third in 1814, the fourth in 1816, and the fifth in 1819. A concluding volume, edited by Robert Walpole, was brought out after his death, making the sixth volume, 4to. His Travels, by which he is chiefly known, are the most popular of his works, and are written in a style which invariably captivates the reader. Full of enthusiasm, and gifted with a prolific imagination, he throws a charm over all that he describes; but unfortunately, his judgment was not sufficiently formed by proper discipline, and neither his observations nor his conclusions can always be relied on. His essays and experiments in physics chiefly appeared in Thomson's 'Annals of Philosophy,' which contain his accounts of the blowpipe, cadmium, &c. In 1803 he published 'Testimonies of different authors respecting the colossal Statue of Ceres;' and in 1805 'a Dissertation on the Sarcophagus in the British Museum.'

He died at Pall Mall, London, on the 9th of March, 1822, and was buried in Jesus College Chapel on the 18th of the same month. (*Life and Remains of Ed. Dan. Clarke*, by the Rev. William Otter, M.A., two volumes, octavo, London, 1825.)

CLARKE, ADAM, LL.D., a highly respected minister among the Wesleyan Methodists, not long ago deceased, the author of various works held in very general esteem, and in several points of view a somewhat remarkable character.

He was born in or about the year 1762. His parents resided in the North of Ireland. They appear to have been persons of respectable character; and his mother especially, who was a native of Scotland, was herself deeply impressed with a sense of the value of high devotional sentiment in union with religious knowledge, and she acted accordingly in the influences which she sought to communicate to her son.

Of education, properly scholastic or systematic, he appears to have received little or none. The effect of this misfortune of his early years is perceived in almost all his writings, as well as in the general tone and character of his mind. The want of it gave a character, and that not a favourable one, to the learning which it is admitted by all that he did by his own unwearied exertions afterwards acquire.

As soon as his mind began to develop its peculiarities, it appeared that Dr. Clarke was extremely eager after knowledge, and possessed within himself resources which would enable him to overcome very formidable obstacles. When he was placed with a linen manufacturer, who lived in the neighbourhood of his father, to learn the trade, he soon found that he was in a situation that afforded no means of gratifying his desire of knowledge. He determined to change the mode of life which had been marked out for him, and he returned to his home. He has related of himself a circumstance which is highly characteristic: that at a very early period of life he took from the Hebrew writers, as his favourite motto, the words, 'Through desire a man having separated himself seeketh and intermeddleth with all wisdom.'

Methodism had been introduced into the part of Ireland in which he resided. His father and mother belonged to that society. There was a Mr. Breedon, one of Mr. Wesley's earliest ministers, who was a friend and the religious instructor of the family, to whom at this period of his life he seems to have owed much.

The union of considerable natural powers with no mean attainments, considering the great disadvantages under which he lay, and of the love of study with a mind eminently devotional, pointed out this young man to the Methodist preachers who frequented his father's house as a person who might be useful in the ministry among the people with whom his family had formed their religious connexion. One of them was so impressed with the persuasion that this was the course of life pointed out for him, that he communicated the circumstance to the great father and director of Methodism. The result was that Clarke removed to England, and was admitted into the school which Wesley had founded at Kingswood near Bristol.

He now found himself in circumstances more favourable for the gratification of his desire to acquire varied knowledge. Not that much was to be learned in such a school as that; but his new situation gave him *time*, which is what a mind disposed as his was chiefly wants. Besides what formed the kind of instruction which was imparted to the students in this school, he undertook to teach himself other things; and it was while here that he purchased a Hebrew Grammar and began the study of that language, which was the commencement of that course of oriental study in which he afterwards spent much time, and made as is believed, great progress.

The time soon came when he was to leave this school, and enter on the duties of an itinerant or travelling preacher. He was accustomed to relate with pride and pleasure that he received his commission to go forth from the mouth of Mr. Wesley himself. There was a peculiar and touching affectionateness in the old man's benediction. The circuit, as it is called, to which he was appointed was a tract of country near Bradford in Wiltshire.

Thus, in 1782, he became a Methodist preacher, and so continued to the time of his death. In the first twenty years he resided in various parts of the kingdom, but afterwards he lived, for the most part, in or about London, or at an estate which was purchased for him in Lancashire.

In his ministerial character he was singularly acceptable and useful. His preaching attracted crowds. He advanced in influence and reputation in the body of Christians to whom he belonged: and for many of the latter years of his life he was regarded as one of the chief lights and brightest ornaments of that religious community.

If this however had been his only claim to distinction, the name of Dr. Clarke would not have appeared in this work or in the many writings in which, since his death, mention has been made of him. We have already intimated that he was eminently desirous of knowledge of very various kinds, and, while leading the laborious life of a travelling preacher, he found time for a great variety of discursive reading, as well as for much steady application to his philological studies, especially those of Oriental literature. He first gave public evidence of those studies in the year 1802, when he published, in six volumes, his book entitled 'A Bibliographical Dictionary.' This work gave him at once a literary reputation, and it may fairly be said to do him no small honour; not that we mean to represent it as to be placed on a level with the works of De Bure, Panzer and Brunet, or that it is the result of original researches like the work of our own Ames and Herbert, but it is a most convenient book for the English student, who found nothing like it in the literature of his own country, and it contains a great body of information well arranged concerning books and authors to which no other easy access was presented. The book had, we believe, an extensive circulation.

A Methodist preacher possessed with a taste for the curious researches of which this book was indicative, was a phenomenon that had not before presented itself. It was regarded, we believe justly, as manifesting that a taste for human learning was beginning to prevail in a class of men whose profession might almost be said to be founded on a contempt for such acquisitions, and of whom at least it might be said that they so exalted other objects and other principles that learning merely human was defeated of its just appreciation. We wish that the biographers of Dr. Clarke had informed us how this work was received by his brethren in the ministry, and especially by his elder brethren. He gained however by it a certain reputation among another class of men, the bibliographical and philological inquirers of his time. He began also about this period of his life to be taken notice of for his acquirements in Biblical knowledge and in Oriental literature. On his coming to reside permanently in London, the Bible Society brought him into connexion with some of the dignitaries of the church. His connexion with the Surrey Institution gave him access to several persons of literary pursuits, and at the same time an easy access to books. He was admitted a Fellow of the Society of Antiquaries. The University of St. Andrew's conferred on him the degree of M.A., and afterwards of LL.D. Some time after he became a member of the Royal Irish Academy.

But the most extraordinary circumstance in his literary history remains to be mentioned. The Board of Commissioners on the Public Records selected Dr. Clarke as a proper person to superintend the publication of the new edition of Rymer's 'Fœdera,' with the preparation of which they were charged.

This was a great and difficult undertaking; for it was not the mere reprinting the work of Rymer, but a large mass of new materials were to be found and to be incorporated with the old. Some eminent antiquarian scholars had shrunk from the task. What particularly pointed out Dr. Clarke as a suitable person for this undertaking is not known, as it was evident that his studies had previously lain in a direction very different from that which pointed to such a work as the 'Fœdera,' and he himself acknowledged that he came to the task with very little acquaintance with the nature of it. He however laboured at it with much assiduity for several years. His name appears in the title of both parts of the first volume, and in the first part of the second volume, which was published in 1818, and from that time Dr. Clarke relinquished his share in the undertaking.

From the time when he settled in London he was constantly in communication with the press. Of some works he was only the editor; others he abridged: and he prepared some original works, among which are particularly to be named, 'A Supplement to his Bibliographical Dictionary,' 'Memoirs of the Family of Wesley,' and a work for the assistance of Biblical students. He was also a frequent contributor to the periodical literature of his day. His, as much perhaps as ever any man's, was at this period a life of incessant literary exertion. His health was good.

But there was one great literary undertaking on which, above all, his mind was intent. This was an edition of the 'Holy Scriptures' in the English version, illustrated with a commentary and critical notes, into which he proposed to throw the results of his own Biblical studies, together with much that he might collect from preceding commentaries. It was to form a kind of Family Bible, and yet be at the same time a book which the Biblical scholar might consult with advantage,—a union which has been several times attempted. The first volume appeared in 1810, and excited no small attention on account of the novelty of some opinions expressed in it respecting the tempter of our first parents. From this period he pursued this work as the main business of his life, till he had completed it, which he did in 1826, when appeared the eighth and last volume. For eight of these years, namely from 1815 to 1823, he lived at a place called Millbrook in Lancashire, where some friends had purchased for him a house and small estate.

We have not attempted to give an estimate of the literary value of Dr. Clarke's publications, or even to enumerate them all. We may observe however that they appear to us to have had their full meed of fame. Dr. Clarke, like other extraordinary men who have appeared in situations in which the world did not expect to find them, has perhaps been overrated. It is also of the nature of religious sects to force up into undue elevation persons really meritorious who belong to them. It is quite absurd to place his scholarship on a level with that of the really great scholars who have adorned our country; and it is perhaps one of the most observable circumstances about Dr. Clarke that his mind never seems to have acquired that refinement which scholarship, when it is genuine, never fails to give, or that superiority to vulgar prejudices and to the affectation of display which is, we believe, the usual accompaniment of high attainments. There is in Dr. Clarke a remarkable affectation of bringing forward the Oriental learning he is understood to have possessed. He cannot keep it out of the introduction to the 'Fœdera.' It appears still more strangely in his 'Lives of the Wesley Family,' where he labours after an Arabic etymon of the surname of Wesley, a word really formed according to one of the commonest analogies of our own language. In the same work he gives encouragement to the most vulgar and childish of the popular superstitions. But while we make these remarks, we wish it to be understood that we regard Dr. Clarke as a person on whom it is impossible to look but with respect, and whose life presents an instructive lesson of rewards and honours attending useful labours and consistent virtuous action. We may add also that it shows how the cultivation and encouragement of the devotional spirit may be united with very vigorous exertion in things which have but a slight connexion with it. We must not omit to add two or three circumstances of his later years.

While he resided in Lancashire the two Buddhist priests, whom Sir Alexander Johnston brought from Ceylon for instruction in Christianity, were placed in his family; he was the means of establishing a Methodist mission in the Shetland Islands; and in 1831, a little before his death, he had the satisfaction of establishing schools in the province of Ulster, the part of Ireland in which he was born. He accumulated a good library, including many manuscripts, and had formed a small museum of natural curiosities.

From 1823, when he left Lancashire, Dr. Clarke resided at Haydon-Hall, in Middlesex, about seventeen miles from London. He died of cholera on the 26th of August, 1832, the only person of much celebrity who was carried off in that time of the nation's visitation.

CLAUDE. Claude Gellée, called Claude Lorraine, was born at Chamagne, in Lorraine, in 1600. His parents were very poor, and it is said that he was originally bound apprentice to a pastrycook. At the age of twelve, being left an orphan, he sought a home at the house of his elder brother, who was in business, as a carver of wood, at Friburg. A relation, who was a travelling dealer, observing some indications of a love for the fine arts, persuaded his brother to allow the lad to accompany him to Rome. Here he was somewhat unceremoniously deserted by his relative, but received pecuniary assistance from his brother. Seeing some paintings by Godfrey Waals which pleased him, he determined to go to Naples, where that painter then resided, to obtain the benefit of his instruction. At the expiration of two years he returned to Rome, attracted by the fame of Agostino Tassi, under whom he studied with unwearied diligence. Having acquired some repute, he made the tour of Italy and France, and part of Germany, staying occasionally for some time at different places to replenish his purse, and paying a visit to his native place. He appears to have frequently suffered through various misadventures, both in health and fortune, during his protracted tour.

On his return to Rome he was received with a general welcome, and a wide and increasing demand for his pictures. Commissions came to him from numerous places, and from many illustrious persons of the principal countries of Europe. He died in 1682.

Claude is an instance of what may be done by a constant and diligent study of nature, and by unwearied manual practice. It was his custom to spend great part of his time, often whole days, from dawn till night, in watching the changes of the effect on earth and sky. He has left proofs of the painstaking labour with which he studied the details of a picture in finished studies of leaves and bits of ground. By these means, although he is said not to have shown any particular quickness in his early progress, he acquired such mastery of hand and eye as produced him fame, wealth, and the rank of the first among landscape-painters. He painted for his study a landscape, compounded of many views, taken in the Villa Madama, with an infinite variety of trees, which he kept as a store of natural objects. He refused to sell it, even when Clement IX. offered to cover it with pieces of gold. This picture, and another of Esther and Ahasuerus, he is said to have mentioned as his best productions. He used to make drawings of his pictures in a book, in order to prevent their being pirated. He left six of these registers, which he called his 'Libri di Verita;' one of them, well known by Earlom's engravings, is in the possession of the Duke of Devonshire.

His colouring is rich, powerful, and brilliant; his tints are varied as in nature itself. His aërial perspective is perfect; the fore-ground stands out with the force and brightness of an Italian sunshine; the distance recedes clear and wide, till the blue hills and blue sky meet in harmonious contrast, or melt into the rich, warm, dewy atmosphere of Rome. His architecture is light and fanciful, and often charmingly mixed with foliage, which is graceful and moving. The water ripples and undulates in the tremulous light, or lies calm and glassy, with deepening shadows. His composition is a singular union of freedom and symmetry. If his landscapes have a fault, it is that the graceful is too invariably selected; a trifle of roughness, or irregularity, would add to the interest of the picture. His figures are very poor, which he freely admitted, saying he sold the landscape and gave away the figures, a trait of modesty which seems in accordance with his mild and amiable character. He left his property to two nephews and a niece, his only surviving relations.

CLAUDE, JEAN, born in 1619, at Sauvetat, near Agen, was the son of a Protestant clergyman, and was himself brought up to the church. He distinguished himself in controversial learning, and was appointed professor of theology in the Protestant college of Nismes, which place he filled for eight years. At the end of this time the vexations of the government authorities obliging him to abandon his chair, he went to Paris, where he was soon after appointed to the church of Charenton in 1666. In this situation he showed himself by his writings one of the ablest champions of the Protestant doctrines, an antagonist not unworthy of Bossuet, Arnauld, Nicole, and other distinguished Catholic divines. In 1671 he published his 'Réponse au Traité de la Perpétuité de la Foi sur l'Eucharistie,' 2 vols., 8vo. [ARNAULD.] In 1673 appeared his 'Défense de la Réformation, ou Réponse aux Préjugés légitimes de Nicole.' In 1681 Claude had a controversial conference with Bossuet, after which he published 'Réponse à la Conférence de Bossuet.' The conference as usual led to no approximation between the contending parties. In 1685 the Revocation of the Edit de Nantes by Louis XIV. obliged Claude to seek refuge in Holland, where he was well received on account both of his talents and his personal character, and the Prince of Orange granted him a pension. He died not long after in 1687, much regretted by his co-religionists as one of their ablest and most estimable advocates. His 'Plaintes des Protestans cruellement opprimés dans le Royaume de France' was published after his death, as well as other posthumous works, chiefly on theological and controversial subjects. He left also some sermons. His style though simple was vigorous, being sustained by great logical skill and much erudition Devèze wrote a biography of Claude, Amsterdam, 1687. His grandson, Jean Jacques Claude, was one of the earliest pastors of the French Protestant church in Threadneedle Street, London, and died in 1712.

CLAUDE, ST., a town in France, in the department of Jura, on the bank of a small stream called the Bienne, which flows into the Ain, a feeder of the Rhône. It is 240 miles S.E. of Paris in a direct line, in 46° 23′ N. lat., and 5° 32 E. long.

This town owes its origin to the retirement of the Saints Romain and Lupicin (the latter bishop of Vesontio, or Besançon) to the deserts of Mount Jura, in the fifth century. The sanctity of these holy men, who were brethren, drew around them a number of kindred minds, and three monasteries with other establishments arose in the neighbourhood of their retreat. In the eighth century St. Claude, archbishop of Besançon, came to end his days in one of these monasteries, which afterwards took its name from him, and thus the town acquired its present designation.

The abbey of St. Claude was of the Benedictine order, and the monks were obliged to make proof of noble descent before they could obtain admission into the establishment. The community possessed immense wealth: it is said by La Vallée (*Voyage dans les Départements*)—no very trustworthy authority, indeed—to have had a revenue of 100,000 *écus*, or about 12,500*l.* The monks, before the suppression of the establishment, had ceased to live in common; each had his distinct portion of the revenue. This monastic institution was the last in France which held its vassals in a state of villainage, and whoever was resident a year in their domains became their serf. It was not until the reign of Louis XVI. that the feudal powers of these ecclesiastics were entirely suppressed. The abbot was lord of the town. In 1742 this abbey was secularized, and erected into a bishopric; the bishop and chapter succeeding to the rights and many of the usages of the abbot and monks.

St. Claude is built at the foot of a mountain, one of those amid which it is placed, and at the confluence of the torrent Ison with the Bienne. It is surrounded by walls, which include a part of the adjacent mountain, but cannot be considered as fortified. The town was destroyed by fire in 1799; but a sum of 750,000 francs (about 30,000*l.*) granted by the consular government, and numerous collections made all over France, enabled the inhabitants to rebuild it on a much more regular plan.

The inhabitants amounted, in 1832, to 4170 for the town, or 5222 for the whole commune. They are busily engaged in the manufacture of toys and trinkets in tortoiseshell, horn, ivory, bone, box and other woods: beads, needles, pins, musical snuff-boxes, and other musical instruments, and nails, are among the articles made here. The traders of this town have direct commercial intercourse with foreigners. Several have establishments at Beaucaire; they import goods from Germany and England. There is a good hospital, a large public school, and several other useful institutions. Beautiful marble is quarried in the neighbourhood, and pretty good ochre is procured. Peat for fuel is also obtained.

The arrondissement of St. Claude contained, in 1832, 52,433 inhabitants, who are engaged in making turnery and other wooden wares, spinning cotton yarn, weaving crape, drawing iron wire, making wooden and metal clocks, enamel watch-faces, roasting-jacks, spectacle-frames, and imitation gems.

The bishopric of St. Claude comprehends the department of Jura, containing 312,504 inhabitants. The bishop is a suffragan of the Archbishop of Lyon and Vienne.

CLAUDIA'NUS (CLAU'DIUS) was born at Alexandria, in Egypt, A.C. 365 (*Epist.* i., 20, v. 3). Though of a family originally Roman, his education was Greek; and he appears to have written first in the Greek language. His work on the 'Antiquities of Tarsus' is lost. Of his early life little is known. His first Latin verses were written during the consulship of Probinus, A.C. 395. (*Epist.* iv., vv. 13, 14). In this year he became a dependent of the regent Stilicho, guardian of the two minors, Arcadius and Honorius; and in his poems he sometimes alludes to his soldier's life. (*Prol. Carm. de Consulatu* Mallii Theodori, vv. 5, 6.) Whether from a hope of being immortalized in verse, or from some other motive, Stilicho warmly befriended the poet; nor were the favours of his beautiful wife Serena acknowledged less gratefully than those of the minister himself. (*De Laudibus* Stilichonis, lib. iii.; *Laus Serenæ Reginæ.*) Claudian seems to have enjoyed all the splendour and luxuries which the high station of Stilicho afforded; and he either purchased or requited those indulgences by lavishing indiscriminate eulogies on his patrons and bringing infamy and ridicule on their enemies. The praises of Stilicho are the constant subject on which he delights to dwell, even when he does not directly mention his name; and where the materials of regular history are wanting, his poems form a valuable clue to the connexion and character of events.

The most important favour for which he was indebted to Serena appears to have been her assisting him to obtain a very wealthy bride (*Epist.* ii.). The nuptials were celebrated at Alexandria (*Epist.* ii., vv. 55, &c.); and it seems probable that Claudian and his wife soon after came to Italy. After the war with Gildo he was honoured with a bronze statue (*Præf. in Bellum Geticum*, vv. 5, 6), erected in the forum of Trajan, an honour which, as Gibbon (ch. 30) observes, he acknowledged as a man who deserved it: the inscription which was cut on the statue is still extant (Orelli, *Corpus Inscript.*, vol. i., p. 259).

The death of Stilicho (A. D. 408) was soon followed by the ruin of his favourite. Hadrian, the successor of Stilicho, had formerly been the subject of a satirical epigram (*Epigr.* 25, in some editions 30,) of Claudian, and he now began to watch for a favourable opportunity of revenge. The particulars of his death are not known; but it seems clear that his attempts to conciliate Hadrian were ineffectual, and that he finally fell a victim to his resentment.

It has been a subject of dispute, whether Claudian was or was not a convert to Christianity. The poems which have given rise to the supposition that he was, have been attributed to him erroneously; they are clearly the work of another writer.

Claudian's poetical merits, though not of the highest order, are considerable. He does not excel in the chastised and severe beauties of the older poets whom he aspired to imitate, nor is he remarkable for great invention or a lofty imagination; but in what may be called the picturesque style he is surpassed by none: he brings out the smallest details of a scene into a vivid and correct form, amplified and ornamented with all the graces of diction. The most prosaic topic in his hands is invested with the charms of poetry. An elegant and harmonious versification always delights his reader. 'In the decline of arts and of empire, a native of Egypt, who had received the education of a Greek, assumed in a mature age the familiar use and absolute command of the Latin language, soared above the heads of his feeble contemporaries, and placed himself, after an interval of 300 years, among the poets of antient Rome.' (Gibbon, *Decline and Fall*, chap. 30.)

Claudian's principal poems are, 3 books 'De Raptu Proserpinæ;' 3 books 'De Laudibus Stilichonis;' 2 books 'In Rufinum,' 2 books 'In Eutropium;' 'De Bello Getico;' 'De Bello Gildonico,' &c. The best editions are those of Gesner and Burmann. Claudian is included in Weber's 'Corpus Poetarum Latinorum.' Frankfort, 1833.

CLA'UDIUS NERO, the son of Drusus Nero, the brother of Tiberius, and of Antonia Minor, the daughter of M. Antonius the Triumvir, by Octavia, the sister of Augustus, was born at Lyon B. C. 10. [Augustus.] In his youth he was sickly, weak, and timid, which made his mother say that he was but the half-finished sketch of a man. Augustus, in compassion, used to call him *misellus*, little wretch. He was left to the company of the women and the freedmen of the palace, and little notice was taken of him under Augustus and Tiberius. He lived in privacy, and appears to have applied himself with perseverance to study. He became a proficient in Greek and Latin, and wrote, with the assistance of Sulpicius Flavius, a history of Rome, in 43 books, which is lost. He suggested the addition of three new letters to the Roman alphabet, and he enforced the use of them during his reign, after which they fell into disuse, but still appeared in the time of Tacitus in the old inscriptions (*Annal.* xi., 14). He also applied himself with much perseverance to the study and practice of oratory, and Tacitus has transmitted to us a favourable specimen in a speech which he delivered before the senate when emperor, in favour of the Gauls, who were asking to be admitted to the rights of Roman citizens. (*Annal.* xi., 24.)

When Caligula, who was the nephew of Claudius, became emperor, he took his uncle as his colleague in the consulship, A. D. 37. After the expiration of his consulship Claudius again withdrew into privacy, from which he was dragged by some mutinous soldiers, who were overrunning the imperial palace after the death of Caligula, and who discovered Claudius concealed behind a tapestry, and trembling from fear. They raised him on their shoulders, and carried him to the camp, where he was proclaimed emperor by the troops, A. D. 41, against the wishes of the senate and of many of the citizens, who were for restoring the republic.

This was the first example of that baneful practice, which the soldiers so often repeated, of disposing of the imperial crown. Claudius, who was then 50 years of age, began his reign by acts of justice and of mercy; he recalled exiles, restored to the rightful owners much property which had been confiscated under Tiberius and Caligula, rejected the honours and titles which the flattery of courtiers would have bestowed upon him, embellished Rome, formed an aqueduct for a fresh supply of water, which still bears his name, constructed a harbour at the mouth of the Tiber, and began the emissary of the lake Fucinus. [Celano.]

He also went over to Britain, which country he first permanently occupied, at least in part, by his generals Plautius and Vespasianus, and afterwards by Ostorius. [Britannia.] Caractacus, who was brought prisoner before him at Rome, experienced the imperial clemency. Claudius afterwards fell into a state of apathy and imbecility, being entirely governed by his profligate wife Messalina and the freedmen of the palace who were leagued with her. They took advantage of his excessive timidity and credulity to make him sign the death-warrants of numerous senators and knights, whom they represented as conspirators, and whose property was confiscated for their benefit. Messalina openly abandoned herself to the most shameless licentiousness, and no one dared to check her, or remonstrate with the emperor on her conduct, for fear of incurring her deadly revenge. She carried her effrontery at last so far as publicly to marry Caius Silius, one of the handsomest men of Rome, while Claudius was absent at Ostia. The emperor, who was roused from his torpor by the report of this scandal, gave orders that Messalina should be put to death. Soon afterwards he married, A.D. 50, his own niece, Agrippina the younger, the widow of Domitius Aenobarbus, and mother of L. Domitius. Agrippina easily prevailed on the weak Claudius to adopt her son Domitius, who assumed his stepfather's name of Nero, by which he was afterwards known as emperor, and to give him in marriage his daughter Octavia. Agrippina having thus paved the way for the succession of her own son to the throne, to the prejudice of Britannicus, the son of Claudius by Messalina, completed her object by poisoning her husband at Sinuessa, where he had gone for the benefit of his health. Claudius died A. D. 54, in his sixty-fourth year, after being in possession of the sovereign power for thirteen years and nine months. His funeral was celebrated with great pomp, and he was numbered among the gods, but his will was not read in public, in order to avoid exciting disturbances among the people on account of the preference given to Nero over Britannicus. (Tacitus, *Ann.* xii. 69; Suetonius, *Claudius*; Dion.)

[Coin of Claudius Nero.]

British Museum. Actual size Bronze. 437 grains.

CLAU'DIUS, or CLODIUS, ALBI'NUS, a native of Adrumetum, in Africa, served with distinction under Marcus Aurelius and Commodus in various parts of the empire; in Asia, in Gaul, in Germany against the Frisians, and lastly in Britain. When Avidius Cassius, governor of Syria, revolted against M. Aurelius, Albinus, who commanded the troops in Bithynia, checked the revolt which was beginning to spread among his soldiers. In consequence of this service he was raised to the consulate, together with Pompeianus, the emperor's son-in-law, A. D. 176. When Septimius Severus became suspected of aspiring to the empire, Commodus, with the view of strengthening himself, offered to Albinus, who was then commanding in Britain, where he had succeeded Pertinax, the title of Cæsar, which Albinus declined. After the assassination of Commodus and of his short-lived successor Pertinax, Didius Julianus being made emperor by the prætorian guards of Rome, who now assumed the right of disposing of the empire to the highest bidder, three commanders of the legions abroad, Albinus in Britain, Severus in Illyricum, and Pescennius Niger in Syria, stood forth to dispute this right by the corresponding argument of the will of their own soldiers. Severus, who was the nearest to Rome, marched upon the city, upon which the senate proclaimed him emperor, and the prætorians made way for him by assassinating the unfortunate Julianus. Severus while on his march had written to Albinus, proclaiming him Cæsar, and adopting him as his successor. This time Albinus accepted the title, which he assumed publicly at the head of his legions; and the senate confirmed it, after the accession of Severus. But the new emperor having first overthrown his competitor Pescennius Niger, resolved to rid himself also of his dubious associate Albinus; who, having discovered his intentions in time, passed over into Gaul, where he was proclaimed emperor, and strengthened himself by fresh recruits. Severus hurried from the east against this new enemy, and after several partial engagements a great battle was fought near Lyon, in February, A.D. 197, in which Severus was worsted at first and wounded, according to Spartianus, but succeeded in rallying his cavalry, with which he gained the victory. The soldiers of Albinus having taken refuge within Lyon, that city was invested, stormed, and burnt, by the troops of Severus. Albinus, according to Dion, killed himself, and his body was carried to Severus, who had the head cut off and taken to Rome, and the body thrown into the Rhone. Severus, with his characteristic inhumanity, put to death the wife and children of Albinus, and ordered a general proscription of all his friends, who were numerous in Gaul and in Spain, and even at Rome. Albinus appears to have been a man of considerable talents and information. He was a distinguished commander, and had many partisans among the senators, but was harsh and even cruel in his military discipline: and is said by Capitolinus to have been an enormous glutton. (Herodian, Dion, and Spartianus; and Julius Capitolinus in the *Historia Augusta*.)

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[Coin of Claudius Albinus.]

British Museum. Actual size. Bronze. 337 grains.

CLAUDIUS, MARCUS AURELIUS, surnamed **GOTHICUS**, was born in Illyricum A.D. 214, served in the army as tribune under Decius, was afterwards governor of his native province under Valerianus, and after the death of Gallienus in 268, near Milan, was proclaimed emperor by the army. The choice was immediately approved by the Senate. Claudius began his reign by defeating the usurper Aureolus, who had revolted against Gallienus, and had taken possession of Milan. Aureolus was killed in the battle. Claudius afterwards marched against the Germans, who had entered Italy, and defeated them on the banks of the Benacus (Lake of Garda.) On arriving at Rome, he was received with great honours, and applied himself to reform many of the abuses which existed in the administration of the empire. In the following year he marched against the Goths, or Scythians, who had invaded the provinces of Mœsia, defeated them with great slaughter, and made a vast number of prisoners, whom he distributed over various provinces as labourers. In consequence of this victory, he assumed the name of Gothicus. In the year after (A. D. 270) he died at Sirmium, in Pannonia, of a contagious disease which had spread in his army, after a short reign of little more than two years, during which he exhibited virtues and abilities that entitle him to be numbered among the best emperors of Rome. The Senate named his brother Quintilius his successor, but the army proclaimed Aurelianus, upon which Quintilius was killed, or killed himself according to others. (Trebellius Pollio *in Historia Augusta.*)

[Coin of Claudius Gothicus.]

British Museum. Actual size. Bronze. 125 grains.

CLAUSENBURG (Kolos), a county in the west of Transylvania, in that part of it called the 'land of the Magyars,' which is one of the four divisions of the principality. It has an area of 1861 square miles, and contains 100,000 inhabitants, who are chiefly employed in rearing cattle, in agriculture, mining, and a few manufactures, and trade. It has one royal free town, five market-towns, 202 villages, and thirty-five prædia, or privileged settlements, and is divided into six 'processes.' The chief rivers are the Szamós and Körös. It is very mountainous: the most elevated points are Varatik, Trugassa, Yladiassa, Balamirassa, and Kalota. It abounds in horses, oxen, sheep, goats, and swine; also in honey and corn, and produces salt, gold, iron, and some wood.

CLAUSENBURG (Klush, Kolosvár), a royal free town and capital of the principality of Transylvania. The town was founded by the Romans, who gave it the name of Claudia, whence its Latin designation Claudiopolis. In 1178 the new town was enlarged by a colony of Saxons, who from its locality called it Clausenburg, from the old word Klause, which signifies a mountain defile. The citadel, which lies on a hill, was not erected till 1721, since which date commodious barracks have been made in it. Owing to its flourishing trade and manufactures it was formerly one of the principal towns of the country. Settlers flocked to it from all parts, till the place becoming too confined, the new-comers were obliged to take up their abode in the neighbouring villages, which thus became the property of the town. Clausenburg is situated on the river Szamos, in the midst of a romantic valley, surrounded with mountains, and studded with fields, gardens, and vineyards. It is surrounded with lofty walls and towers, and is divided into the inner town and six suburbs; the former consists of the Ovar (Altburg), or old town, and Ujvas, or new town, and though of small extent has a very pleasing appearance. It has some handsome streets and houses, and a large market place, 500 paces long and 360 broad. There are also several churches, the most striking of which is the Roman Catholic cathedral, erected in pursuance of a vow of King Sigismund in 1399; it is 94 paces long and 34 broad, and contains some fine monuments. Of the other churches, five are Roman Catholic, several Protestant, and one Græco-Catholic. The members of the Oriental Confession have their distinct places of worship.

Clausenburg contains an academical lyceum, having 185 students, with a public library attached; a Roman Catholic gymnasium, with 270 pupils; a reformed college, with 550 pupils; a Græco-Catholic, with 306 pupils; a Roman Catholic seminary; a seminary for the young nobility; a Franciscan convent; normal schools, with above 300 scholars; a house of industry for poor men and women, established by an association of ladies; an orphan asylum, two hospitals, and various other charitable institutions; a Casino, containing the assembly rooms, the profits of which are devoted to purposes of charity; a large national theatre, and several public gardens around the town, one of which is called the 'People's Gardens.' Among the other buildings is the old castle, which is now in ruins, the town-hall in the market-place, and numerous palaces belonging to the higher nobility.

Clausenburg is the seat of the government of Transylvania, of the consistory of the Protestant and Græco-Catholic communions, the board of education, and other public departments. Being a Fiskal-gut or Taxal-Ort (that is, a place having its own independent jurisdiction), it is not included in the jurisdiction of the province, but all its civil and other affairs are conducted by its own judges and magistrates. It contains 20,000 inhabitants, who are chiefly Hungarians, intermixed with Saxons, Armenians, Greeks, and Jews. There are few mechanics, and it has little trade. The manufactures, which are inconsiderable, are chiefly woollens, earthenware, and paper. It is the birth-place of the celebrated Matthias Corvinus, king of Hungary. 46° 53′ N. lat., 23° 48′ E. long.

CLAUSI'LIA. [LIMACINEA.]

CLAUSTHAL, in the Hanoverian Landrostei, or Bailiwick of the Harz, the largest and most important of the mining towns of the Harz, is an open place built upon two naked eminences, and separated from Zellerfeld (a town of 4000 souls) by the rivulet called Zellerbach. It is the seat of administration for the mining districts of Hanover, and lies at an elevation of 1170 feet above the sea, and about 50 miles S.E. of Hanover. The adjacent parts abound in ores. The streets are straight and broad, and planted in general with chestnuts and lime-trees, but are very badly paved. It contains two churches, an orphan asylum, a mint, in which about 700 ducats and 400,000 dollars are annually coined, and public offices, a mining academy, to which a seminary for teaching forest economy is attached, with collections in mineralogy, &c., a gymnasium, manufactories of iron ware, yarns, woollens, camlets, &c., and several elementary schools. In the immediate vicinity are the richest mines of the Upper Harz: their chief products are annually about 160,000 ounces of silver, 4 tons of copper, and 2400 tons of lead and litharge: they employ upwards of 2000 workmen. The number of houses in Clausthal is about 850, and of inhabitants about 8900. 51° 48′ N. lat., 10° 20′ E. long.

CLAVAGELLA (Zoology), a genus of testaceous acephalous animals established by Lamarck in the fifth volume of the 'Histoire Naturelle des Animaux sans Vertèbres,' published in 1818, and arranged by him under his Tubicolées, between *Aspergillum* and *Fistulana*. He described four species, all fossil, referring at the same time to the 'Annales du Muséum,' where he had figured the first of them under the name of *Fistulana echinata*. Lamarck thus defines the genus:—'A tubular, shelly sheath, attenuated and open anteriorly, terminated posteriorly in an ovate subcompressed club beset with tubular spines; the club presenting on one side the one valve fixed in its wall or substance, while the other valve remains free in the tube.'

The genus was only known in a fossil state to conchologists, when Mr. George Sowerby, to whom students in this department of zoology are much indebted, observed in the British Museum a recent specimen, which he at first thought might be an *Aspergillum*, inclosed in a mass of stone. On application to Mr. Children, that gentleman allowed Mr. Sowerby to examine it more closely, and on scraping away some of the investing stone, the latter found *Clavagella aperta*, the first recorded recent species, and figured and described it in his 'Genera of Recent and Fossil Shells. The same naturalist, on the return of Mr. Samuel Stutchbury from his voyage to some of the Australian and Polynesian Islands, described and figured (1827) a second species, *Clavagella Australis*, three specimens of which were with difficulty obtained by Mr. Stutchbury at North Harbour, Port Jackson, in a siliceous grit like that of the coal-measures, where their presence was betrayed just beneath low-water mark, by their forcible ejection of the water from the aperture of their tubes: the specimen of *Clavagella Australis* figured by Mr. Sowerby is also in the British Museum. In 1829 Mr. Henry Stutchbury, in arranging the collection of Mr. Isaac Lyon Goldsmid, suspected the presence of a *Clavagella* in a mass of *Astræopora*, and, on fracturing the specimen, laid open two individuals of another species (*Clavagella elongata*, Brod.). According to Cuvier, and a notice in the 'Annales des Sciences Naturelles' (tome xvii., p. 78), M. Audouin (1829) described a recent species, and M. Rang, in his 'Manuel des Mollusques' (1829), mentions another, apparently *Clavagella rapa*.

Still the animal remained unknown; when, on the return of Mr. Cuming from his first voyage, that zealous collector produced another specimen which fortunately included the soft parts. A fragment of calcareous grit was dredged up by Mr. Cuming from a depth of eleven fathoms, at the island of Muerte, in the bay of Guayaquil, and in this was the greater portion of the chamber and tube, both valves, and the animal of *Clavagella lata*, Brod. Mr. Broderip, who has described this and two other recent species in the first volume of the 'Transactions of the Zoological Society' (p. 261), says, that a close examination of the recent species has convinced him that though one valve is always fixed or imbedded in the chamber, and soldered, as it were, to the tube, so as to make one surface with it, the tube is not necessarily continued into a complete testaceous clavate shape. In Mr. Goldsmid's best and largest specimen, the fixed valve was imbedded in the coral, and though continued on to the tube or siphonic sheath, was surrounded by the wall of the coral chamber at its anterior extremity. In the other specimen the fixed valve was also continued on to the tube. In the first-mentioned specimen of *Clavagella elongata*, at the anterior or greater end of the ovate chamber, an insulated or shelly plate had been secreted with tubular perforations; that part of the chamber having afforded (apparently at a former period) the best communication with the ambient fluid: but a calcareous deposit having almost entirely cut off that communication, the animal seemed to have been compelled to secrete a second shelly plate towards the anterior ventral edge of the fixed valve, where the perforation of some other shell (a *Lithodomus* probably) secured the necessary influx of water. Nor is this the only instance of the secretion of a second tubular plate which has fallen under Mr. Broderip's notice. In the last-mentioned, or smaller specimen, the perforated shelly plate joins the anterior ventral edge of the fixed valve laterally, that point of the chamber being evidently the most practicable for communicating with the water by means of the tubules: the rest of the anterior edge of the fixed valve is surrounded by the coral wall. In Mr. Cuming's specimen the fixed valve is continued on to the tube. The anterior edge of this valve is surrounded by the naked wall of the chamber, and the greater end of the chamber, or that part of it which is opposite to this anterior edge, being impracticable, from its thickness, as a water communication (with a small exception, which, not improbably, had ceased to be available), the animal had been driven to secrete the perforated shelly plates not far from the throat of the tube on either side, where the chambers of *Petricolæ* or *Lithodomi* opened a passage to the surrounding water.

Organization

Position, &c. of the animal.—Mr. Owen made his observations in his excellent paper on the anatomy of *Clavagella* (*Zool. Trans.*, vol. i. p. 269) from the specimen of *Clavagella lata* above alluded to, the soft parts of which were placed in spirit by Mr. Cuming soon after its capture. He found the following to be the relative position of the animal:—The *mouth* turned towards the closed end of the chamber, which is consequently the anterior part. The *heart* and *rectum* near the side where the valves are connected by the ligament, or the dorsal part. The visceral mass projecting towards the opposite or neutral side. The *siphon* extending into the commencement of the calcareous tube, which leads out of the anal or posterior part of the chamber. The *fixed valve*, which covers the rough surface of the porous rock or coral, like the tiling of a chamber-floor, and affords a smooth polished surface for the support and attachment of the animal, is the *left valve:* the *right valve* remains free, or is connected only to the soft parts and cardinal ligament, in order to assist in the excavating and respiratory actions.

Shell.—The shelly substance of the fixed valve passes without interruption into that of the tube; a slight ridge circumscribing the entry of the tube into the chamber indicating the line of separation, unless the extent of the valve be limited to that of the internal nacreous deposition. The *tube* of an oval form, 7 lines by 5 in diameter. The calcareous walls $\frac{1}{30}$th of an inch in thickness at the outlet, and about $\frac{1}{30}$th at the opposite extremity. The *free valve* unequally triangular, with the angles rounded off, about the thickness of a sixpence, moderately concave towards the soft parts, and striated only in the direction of the layers of increment on the outer surface, as in most of the *Pyloridean* Bivalves of M. De Blainville. The layers gradually increase towards the dorsal edge for a little more than one half of the valve, beyond which the layers continue of almost equal breadth. 'This growth of the valve,' adds Mr. Owen, 'corresponds to the direction in which the chamber is enlarged, which is principally on the dorsal, dextral, and anterior sides: now this is the mode of enlargement best adapted for the full development of the ovary; so that it would seem that the *Clavagella* continues for a time to work its way into the rock without material increase of size, leaving behind it a calcareous tube, which marks its track; after which it becomes stationary, and limits its operations to enlarging its chamber to the extent necessary for the accomplishment of the great object of its existence.'

Mantle, and Muscular System as ancillary principally to Respiration.—*Mantle* enveloping the body like a shut sac, but perforated for the siphon and foot, the opening for the latter being reduced to a small slit. M. Rüppell observed an analagous orifice in the corresponding part in *Aspergillum*, viz. that which is next the sunken sieve-like extremity of the tube, and by which he supposes the water necessary for respiration to be received when the retreating tide leaves exposed the expanded siphonic extremity. Mr. Owen is of opinion that this cannot be its use in those species of *Clavagella* which exist at depths too great to allow of their being ever left with the siphonic aperture out of water; but that it must serve to keep up a communication with the neighbouring cavities of the rock, by means of the calcareous tubules, the formation of which is determined by the proximity of these cavities. When therefore the *Clavagella*, by a sudden contraction of its adductor muscles, has forcibly expelled the branchial currents from the siphon, as was observed by Mr. Stutchbury, the space between the free valve and the walls of the chamber would be simultaneously filled, either by water rushing in through the tubules, or forced out from the branchial cavity through the small anterior orifice of the mantle. To assist this operation there is a proportional development of the muscular system, which is remarkably powerful. The impression of the great or posterior adductor is carried two lines beneath the surface of the chamber posteriorly, but gradually rises to the level of the valve. The impression of the smaller anterior adductor is more faint, and is continued into the sinuous pallial impression, which follows the contour of the anterior margin of the valve at about two lines distance from it. In the free valve the last two muscular impressions are separate. The outer dermoid layer of the mantle is extremely thin, and where it does not line the valves, is mottled with minute dark spots, less numerous than those on the skin of *Cephalopods*, and presenting, under the microscope, a glandular appearance. The muscular layer, after forming the *siphon* and its retractors, is confined to the anterior part of the mantle, where it swells into a thick convex mass of interlaced and chiefly transverse fibres, and forming, Mr. Owen supposes, one of the principal instruments in the work of excavation. No fibres could be detected in other parts of the mantle; nor, observes Mr. Owen, could any be expected in a mantle which had no lobes to be retracted. The *siphon*, in the contracted state, formed a slightly compressed cylindrical-tube, half an inch in length, and the same in the long diameter, traversed longitudinally by the branchial and anal canals, separated from each other by a muscular septum, extending to the end of the siphon, beyond which the two tubes do not separately extend outwards, agreeing in this respect with *Gastrochæna* and *Aspergillum*. Muscular walls of the siphon two lines in thickness: the septum separating the branchial and anal canals one line; diameter of each canal about one line; inner extremity both of the anal and respiratory tube provided with a valvular fold; terminations beset with short *papillæ*. The retractor muscles attach the siphon to the posterior adductor on one side, and to the anterior extremity of the oval mass of muscular fibres above mentioned on the other, leaving an intermediate space on both sides the body, which exposes part of the gills and labial tentacles. The muscular mass which bounds the anterior part of the animal's body is oval, one inch three lines long, eight lines broad, and varying in thickness from two to three lines: it is smooth and convex externally, and hollowed out within to lodge the *viscera* at the base of the foot, for the passage of which it leaves the small orifice above mentioned. The margins attached to the valves are more or less irregular; that affixed to the loose valve is the broadest, being at the ventral extremity three lines in length. Mr. Owen thinks that it may here be regarded as a third adductor; posteriorly it is continued into the small adductor muscle.

Branchiæ and Circulating System.—The gills have the same laminated structure as that observed in other bivalves, they are broad and short, corresponding to the form of the animal, and the *laminæ*, not thin compressed layers, but broad and projecting but little from the sides of the visceral mass, are arranged in three layers instead of two, on either side of the foot. They take their origin between the labial appendages, at the side of the mouth, extending backwards towards the inner orifice of the respiratory tube, where they meet, join, and terminate in a point which is unattached for about one eighteenth part of the entire gill. The branchial veins are continued from the concave side of the gills, a few lines behind their anterior extremities: these veins are joined by others from the muscular part of the mantle, and then terminate in two large membranous dark-coloured auricles. These communicate with a fusiform ventricle, single externally, but divided within, by a longitudinal *septum*, into two compartments, corresponding to the auricles: which compartments communicate together at the *apex* of the ventricle, from which the principal artery is continued. (Owen.)

Digestive System, accordant with the structure of the same part in the other acephalous mollusks. The mouth, a transverse slit, without masticatory or salivary organs, is bounded by the upper and lower labial processes which are continued in the form of two transversely striated pointed tentacles on either side: these prehensile, sensitive, and, according to Mr. Owen, probably respiratory organs measure, each, six lines in length, and about one and a half line in breadth. The œsophagus, after a course of two lines, dilates into a stomach, the sides of which are perforated by the large hepatic ducts. The intestine, after a course of eight lines, forms a small cæcum about one line in length: this, Mr. Owen observes, may be taken for a *pancreas;* or perhaps is the analogue of the blind sac containing the peculiar amber-coloured style which projects into the pyloric end of the stomach of some *Bivalves*. The little *cæcum*, in the specimen dissected, contained the same brown granular material as distended the rest of the canal. The intestine, after making three close turns upon itself in the mass of *ova* and hepatic follicles at the base of the foot, passes in immediate contact with, but not through, the heart, and then below the posterior adductor, to opposite the posterior office of the anal tube. The exterior of the intestine has an irregular honey-combed appearance, from the close adhesion to it of the capsules of the *ova*. The *liver* has the same divided follicular structure and green colour as in the other *Bivalves*. (Owen.)

Nervous System.—A large and conspicuous *ganglion* is situated at the posterior part of the base of the foot, just above the orifice of the anal tube. Two nervous cords extend from this *ganglion*, on either side the foot to the mouth; other branches radiate in the opposite direction to the siphonic and adductor muscles. (Owen.)

Generative System.—The ovary, of a grey colour, forms a mass at the dorsal aspect of the body above the great adductor muscle, and extending ventrad on either side the *œsophagus* and stomach to the opposite end of the base of the foot. All this mass of intestinal folds, hepatic follicles, and *ova* was covered by a thin membrane. The little muscular process or foot which passes through the anterior slit of the mantle is but four lines long, and half a line in breadth: its possible use may be to apply a solvent to the rock in which the chamber is excavated. (Owen.)

Habits.—Mr. Broderip observes that we are left to conjecture the causes which operate to determine the animal in the choice of its abode, if indeed it can be called choice, for most probably *Clavagella* is the creature of circumstances, and if, soon after its exclusion from the parent (when Mr. Broderip supposes it to be furnished with its two valves only, and to float free, with, perhaps, some voluntary impulse), it arrives at the vacant hole of some small *Petricola*, *Lithodomus*, or other perforating *Testacean* which suits it, one valve soon becomes attached to the wall of the hole, and then the enemy proceeds to secrete the siphonic sheath or tube, to enlarge the chamber according to its necessities, and to form the shelly, perforated, tubular plate which is to give admission to the water at the practical part of the chamber. How the excavation is carried on is also doubtful. The chambers of the individuals of *Clavagella Australis*, described by Mr. Broderip, were formed in a siliceous grit, those of *Clav. elongata* in an *Astræopora*, that of *Clav. lata* in a calcareous grit, and those of *Clav. Melitensis* in an argillo-calcareous tufa. 'If,' says the author last mentioned, 'the excavation be the work of a solvent secretion, it must be a solvent of extensive power. The situation of the glands, detected by my friend Mr. Owen, leads me to think that they minister in some way to this operation; and I do not see how the anterior or greater end of the chamber can be operated on by mere mechanical attrition with such parts as must have been contiguous to it. It has been objected that any solvent which would set on a calcareous rock would equally act on the calcareous shell of the animal; but there is, perhaps, more of point than of strength in this objection. Without laying too much stress on that law of nature by which chemical and vital forces are placed in a state of hostility,* and which may or may not be applicable to such a substance as shell, the gland for the secretion of the supposed solvent, as well as the organ for applying it, may be so placed as that the solvent shall only come in contact with the inorganic or dead substance to be acted on without touching the shell. Again, it has been asked, what solvent would act equally on a calcareous and on a siliceous substance? To this it may be answered, first, that it is not pretended that the nature of the supposed solvent is known; secondly, that, in siliceous grits, there is more or less calcareous matter by which the mass is held together, and that the solution of the calcareous particles would be followed by the disintegration of the stone. **** One observation, arising from the various depths at which the recent species have been found, will not, perhaps, be deemed irrelevant. *Clav. Australis* was so near the surface at low water, that it was detected by its ejection of the fluid: *Clav. elongata*, from the nature of the coral in which

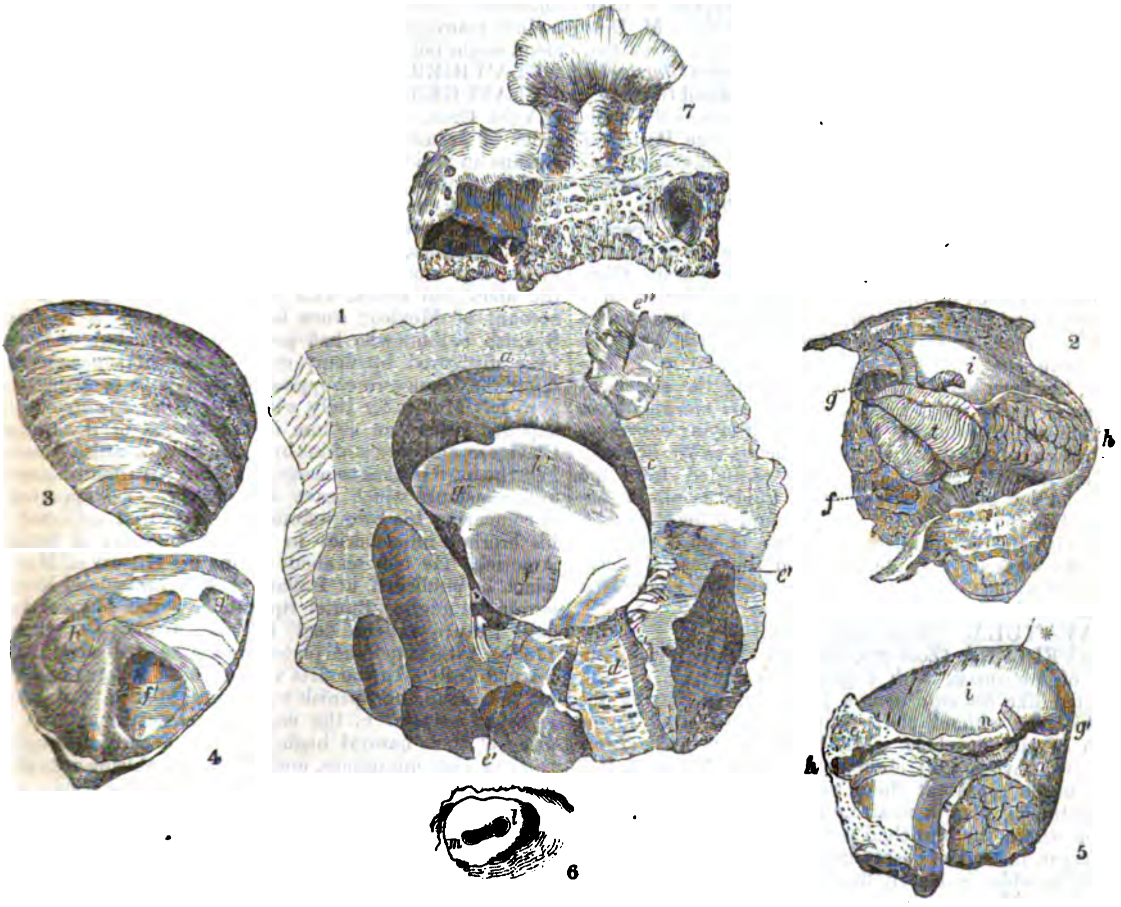

Fig. 1, part of calc. grit rock containing the fixed valve and part of the tube of Clavagella lata; *fig.* 3, external view of the right or free valve; *fig.* 4, internal view of same, showing the muscular impressions corresponding with those of the left or fixed valve; *fig.* 2, soft parts of Cl. lata seen from the right side, the dermal layer of the mantle, *e*, being removed: *fig.* 5, the same seen from the left side, or that which is in contact with the fixed valve. The extremities of the left labial appendages only are exposed, no part of the gill being protruded. A bristle is placed in the opening of the mantle; *a*, anterior wall of the chamber; *b*, dorsal wall; the letter placed on the hinge of the fixed valve; *c*, ventral wall; *d*, posterior or siphonic outlet; *e*, tubular communications with a neighbouring cavity, here sent off from the posterior part of the mantle; *e'*, *e'*, calcareous tubes secreted by the above processes and extending into the cavities contiguous to the throat of the tube; *e''*, a cavity communicating with the anterior part of the chamber; *f'*, impression of the posterior adductor muscle; *g'*, impression of the anterior adductor muscle; *h'*, impression of the pallial muscle, or third adductor: *f* posterior or large adductor (the single adductor of the *Ostracea*, &c., corresponds to this, the following are superadded in other families of *Bivalves*); *g*, the anterior antero-dorsal, or smaller adductor; *h*, the pallial or antero-ventral adductor; *i*, the convex muscular mass continued over the anterior part of the body, and reducing the opening of the mantle to the small slit,* through which a bristle is placed in *fig.* 3; (this mass is an inordinate development of what forms the muscular margins of the mantle lobes in other bivalves): *k*, muscular fibres of the *siphon*: *l* (*fig.* 6), the respiratory, or ingestive siphonic canal; *m*, the anal, or egestive siphonic canal; *n*, the labial or buccal appendage; *t*, the gills: in *fig.* 2 the right gill is seen partially protruded between the muscular parts of the mantle; *x*, part of the ovary (figures and description from Owen, to whose lucid memoir and illustrations the reader is referred for the anatomy of the internal parts); *fig.* 7, anterior termination of the shelly tube of *Clav. aperta*, *Sow.*, from Mr. Sowerby's Genera of Recent and Fossil Shells.

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* John Hunter's paper in the 'Philosophical Transactions' for the year 1772, 'On the Digestion of the Stomach after Death,' and Spallanzani's experiments on that organ, will readily occur to the physiologist.

it was chambered, could not have been living far beneath the surface; whereas *Clav. lata* was dredged up from a depth of sixty-six feet. Any inferences, therefore, as to the state of submersion of a rock during the life of the fossil species of *Clavagella* which there occur, should be made with caution by the geologist.'

Geographical Distribution.—The diffusion of the genus, though now comparatively rare in cabinets, is probably wide. A sharp investigation of masses of coral and of submerged perforated rocks or stones, particularly in warm climates, is very likely to be rewarded by the discovery of *Clavagellæ.*

Probable place in the Natural System.—Mr. Owen is of opinion that the organization of *Clavagella*, like that of *Aspergillum* described in the 'Reise von Afrik' of Dr. Rüppell, is modelled on the type of the *Acephalous Bivalves*, and that it follows most closely, in the variations from that type, the modifications which have been observed in *Gastrochæna.* The lengthened worm-like figure of *Aspergillum* is exchanged in *Clavagella*, observes Mr. Owen, for a shorter form with greater lateral development: and instead of the small rudimentary valves, which are enchased, as it were, in the calcareous sheath of *Aspergillum*, we find them here largely developed, and one of them always remaining at liberty, to be applied by a powerful muscular apparatus to those offices which are essential to the forcible expulsion of the fluid in the branchial cavity, and probably to assist in the excavation of its secure abode.

Fossil Clavagellæ.

Mr. Broderip says that no fossil species appear to have been detected below the supracretaceous group. M. Deshayes, in his tables (Lyell, 3rd vol., ed. 1833), gives two living and seven fossil (tertiary) species, and one (*Clavagella aperta*, Sowerby) as found both living and fossil (tertiary). He gives the Mediterranean and Indian Ocean as the habitation of the living animal, and Sicily (Pliocene Period of Lyell) as the locality of the fossil. In his edition of Lamarck he makes the whole number (living and fossil) seven, the seventh and last species being *Clavagella aperta*; but he refers to Rang's 'Manuel' for a second living species. (See the 'Manuel' and Mr. Broderip's paper above referred to.) In Deshayes's edition of Lamarck the species *Clav. echinata* is followed by *Clav. cristata*, and the editor, in a note referred to from the latter, says that these two species should be united, as they only differ in size and age. He also observes that the free valve of *Clav. cristata*, or of *Clav. tibialis*, has been placed by Lamarck among the species of *Glycimeris* under the name of *Glycimeris margaritacea.* And here we may mention the difficulty of laying down specific characters from the valves, which being, as Mr. Broderip remarks, nearly, perhaps altogether, excluded from the light, colour, at best but a treacherous guide, is absent entirely; while the shape of the chamber and of the valves, together with the comparative roughness or smoothness of their outer surfaces, may depend upon the greater or less degree of hardness of the material in which the chamber is formed.

CLAVA'TULA. [Siphonostomata.]

CLAVELLI'NA (Zoology), Savigny's name for a subgenus of Ascididæ, with a gelatinous envelope or test, supported like *Boltenia* upon a peduncle, and having the branchial sac without plaits, but not penetrating to the bottom of the envelope. Mr. W. S. Mac Leay (*Linn. Trans.*, vol. xiv., p. 539) observes that those figures of *Bolteniæ*, which represent them as supported vertically on a rigid peduncle, give them an unnatural position; that is, a position where the branchial pouch, and consequently the œsophagus, instead of descending, ascend. The peduncle, indeed, he adds, is clearly flexible in a natural state, in order that its drooping by the weight of the body may give this last a position analogous to that of other *Ascididæ.* When such animals exist, supported by a rigid peduncle, this must be inserted at the other extremity of the body, as in *Clavellina*, the compound family of *Botryllidæ*, and perhaps *Ascidia globularis* of Pallas and Lamarck. It seems, according to Mac Leay, necessary for the digestion of *Ascididæ*, if we may judge from their general construction, that the intestinal canal should form a loop or *ansa.* This loop may be either ascending, as in *Boltenia*, or descending, as in *Clavellina;* the only circumstance common to both genera being that the loop points towards the peduncle. Mr. Mac Leay thinks that in *Clavellina* the peduncle may possibly be a receptacle for the eggs, as in certain Cirripeds, and as it seems to be in the compound *Tunicata* of the family of *Botryllidæ*, but that whether it be also the case in *Boltenia* is not so certain. The student should refer to the second part of Savigny's admirable *Memoir upon the Invertebrate Animals* (Paris, 1816), and Mr. Mac Leay's interesting paper above quoted.

CLAVICHORD (or, improperly, *clarichord*), a musical keyed instrument, much in use till the middle of the last century, but now only to be met with as a curiosity. Its shape is that of a square piano-forte, though smaller, and the strings are struck, or rather pressed, by brass pins projecting from the further end of the keys. The tones of the Clavichord are rendered exceedingly soft by means of pieces of cloth interwoven with the strings. This softness was its great recommendation in convents, the nuns having thereby been enabled to practise without disturbing others in the dormitory.

CLAVICO'RNES (Entomology), a name given by Latreille to a subsection of Coleopterous insects of the section Pentamera.

The insects of this subsection almost always have the antennæ thickened at the apex, and frequently the terminal joints forming a club: the joints of the tarsi are usually entire.

Such are the principal characters of the subsection Clavicornes, a group in which Latreille includes the families *Scydmœnidæ*, *Histeridæ*, *Silphidæ*, *Scaphididæ*, *Nitidulidæ*, *Dermestidæ*, *Byrrhidæ.* We thought it proper to notice this subsection, since it is adopted by many of the continental entomologists. It appears to us, however, to include many genera of insects, which, in a natural arrangement, ought not to be associated under one head.

CLA'VIGER. [Pselaphidæ.]

CLAVI'GERO, FRANCESCO SAVERIO, was born at Vera Cruz, in Mexico, about 1720. He entered the order of Jesuits, and was sent as missionary among the Indians in various parts of Mexico, where he says, in the preface to his work, he spent thirty-six years, visiting the country in every direction, living at times entirely among the Indians, whose language he learned, collecting their traditions, and examining the historical paintings, MSS., and monuments relative to the antient history of the aboriginal tribes, with the view of writing a correct account of Mexico; since he had found, on reading the Spanish authors who had preceded him, that their works were disfigured by many errors and misrepresentations. After the Jesuits were suppressed by Spain in 1767, Clavigero left Mexico for Italy, where the Pope granted to the expelled fathers an asylum in the States of the Church. Clavigero, and others of his brethren from Spanish America, had the town of Cesena assigned to them as their residence; a circumstance which gave Clavigero a good opportunity of comparing his own information with that collected by his brother missionaries in various provinces of Spanish America. He now set about writing his History of Mexico, which he published in Italian, 'Storia antica del Messico cavata dai migliori Storici Spagnuoli, e dai Manoscritti e dalli Pitture antiche degl' Indiani,' 4 vols. 4to. Cesena, 1780–1, with maps and plates, which he dedicated to the learned Carli. In the first volume, after a long and critical list of all the Spanish writers on Mexico, the author gives an account of the countries constituting that empire; of their natural history, of their early inhabitants, their various migrations, and of the establishment of the dominion of the Aztecs, and concludes with a sketch of the political state of the country when Cortez landed on its shores in 1521. The second volume treats of the manners, customs, arts, sciences, and language of the people. The third, which contains the account of the conquest by Cortez, is written with great impartiality. The author feels as a Mexican rather than a Spaniard. The fourth volume consists of dissertations on the physical and moral constitution of the antient Mexicans, on their progress in the arts and sciences, on their religion, on the proper boundaries of the empire of Anahuac; and lastly, the author gives a list of works written in the various native languages since the conquest, either by Spaniards or natives. Clavigero indignantly refutes the assertions of Paw, Raynal, and others, who chose to consider the Indians of America as an inferior race, little removed from the brute creation. In these dissertations Clavigero has at times shown more industry and honest zeal than critical discrimination. His work, however, is, upon the whole, the best that has been written on antient Mexico; Humboldt, Navarrete, and other recent writers often refer to it. [Aztecs.] It was translated into English by C. Cullen: 'The History of Mexico,' 2 vols., 4to., London, 1787. Little is known of Clavigero's private life. He died in the Papal State towards the end of the last century. Clavigero, although the author of a most important Italian work, has been singularly neglected by the Italian bibliographists and biographists. His name is not even mentioned in Lombardi's 'Literary History of Italy in the Eighteenth Century.'

CLAVIPA'LPI (Entomology), according to Latreille, the seventh family of Tetramerous Coleoptera.

The insects of this family are principally distinguished by the antennæ being terminated by a perfoliate club. The tarsi are generally furnished with a velvet-like substance beneath, and have the penultimate joint bilobed; some few, however, have the tarsi simple. The mandibles are emarginated or dentated at the apex; the maxillæ are armed on the inner side by a tooth-like process; the palpi have the terminal joint large. Many of the species of this group feed upon fungi and boleti, and their form is often rounded and convex. The genera included in the family Clavipalpi are *Erotylus*, *Triplax*, *Languria*, *Phalacrus*, *Agathidium*, and some others.

CLA'VIUS, CHRISTOPHER, of Bamberg, entered into the order of Jesuits, and died at Rome February 5, 1612, aged 75. He was selected by Gregory XIII. to superintend the reformation of the Calendar, in which capacity he had to endure and reply to the attacks of Moestlinus, Joseph Scaliger, Vieta, and others of less note. As a mathematical writer, Clavius is distinguished by the number of his works, the frequency with which they were reprinted, his rigid adherence to the geometry of the antients, and the general soundness of his views. According to Riccioli (*Chronicon*, *Nov. Almag.*), the most learned Germans resorted to Rome, that they might converse with Clavius, and several were accustomed to say that they would rather be attacked by him than praised by others. As Clavius did not possess any great original talent, his works are now of little consequence, except to the mathematical historian. The following is the list of those which have been mentioned by succeeding writers:—

(1.) In 'Sphæram Johannis de Sacro-bosco Commentarius,' Rome, 1570, reprinted more than a dozen times: the last edition we can find is that at Leyden, 1618. (2.) The Works of Euclid, with a commentary; Rome, 1574; Cologne, 1591; Frankfort, 1607, &c., &c. (3.) 'Epitome Arithmeticæ Practicæ,' Rome, 1583; Cologne, 1637, &c. (4.) Edition of the Spherics of Theodosius, with a Table of Sines, Tangents, &c.; Rome, 1586. (5.) A work on Gnomonics, Rome, 1587; several times reprinted. (6.) 'Defence of the Calendar against Moestlinus;' Rome, 1588. (7.) 'Fabrica et Usus, &c.,' a work on Horology; Rome, 1586; 'Constructio, &c.,' a second work; Louvain, 1595; 'Horol. Nov. Descr., &c.,' a third; Rome, 1599. (8.) On the Astrolabe, Rome, 1593, &c. (9.) Refutation of J. Scaliger on the Calendar, Rome, 1595; Mayence, 1609. (10.) 'Romani Calendarii a Greg. XIII. Restituti Explicatio,' Rome, 1603. This is to us the most important of the works of Clavius: it contains the description of the reasons and methods employed in the alteration of the calendar, with the answer to Vieta and others. (11.) 'Elements of Algebra,' Rome, 1604. (12.) 'Geometria Practica,' Rome, 1604. (13.) 'Refutation of George of Wirtemberg on the Calendar,' Rome, 1610. We have taken the earliest editions which we could find in any of the authors cited at the end.

A complete edition of the works of Clavius was published at Mayence in 1612. The account of the Calendar is in the fifth and last volume. (Riccioli, Weidler, Blancanus, Lipenius, Bouillaud (*Cat. Bibl. Thuan.*), Lalande, Delambre.)

CLAVULA'RIA. [Zoophytaria.]

CLAVULI'NA, D'Orbigny's name for a genus of his family Hélicostègues, order Foraminifères. [Foraminifera, Symplectomerea.]

CLAY, any natural mixture of earths which breaks down or disintegrates in water, and affords a plastic ductile mixture. It depends upon this property, rather than colour or composition, whether an earthy body belongs to the class of clays. There are many varieties of clay used for different purposes.

Pipe-clay is of a greyish-white colour, has an earthy fracture, and a smooth greasy feel; it adheres to the tongue, and is very plastic, tenacious, and infusible. Its name shows the purpose to which it is applied. It is found near Poole in Dorsetshire.

Potter's clay is of various colours, and disintegrates by exposure to the air; when mixed with sand, it is made into bricks and tiles. It is found in Hampshire, Berkshire, Devonshire, and is largely used in the Staffordshire Potteries. The Hampshire clay yielded by analysis,—

Silica . . .	51
Alumina . .	25
Lime . . .	

with some oxide of manganese and water

Stourbridge clay has the general properties above described, but is of a dark colour, owing apparently to an admixture of carbonaceous matter. It is most extensively employed in the manufacture of crucibles, and especially for those used in glass-making. It is extremely refractory in the fire. It yielded by analysis,—

Silica	57
Alumina	30
Moisture	12·6

A trace of iron and carbonaceous matter.

It appears to have originated from the disintegration of shale.

Brick clay, or loam, varies much in appearance, texture, and composition; its colour is dependent upon the proportion of oxide of iron which it contains. It lies in abundance upon the London clay, and frequently rests upon an interposed bed of sand. The organic remains found in it are few, but it sometimes contains the teeth of elephants.

London clay is a very extensive deposit of a bluish clay, except near the surface, where it has often the usual clay colour. It forms the greater part of Middlesex, the whole of Essex and Suffolk, and part of Norfolk, and frequently rises almost to the surface. Some of the lower beds are yellowish white or variegated. This clay occasionally includes beds of sandstone, and of a coarse argillaceous limestone, of which Parker's Roman cement is made. It contains also frequently the bones of the crocodile, turtle, &c.

Plastic clay skirts the London clay within the London chalk basin, and it appears also at the Isle of Wight. This formation consists of a variable number of sand, clay, and pebble beds irregularly alternating, lying immediately upon the chalk; it contains some appearance of coal, decidedly of vegetable origin, pyrites, oyster-shells, and the branches of trees. The sand-beds of the plastic clay formation are the grand reservoir of soft water from which the deep wells in and round London are supplied.

Porcelain clay is of various shades of white; it is dull and opaque; occurs friable or compact; feels soft to the fingers, and adheres to the tongue. It is infusible, and its specific gravity is 2·216. A large tract of this clay, which includes crystals of felspar, quartz, and mica, occurs near St. Austell, in Cornwall. The porcelain manufactures of Worcester are supplied from it; according to Wedgwood, it consists of 60 parts alumina and 40 silica. It probably arises from the decomposition of felspar. The porcelain clay of China is called *Kaolin*. This clay occurs in France, Saxony, and Austria. Various other kinds of clay are met with in different situations; their nature and composition depend upon those of the rocks from the disintegration of which they have been formed; thus slate, steatite, and trap, each yields a different kind of clay.

Clay is an essential component part of all fertile soils. A clay soil consists of a large proportion of alumina [Alumina] united to silica of various degrees of fineness, and frequently also a portion of carbonate of lime. When the silica is very fine and intimately mixed with the alumina, the clay, although stiff in appearance, is fertile in proportion to the humus which it contains, or which is artificially added to it. It then forms that class of rich wheat soils which produce many successive abundant crops without change or manure. It has a strong affinity for water, which prevents the plants that grow in it being injured by drought; and it has a sufficient degree of porousness to allow superfluous moisture to percolate without making it too soft. All that is required for such a soil is a porous substratum of rock or gravel; and where this is not the case, sufficient under-drains must be made to produce the same effect. The clay soils in Britain are not in general of this fertile kind. They are of a compact nature which retains the water; and the various oxides and salts of iron which they contain are mostly injurious to vegetation. Hence they require expensive draining, and manuring, to render them productive. This has made lighter soils, which are more easily worked, to be generally preferred, although naturally less adapted to the growth of wheat; and the mode of cultivation of the light soils has advanced more rapidly towards perfection than that of the clays. Yet the latter will undoubtedly repay the outlay best, when once they are brought to a certain state of improvement. When clay soils are well drained, and when the effect of noxious salts has been removed by liming, burning, and frequent stirring, it will be found that a much smaller quantity of manure will produce a certain return in grass or corn, than on any light soil. The great difficulty is to choose the time when stiff clays are to be worked; and here it may be observed, that ploughing sometimes does more harm than good. When clay is wet, especially in the beginning of summer, and it is ploughed in the regular process of fallowing, the tough moist slice cut out by the plough is set on edge, and the sun bakes it into a hard mass like brick. In this state it is not improved by exposure to the air, which cannot penetrate this hard substance. It would be much better to plough out deep water-furrows with a plough made on purpose, and wait until the moisture is reduced by gradual percolation and evaporation; so that the plough should raise a slice ready to break and crumble as it is turned over. This should be done immediately before winter, and then the frost will so divide and mellow the soil, that, provided it be kept free from superfluous water by under-drains and water-furrows, it will have the appearance of the finest mould when worked with the harrows in spring. To plough it again would be to spoil all. It should have received the necessary manuring in autumn, and be ready for the seed to be sown on this pulverized surface. The horses which draw the harrows or the sowing machines should be made to walk in the furrows, which should afterwards be deepened out with the spade, or by a plough constructed for the purpose. A free course and outlet should be formed for all surface water; for no maxim is more true than this, that stiff clays are never injured by a continuance of dry weather, unless they were in a wet state immediately before. The dryest clay contains sufficient water to supply the roots of plants for a long time; but wet clay in drying and shrinking destroys the texture of the roots by mechanical pressure. This may be of use when weeds are to be eradicated, and in that case a different mode of proceeding may be recommended; but when good seed is sown, the clay should be in such a state as to crumble under the harrows, and it should not be too moist. Experience has taught the ploughman, that clay soils should be laid in round lands or stitches: and much of the produce of a field depends on the skill with which this is done. It is not only the surface which should lie in a rounded form, but the bottoms of the furrows should lie in a regular curve, without small ridges or inequalities between them; so that when heavy rains penetrate through the whole thickness which the plough has raised, the water may find its way into the intervening furrows, without being retained by the small ridges left by an unskilful ploughman. It is seldom that a common labourer can be made to perceive the consequences of his carelessness. The slightest inclination of the plough to either side makes an inclination in the bottom of the furrow. An inequality in the depth does the same. The usual method is to increase the depth of the ploughing from the crown of the stitch to the outer furrow. If the land has been cross-ploughed or dragged level before the last ploughing, this may answer the purpose; but if the stitches are only reversed, and the centre of the new stitch is to be where the water-furrow was before, it requires twice ploughing to bring the stitch to its proper form, and this is not always done, for fear of treading the land too much. Hence it is always preferable, where it can be done, to lay the land flat by cross-ploughing and harrowing before it is raised in stitches. The narrower the stitches are, the dryer the land will lie. The most convenient width is five bouts, as it is called, that is, five furrows on each side of the centre, which, allowing 9 inches for each furrow, makes 7½ feet, leaving 18 inches for a water-furrow, which is deepened into a narrow channel in the middle.

We have been thus particular in describing the management of clay land, because it seems not so generally understood, and there is great room for improvement in the common modes of cultivation. Fallowing for wheat is the old system on clay soils, and continues to be so in nine farms out of ten; but it often happens that in a wet season the whole advantage of the repeated ploughings is entirely lost, the land sown with wheat is neither enriched nor improved by all the tillage bestowed upon it, and is as full of weeds as it was when first broken up from the preceding stubble. The better system is to clean the land well in summer, after it has borne a crop of winter tares, which have been cut green or fed off by sheep in May or June, and to lay it up high and dry for the winter, after having given it the proper liming and manuring; to sow it with oats and grass seeds in spring, keep it in grass as long as is convenient, and break it up in autumn. Wheat may then be sown; or it may have the benefit of another winter's frost, and beans may be drilled or dibbled early in spring. After harvest the bean stubble may be cleared with harrows or scarifiers, and the seeds allowed to vegetate; the plough will then destroy them. A good crop of wheat may be depended upon after this, if the land is in good heart; if not, it should have been manured for the beans: but if the grass was fed off the preceding year, and the land well managed before, it cannot fail to be in good heart. Clay land will bear a repetition of the same crops much oftener than lighter lands; but every scientific agriculturist knows the advantage of varying the produce as much as possible, making plants of different families succeed each other. The cereal grasses are of one family, which is the reason why wheat, barley, oats, rye-grass, &c., do not succeed so well after each other as after leguminous plants or clover, and that turnips, besides cleaning the land by the repeated hoeings given them, are so good a preparation for corn. A good rotation for stiff clays is yet a desideratum in agriculture; and although we will not affirm that fallows can be entirely dispensed with, we are persuaded that they might be separated by much larger intervals than is usually done. And if advantage is taken of early seasons, at least in the southern parts of the island, most lands may be kept clean by what is called a bastard fallow immediately after harvest, without losing a crop. We will go farther, and assert that instead of three crops in four years, which is the common method, and an improvement on the old system of two crops and a fallow, five might easily be obtained, especially if tares and trifolium incarnatum are considered as crops. For example: 1. Oats or barley; 2. Clover; 3. Wheat; 4. Trifolium cut in May, and succeeded by spring tares, cabbages, or potatoes. At all events the trifolium or winter tares may always be had in the year in which the land is to be cleaned by repeated ploughings; as they may be cut early in summer, and leave ample time for the operations.

The most profitable management of a stiff wet clay soil, after thorough draining it, is to cultivate it on the convertible system; that is, to have it three years in grass and three years under the plough, unless a permanent and good sward can be obtained upon it, in which case it will give the surest return by remaining in grass. A preliminary course of cropping with ample manuring will so much improve the texture of the surface, that a much better herbage will grow upon it; and when this is well established, it may be left so until it degenerates.

The great disadvantage of clay soils in a moist climate like that of Great Britain arises from an excess of water and the obvious remedy is perfect draining of the subsoil. This is effected by numerous hollow drains judiciously arranged to convey the water to a proper outlet. An instrument has been lately invented or improved by which this is done effectually, and at a comparatively small expense. [DRAINING.]

Clay is extensively used in many parts of England to improve light land, by being carried on the surface in considerable quantities, but this is chiefly where it approaches to the quality of marl, by having a considerable portion of calcareous earth in its composition.

The effect of burnt clay as a manure has been highly extolled, and not without some reason in particular situations. Clay by burning alters its nature; it becomes insoluble in water, and loses its attraction for it; it then resembles silicious sand, and may greatly improve a very strong retentive clay, tempering it and rendering it more porous. To burn clay, it is dug out in lumps and dried; heaps are made of these at regular distances in a field, with a small cavity in the centre, in which dry furze and brushwood are introduced. This being lighted, the fire is allowed to burn very slowly, and the smoke kept in by adding a sod or clod wherever it bursts out. When the heap is once burning, more clay may be added, even without being dry, and the combustion goes on without other fuel. It must be so managed as to bake the clay without heating it too much; and when the heaps are cooled and opened the whole should appear pulverized, and of a red colour if oxide of iron exists in the soil. A coat two or three inches thick spread over a field and ploughed in will greatly improve its texture; but sufficient animal or vegetable manure must be added to make it fertile.

CLAY SLATE. [SLATE.]

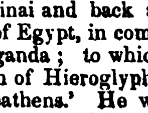
CLAYTON, ROBERT, Bishop of Clogher, was born at Dublin in 1695, and educated at Westminster School and Trinity College, Dublin. He was successively appointed to the sees of Killala, Cork, and Clogher, although his orthodoxy seems to have been very doubtful from his first entrance into the church. His preferment was chiefly owing to a lady who was connected with his family by marriage—Mrs. Clayton, afterwards Lady Sundon, who was one of Queen Caroline's chamber-women. His first published work was 'An Introduction to the History of the Jews.' This was followed by 'The Chronology of the Hebrew Bible vindicated' (published in 1747). 'A Dissertation on Prophecy' (in 1749): and 'An Essay on Spirit' (1751). This essay, which was full of the notions contained in what is called the Arian heresy, gave great offence to the Church, and prevented his being promoted to the archbishopric of Tuam. There is some doubt whether Clayton was really the author of it, but he soon avowed all the sentiments which it contained, and even more, in his 'Vindication of the Old and New Testament, in answer to the Objections of the late Lord Bolingbroke, in Two Letters to a young Nobleman;' which was published at different periods in three separate parts.

On the 2nd of February, 1756, he made a motion in the Irish House of Lords for the expunging of both the Athanasian and Nicæan Creeds from the Liturgy. The motion, which did not find a single supporter in the House, created a violent storm at court and out of doors; and when he renewed his attack in the following year, in the third part of his 'Vindication of the Old and New Testament,' &c., it burst upon his head. The king instructed the lord-lieutenant to bring on a legal prosecution of the bishop, but before the day fixed for the opening of the proceedings he was carried off by a nervous fever. He died February 26, 1758.

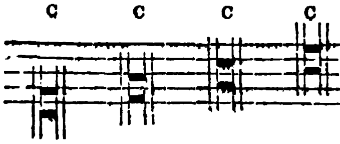
Besides the works already mentioned, he published 'A Journey from Mount Sinai and back again,' from a MS. written by the Prefect of Egypt, in company with the missionaries of the Propaganda; to which are added some 'Remarks on the Origin of Hieroglyphics and the Mythology of the ancient Heathens.' He was a man of great generosity and benevolence, and his charities were frequently well directed. He gave away many reels and spinning-wheels to the poor about Clogher, encouraging industry, and teaching them to provide for themselves.

CLEF (Fr. *clef*, a key), in music, a character placed at the beginning of the staff, to give names to the lines and spaces, and determine the acuteness or gravity of each note.

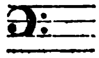
There are three clefs—the *treble*, the *mean*, (or C clef), and the *base*. The *Treble Clef* is now only placed on the second line, which it names G.



The *Mean Clef* gives the name of C to any line on which it is placed: it is called the *soprano clef* when placed on the 1st line, the *mezzo-soprano* when on the 2nd, the *alto*, or *contratenor*, or *countertenor*, when on the 3rd, and the *tenor* when on the 4th.



The *Base Clef* is now placed only on the 4th line, giving it the name of F.



The treble clef is appropriated to female and boys' voices, and to instruments whose scales run high. Of the four kinds of *mean clef*, the first is used for female and boys' voices; the third and fourth for men's voices, also for the viola, the two higher trombones, and occasionally for the clarinet and violoncello. The *base clef* is appropriated to the lowest male voices, and to instruments the scales of which run deep.

In the 17th century the treble clef was used on both 1st and 2nd lines, and the base on both 3rd and 4th. The correction of so great an evil was a step towards simplification; and, in 1672, a distinguished mathematician (Thomas Salmon, M.A., of Trinity College, Cambridge) published his plan for a complete amelioration, by the abolition of all clefs, and substituting for them one universal character. The plan was simple and feasible, but immediately, violently, and successfully opposed by the musicians of the day, at the head of whom, we regret to say, was Matthew Lock. Thus was strangled in its birth a most rational attempt to remove much of the difficulty attending the practice of music. The C clef is now gradually falling into disuse, but we fear that its final rejection is not near at hand, and that a long time will elapse before other desirable reforms in music—reforms that would remove many of the impediments to the practice of the art—will be accomplished, so blind and so strong is prejudice.

CLEIDOTHÆRUS, a genus of Acephalous mollusks (Conchifers of Lamarck), established by Mr. Samuel Stutchbury for a testaceous animal, the mechanism of whose hinge connecting the two valves differs most materially from that exhibited by other bivalves.

Shell bivalve, somewhat pearly, inequivalve, involute, attached by the outside of the larger valve. Hinge with a small conical pointed tooth in the free valve fitting into a corresponding pit in the attached valve. A testaceous, rather elongated, curved appendage, connected by cartilage, is inserted into a deep cicatrix within each umbo; muscular impressions, two in each valve, lateral, the anterior ligulate, the posterior suborbicular. Muscular impression of the mantle entire. Ligament external. (Stutchbury, modified by G. B. Sowerby.)

M. De Roissy had separated the genus from *Chama* with which it might be easily confounded by a superficial observer under the name of *Camostrée* (*Chamostrea*), but he does not seem to have been aware of the appendage, and, as Mr. Stutchbury observes, his name is entirely inapplicable, there being nothing in the shell to connect it with *Ostrea*. Example, *Cleidothærus Chamöides*. (Stutchbury.)

Description. Shell involute, brownish red, internally of a greenish pearly lustre, attached by the anterior side of the right valve, which is of great depth; left valve but slightly convex; the clavicular appendage with a groove on the convex side. (Stutchbury.)

Locality.—Mr. Stutchbury states that *Cleidothærus Chamöides* was found attached to sandstone rocks by T. Young, Esq., R.N., together with an *Aspergillum* (perhaps *agglutinans* of Lamarck), some *Chamæ*, &c., while searching near the entrance of Port Jackson, pointed out to him as the spot where Mr. Stutchbury discovered, in 1826, the first living *Clavagellæ*. Mr. G. B. Sowerby says that some imperfect specimens had been sent to England many years ago, probably from the same spot, by Mr. A. Humphrey. Some of these were of a brownish red colour, whereas those procured by Mr. Young were of a dull livid colour. The imperfection of the specimens above alluded to consisted in their having lost the internal appendage. All the specimens had adhered by the anterior side of the large and deeper valve. Mr. Stutchbury says that in general contour this shell has so great a similitude to Chama, that without opening it there would be no hesitation in pronouncing it of that genus, belonging to Lamarck's division. 'Crochets tournant de droit à gauche;' a division which it seems will not bear the test of examination. [CHAMACEA.[*]]

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[*] Lamarck and Deshayes both make *Diceras* feminine, and the cut [Article CHAMACEA], in conformity with them and other zoologists, is named *Diceras aristina*; but there can be no doubt that, correctly, it should be *arietinum*, *Diceras* being a Greek noun from κέρας, a horn. In the same article, p. 470, 2nd column, line 23rd upwards from the cut, for *Chama* read *Chama*.

Mr G B. Sowerby is of opinion that as far as the character of the internal hinge cartilage having an elongated testaceous appendage goes, *Cleidothærus* connects the *Camacées* (*Chamæ*) of Lamarck with his *Myaires*. For figures and further description, the reader is referred to the *Zoological Journal*, vol. v., p. 97; *Tab. Supp.* xlii., figs. 5, 6, 7, 8; and Mr. G. B. Sowerby's *Genera of Recent and Fossil Shells*, No. xxxii.

CLEI'STHENES, an Athenian, one of the family of the Alcmæonidæ, was grandson of Cleisthenes, the tyrant of Sicyon. After the expulsion of the Pisistratidæ (B.C. 510) he changed his line of politics and headed the democratical party: the opposite faction was conducted by Isagoras. Cleisthenes soon obtained the favour of the people, and the sanction of an oracle from Delphi enabled him to effect changes in the constitution of Attica which were productive of very important results. The four tribes into which Attica had antiently been distributed gave place to a division altogether new. He made ten tribes, called severally from the name of some hero: each tribe contained a given number of demi (δῆμοι), or townships, which were under the direction each of a demarch (township-governor). Every citizen was obliged to have his name enrolled in the register of some township. Many other changes were also effected. The senate was increased from 400 to 500; 50 were sent by each tribe. The process of ostracism is said to have been first formally established by Cleisthenes. The Spartan king Cleomenes, acting on the suggestions of Isagoras, insisted on the expulsion of Cleisthenes and the *accursed* persons. (Herod. v. 70.) Cleisthenes left Athens (Herod. v. 72), but waited a favourable opportunity for prosecuting his schemes. Seven hundred families were banished at the same time. (Herod. v. 72.) When Cleomenes and Isagoras were besieged in the citadel which they had occupied, and were forced to capitulate, they left Athens with the Spartan troops, and Cleisthenes with the 700 families returned in triumph. [ATTICA.] (Thirlwall's *Greece*, vol. ii. pp. 73—80; Niebuhr's *Rome*, vol. ii. p. 306, &c. *Eng. transl.*)

CLE'MATIS, a genus of climbing plants belonging to the natural order *Ranunculaceæ*, and characterized by having a valvate coloured calyx, carpels in a ripe state terminated by long feathery styles, and opposite leaves. The most common species is *C. vitalba*, the 'Traveller's Joy,' which runs over the hedges in many parts of England, loading them first with its copious clusters of white blossoms, and afterwards with heaps of its feather-tailed silky tufts. It is however better known from some of the exotic species being favourite objects of cultivation. *C. flammula*, a species with panicles of small white flowers, is among the most fragrant of plants. *C. cirrhosa, crispa, et florida*, are remarkable for the large size of their greenish-white flowers; while the purple or pink bells of *C. viticella*, hanging gracefully from its festooning branches, render that species, when well managed, one of the most elegant and ornamental of climbers. Atragenes, Siberian and Alpine plants, with finely-cut leaves and delicate purple flowers, considered a peculiar genus by Linnæus, are other species of Clematis. They have a climbing habit, and are occasionally seen in gardens; their stems however are apt to become naked, and they are not so generally cultivated as the species of genuine Clematis.

All these plants are hardy; but they are impatient of damp in winter. The latter circumstance is therefore to be attended to by those who wish to ornament their gardens with them.

CLE'MENCE, ISAURE, a French poetess, born near Toulouse, but at what time has been a matter of much dispute. The first known writer who spoke of her is Guillaume Benoit, a jurist of the fifteenth century, who says that she instituted the floral games, 'jeux floraux,' at Toulouse, which were held yearly on the 1st of May, and that she instituted prizes for those who distinguished themselves in various kinds of poetry. The prizes were a gold violette, a silver eglantine, and a gold souci or marigold. This distribution of prizes continued till the Revolution. The capitouls or echevins of Toulouse distributed the prizes, on which occasion an eulogium was recited in memory of Clemence Isaure, and her statue in the Hôtel de Ville was crowned with flowers. In 1527, Etienne Dolet, a writer and printer at Lyon, who was hanged and burnt for heresy in 1546, wrote an eulogium of Clemence in Latin verse, with the title, 'De Muliere quâdam quæ Ludos literarios Tolosæ constituit.' These writers were followed by numerous others, and among them De Thou and the President Berthier, who wrote about Clemence, and placed her existence in the fourteenth century. Catel, however, in his *Mémoires du Languedoc*, expressed doubts on the subject, and treated the existence of Clemence as fabulous. Dom Vaissette, *Histoire du Languedoc*, supports the personality of Clemence, and her foundation of the prizes, as proved by tradition, instruments, and public documents in the Hôtel de Ville of Toulouse. In 1775 a Memoir appeared, in which Clemence Isaure is stated to have lived in the latter half of the fifteenth century. This controversy seems to have originated in having attributed to Clemence Isaure the original foundation of the poetical academy known by the name of the floral games. But that academy was founded long before Isaure by the troubadours, and was called the college of 'la gaie science,' or 'gai sçavoir.' The first authenticated meeting on record dates from the year 1323; they then assembled in a garden outside of Toulouse. The registers of this college, till about 1500, make no mention of Isaure. It may be about this latter period that she founded the prizes of gold and silver flowers, from which the academy took its more recent name. The accounts of Isaure's life and adventures which are found in several compilations appear very problematic. (*Encyclopédie Méthodique, Histoire*, art. 'Isaure;' and Moreri's *Dictionnaire*.)

CLEMENS, TITUS FLA'VIUS ALEXANDRI'NUS, was born about the middle of the second century of our æra. According to St. Epiphanius he was an Athenian, and at first a follower of the Stoic philosophy; but according to others he belonged to the Platonic school, an opinion which seems countenanced by the manner in which he speaks of Plato and his philosophy in many passages of his writings. He says in his Stromateis (lib. i.), that 'he had for teachers several learned and excellent men; one an Ionian, who lived in Greece, another from Magna Græcia, a third from Cœlesyria, a fourth from Egypt, and others who had received the Christian doctrine in the East, of whom one was from Assyria, and the other from Palestine, of an antient Hebrew family; but that at last he found in Egypt one superior to all, with whom he remained.' This was Pantæmus, whom he repeatedly mentions in his works, and who kept a Christian school at Alexandria, in which capacity Clemens succeeded him. St. Jerome says that Clemens was teacher of the catechumeni in that city. He was ordained presbyter of the church of Alexandria, where he appears to have remained the rest of his life. His death is believed to have happened about A.D. 220. Among his disciples were Origen, and Alexander, afterwards bishop of Jerusalem. He left many works, in which he has mixed with the precepts of the Christian doctrine and morality, which it was his object to inculcate, much information concerning the learning, philosophy, history, and manners of the heathens. Of the earlier Christian writers, he is the most conversant with the science and learning, with the opinions and practices, of the various nations of that day; and his works are extremely interesting, as showing the state of society, both among Heathen and Christian subjects of the Roman empire at that early time. They also contain much information on antient history, chronology, and the various schools of philosophy; many extracts from antient writers, whose works are lost; and also accounts of the early heresies and schisms which divided the primitive Christian church. The works of Clemens which have come down to us are:—1. 'Exhortation to the Greeks,' 1 book. This is an exhortation addressed to the heathens to abandon their false gods, whose absurd stories and obscene adventures he exposes by the testimony of the poets and philosophers of antiquity. 2. 'Pædagogus,' in 3 books. This is a treatise on Christian education. He begins by describing the qualities required in a teacher, and also what he ought to teach his pupils; he then gives an exposition of Christian ethics, recommends temperance, decency, moderation in the enjoyments of life, and declaims against the effeminate manners and luxury of his time, against public baths, and other practices which led to laxity in morals. His satire of the vices and follies of the age is caustic and humorous, and reminds us at times of Juvenal. When we reflect that he lived under the reigns of Caracalla and Heliogabalus, we do not feel inclined to suspect him of exaggeration. 3. 'Stromateis,' (τῶν κατὰ τὴν ἀληθῆ φιλοσοφίαν γνωστικῶν ὑπομνημάτων στρωματεῖς ή) in 8 books. The word stromateis he has used to mean a party-coloured or patch-work; 'opus varie contextum,' from the multifarious kind of information, religious and profane, anecdotical, historical, and didactic, put together without much regard to order or plan. Clemens says that he adopted this want of arrangement 'to veil the doctrines of Christianity under the maxims of profane philosophy, in order to screen them from the eyes of the curious and the uninitiated, that those only who are intelligent and will give themselves the trouble of studying, may understand the meaning.' Probably also he found this style of composition better adapted for his multifarious information, and best suited to his old age, in which he apparently wrote it. In the first book he descants upon the utility of philosophy, and concludes by asserting, by the help of chronology and quotations, that the philosophy contained in the sacred books of the Hebrews was the most antient, and that other nations had borrowed much from it. In the second he treats of faith, sin and repentance; he asserts the free will of man, condemns licentiousness, commends lawful marriage with one wife and one alone. In the third he continues the preceding subject, condemns the incontinence of the Nicolaites, Valentinians, and other early heretics, and defends marriage against the Marcionites. He says the apostles Peter and Philip were married and had children. He discountenances second nuptials, without absolutely condemning them. He speaks also with great praise of virginity, when preserved for the love of God and according to his ordinances. In the fourth book he treats of Christian perfection and martyrdom, exhorting the Christians to submit to death for the love of God and of Christ. Perfection he places in the precept of loving God and our fellow-creatures. In the fifth he shows that the method of speaking by figures and symbols is very antient, both among the Hebrews and the Greeks; the Greeks, he says, borrowed most of the truths they have written from those whom they called barbarians, and especially from the Jews. This book is full of quotations from antient poets and other writers. In the sixth and seventh books he sketches the portrait of a true Gnostic, a term which with him is synonymous with that of a perfect Christian. It is a complete model of moral conduct. He combats the reproach of the Greeks about the divisions and schisms existing among the Christians. He says that schisms will arise in any community; that they were foretold by Christ; that they had existed among the heathens and the Jews; that the way to ascertain the truth is to consult the Scriptures, and the whole Scriptures, and not merely some parts of them, and to follow the tradition of the church; that there is only one universal church, older than all heresies, that it began under Tiberius, and was promulgated all over the world under Nero, while the older heresies date only from the reign of Hadrian. He then recapitulates the subjects of his seven books, and promises to begin the next by a new subject. The eighth book, as we have it in our editions, differs altogether from the rest, being a treatise on logic. Photius, in his Bibliotheca, says, that in some editions in his time the eighth book of the Stromateis consisted of the treatise 'Can a rich man be saved?' which however is generally placed as a distinct work, after the eight books of the Stromateis. This treatise has also been published separately, with a copious and learned commentary by a professor of Utrecht. 'Clementis Alexandrini liber: Quis dives salutem consequi possit, perpetuo Commentario illustratus a C. Seegario,' 1816. Among the works of Clemens which are lost was the 'Hypotyposeis,' or Commentaries on various parts of the Scriptures, in eight books, mentioned by Photius, who quotes several passages, and severely condemns it as heretical. (Photius among the *Testimonia*, at the beginning of Clemens' works, Potter's edition.) This seems rather strange, as the other works of Clemens have been esteemed perfectly orthodox, and greatly commended by Eusebius, Jerome, and other antient fathers, with the exception perhaps of one or two obscure passages concerning the nature of Christ and original sin. The errors however ascribed to the 'Hypotyposeis,' may be accounted for in some manner by the supposition that it was an earlier work of Clemens, written before he was properly instructed in the Christian doctrines, and while he was still much imbued with his Platonic philosophy. Upon the whole Clemens is more of a Christian philosopher and moralist, than a professor of dogmatic theology. Some believe that the 'Excerpta ex Scriptis Theodoti et Doctrina quæ Orientalis vocatur,' which appear at the end of Clemens' works, as well as some other fragments, are extracts from his 'Hypotyposeis.' He also wrote several treatises, 'De Pascha,' 'De Jejunio,' 'De Obtrectatione,' &c., which are lost. Clemens' works were published, with a Latin translation, by J. Potter, 2 vols., folio, Oxford. 1715; and also at Würzburg, 3 vols., 8vo., 1780.

CLEMENT I., or CLEMENS ROMA'NUS, succeeded Anacletus as bishop of Rome in the latter part of the first century of our æra. The chronology of the early bishops of Rome has been the subject of much controversy. One of the earliest authorities, Irenæus, bishop of Lyon, who lived in the latter part of the second century, says, that 'when the blessed apostles, Peter and Paul, had founded and established the church at Rome, they delivered the office of the bishopric in it to Linus. To him succeeded Anacletus, after whom, in the third place after the Apostles, Clement obtained that bishopric, who had seen the blessed Apostles and conversed with them; who had the preaching of the Apostles still sounding in his ears, and their traditions before his eyes. Nor he alone, for there were still many alive who had been taught by the Apostles. In the time therefore of this Clement, when there was no small dissension among the brethren at Corinth, the church at Rome sent a most excellent letter to the Corinthians, persuading them to peace among themselves,' &c. This is the epistle which is ascribed to Clemens Romanus, by Clemens Alexandrinus, Origen, Eusebius, Jerome, and other antient fathers, as having been written by him in the name of the church of Rome to that of Corinth, and which was often read in the time of Eusebius in the churches, after the gospels, on account of the excellent precepts which it contains. Eusebius (*Hist. Ec.* iii. 13) says that Clement succeeded Anencletus, or Anacletus, in the twelfth year of Domitian (A.D. 92), and that he died in the third year of Trajan (A.D. 100), having been bishop nine years. After mentioning his epistle to the Corinthians, Eusebius says that another epistle was also ascribed to him by some, but was not generally received as genuine; and that 'there had been published not long since other large and prolix works in his name, containing dialogues of Peter and Apion, of which the antients had not made the least mention.' Eusebius wrote at the beginning of the fourth century; and Jerome, who lived half a century later, repeats and confirms the remark of Eusebius. The first epistle of Clement, which was written in the name of the church at Rome to that of Corinth, 'Dei Ecclesia quæ Romæ peregrinatur Ecclesiæ Dei quæ Corinthi peregrinatur,' and was occasioned by a schism which had broken out at Corinth among the Christians, is full of sound and charitable advice. It consists of fifty-nine chapters, and is one of the most interesting memorials of the primitive church. The second epistle, supposed also to be Clement's, is only a fragment, containing likewise moral and religious advice; but it breaks off abruptly in the middle of the twelfth chapter, and there is no evidence of its being written to the Corinthians. It is supposed to be a fragment of some other work, but whether by Clement or by some subsequent writer is uncertain. Both epistles were found at the end of the New Testament in a MS. brought from Alexandria, and were published by Patrick Junius: 'Sancti Clementis Romani ad Corinthios Epistolæ duæ expressæ ad fidem MS. Cod. Alexandrini,' Oxford, 1633; and again by H. Wootton, Cambridge, 1718. Baratier and others argue from some passages in the first epistle, that Clement wrote it before the destruction of Jerusalem by the Romans, about A.D. 67 or 68, and probably before he became bishop of Rome, though some chronologists place his pontificate about that date; but the authority of Irenæus, Eusebius, and the other old fathers, seems to be the safest on such matters. A long account of Clement's life, pilgrimages, and martyrdom, has been made out by Gregory of Tours, Nicephorus, and others, entitled 'Acta S. Clementis,' and adopted by Baronius; but it is considered doubtful, even by most orthodox Catholics. It is not quite certain that Clement suffered martyrdom. He is said by some to have been exiled from Rome, and to have died in the Chersonesus Taurica; but this is also contested by others, and apparently with sufficient reason. (Nath. Lardner, *Credibility of the Gospel History*, vol. i. part ii ch. 2.) Clement was succeeded in the see of Rome by Evaristus. Several other works have been attributed to Clement, which are evidently apocryphal, such as eight books of Institutiones or Constitutiones, &c. (Tillemont, *Mémoires pour l'Hist. de l'Eglise*, vol. ii.; Du Pin, *Bibl. des Auteurs Eccles.*) Wetstein published two more epistles attributed to Clement, which he found at the end of a Syriac version of the New Testament; they are chiefly in praise of virginity, and are considered as spurious. (Venema, *Epistola ad P. Wesseling qua duas Clementis Epistolas a C. Wetstenio ad calcem Novi Testamenti nuper publicatas, Epiphanio ac Hieronymo notas fuisse in dubium vocatur*, &c., Harlingen, 1754; and Wetstein's *Reply to Venema*, Amsterdam, 1754; also Nath. Lardner's *Dissertation upon two new Epistles, ascribed to Clement of Rome*, Lond., 1753.)

One of the oldest churches at Rome on the Cælian Mount is dedicated to St. Clement; but it is not quite certain whether it was built in honour of the bishop, or of Flavius Clement, the martyr, with whom the other has been often confounded. Flavius Clement was cousin to Domitian, and his colleague in the consulship (A.D. 95), and was put to death by order of that emperor on a charge of impiety towards the gods, which is understood to mean that he belonged to the Christian communion. His wife, Domitilla, was exiled on the same charge to Pandataria. Flavius Clemens is numbered among the martyrs by the earliest ecclesiastical historians. The old church, which is believed to have been built in the fifth century, fell to ruins, and was taken down by Adrian I. towards the end of the eighth century, and rebuilt by Nicholas I. in the ninth. In the year 1725, Cardinal Annibale Albani having made excavations under the great altar of St. Clement's, found a tomb with an inscription to Flavius Clemens, martyr. A full account of it with a dissertation was published: *Titi Flavii Clementis Viri Consularis et Martyris Tumulus illustratus*, Urbino, 1727.

CLEMENT II., Suidger, bishop of Bamberg, succeeded Gregory VI. in the papal chair in 1046, and after crowning the emperor, Henry III., died the following year, and was succeeded first by Benedict IX., who had been previously deposed by the council of Satri, and who was again obliged to abdicate, and lastly by Damasus II.

CLEMENT III., a native of Rome, succeeded Gregory VIII. in 1188. He summoned a crusade against the Saracens, in which the emperor, Frederick I., Richard of England, and Philip of France, embarked. He died after little more than three years' pontificate in 1191. He was succeeded by Celestine III.

There was also an antipope, or competitor, of the celebrated Gregory VII., who assumed the name of Clement III. from 1080 to 1101, but he is not numbered among the legitimate popes.

CLEMENT IV., a native of St. Gilles, in Languedoc, succeeded Urban IV. in 1265. He showed the same inflexible hostility as his predecessor against the Suabian dynasty of Naples, and assisted Charles of Anjou in the conquest of that kingdom, which was accomplished by the defeat and death of Manfred at the battle of La Grandella, near Benevento. Charles, in return, acknowledged himself at his coronation as feudatory of the see of Rome, and agreed to pay tribute. Conradin, Manfred's nephew, having attempted to reconquer his hereditary kingdom, was defeated by Charles at Tagliacozzo, and beheaded in the market-place at Naples, with the approbation of Clement, as it was reported. A month after Conradin's execution, Clement himself died, in November, 1268. His death was followed by an interregnum of about two years, after which the Cardinals at last elected Gregory X.

CLEMENT V., a Frenchman, and archbishop of Bordeaux, succeeded Benedict XI. in 1305, by the influence of Philip le Bel, who induced him to remove the papal residence to France. Clement joined Philip in suppressing the order of the Templars, and in condemning the grand master and sixty knights to be burnt alive. Clement died in April, 1314, and was succeeded, after two years interregnum, by John XXII. [Clementines.]

CLEMENT VI., a Frenchman, succeeded Benedict XII. in 1342. He resided at Avignon like his immediate predecessors, and it was under his pontificate that Rienzi made the attempt to re-establish the republic at Rome. [Rienzi.] Clement took the part of Joanna I., queen of Naples, against her brother-in-law, Lewis of Hungary, who had invaded her dominions to avenge the murder of her husband. Joanna, on her part, sold or gave away to the papal see the town and county of Avignon, which belonged to her as sovereign of Provence. Clement fixed the jubilee to be held at Rome every fifty years. He died in 1352, and was succeeded by Innocent VI.

CLEMENT VII., Giulio de' Medici, the natural son of Giuliano de' Medici, and nephew to Lorenzo the Magnificent, was made cardinal by his cousin, Leo X., and was afterwards promoted, in 1523, to the papal chair, then vacant by the death of Adrian VI. His pontificate was full of vicissitudes and calamities to Italy. He first allied himself with Francis I. against Charles V., in order to prevent the latter possessing himself of all Italy; but he only hastened the progress of the imperial arms, and saw his own capital, Rome, stormed and cruelly pillaged by the army of Charles, and himself besieged in the Castle Sant' Angelo. He afterwards made peace with the emperor, and united with him to destroy the independence of Florence, his native country. Clement's quarrel with Henry VIII. of England, which arose from his refusing the bull of divorce between that king and Catharine of Aragon, led to the schism between Henry and Rome. He died in 1534 after a long illness, leaving behind him a character stained by avarice, harshness, and deception; he had most of the failings, but none of the splendid or amiable qualities, of his cousin, Leo X. He was succeeded by Paul III.

There was also an antipope in the fourteenth century, who was elected by a party among the cardinals in opposition to Urban VI., and who assumed the name of Clement VII. The schism lasted many years, and was continued by the respective successors of Urban and of Clement till the Council of Constance decided the question. The Roman calendar acknowledges Urban and his successors as legitimate popes, and places Clement among the antipopes. [Urban VI. and Benedict Antipope.]

CLEMENT VIII., Ippolito Aldobrandini, succeeded Innocent IX. in 1592. He was a man of learning, and of considerable political sagacity. He succeeded in the negotiations with Henry IV. of France, by which that prince made public profession of Catholicism, and was acknowledged king by his subjects. Clement annexed, by force, the duchy of Ferrara to the papal state after the death of Duke Alfonso II., disregarding the claims of the Duke's cousin, Cesare d'Este, who was obliged to yield, and retire to Modena. Clement died in February, 1605, and was succeeded by Leo XI. He published a new edition of the Vulgate, differing in some particulars from that published under Sixtus V., in 1590. He also issued many bulls, the most remarkable of which are the 28th, defining the lawful and unlawful rites and usages of the Greek church, and the 87th, concerning the practice of confession and absolution in writing.

CLEMENT IX., Giulio Rospigliosi, of a noble family of Pistoia, succeeded Alexander VII. in June, 1667. He showed a wise conciliatory spirit, hushed for awhile the controversy between the Jansenists and the Jesuits [Arnauld], and settled the long-pending dispute between the see of Rome and the king of Portugal, on the right of nomination to the vacant bishoprics, by confirming the prelates appointed by King Pedro II. He took a warm interest in the war between Venice and the Turks, and sent assistance of men and money to the Venetians for the defence of Dalmatia and of Candia. The news of the loss of that island, which was finally conquered by the Turks in 1669, is said to have hastened the death of Clement, which occurred in December of that year. He was much regretted by his subjects as well as by foreign princes. He embellished Rome, and was magnificent in his expenditure. His nephew was made a Roman prince, and married the heiress of the house of Pallavicini, of Genoa. Clement IX. was succeeded by

CLEMENT X., Emilio Altieri, who was 80 years of age at the time of his election, in 1670. He intrusted the affairs of the administration chiefly to Cardinal Paluzzi, a distant relative, whom he adopted as his nephew, and gave him his family name of Altieri, as he had no nearer relations living. He died in 1676, and was succeeded by Innocent XI.

CLEMENT XI., Gian Francesco Albani, succeeded Innocent XII. in November, 1700. He was then fifty-one years of age, had been made a cardinal by Alexander VIII., and had a merited reputation for learning and general information. He was one of the men of letters who frequented the society of Christina of Sweden during her residence at Rome. It was with seeming repugnance, and after several days' hesitation, that he accepted the papal dignity. The war of the Spanish succession was then just breaking out, and Clement in vain exerted all his powers of persuasion with the courts of France and of Austria to prevent the impending calamity Louis XIV. having placed his grandson Philip on the throne of Spain, demanded for him of the pope the investiture of the kingdoms of Naples and Sicily, whilst the emperor claimed it likewise as his right. Clement delayed giving his decision, and the intrigues of the agents of the two rival powers disturbed the peace of his own capital. In 1707 the Austrians, under Marshal Daun, traversed the papal state to proceed to the conquest of Naples; and the pope, unable to prevent them, stipulated only that they should not pass through the city of Rome. In the following year the pope came to an open rupture with the emperor, Joseph I., whose troops had taken possession of Comacchio in the papal state. After trying remonstrances in vain, Clement collected an army of 25,000 men, under the command of Count Marsigli; but the papal troops retreated before the Austrians, who occupied Romagna and the Marches, and the pope was obliged to sue for peace, which the emperor readily granted in January, 1709. Comacchio was ultimately restored to the pope.

About the same time a large volume was written by Clement's directions, concerning the claims of the see of Rome upon the duchies of Parma and Piacenza, which the emperor considered as feudatory to the empire, and had accordingly stopped the remittances to Rome of the fees and revenues claimed by the papal see from the ecclesiastical benefices in Lombardy, and other countries subject to the House of Austria. Clement was tenacious of what he considered as the prerogatives of his see over the clergy of other countries, and he quarrelled in 1715 with the House of Savoy, which then ruled over Sicily, about a tribunal in that island, called di Monarchia, which interfered with the ecclesiastical immunities and the alleged rights of Rome over Naples and Sicily, as fiefs of the papal see. The king, Victor Amadeus II., stood firm; and many of the Sicilian clergy, who refused to obey the directions of the tribunal, were either imprisoned or obliged to emigrate. About four hundred of the latter took refuge at Rome. Clement had also long and serious disputes with France. He began by his bull 'Vineam Domini,' renewing the interdict which his predecessors had issued against the Jansenists, and declaring their propositions about grace and free will to be heretical. In 1713 he issued the famous bull 'Unigenitus,' which set the whole kingdom of France, court, parliament, and clergy, in an uproar. This bull condemned 101 propositions of a book by Father Quesnel, entitled 'Moral Reflections on the New Testament;' in which that writer revived several opinions of St. Augustin, St. Prosper, and other old fathers, which sounded favourable to the Jansenistic dogmas of predestination and grace. The Jesuits, who asserted that grace was subordinate to the will of man, and who were accused by the Jansenists of Pelagian heresy, stirred themselves to have Quesnel's book condemned. Several French prelates, Bossuet and Cardinal Noailles among others, approved of the general tenor of Quesnel's book, which contains much sound moral doctrine. Cardinal Noailles had already indisposed the pope against him by presiding at an assembly of the French clergy in 1705, in which the bishops were declared to be judges in matters of doctrine, independent of the pretensions of the popes, who would reduce them to the condition of mere registrars and executors of the papal decrees. Father le Tellier, a Jesuit and confessor to Louis XIV., urged the king in favour of the bull 'Unigenitus,' which was at last registered by the parliament of Paris, after much opposition, and continued for years after to keep up a sort of schism between France and Rome. Father Quesnel, the involuntary cause of all this disturbance, died in December, 1719, at Amsterdam, where he had taken refuge. In a declaration which he signed before a notary he professed that he died in the bosom of the Roman Catholic church, appealing to a future council against the bull 'Unigenitus.'

Another source of tribulation to Clement proceeded from the disputes concerning the Jesuit missionaries in China, who had gained considerable influence at the court of Pekin, and were accused by the other missionaries of latitudinarianism, of winking at several superstitious practices in order to make proselytes, and of even countenancing idolatry. Clement sent, in 1702, Cardinal de Tournon as legate to China; but the cardinal on arriving at Macao was so worried by the angry controversialists that he died of anxiety and disappointment, and the quarrel between the missionaries continued to rage more furiously than ever, to the great scandal of the Chinese. Clement at last issued a constitution, or series of ordinances, by which he regulated the course to be followed by missionaries in making proselytes: it was sent in a circular to the superiors of the different monastic orders who had missionaries in China. As the quarrel however continued to rage in China, Clement sent the prelate Mezzabarba as his legate. Mezzabarba went to Pekin, where he was coldly received by the emperor, who was said to be prepossessed against him by the Jesuits, and the legate was soon dismissed from the celestial empire.

Clement took a warm interest in the expedition of the Pretender, son of James II., in 1715, and furnished him with money. After the failure of that attempt, the Pretender, being forsaken by France, retired to Italy under the name of the Chevalier de St. George, and Clement appointed the town of Urbino for his residence. He afterwards negotiated his marriage with Clementina Sobieski, which was celebrated at Monte Fiascone, at the pope's expense, who gave to the married couple a palace at Rome to reside in, with an annual pension of 12,000 crowns. The court of Rome did not for a long time after give up its favourite scheme of regaining England to Catholicism, by means of the Stuarts.

Clement was more profitably employed in frustrating the schemes of the Turks, who, having invaded the island of Corfu in 1716, were threatening Italy with an invasion. The pope sent a squadron to join the Venetians, he levied a contribution upon the clergy of all Italy to defray the expense of the war, and he prevailed on the emperor, Charles VI., to join Venice against the Porte. This led to the brilliant campaign of Prince Eugene, who defeated the Turks at Peterwaradin, and took Temeswar. The Turks were also obliged to raise the siege of Corfu.

After the fall of the intriguing Alberoni, in 1719, Clement succeeded in settling his disputes with Philip V. of Spain, and his Nunzio was again received at Madrid. Europe was now at peace, and Clement enjoyed a short period of rest, after a long series of agitations, until March, 1721, when he died, after a pontificate of more than twenty years. In his private character he was amiable and generous, and his morals were irreproachable. He was very moderate in providing for his nephews, who owed their elevation more to his successors than to himself. He embellished Rome, and established the Calcografia Camerale, which has since given to the world many splendid engravings; he encouraged the art of mosaic, and he introduced at Rome the manufactory of tapestry, on the model of the Gobelins. He added to the Vatican library, and to the museum which is annexed to it. Grateful to the memory of his early patroness, Christina of Sweden, he raised to her a monument in St. Peter's. He patronised men of letters and of science, was the friend of Guidi, Menzini, Sergardi, Marsigli, Martelli, Zappi, and the learned Bianchini. A fine edition of his decretals, bulls, and constitutions, was published by his nephew, Cardinal Annibale Albani, after his death, 'Bullarium Clementis XI.,' one vol., fol. He wrote also several Latin homilies, which he recited on solemn festivals, and which were translated into Italian by Crescimbeni.

CLEMENT XII., Lorenzo Corsini, of Florence, succeeded Benedict, in July, 1730. He was then seventy-nine years of age, and infirm. He resumed the old contest with the empire about the reversion of the duchies of Parma and Piacenza, but succeeded no better than his predecessors. He endeavoured, and also in vain, to mediate in the war between the republic of Genoa and the Corsicans. He succeeded better in restoring, in 1740, the little republic of San Marino to its liberties, which had been encroached upon by Cardinal Alberoni. He died soon after, in 1740, and was succeeded by Benedict XIV.

CLEMENT XIII., Carlo Rezzonico, a native of Venice, succeeded Benedict XIV. in July, 1758. He was more distinguished for his piety and private virtues, than for political abilities or knowledge of the world. His pontificate was a continual, but on his part ineffectual, struggle to uphold the ecclesiastical immunities and the old prerogatives of the see of Rome against the determination of the other powers to be complete masters in their respective countries. He strove hard to support the Jesuits, who had become obnoxious to various courts, and who were suddenly suppressed in Portugal, Spain, France, and Naples. In their distress, most of the expelled fathers sought an asylum in the Papal States, and found in Clement a generous protector. All the remonstrances and threats of France and Spain could not induce him to abolish the Order, which he considered as the firmest support of the Roman see. The king of France seized upon Avignon, and the king of Naples upon Benevento; still the pope held firm till his death. The Venetian senate, by a series of decrees passed in September, 1768, enforced numerous reforms in ecclesiastical discipline in their own dominions, subjected the clergy to the payment of tithes, suppressed some convents, placed the rest under restrictions with regard to their property and the number of their inmates, and subjected all ecclesiastics to the jurisdiction of the secular courts in temporal matters. Clement strongly remonstrated against these innovations: he threatened excommunication, but the senate persisted in its resolutions. He also came to a rupture with the republic of Genoa, because he had sent an apostolic vicar into Corsica, which was then in a state of revolt against the Genoese. The elector of Bavaria, about the same time, declared that none but his own subjects should hold benefices within his dominions. Maria Theresa made similar enactments in her own states, and she took away the censorship of books from the ecclesiastical authorities, and gave it to the secular magistrates. Tuscany, Parma, and Naples suppressed convents, and checked the practice of donations and legacies to the church. In the midst of all these blows against the papal authority, Clement died in February, 1769. A splendid mausoleum was raised to him by Pius VI. in St. Peter's church, which is much admired, especially for its statue of the pope kneeling at prayers, and the two lions couching at the foot of the monument. It was one of the earlier, and among the best, works of Canova, who was employed eight years upon it. It was finished and exposed to public view in the holy week of 1795.

CLEMENT XIV., Gian Vincenzo Ganganelli, was born at Sant' Angelo in Vado, near Rimini, in 1705. At an early age he entered the order of Franciscans, distinguished himself by his learning, was favourably noticed and employed by Benedict XIV., and was made a cardinal by Clement XIII., whom he succeeded in May, 1769, after a stormy conclave, which lasted two months. He adopted a conciliating tone towards the foreign powers, which at the death of his predecessor were on the eve of an open rupture with Rome. He discontinued the public reading of the bull in Cœna Domini, which was considered offensive to the sovereigns. The great question which at that time agitated the Roman Catholic world was the definitive abolition of the order of the Jesuits. Ganganelli took several years to decide on this important subject, and at last, on the 21st July, 1773, he issued the bull of suppression. But the manner in which that suppression was executed in the papal state partook of unnecessary rigour and harshness. Soon after this step, Clement, overcome by labour and anxiety, began to decline in health. About Easter, 1774, he was taken dangerously ill, under suspicious symptoms; he lingered a few months, and died 22nd September, 1774. Rumours were spread that he had died of poison, but the post mortem examination of his body and the report of the physicians did not countenance the suspicion. Ganganelli was a man of enlightened mind; perhaps too much so for the taste of the more violent zealots about the court of Rome. He had a taste for the arts; he continued the collection of antique sculptures begun by Lambertini, and ranged them in a suite of rooms in the Vatican, which was called the Clementine museum, and was afterwards greatly enlarged by his successor, Pius VI., when it received the name of Museo Pio-Clementino. He added also to the Vatican library. A fine monument, the work of Canova, was raised to him in the church of S. Apostoli, which belonged to a convent of his order. The letters published by Caraccioli under the name of Ganganelli are now generally understood to be apocryphal; although the writer has traced pretty faithfully the character and many of the sentiments of that distinguished pontiff. Ganganelli was simple in his habits, free from ambition, and not given to nepotism.

CLEMENTI, MUZIO, who is justly entitled to rank as the father of the piano-forte school, both as regards composition and performance, was born, in 1752, at Rome, where his father practised as an embosser of silver figures and vases for the service of the church. At nine years of age he had made so much progress in music under Cordicelli, that he passed a close examination, and was appointed to an organist's place in his native city. He afterwards studied under Santarelli and Carpani, and wrote a mass for four voices when in his thirteenth year. About that time his talents attracted the notice of Mr. Peter Beckford, an English gentleman, then travelling in Italy, who undertook the future education of the young artist, and brought him to his seat in Dorsetshire, where the society of a literary and accomplished family inspired him with that taste for the belles-lettres which encouraged him to pursue a course of study that had been well commenced under a member of the Society of Jesus, and to acquire an extensive knowledge of the learned and living languages, as well as of various branches of science. But he did not neglect the art which he had chosen as his profession, for before he had completed his eighteenth year he composed his celebrated Opera 2: 'a work which, in the opinion of all good musicians, is the basis on which the whole fabric of modern piano-forte sonatas has been founded.'

At the time agreed on by his father, Clementi quitted Mr. Beckford. He shortly after was engaged to preside at the harpsichord at the King's Theatre, and soon was actively and lucratively employed as a master of the first rank. In 1780 he made a tour on the continent, whither his fame had long preceded him, and enjoyed everywhere the highest patronage and the most flattering applause. In Vienna he made the acquaintance of Haydn, Mozart, &c., and played alternately with the latter before the Emperor Joseph II. and other royal personages. While in Paris he wrote his Operas 5 and 6; and in Vienna his Operas 7, 8, 9 and 10 were composed. On his return to England he published his Opera 11, and Toccata, as well as his Opera 12. In 1783, J. B. Cramer, who had previously studied under Abel and Schrœter, became his pupil, and attended him almost daily.

About the year 1800, having suffered considerably by the failure of the house of Longman and Broderip, he was, by the advice of some eminent mercantile friends, induced to take possession of the premises of those partners, to embark in the music-publishing and piano-forte manufacturing business, and become the head of a new firm, from which time he declined all pupils, and devoted himself wholly to his new, important, and successful occupation. But the peace of 1802 tempted him abroad again, and, accompanied by his pupil, Field, he proceeded from city to city till he reached St. Petersburg, where he made some stay. In Berlin he married, and with his bride proceeded to Rome and Naples. He shortly after lost his wife, in childbed of a son, who grew up to be his father's pride and solace, but unhappily lost his life by the accidental discharge of his own pistol. In 1810 Mr. Clementi, after encountering many difficulties in his attempts to reach England during the fiercest period of the renewed war, arrived in London, and shortly after entered again into the married state. During his last visit to the continent he published his Opera 41, and collected materials for many other works, which subsequently appeared, among which his *Practical Harmony* in four volumes, and his *Gradus ad Parnassum*, in three, must not be left unnoticed.

In 1813 Mr. Clementi assisted in founding the Philharmonic Society, of which he frequently consented to act as a director, and presented to it his two symphonies, which were more than once performed by that admirable band, and received with every mark of respect. They both abound in agreeable melody, and are most skilfully written; but the real vigour of the composer's genius is exhibited in his piano-forte works, which will be revived or laid aside as true taste shall happen to be in the ascendant or on the decline.

After an illness of no long duration, Mr. Clementi died on the 10th of March, 1832. His remains were deposited in the cloisters of Westminster Abbey, and attended to the grave by the choir of that church, of the King's chapel, and of St. Paul's, together with numerous friends. In the *Harmonicon* for April, 1832, is a just eulogy of this very celebrated composer, by a brother-member of the Philharmonic Society, who thus speaks of him:—'He was honourable in his intercourse with the world, affectionate and attentive to his family, constant in his friendships, and benevolent in his feelings towards the whole human race.'

CLEMENTINES is the name given to a collection of decretals and constitutions of Pope Clement V., which was published in 1308 under the title of 'Liber septimus Decretalium,' being the seventh book in order of time of the collection of the decisions and rescripts of the popes on matters of ecclesiastical discipline, and also on matters concerning laymen which then came within the cognizance of the ecclesiastical courts. [Canon Law.] The first printed editions of the Clementines are those of Mainz, 1460 and 1467, fol., which are very scarce.

CLEODO'RA. [Hyalæidæ.]

CLEO'MBROTUS I., brother of Agesipolis, succeeded him as king of Sparta. In 378 B.C. he marched with an army into Bœotia to attack the Thebans. Passing into the Theban territory he encamped at Cynoscephalæ, and, after remaining there sixteen days, withdrew to Thespiæ. The purpose of the expedition not requiring his presence longer, he left a third of his forces under Sphodrias, and led back the rest to the Peloponnesus. Two years afterwards, 376 B.C., in consequence of the severe illness of Agesilaus, he was chosen to lead another army against the Thebans. In 371 B.C. he commanded, in the celebrated battle at Leuctra, against Epaminondas. The Lacedæmonian horse were quickly routed and were immediately charged by the Theban phalanx. Cleombrotus was mortally wounded in the attack, and died soon after. (Xenophon, *Hellen.* v. 4, vi. 4.)

CLEOMBROTUS II., son-in-law of Leonidas, was elected king of Sparta on the expulsion of Leonidas. (Pausanias iii. 6; Clinton, *Fast. Hel.*, p. 217.)

CLEOME'DES, a Greek writer on astronomy. There is some doubt about the age in which he lived; or, which is the same thing, whether the manuscripts remaining which bear the name of Cleomedes were all written by one man, or by two men at different times. The manuscripts which remain are on astronomy, on the doctrine of the sphere, and on arithmetic. Vossius conjectures that the work on music attributed to Cleonidas belongs to Cleomedes. Riccioli seems to have been one of the first who supposed that there were two of this name, one about the time of Augustus, the other in the reign of Theodosius. The work on astronomy was attributed by Vossius to the latter; but the principal arguments against so late an author lie in his frequent mention of Pythagoras, Eratosthenes, Hipparchus, and Posidonius, and his entire silence about Ptolemy. See however the arguments of Letronne, *Journal des Savans*, 1821, p. 713.

We mean by Cleomedes the one of that name who wrote the work *Περὶ κυκλικῆς ϑεωρίας μετεώρων*, in two books, On the Circular Theory of the Heavenly Bodies. It is professedly in several parts taken from a writing, or from the public lectures, of Posidonius, who was certainly the contemporary of Cicero. It is a probable conjecture that Cleomedes was a pupil of Posidonius. The work in question has considerable historical value it records the measures of the earth by Posidonius and Eratosthenes, establishes the antiquity of the opinion that the rotation of the moon is equal to her synodical revolution round the earth;—had it been the sidereal revolution, it would have been correct. It gives various arguments in proof of the rotundity of the earth, in opposition to the supposition of flat and cubical forms, &c., and from this source the early English writers drew much of what they said on the same subject. It mentions eclipses as having happened without having been predicted in the 'canons;' a proof that something answering to an almanac was in common use. It decidedly suggests the possibility of rays of light being bent by the air. Delambre has made it sufficiently apparent that Cleomedes was not acquainted with the writings of Hipparchus, though he frequently cites opinions and methods which he attributes to him.

The earlier editions of Cleomedes are, 1. The Latin version of George Valla, Venice, 1497 or 1498. 2. In Latin, with Aristotle and Philo, Basle, 1533. 3. The first Greek edition, by Conrad Neobarius, Paris, 1539. 4. In Greek and Latin with Aratus, Proclus, and Dionysius, Basle, 1547; again in 1561; again in 1585. 5. In Greek and Latin, with a Commentary, by George Balfour, Bordeaux, 4to., 1605. This edition was re-published with additional notes, by Janus Bake, Leipzig, 1820; this also was re-published, with additional notes, by C. C. Theoph. Schmidt, Leipzig, 1831. The most esteemed manuscript is that in the public library at Wittenberg. (Riccioli, Vossius, Weidler, Heilbronner, Delambre, *Hist. Astr. Anc.* i. 218.)

CLEO'MENES, the name of several kings of Sparta. Cleomenes I., son of Anaxandrides (Herod. v. 39), although not perfectly sane, succeeded his father. (Herod. v. 42.) He expelled the Peisistratidæ from Athens (Herod. v. 63, 64), 510 B.C., and espoused the cause of Isagoras in opposition to Cleisthenes [Cleisthenes], who, however, with the seven hundred families that had been banished, afterwards returned and forced him to leave the city. Demaratus, the colleague of Cleomenes, accused him of favouring the Medes, while on an expedition against the Æginetæ, and obliged him to return home. By the aid of Leotychides, a private enemy of Demaratus, and by bribery of the Delphic oracle, Cleomenes succeeded in effecting the abdication of Demaratus. (Herod. vi., 65, 66.) In a war against the people of Argos (about 491 B.C., Clinton, *Fast. Hel.*, p. 425, *note* x.), Cleomenes was completely victorious, and burnt a great number of the fugitives in a sacred grove where they had taken refuge. (Herod. vi., 80.) The means by which he had contrived to get rid of Demaratus afterwards becoming known, he was banished into Thessaly and subsequently to Arcadia, where he endeavoured to stir up the people against the Lacedæmonians. (Herod. vi., 74.) He was ordered to return, and on his arrival in Sparta he confirmed the belief of his madness by mortally wounding himself (Herod. vi., 75), 492 B.C.

CLEO'MENES II. succeeded his brother Agesipolis II. (Diodor. Sic. xv., 60), 309 B.C., and reigned 61 years: he died 370 B.C. (Clinton, *Fast. Hel.*, pp. 205, 213).

CLEO'MENES III. succeeded his father Leonidas on the throne of Sparta B.C. 236. Immediately on his accession he set himself to oppose Aratus and the Achæans, who were endeavouring to draw all the Peloponnesians into their league. [Achæi.] The Ephori were averse to the war, and Cleomenes saw no way to attain his ends but by abolishing their power. Accordingly he put four of them to death, and attempted to excuse this act of violence by showing the necessity of restoring the antient institutions of Lycurgus, which could not be effected by any other means. He renewed the old Spartan system of education, and himself observed great simplicity in his mode of life. His colleague of the house of Proclus, an infant, whose name was Eurydamidas, he also removed out of the way by poison, and shared the kingly power with his own brother Eucleidas (Pausanias, 2, 9). He also abolished the Gerusia (*γερουσία*) or senate, and transferred their powers to another body (patrónomi) apparently of his own creating; but this rests solely on the authority of Pausanias. Cleomenes, in his invasion of Achæa, took several cities, and soon afterwards attacked Argos. In order more effectually to oppose Aratus, who had obtained the assistance of Antigonus, Cleomenes formed an alliance with Ptolemy, king of Egypt. The contending parties fought a decisive battle at Sellasia, in Laconica, in which the Lacedæmonians were completely defeated: of 6000 men only 200 survived. After the battle Cleomenes fled to Egypt, where he was hospitably entertained by Ptolemy Evergetes. His son and successor however, Ptolemy Philopator, soon showed considerable jealousy of the royal guest, and accordingly put him in confinement. Cleomenes killed himself in the third year after his flight, and his body was afterwards nailed upon a cross by Ptolemy Philopator, B.C. 220 (Clinton, *F. H.*, p. 205). He reigned sixteen years. (Plutarch, *Cleom.*, c. 38.) Livy (xxxiv. 26), following Polybius (iv.), represents Cleomenes as a tyrant; but Polybius was a native of a city (Megalopolis) which Cleomenes had destroyed, and the support of the Achæan league was a family concern. The truth appears to be, that the great object of Cleomenes was to revive the antient discipline and institutions of Lycurgus, and to put an end to the luxury and corruption which had crept into the state. If the means which he took were sometimes indefensible, it may perhaps be said in reply that his ends were good, and that such means were not entirely condemned by the positive morality of his age and country (Polybius, ii. iv. and v.; Plutarch, *Life of Cleomenes.*)

CLEON, of Athens, the son of Cleænetus, was originally a tanner. Early in life he began to take an active part in the political affairs of Athens, and his success seems to have drawn him from his business. He set himself up as the champion of the people, and was especially vehement in their cause, when their interests appeared to be opposed to those of the rich. The first affair in which he took a prominent part was the discussion on the massacre of the Mitylenæan prisoners, 427 B.C., who were sent to Athens after the reduction of the island by Paches. Such was the influence of Cleon on this occasion that he succeeded in persuading the assembly to pass a decree, by which all the Mitylenæan prisoners sent to Athens by Paches, and every citizen in Mitylene, should be put to death, and the women and children made slaves. The prisoners, who had been sent to Athens, were massacred the same day to the number of more than one thousand; but the timely remorse of the Athenians prevented the execution of the remainder of the sentence. In an assembly called on the following day to reconsider the decree, Cleon came forward to support it with the utmost vehemence, and the majority of his opponent Diodotus was very small.

In 425 B.C., the Athenians built a small fort at Pylos, in Messenia, under the direction of their general, Demosthenes. The Lacedæmonians, with the view of destroying a post that would prove a great annoyance to them, made preparations to besiege it, and also threw a body of men into the small island of Sphacteria, which lay at the entrance of the harbour of Pylos. The island was immediately blockaded by the Athenians; but as there seemed no prospect of its being speedily taken, the Athenians at home began to complain, and Cleon accused the generals of want of activity in pressing the blockade. 'If he were in command,' he said, 'he would soon finish the business.' The people took him at his word; Nicias, one of the commanders at Pylos, insisted that Cleon should supersede him, and the demagogue, much against his will, was obliged to accept the command. However, he put the best face on the matter, and said that he would be back at Athens in twenty days, and would either bring with him all the Lacedæmonians in the island prisoners, or he would not leave a man of them alive. He took Demosthenes as his colleague in the expedition. He was as good as his word, and brought the Lacedæmonians prisoners to Athens within the twenty days. Thucydides, who rarely indulges in reflections on the character of persons in the body of his history, could not abstain from a side-blow at this odious demagogue. The most sensible among the Athenians, he observes, were rather pleased at Cleon's being intrusted with the affair of Pylos, for they thought that the result in any event could not be otherwise than good: they would either get rid of Cleon for ever, which they rather expected, or, if they were disappointed in this, he would probably take the place.

Whether any of the merit of this exploit belonged to Cleon seems more than doubtful. (Aristoph. *Equ.* 54, &c.) His prudence in the selection of his colleague cannot be questioned. The reputation which he gained for energy and promptitude in this affair, added to his inordinate vanity, completely turned his head, and it would seem by what followed as if many of his countrymen were so far deceived by this lucky business of Pylos as to think that Cleon actually had the talents that he pretended to. Accordingly, in 422 B.C. this incapable babbler was fixed upon as the proper person to oppose the movements of the able Spartan general Brasidas in Macedonia and Thrace, and he received the undivided command of 1200 heavy-armed men and 300 horse, with still larger forces of Imbrians and Lemnians, and a fleet of 30 galleys. He did not march direct to Amphipolis, which was the principal object of the expedition, but stopped in his way to recover Torone. Brasidas, who had left the town, had stationed there a garrison which was inadequate for its defence, and accordingly Cleon was successful in his attack on the place. He sold all the women and children as slaves, and sent more than 700 men as prisoners to Athens. Proceeding with increased confidence in his own military powers, he stationed himself at Eion on the Strymon, and delayed the attack on Amphipolis till he had received reinforcements. During this interval he made a fruitless attempt on Stagirus, but succeeded in his attack on Galepsus. The murmurs of his soldiers, who from the first had not been pleased with Cleon's being appointed to the command, soon induced him to move towards Amphipolis with a view of reconnoitring, but not of fighting. Brasidas, however, who was in Amphipolis, did not choose to let him off so easily: he made a sudden sally out of the place, while Cleon, who was quite unprepared for an attack, and had not the least intention to fight, was giving orders for a retreat. In the battle that ensued both the Lacedæmonian and the Athenian generals fell B.C. 422. Cleon, says Thucydides (with a half malicious coolness), who had never had any idea of keeping his ground from the first, was caught as he ran away, and killed by a Myrcinian targeteer. The remains of the Athenian army returned home.

If Cleon possessed any qualifications at all as a statesman, they consisted not in superiority of talent or in political knowledge (for he had little of either), but in a singular facility of speaking and a great command of words, which, combined with low manners, unsparing abuse of those who were better than himself, and a coarse vehement mode of delivery, rendered him acceptable to the mob. Whatever influence he gained with the more considerate citizens seems to have arisen from the reputation which he gained for blunt honesty in the declaration of his sentiments, and a general promptness in action. The real qualities which he contrived to get so favourably interpreted appear to have been impudence and rashness. The indignation of the comic poet (Aristophanes) was at last roused to endeavour to suppress what seemed to defy all other opposition. Aristophanes levelled at Cleon the shafts of his satire, and held him up to public ridicule in the most ridiculous colours. On one occasion (in the *Acharnenses*), alluding to the demagogue's former occupation, he threatens to 'cut him into shoe-leather,' and the comedy of 'the Knights' (Ἱππῆς) was composed with the express object of destroying his authority, which had been raised to so extraordinary a pitch by his success in the affair of Pylos. The victory at Sphacteria took place 425 B.C., and 'the Knights' was represented 424 B.C. Such was the dread of offending Cleon, that not an actor was to be found bold enough to personate him on the stage, while the mask-maker refused to give a representation of his face, and Aristophanes was obliged to act in that character himself, supplying the want of a mask by smearing his face with the lees of wine. [BRASIDAS; ARISTOPHANES.] (Thucyd. iii., 36; iv., 21-40, &c.; v., 2-10; Aristoph., *Equites*; Thirlwall's *Greece*, vol. iii., pp. 185-192, 244-251, 300-304.)

CLEO'NUS, a genus of Coleopterous insects, of the section Rhyncophora, and family Curculionidæ.*

Technical characters:—antennæ rather short, the scape not touching the eyes; basal joint of the funiculus nearly obconic, and rather longer than the remaining joints; the joints from the second to the sixth short and coarctate, the seventh stouter, and closely applied to the club, which is oblong-ovate or nearly so; rostrum short and thick, having generally a channel above; eyes oblong and depressed; thorax subconic, slightly constricted anteriorly; elytra elongate, generally furnished with a protuberance near the apex, which is rounded; legs nearly equal; femora unarmed; tibiæ with the apex slightly thickened, and furnished with a short spine.

Of the genus Cleonus about a hundred species are known; they inhabit Europe, Asia, and Africa. The ground colour of their body is almost always black, but this is for the most part hidden by the denseness of the little scales with which they are covered. These scales are generally of an ash-like colour, grey, white, or pale-brown, and small patches of two or more of these tints form clouded markings. Dark markings are often produced by the want of these scales on certain parts, the ground colour of the body then showing itself.

Cleonus sulcirostris is given as the type of this genus. We will therefore describe it. It is about two-thirds of an inch in length, of an elongate oval form, and of an ashy or white colour; the rostrum is thick, nearly as long as the thorax, and furnished with three deep longitudinal furrows; the thorax is almost as wide as the elytra at the base, and tapers towards the head; there is a longitudinal pale line in the centre, which is bordered by two broad dark brown patches; the rest of the thorax is pale, with the exception of a small brown patch on each side; the elytra are of an ashy colour, and have two oblique V-shaped fasciæ near the middle.

This insect is common in various parts of England, and seems more particularly to frequent chalky and sandy situations; it is sometimes found on nettles and thistles, and often crawling on barren sand-hills near the sea-side. Three or four other species are also found in this country. *Cleonus nebulosus* is very common in some parts of Hampshire, and nearly resembles the one above described, but may be at once distinguished by the absence of the sulci on the snout or rostrum: the scales in this species are not unfrequently red.

CLEOPA'TRA (Κλεοπάτρα), a daughter of Ptolemy

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[*] Among the various modes of dividing the immense group of insects called Rhyncophora by Latreille, Curculionidum by Schonherr, and Curculionidæ by Leach, it is difficult to choose which to adopt. It is necessary to state, that the term Curculionidæ is here restricted to that group of the Rhyncophora included under the head Curculio proper by Latreille.

Auletes, king of Egypt, was born about B.C. 69 Her father, who died B.C. 51, left two sons called Ptolemy, besides Cleopatra and her sister Arsinoe. By her father's will Cleopatra and her elder brother were to be joint sovereigns, but they soon disagreed, and Cleopatra was obliged to take refuge in Syria. In B.C. 48, Julius Cæsar arriving in Egypt in pursuit of Pompey, who had fled from the battle of Pharsalia, determined to carry the will of Ptolemy into effect, and to settle the dispute between Cleopatra and her brother. The youthful queen, who probably knew the character of the Dictator, contrived to get herself privately conveyed into his presence, and by her fascinating manners completely gained his favour. Though not remarkable for beauty, according to the testimony of antient writers, which is confirmed by her medals, she possessed great natural abilities, which had been carefully cultivated. She is said to have spoken with facility several languages, besides her native Greek; a circumstance in itself well calculated to give an artful woman a great ascendency over all with whom she came in contact. Cæsar decided that Cleopatra should be restored to her equal share of power. This decision giving dissatisfaction to the young prince and his advisers, led to an attack upon Cæsar's quarters under Achillas, the commander of the king's troops. After a blockade of some months Cæsar received reinforcements, and completely defeated the party of the king, who was drowned in the Nile. The sovereign power was now given by Cæsar, in conformity with the meaning of Ptolemy's will, to Cleopatra and her younger brother Ptolemy. On Cæsar's return to Rome, Cleopatra shortly after followed him, and remained there till his assassination (B.C. 44), when she hastily quitted the city and returned to Egypt. (Cic. *Ep. ad Att.* xiv. 8.)

In the fourth year of their joint reign Cleopatra murdered her brother Ptolemy. Her connexion with Marc Antony commenced after the battle of Philippi, about B.C. 40, with the interview at Tarsus in Cilicia, of which Plutarch (*Anton.* 25—27) has given a minute description, and which Shakspeare, in his play of 'Antony and Cleopatra,' has turned into a glowing picture. Antony had no doubt seen Cleopatra during her residence at Rome, but, according to Appian, he was first struck with her charms in Egypt (B.C. 55) when he accompanied Gabinius, who was commissioned to restore Ptolemy Auletes to his throne. Cleopatra at this their first interview was only in her fifteenth year. From the time of the meeting at Tarsus the destinies of Antony and Cleopatra were united. The voluptuous queen, whose love of pleasure was unbounded, found in Antony a companion to her taste; and she spared no pains to attract him by all the allurements that her inventive talents could devise. Her influence over him seems to have continued undiminished to the end of his life.

If we may believe the extant authorities, Antony was even prevailed upon by Cleopatra to order her sister Arsinoe to be put to death, who had taken sanctuary in the temple of Diana at Ephesus.

The return of Antony to Italy, and his marriage with Octavia, the half-sister of Octavianus, for a time separated him from the queen of Egypt; but they met again in Syria (B.C. 36) previous to the unsuccessful Parthian expedition of that year, after which Antony renounced his wife for the charms of Cleopatra. Cleopatra was present at the decisive battle of Actium, and set the example of flight, which was followed by Antony. On the death of Antony Cleopatra committed suicide in order to avoid the humiliation of being led in the triumphal procession of Octavianus. Most probably she took poison. According to the story in Plutarch, she was closely watched by the orders of Octavianus, who suspected her designs, but she procured a poisonous serpent to be introduced in a basket of figs. The queen, after using the bath, and partaking of a sumptuous repast, applied the deadly serpent to her arm. Two of her female attendants died with her. The emissaries of Augustus, who had received a letter from Cleopatra declaring her intention, came too late to save her for a Roman triumph. They found her body lying on a golden couch in her royal robes, with one of her attendants dead by her side, and the other with just strength enough remaining to fix the diadem on the head of her mistress. Cleopatra at the time of her death was in her thirty-ninth year. She was buried by order of Octavianus with royal honours in the same tomb with Antony. With Cleopatra ended (B.C. 30) the dynasty of the Greek kings of Egypt, which commenced with Ptolemy, the son of Lagus, B.C. 323.

She had by Julius Cæsar a son, Cæsarion, who was put to death by Octavianus. By Antony she had three children, Alexander, Ptolemy, and Cleopatra, all of whom adorned the triumph of Octavianus at Rome. Cleopatra afterwards married Juba, king of Mauritania: [ANTONY, AUGUSTUS, CÆSAR.] (Plutarch's *Life of Antony*; Appian; Dion Cassius.)

CLE'PSYDRA (κλεψύδρα, from κλέπτειν, ὕδωρ). Before the invention of pendulum clocks, it was not unusual in astronomical observations to measure time by the flowing of water, upon a principle which, in its most simple application, resembled that of the hour-glass, but which was varied by contrivances for accuracy or ornament. Such an instrument was used, up to the time of Galileo, by Tycho Brahé for instance, but as he does not describe it among his instruments, we suppose he hardly considered it as among the primary aids of an observer.

The Chaldæans, it is said, divided the zodiac into twelve equal parts, as they supposed, by allowing water to run out of a small orifice during the whole revolution of a star, and dividing the fluid into twelve equal parts, the time answering to each part being taken for that of the passage of a sign over the horizon. The authority for this story is Sextus Empiricus (*Adv. Math.* cap. 21), who adds, that they regularly used the instrument in finding their astrological data, and remarks that the unequal flowing of the water, and the variations of temperature of the atmosphere, would affect the accuracy of their results. Pliny mentions Scipio Nasica as the first who introduced clepsydras into Rome.

We might perhaps object to Sextus Empiricus as an authority on Chaldee usages, but a good presumption of the early use of clepsydras in India is afforded by the arithmetical treatise of Bhascara, written in the twelfth century. The prediction at the birth of his daughter, Liliwati, was that she should die unmarried. The father determined to have at least one struggle against the prophecy, and accordingly procured a bridegroom and an astrological determination of a lucky hour. The girl remained in her ornaments near the clepsydra, watching for the moment when she and her parent might set fate at defiance. But at length it was ascertained that the hour was past; and on examining the clock, which should have prevented such a catastrophe, it was found that a pearl had escaped from the daughter's dress and closed the orifice through which the water should have flowed. The father, thus disappointed, said to his unfortunate daughter, 'I will write a book of your name, which shall remain to the latest times.' The Liliwati accordingly remains, and bids fair to realize the prediction. (Taylor's *Liliwati*, Bombay, 1816.)

In the account given by Vitruvius (*De Architectura*, lib. ix.), he attributes the invention to Ctesibius: but the instrument described is so complicated that we by no means suppose he intends to assert that this was the first application of the principle even at Alexandria. Some mode of measuring time by the efflux of water, however rude it might be, was used at Athens before the time of Ctesibius, as we see by various passages in Demosthenes. The instrument described by Vitruvius is an elaborate contrivance, which shows the hour, day, month, and sign of the sun. The astronomical clepsydra was rejected by Ptolemy on account of its imperfections, and it is not necessary to follow the moderns through the various modifications under which they have attempted to apply the principle. Such instruments continued to be common, as toys at least, till the middle of the last century.

If we suppose a clepsydra made of a glass cylinder, with a very small orifice at the bottom, and the apparatus to be filled with water, and the orifice then to be opened, the upper surface of the fluid will not descend equally in equal times, according to the notion which Sextus Empiricus attributes to the Chaldæans. If the water be perfectly pure, and the orifice very small and unclogged, the following will be the law of descent. Ascertain first the whole time of emptying the cylinder: then in the fraction m of the whole time, the fraction $m(2-m)$ of the fluid will have discharged itself; or that same fraction of the whole height will have been fallen through. Thus in one-half the whole time of emptying, $\frac{1}{2}(2-\frac{1}{2})$ or $\frac{3}{4}$ of the whole fluid will have been discharged, while in $\frac{1}{4}$ of the whole time $\frac{7}{16}$ of the whole will have been discharged. It is totally out of the question to suppose that the ecliptic was so nearly divided into twelve equal parts as actually was done, by any such imperfect process; though it is not impossible that by keeping the clepsydra constantly full, or very nearly so, equal times may have been estimated by the discharge of equal bulks of fluid. Supposing the cylinder to be kept constantly full, it would discharge its own bulk of fluid in exactly one-half the time in which it would empty itself undisturbed.

CLE'PTICUS, a genus of fishes, of the section Acanthopterygii and family Labridæ.

But one species of this genus is known (*Clepticus genizara*), and this is from the Antilles.

The generic characters are:—head obtuse; mouth protractile; teeth minute, barely perceptible to the touch; body elongate, lateral line uninterrupted; dorsal and anal fins covered with scales nearly to their outer margins.

CLERC, JEAN LE, born at Geneva in 1657, was the son of Etienne le Clerc, and nephew to David le Clerc, a clergyman and professor of Hebrew at Geneva, both known for several theological works. Jean le Clerc early manifested great capabilities for learning joined to an extraordinary memory. He travelled in France and England, and at last settled at Amsterdam, where he became professor of philosophy and belles lettres and of the ancient languages. He wrote a vast number of books, of very unequal merit, on all sorts of subjects. Those which made most noise at the time concern Biblical history and theological controversy, such as Latin commentaries on various books of the Bible, 5 vols. fol., Amsterdam, 1710-31; 'Harmonia Evangelica,' in Greek and Latin, fol., 1700; 'Traduction du Nouveau Testament, avec des notes,' 4to., 1703. These works pleased neither Catholic nor Protestant divines, from their having a tendency to Socinianism—a tendency made still more manifest by another work generally attributed to him, entitled 'Sentimens de quelques Théologiens de Hollande touchant l'Histoire Critique du Vieux Testament,' followed by a 'Défense' of the same work, 2 vols. 8vo., 1685. In these the author openly attacks the inspiration of the Scriptures and the very foundation of Revelation. As a critic, Le Clerc published his 'Ars Critica,' 3 vols. 8vo., 1712-30, a work which is much esteemed; and he also edited the 'Bibliothèque Historique et Universelle,' a periodical begun in 1687 and closed in 1693, making 26 vols. 12mo.; the 'Bibliothèque Choisie,' 1712-1718, 28 vols. 12mo.; and the 'Bibliothèque Ancienne et Moderne,' 1726-30, 29 vols. 12mo. These literary journals enjoyed a good reputation in their days. He also wrote—1. 'Parrhasiana, ou Pensées diverses sur des matières de Critique, d'Histoire, de Morale, et de Politique,' 2 vols. 12mo., 1701, a compilation to which he has added some hasty reflections, and many favourable comments upon his own works. 2. 'Histoire des Provinces Unies des Pays Bas,' from 1650 to 1728, 2 vols. fol., Amsterdam, 1738. 3. 'Histoire du Cardinal de Richelieu,' 2 vols. 12mo., 1714; 4. 'Traité de l'Incrédulité,' 8vo., 1733, in which he examines and discusses the various motives and reasons which occasion many to reject Christianity: this work is written with considerable talent and judgment. He also wrote a number of polemical works and pamphlets, most of which were tinged with bitterness and dogmatism. Le Clerc was one of the first critics of his age, but it was an age in which the critical art had not attained a high degree of excellence. He was learned, had quickness and penetration, and a great facility of composition; but he generally wrote in haste and upon too many and various subjects, having at times five or six works in hand at once. He published also a supplement to Moreri's Dictionary, and several editions of ancient classics, among others, Livy, Ausonius, Sulpicius Severus, &c. This edition of Menander and Philemon's fragments was severely criticised by Dr. Bentley. In 1728, while he was giving his lecture, Le Clerc suddenly lost the use of his speech through a paralytic stroke. His memory also failed him, and he lingered some years in a state bordering upon idiocy. He died at Amsterdam, on the 8th of January, 1736.

CLERGY, a collective term, under which that portion of the population of a country is comprehended who are in holy orders. It is used in contradistinction to *laity*, which comprehends all other persons. Like most ecclesiastical terms, it is of Greek origin, the word κληρικός (clēricus) having been used in the sense of 'appertaining to spiritual persons' by the Greek ecclesiastical writers. From *clericu* comes the word *clerk*, which is still a law-term used to designate clergymen, but which appears antiently not to hav been confined to persons actually in holy orders, but t have been applied to persons possessed of a certain amoun of learning.

The distinction of clergy and laity in the Christian church may be considered as coeval with the existence of the church itself; for in the apostolic period there were officers in the church specially appointed to discharge the duties of pastor or deacons, and even, as many suppose, bishops or overseers who had the superintendence of various inferior officers These persons, though they might not perhaps be entirely relieved from the ordinary duties of life so that they migh devote themselves exclusively to their sacred office, yet mus necessarily have been nearly so, and it is certain that they were nominated to their offices by some peculiar forms Very early however the distinction became complete. The bishops, priests, and deacons of the Christian church, each ordained to the office in a manner which it was believed the founders of Christianity appointed, and each supposed to have received a peculiar spiritual grace by devolution from the apostles and from the sacred founder of Christianity himself, soon formed a distinct body of men demanding to be distinguished by some particular appellation.

In all Christian nations the distinction has been recognised by the political authorities, who have allowed certain social privileges or exemptions to the clergy. No inconsiderable share of temporal power, extending not only over the members of their own body, but over the laity, has in most states been conceded to them. In the great German confederation the sovereign power in some of the states was vested in ecclesiastics; while at Rome there has been for many ages an elective monarchy of ecclesiastics, in whom all temporal as well as spiritual authority has been vested.

It is easy to account for the ascendency of the clergy in the middle ages, and for the acquisition by them of so many valuable exemptions, and so much actual power. They were the best instructed part of the population. The learning of the age was almost exclusively theirs; and knowledge, if it is not itself power, is at least a means of obtaining it. Beside this they had a most powerful instrument with which to work upon the ruder minds of the laity, in the power vested in them of alone administering the sacraments of the church, and of regulating alone under what circumstances those sacraments ought to be administered. This enabled them to win acquiescence in any favourite design, sometimes by gentle influences and sometimes by terror.

The history of almost every country of modern Europe presents instances of struggles between the laity and the clergy for power or privilege. Our limits will not permit us to enter on these, not even on the struggles of this kind in our own country, where they were as determined, and sometimes as fierce, as in any country of Christendom. All power in the clergy of England to erect an authority dangerous to the laity, or to secure to themselves political immunities or privileges inconsistent with the general good, was broken at the Reformation. The clergy of England then became but a fragment of a once great and well-disciplined body, dispersed through the whole of Christendom, which, when acting with common effort, and putting forth all its strength, it had been difficult for any single temporal prince to resist with effect.

We shall take from Blackstone a short statement of the privileges which the law of England allows to the clergy. They are but a faint shadow of the privileges which the clergy enjoyed before the Reformation. A clergyman cannot be compelled to serve on a jury, or to appear at a court leet or view of frankpledge. He cannot be compelled to serve the office of bailiff, reeve, constable, or the like. He is privileged from arrest in civil suits while engaged in divine service. He could claim benefit of clergy more than once. (BENEFIT OF CLERGY, p. 228.) Such are the legal exemptions. On the other hand, the clergy cannot now sit in the House of Commons, nor can they engage in any kind of trade, though sometimes clergymen have been brought within the scope of the bankrupt laws. By the law as it stood previously to the 57 Geo. III., c. 99, they were not allowed to take lands to farm, but by that act (s. 2) they are permitted (with the consent of the bishop of the diocese) to farm lands to the extent of 80 acres for a term not exceeding seven years.

The clergy meet by delegates in convocation at the beginning of every new parliament, but this is now merely a form, the king, as supreme head of the Church of England, invariably dissolving the convocation before they can proceed to any business. They have however still courts in which jurisdiction is exercised touching ecclesiastical affairs, and causes testamentary or matrimonial, and where the church's censures are directed against particular classes of offenders. To them also belongs the whole ecclesiastical revenue, with divers fees or customary payments, and to them also the whole regulation of the terms of admission to their order.

The three great classes of the English clergy are the bishops, priests, and deacons. To be admitted into each of those classes requires a peculiar ordination. This distinction is of an entirely different kind from that which arises out of office or appointment. Of this kind of distinction there is in the English clergy the archbishop, the bishop, the dean and canons of a conventual or collegiate church (some of the canons being in many instances invested with particular characters, as precentors, succentors, and the like), the archdeacon, the rural dean, the dean of some church whose constitution is peculiar, the rector, the vicar, the curate in some chapels called parochial, the minister in some newly-founded chapel, whether a chapel of ease or what is called a proprietary chapel, assistant ministers to aid the vicar or the rector in some churches of antient foundation, and, finally, a body of persons called curates, who are engaged by the incumbents of benefices to assist them in the performance of their duties, but who are not dismissible at the caprice of the incumbent, nor left by law without a claim upon a certain portion of the profits of the benefice.

These are the various offices in which the clergy of the church of England are distributed. As the subject is of importance, and seems to be but imperfectly understood, we shall here briefly notice wherein lies the distinction of *rector*, *vicar*, and *curate*, to one of which belongs nearly every individual of the English clergy.

For this purpose, England must be regarded as divided into something more than 10,000 small districts, varying in extent, called parishes. Each of these parishes must be regarded as having its church, and one person (or in some instances more than one), who ministers divine ordinances in that church. This person, whose proper designation is *persona ecclesiæ*, enjoys of common right the tithe of the parish, and has usually a house and glebe belonging to his benefice. When this, the original arrangement, is undisturbed, we have a parish and its *rector*. But in the times before the Reformation it was a very common practice of the *patrons*, or persons who had the right to nominate the persona or rector, to give that right to some monastery or community of religious. Such community, instead of nominating some person as rector, would profess to discharge the duties of the parish by sending from time to time one of its own body to perform those duties, or by engaging some person at a stipend, settled by themselves, to perform the duties, they taking the tithe and other profits of the benefice to the use of their house. Some few of the antient parishes of England have thus been entirely stripped of their tithe and the other property out of which a resident minister might have been supported; but in nearly every instance the bishops interfered, and compelled the religious houses to settle some determinate share of the profits of those benefices upon a clergyman who should be fixed in the parish upon the nomination of the monastery, but no more removable than if he had really been the persona or rector. This person was called the *vicar*, *vicarius*, that is, one who stands in the place of another; and the other whom the vicar represented was in this instance the religious community, in whom vested the two characters of patron and rector. The provision made for the support of the vicar varied in different parishes, but it was usually some fixed portion of the tithe with the oblations. The agreement however, which was between the religious community and the bishop, was arbitrary, and hence it is that we find the vicars so variously endowed. At the Reformation, whatever interest the religious communities possessed in the parishes was seized by the crown, and has since been either retained by it, or, what has usually been the case, has been sold to private persons, whence arises the class of the *lay impropriators*, who are in fact, the rectors of the parish, the performance of the spiritual duties devolving on the vicar. *Curates* who are not merely assistants to a rector or a vicar, are in general incumbents of churches in which no vicarage was ever ordained, or incumbents of chapels of foundation later than the æra of the foundation of parishes, and endowed by the special bounty of particular persons. [CHAPEL.]

CLERGY, BENEFIT OF. [BENEFIT OF CLERGY.]

CLE'RIDÆ (*Tillidæ*, Leach), a family of Coleopterous insects, of the section Malacodermi. Characters; palpi generally clavate; mandibles dentated internally; penultimate joint of the tarsi bilobate; antennæ more or less serrated or terminated by a club; body generally cylindrical and pubescent; head and thorax narrower than the abdomen; eyes emarginated. Most of these insects are found on flowers and some on old trees; the larvæ of those which are known are carnivorous.

The principal genera included in this family are *Cylindrus*, *Tillus*, *Priocera*, *Axina*, *Eurypus*, *Thanasimus*, *Opilus*, *Clerus*, *Necrobia*, and *Enoplium*.

The genus *Clerus* is thus characterized: maxillary palpi with the terminal joint thicker than the rest, compressed, broadest at the apex, and truncated; labial palpi with the terminal joint securiform; antennæ with the basal joint rather long, the seven following short, the three terminal joints forming a compressed knob of the form of a reversed triangle; tarsi exhibiting only four distinct joints.

Two species of this beautiful genus (*Clerus apiarius* and *C. alvearius*) are natives of this country, but they are here of rare occurrence, though in Germany, France, and Italy, they are common, and are found on the flowers of umbelliferous plants.

Clerus apiarius varies from half to two-thirds of an inch in length, and is very thickly covered with hairs; it is blue, the elytra are red, and have three blue fasciæ, one of which is at the apex.

The larva of this species feeds upon those of the common hive-bee, and is sometimes very destructive to hives.

Clerus alvearius very much resembles the species just described, differing chiefly in having a blue spot in the region of the scutellum in addition to the three blue fasciæ on the elytra; its larvæ feed upon those of the mason bees.

Dejean enumerates thirty-seven species of the genus Clerus in his 'Catalogue des Coléoptères,' and it appears that the genus is not confined to any particular part of the globe, as is frequently the case.

CLERK, JOHN (of Eldin, N.B.), was the inventor of one of the most important parts of the modern British system of naval tactics. In 1779 he communicated to some friends his notions concerning what is technically called 'breaking the line.' In 1780 he communicated his plan to Mr. Richard Atkinson, the particular friend of Sir George (afterwards Lord) Rodney, and that distinguished officer, before leaving London, said he would strictly adhere to it in fighting the enemy. On the 12th of April, 1782, when the experiment was tried for the first time, it led to Rodney's decisive victory over the French, under De Grasse, in the West Indies. From that time the principle has been adopted by all British admirals; and during the last war, when Howe, Nelson, and others, executed the manœuvre in perfection, it was universally attended with success. (See *An Essay on Naval Tactics, systematical and historical*, with explanatory plates, in 4 parts, by John Clerk, Esq., of Eldin, Fellow of the Society of Scottish Antiquaries, &c.; also an excellent article in the *Edinburgh Review*, vol. vi., p. 301.) A few copies of the first part of this valuable Essay were distributed among friends in the beginning of 1782. This part was reprinted and published in 1790, and the second, third, and fourth parts were added in 1797. Mr. Clerk was no sailor, and had never even made a single sea-voyage.

Such is the account given by Mr. Clerk's relatives and friends, but it has been indignantly contradicted in various publications by General Sir Howard Douglas. In a circumstantial narrative of Admiral Rodney's battle, he proves that the passage of the British through the enemy's line, and thereby cutting off the rear ships, arose from the chance position of the two fleets, and was one of those happy and unpremeditated decisions of the moment which always characterize a great and successful commander. By a close examination of dates, he also shows that Mr. Clerk's ingenious essay could not have been communicated to Lord

Rodney before the engagement took place; and he supports these statements by letters and other documents which have fallen into his hands since the death of his father, the late Admiral Sir Charles Douglas, who was at that time Rodney's 'Captain of the Fleet,' and therefore minutely acquainted with all the transactions. (See the several publications on this subject by Lieutenant-General Sir Howard Douglas, Bart.)

CLERMONT, the name of several towns in France, of which the following are the only ones of importance.

CLERMONT-FERRAND is the capital of the department of Puy de Dôme; it is in the neighbourhood of the Puy de Dôme, and on a torrent which, rising on the side of that mountain, flows into the Allier: about 216 miles S. by E. of Paris, in a direct line, or 232 miles by the road through Nevers and Moulins: in 45° 46′ N. lat., and 3° 5′ E. long.

It is not known whether this town existed when Julius Cæsar invaded Gaul: it was certainly not the Gergovia, in attacking which he experienced his most considerable check. Strabo mentions it under the name of Νεμωσσὸς (Nemossòs), and calls it the metropolis of the Arverni, from whom Auvergne is named: Ptolemy calls it Αυγουστονίμετον. In the Theodosian table the name is found in a contracted form, Aug. Nemeto. At a subsequent period it assumed the name of the tribe to which it belonged; and it appears under the name of Arverni, or Urbs Arverna, in the pages of Ammianus Marcellinus and Sidonius Apollinaris, in the 'Notitia Imperii' and the 'Notitia Provinciarum Galliæ.' In the middle ages, the castle by which the town was defended, was named *Clarus Mons;* and this name, which at first was restricted to the castle, was afterwards extended to the whole town.

In a council at Clermont, held A.D. 1095, the first crusade was resolved on. Pope Urban II. presided. The transactions of this council were numerous and important. In the middle ages, and up to the period of the French revolution, Clermont ranked as the capital of Auvergne. The bishopric originated in the third century, and the bishop held the first rank among the suffragans of the archbishop of Bourges; and until the erection of the bishopric of St. Flour in 1317 was the only bishop in Auvergne. The diocese at present comprehends the department of Puy de Dôme, which had in 1832 a population of 573,106.

This town is delightfully situated in a part of the rich plain of the Limagne, in a nook nearly embosomed in the hills which rise round the base of the Puy de Dôme, and which surround the town on every side except the E. and N.E.: it is close to a small mountain-torrent which flows into the Allier, from which river Clermont is distant about six or seven miles. In approaching the town from Paris, the traveller passes through the little town of Montferrand, containing some 3000 or 4000 inhabitants, situated on a little eminence, and having very steep streets. It was one of the strongest places in Auvergne; but its walls have been demolished and the ditches filled up. This place has been, since 1731, regarded only as a suburb of Clermont. It has some cavalry barracks, the diocesan seminary for the priesthood, and a church remarkable for its large nave unsupported by pillars. Here also is held a large cattle-market. From Montferrand to Clermont is a noble road or avenue, two miles long, perfectly straight, and bordered with willows and walnut-trees. Clermont itself, built on an eminence, forms, when viewed at a little distance, a noble termination to this avenue, and inspires the traveller with a notion of its beauty which the interior of the town does not keep up. It is not well laid out; the streets are narrow, and the houses, though not ill built, yet present, from the dark colour of the lava, which is the chief building material, a sombre appearance; several are however white-washed. There are several *places*, or squares; and the original town of Clermont is separated from the faubourgs, which (exclusive of Montferrand) comprehend half its extent and a third of its population, by a line of boulevards, which are for the most part planted with trees. The *place* of Le Taureau is remarkable for a handsome fountain in form of an obelisk, dedicated by the townsmen to the memory of General Desaix, who was born in the neighbourhood: this *place*, and those of Poterne and of L'Espagne, command most agreeable prospects: that of Champleix is adorned with a Gothic fountain, richly sculptured, which was formerly in the cathedral close.

Of the public buildings the cathedral is the principal; it is on the central point of the city; and though it has never been completely finished, it is regarded as one of the finest monuments of Gothic architecture in France. It is built of the lava of Volvic, the dark hue of which is in keeping with the style of the building. Of five towers which formerly adorned it, four were destroyed in the revolution; from the summit of the remaining one is a beautiful prospect, extending on every side of the town. The nave and choir are remarkable for their lofty elevation, and the lightness and arrangement of the pillars which support their vaulted roofs. The carving of the wood-work of the choir is exquisite. There are some beautiful painted windows, but they have been much damaged. This cathedral, the fourth which has been built here, was begun as far back as A.D. 1248. The first cathedral was destroyed by the Allemanni, the second by Pepin le Bref, and the third by the Northmen. The church of Notre Dame du Port is very ancient; several parts of the present building belonged to the original church, erected in the sixth century, and destroyed by the Northmen in the ninth.

There are two handsome halls, or covered markets, one for linens, the other for corn; a town-hall with courts of justice, lately built; and a handsome *collège royal*, or high school, which contains 500 pupils. There were, before the revolution, several monastic establishments, the buildings of some of which yet remain, and are of good appearance; there are some good inns, and a number of handsome private houses. The *place* Jaude, used as the *place d'armes*, or parade for the troops, is a very large parallelogram surrounded by private houses mostly new and well built.

The inhabitants of Clermont amounted, in 1832, to 24,077 for the town, or 28,257 for the whole commune: we presume that in the latter number the population of Montferrand is included. Clermont is not the seat of any important manufacture, but considerable trade is carried on; the situation of the town causing the inhabitants of the department of Puy de Dôme, and of the neighbouring departments of Cantal, Lozère, Haute Loire, and Aveyron, to resort to it to exchange their cheese, their cattle, and their wool, for the articles which are sent from Paris. Hemp, linens, fruit, and the wines of the Limagne, find a market here: the wines were commonly sent to Paris, until the charges made at the barriers of the metropolis on the inferior wines were rendered equal to those on the wines of superior quality. Some coarse woollen cloths, paper, hats, silk stockings, pipe-clay, sweetmeats, pottery, Prussian-blue, and glue, are made in the town; there are some tanyards and breweries, and a refining house for saltpetre. Clermont is one of the places by which the commercial communication between Lyon and Bordeaux is carried on. The transit of goods is chiefly effected by mules; there is no navigable river in the neighbourhood; the navigation of the Allier does not commence till many miles lower down. Clermont is famous for its preserves of apricots and apples.

There is a high school (already mentioned); a public library of 16,000 volumes, tolerably well chosen, which owes its origin to the celebrated Massillon, once bishop of Clermont; a museum of mineralogy, very rich especially in the minerals of the district; a large botanic garden, well kept up; and courses of public instruction, delivered gratuitously on botany, mineralogy, geology, arithmetic, and geometry, applied to the arts; writing, drawing, music and architecture. The library of the Academy of Sciences, Arts, and Belles Lettres of the town is adorned with a bust of Delille and a statue of Pascal. There is a handsome theatre near the cathedral. There are several hospitals: the Hôtel Dieu and the Hôpital Général are the principal. The Cour Royale, to the jurisdiction of which the department is subject, has its seat not at Clermont, but at Riom, a small town in the department. Clermont is the seat of a conseil académique.

Among the eminent natives of Clermont, Pascal, the author of the 'Lettres Provinciales,' holds the first place.

Clermont is distinguished by some remarkable mineral springs: that of Jaude, near the *place Jaude*, is intermittent: it flows steadily for a few minutes, then suddenly gushes out with a violent ebullition, which also lasts some minutes; it then returns to its previous equable flow, and then alternates. The fountain of St. Alyre, which derives its name from the Benedictine abbey of St. Alyre, in the Faubourg St. Alyre, is still more remarkable. It forms a streamlet which, running through some kitchen gardens, deposits as it runs a calcareous sediment, and gradually raises its bed until it attains the level of its source, when the waters, unless a new channel be found for them, overflow on all sides. These deposits harden as they are formed, and the proprietors of the gardens are obliged, from time to time, to alter the course of the stream and to break up the incrustations to prevent the land being covered by them. In one instance where they allowed the incrustation to remain and increase, the consequence has been the formation of a natural dyke or wall 250 or 260 feet long, which preserves nearly the same level, while the ground on which it stands has a gradual slope, so that it appears at one end to rise out of the ground, while at the other it has a height of 17 feet and a breadth of 13 feet. At its extremity this dyke has formed a natural bridge over a brook which crosses its direction, and into which the streamlet flowed. The raising of the bed of the streamlet led to the formation of a small cascade, which increased in height as the bed rose higher and higher, and threw its waters farther into the current of the brook: this current prevented the extension of the dyke at the bottom, but the continued deposits at the top caused it to impend more and more over the stream, and to throw out its waters farther until they fell on the opposite bank, and there forming new concretions, completed the arch. This bridge is somewhat broken. The owners of the gardens turn the streamlet to a profitable account by placing, where the waters have a fall, various objects, as fruits, flowers, birds, and other things, which are speedily covered with a hard calcareous crust.

The plateau of Gergovia, some five or six miles to the south-east of the town, is said by Vaysse de Villiers to have only the name in common with the Gergovia of which Cæsar had to raise the siege in his campaign against Vercingetorix (*Comment. de Bell. Gall.*, lib. vii.); but D'Anville seems to incline to a contrary opinion. The arrondissement of Clermont contained, in 1832, a population of 171,566. (Malte Brun; Vaysse de Villiers; Balbi; Expilly; Puchet, *Diction. de Géographie Commerçante; Tour in France* by F. J. Carey.)

CLERMONT DE LODE'VE, a town in France, in the department of Herault, near the right bank of the little river Lergue, which flows into the Herault. It is 367 miles S. by E. from Paris in a straight line, in 43° 38′ N. lat. and 3° 26′ E. long.

Clermont de Lodève is situated on the slope of a hill, in a territory fertile in grain and fruit, and supplying abundant pasturage: there is an antient castle. The population, in 1832, amounted to 5905 for the town, or 6199 for the whole commune. The inhabitants are engaged in the manufacture of woollen cloth for the Levant trade (a branch of industry introduced in 1678) and for home consumption, handkerchiefs, worsted and cotton stockings, verdigris, cream of tartar, vitriol, cotton yarn, and leather. In these articles, as well as in the agricultural produce of the neighbourhood, sheep, wool, wine, brandy, oil, and almonds, considerable trade is carried on. Clermont furnishes wool for the manufactures of Carcassonne, Lodève, Aubenas, Bedarrieux, &c. There are several considerable markets in the week.

CLERMONT-OISE. [OISE, DEPARTMENT OF.]

CLEVES (Kleve, German), the most north-westerly district of the kingdom of Prussia, and part of the old duchies of Cleves and Guelderland, is at present one of the thirteen circles of the province of Düsseldorf, in the Prusso-Rhenish provinces. It contains about 185 square miles; six towns and seven villages; and in 1831 had a population of 42,194 souls, of whom about 37,500 are Roman Catholics. These numbers give an increase of 3582 since the year 1817. Cleves is bounded on the west by the Rhine, and on the north and west by Holland; the surface is a complete level, and the soil, though very sandy in many parts, has in general been rendered extremely productive by careful cultivation. In the westerly districts lies the extensive Reichswald, or Forest of Cleves: 31,000 acres of this circle are occupied by woods and forests, while of the remainder 58,350 acres are arable land, and 23,200 are in meadows or pastures. The stock of horses, in 1831, was 3964; horned cattle, 16,893; sheep and goats, 7060. The produce is chiefly wheat, rye, barley, oats, buckwheat, peas and beans, potatoes, cloverseed, butter, and cheese, of which three last-mentioned articles much is exported. Cleves is divided into eleven districts (Bürgermeistereien), and contains, besides the capital, the towns of St. Oranenburg, between the Maass and Waall, 1100 inhabitants; Calcar, 1900; Goch, a manufacturing town on the Nies, 3350: Grieth, 1000; Griethausen, 700; and Uedem, 1300. On a heath near Goch is a village of 2700 inhabitants, called the Pfulzdorf, or palatinate village, from its having been built by emigrants from the Palatinate. The manufactures carried on in this circle are cotton-yarn, woollens, silks, cottons, linens, cutlery, leathers, &c.

Kellen, in the territory of Cleves, is conjectured to be the site of the Castra Ulpia Leg. xxx. (Amm. Marc. xviii. 2), and Goch, the Quadriburgium Gugerni, who were forced to abandon the country about Cleves and between the Maas, Waal, and Rhine, in the times of Tiberius. (Tacitus, *Annal.* iv. 26; Eutrop. vii. 9.)

CLEVES, the capital of the Circle, and formerly of the duchy of this name, is pleasantly situated on the Kermisdahl, about a mile from the banks of the Rhine, with which it communicates by the Spoy canal. It is walled, well built, and divided into the Upper and Lower towns; but the Upper being built on three hills, the streets are steep and irregular. Formerly it was fortified, and was considered a place of strength until the middle of the sixteenth century. It contains a cathedral, built in 1346, with two towers, a Catholic church, three Protestant churches, a synagogue, and a royal palace, called the Schwanenburg, the tower of which, built by the duke of Cleves in 1439, is extremely massive, and being on the highest point of the hill on which the palace stands, forms a stately ornament to the town. There are extensive gardens round the palace, which contains a valuable collection of Roman antiquities found in the town and its environs: it is now used partly as government offices, and partly for a prison. Cleves possesses a high-school, three hospitals, a house of industry, house of correction, &c. The houses, about 950 in number, are built in the Dutch style; the population is about 7000; it increased, between 1765 and 1810, from 4977 to 5200; and between 1817 and 1831, from 6511 to 6967. The manufactures consist of yarns, cotton goods, silks, woollens, flannels, stockings, linens, tobacco, brass-ware, &c. There are three squares, or open spaces, and in the vicinity a park of about 700 acres, and a chalybeate spring surrounded by handsome grounds, which was opened in 1742. The place is much frequented by visiters in summer Over the Middle Gate is a statue of Eumenius Rhetor, a Roman, who founded the first schools in Cleves. 51° 47′ N. lat., and 23° 46′ E. long.

CLIENT (Cliens), apparently derived from the verb *cluo*, 'to listen to,' 'to obey.' From the origin of the institutions of antient Rome, there appears to have existed the relation of patronage (patronatus) and clientship (clientela) Romulus, the founder of Rome, was, according to tradition, the founder of this institution. The cliens may perhaps be compared with the vassal of the middle ages. Being a man generally without possessions of his own, the client in such case received from some patrician a part of his domains as a precarious and revocable possession. The client was under the protection of the patrician of whom he held his lands, who in respect of such a relation was named patron (patronus), *i. e.*, father of the family, as matrona was the mother, 'in relation to their children and domestics, and to their dependents, their clients.' (Niebuhr.) It was formerly the opinion that every plebeian was also a client to some patrician; but Niebuhr, in speaking with reference to the proposition that 'the patrons and clients made up the whole Roman people,' affirms that the proposition is only true 'if applied to the period before the commonalty was formed, when all the Romans were comprised in the original tribes by means of the houses they belonged to.' In the later times of the republic the clients probably, for the most part, consisted of liberti and their descendants. Between the patron and his client there existed mutual rights and obligations. The patron was bound to take his client under his paternal protection; to help him in case of want and difficulty, and even to assist him with his property; to plead for him and defend him in suits. The client on his part was bound in obedience to his patron, as a child to his parent; to promote his honour, assist him in all affairs; to give his vote for him when he sought any office, to ransom him when he was made prisoner and not able to pay the ransom himself; and to contribute to the portion of the patron's daughter. The patron succeeded to his property when the client died without heirs; which was also the law of the twelve tables in the case of a freedman

(Ulpian., *De Bonis Libertorum*) who died intestate and left no heir (*suus heres*). Patron and client were not permitted to sue at law, or give evidence against one another.

Originally patricians only could be patrons; but when, in the later times of the republic, the plebeians had access to all the honours of the state, clients also were attached to them.

The terms patronus and libertus, or even patronus and cliens, as used in the later years of the republic, and under the emperors, cannot be considered as expressing the same relation as the terms patronus and cliens in the early ages of Rome, though this latter relation was probably derived from the earlier one. When a foreigner who came to reside at Rome selected a patron, which, if not the universal, was the common practice, he did no more than what every foreigner who settles in a strange country often finds it his interest to do. The existing relationship at Rome between patron and client facilitated the formation of similar relations between foreigners and Roman citizens; the foreigner thus obtained a protector and perhaps a friend, and the Roman increased his influence by becoming the patron of men of letters and of genius. (See Cicero *pro Archia*, c. 3, and *De Oratore*, i. 39, on the 'Jus Applicationis.' See also Niebuhr, vol. i., p. 316, &c., and the references in the notes.)

As a Roman client was defended in law-suits by his patron, the word client is used in modern times for a party who is represented by a hired counsellor or solicitor.

CLIFTON. [Bristol.]

CLIMATE is a word which has been transplanted from the Greek into every modern European language. The Greek word κλῖμα (from κλίνω, to incline) seems originally to have been used to express the apparent inclination of the heavens towards the horizon; and it was afterwards used as a technical term in astronomy and geography to indicate generally the distance on the celestial sphere, as well as on the terrestrial globe, from the equinoctial line towards the poles.

The plural of this word, κλίματα (climata), however, was used in a somewhat different sense, and answered, in some degree, to our parallels of latitude. The Greeks supposed the celestial sphere to be divided into girdles or zones, parallel to the equator, and surrounding the whole sphere. They then endeavoured to ascertain through what stars the parallel circles forming the boundary-lines of such a zone were to be drawn, and what stars fell within the zone. The same division they afterwards applied to the terrestrial globe, ascertaining first the places through which the boundary-lines of the zones ran, and then determining at what distance from them the intermediate places were situated. These zones were called climata, or climates, and were used by them as we now use the degrees of latitude.

These climata of the Greek geographers however did not always embrace an equal number of degrees of latitude. The principle of the division into zones was the length of the longest days; and a difference of half an hour generally determined the breadth of one of these climates. For instance, one of the boundary-lines of a zone would run through the places in which the longest day had thirteen hours, and the other through those in which it was thirteen hours and a half. This was sufficient for their purposes in those parts of the globe where there was only a small number of places the position of which had been determined. But it was not sufficient for those parts where the number of places determined was greater, as in Greece and the adjacent countries. Here they gave a less width to the climata, allowing only a quarter of an hour for the difference between the boundary-lines of a climate. For instance, the southern boundary-line of such a zone would run through the places whose longest day was fourteen hours, and the northern through those in which it was fourteen hours and a quarter.

The greater exactness of modern astronomical observations has rendered this division of the globe useless, and we have substituted for it the notation by degrees of latitude. The Greeks, of course, made use of these climata as we do the degrees of latitude, to indicate in a general way the comparative temperature which a country enjoys by reason of its smaller or greater distance from the equator. Modern nations have adopted the term climate, but with a somewhat enlarged signification. Climate, with us, not only implies the greater or less degree of heat which a country is subject to, but also the quantity of moisture in its atmosphere, and, in general, all the phenomena which affect vegetation, and render a country a fit abode for men and animals.

Heat and moisture, properly speaking, constitute climate. The other phenomena, such as winds, electricity, &c., affect these constituents of climate; but they require a separate consideration, as modifiers of climate, according to the view which we take of the subject.

We may observe, that those places where a high temperature is combined with a great quantity of moisture, are the most fertile, and display the most luxuriant vegetation, provided the surface is not formed of naked rocks; but even the solid rocks will in time yield to the combined influence of heat and moisture, and be clothed with a rich vegetation.

The latitude of a place is generally considered as the principal circumstance in determining its temperature. It is laid down as a fact, that countries lying under the equinoctial line or close to it are subject to the greatest comparative heat, which constantly decreases with the increase of distance from that line. This general rule must be admitted to be true for all the countries which lie between the tropics and the pole; but it may be questioned how far it is true of the countries within the tropics. A glance at a globe or sphere shows that the sun at the end of the first month after the equinox has already advanced 12° of latitude towards the tropic; but in the second month it traverses only 8°. At the end of the second month it is consequently 20° from the equator. There remain therefore only 3½° to be traversed in the third month. The sun recedes from the tropic in the same way. It passes the first month through 3½°; the second through 8°; and the third through 12° of latitude. Hence it is evident, that at all places between 20° and 23½° of latitude, the solar rays during two months fall at noon either perpendicularly, or at an angle which deviates from a right angle only by 3½° at most. If we take a place intermediate between 20° and 23½° of latitude, the solar rays must fall on it during two whole months, either perpendicularly, or in a direction still less removed from the perpendicular than in the former case. On the other hand, when the sun passes the equator, two places on which the vertical rays of the sun fall on two consecutive days are nearly ½° of latitude distant from one another; and a place situated exactly under the equator has only during six days the sun as near its zenith as the above-mentioned places near the tropics have it during two whole months. We might therefore presume, that the summer heat of the latter position must be much greater than that of places near the equator. This degree of temperature must be increased by the greater length of the longest days, which near the tropic are 13½ hours; but at the equator are always of the length of 12 hours.

This reasoning is not contradicted by experience. The countries in which the greatest degree of heat is experienced lie near the tropic of Cancer. They are the countries on the banks of the Senegal, the Tehama of Arabia, and Mekran in Beloochistan. The antients were not unacquainted with this fact; and one of their most ingenious inquirers, Posidonius, was so struck by the peculiarities of the countries near the tropic, that, for the purposes of physical geography, he wished to consider them as forming a particular zone, different both from the equatorial zone and from the temperate zone, and separating these two in the form of a narrow belt. He observes that these countries are characterized by the aridity and sterility of their soil, and that no rain falls there, while the regions nearer the equator, having abundance of rain and moisture, are exceedingly fertile. (Strabo, ii.)

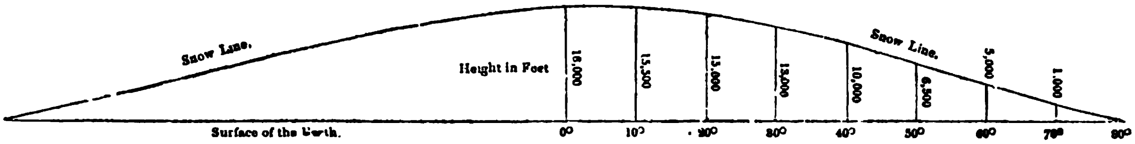
It remains however a question whether the mean temperature of places near the tropic is greater or less than that of places near the equator. During nearly eight months of the year the solar rays fall on the equator less obliquely than on the countries near the tropics; but it is not yet determined by exact observations if the greater degree of heat which these countries are subject to during that period is sufficient to compensate for the much greater degree of heat during the remainder of the year near the tropics. Very few meteorological observations made between the tropics have yet been published; and of these few we know not how they were made, and how they were affected by local circumstances. There is however a well-established fact which clearly seems to indicate that in summer the mean temperature near the tropics is higher than near the equator; this is the line of perpetual snow, which in the Bolivian

Andes is found to be at least 1000 feet higher than in the Andes of Ecuador, which are situated under the equator.

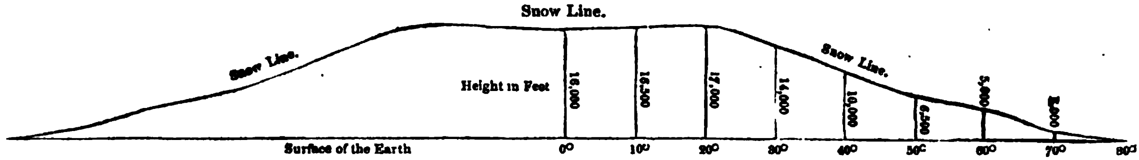
Though the mean temperature differs greatly in countries lying in different degrees of latitude, the most intense degree of heat which is experienced in all countries between the equator and 60° of latitude is nearly equal. The thermometer rises almost every year at St. Petersburg above 90°; and it is observed that even on the coast of Guinea, and on the banks of the Senegal, it rarely exceeds 95°. There are certainly instances in which it has attained a much higher degree. Dr. Coulter observed it at 140° on the banks of the Rio Colorado (32° 30′ N. lat.); but such exceptions must be ascribed to local circumstances, especially to the reflection of the solar rays from an arid and sandy surface.

The general rule derived from geographical position, as to the distribution of heat over the surface of the earth, is subject to many exceptions, arising from local circumstances. But none of these local circumstances probably affect it so much as the elevation of the surface. It is a well-known fact, that near the tropics and the equator there are mountains which, owing to their great elevation, are covered with snow all the year round. The heat experienced in a given place not only depends on the greater or less obliquity of the rays of the sun, but also on the greater or less column of the atmosphere. The column of air is greatest on the surface of the sea and in such countries as are nearly on a level with it. The higher we rise above this level the more the air is rarefied, and the degree of heat due to the solar rays decreases. Thus we at last arrive at an elevation where the heat, even under the equator, is insufficient to melt the snow. As the density of the air and the intensity of the heat continually decrease as we rise higher, some attempts have been made to determine the law of the decreasing temperature. Alexander von Humboldt, who has made a great number of observations on the steep declivities of the Andes near the equator, came to the conclusion that the thermometer of Fahrenheit descends one degree when we rise 343 feet above the level of the sea, and one degree for every 343 feet more. Thus the thermometer may be used to determine in a rough way the heights of mountains or of elevated plains. The calculations of Humboldt however are only founded on observations made in the intertropical countries, and it is supposed that the same law will not be applicable in all its extent to places situated without the tropics.

As already observed, at a certain height above the surface of the sea, the heat caused by the solar rays is too feeble to melt the snow and ice: this limit has been called the snow-line, or line of perpetual snow, or line of perpetual congelation. This snow-line does not occur in all places at the same elevation, but is dependent on the mean temperature in summer, and consequently on the latitude of a place. In warm countries it is consequently found at a much higher elevation than in cold countries. It has been ascertained by numerous observations, that in the Andes of South America, near the equator, the summit of a mountain rising to less than 16,000 feet does not attain the snow-line; but in Norway, in 60° of lat., mountains with an elevation of 5000 feet are always covered with snow, and in the southern hemisphere the line of perpetual snow in the Straits of Magalhaens (52° S. lat.) is, according to Captain King, about 3500 or 4000 feet above the sea. At about 80° of N. lat. the snow-line is considered to come down to the surface of the earth. Numerous observations made on the mountains of Europe, combined with those made by Humboldt in South America, suggested the idea that the snow-line forms a regular curve (north and south) on the surface of the earth in the following way·



But more recent observation has shown, that we are still very imperfectly acquainted with the laws by which this important boundary-line in the atmosphere is determined. Mr. Pentland ascertained by a great number of observations, that in the Andes of South America, between 14° and 17° S. lat., the snow-line does not occur on mountains below the height of 17,000 feet. Poeppig, in traversing the Andes, near 11° S. lat., found that here also they were free from snow at an elevation several hundred feet higher than the snow-line under the equator. As the Bolivian and Peruvian Andes, on which these observations were made, exactly resemble those of Ecuador in their local circumstances, it may perhaps be a reasonable conjecture that the mean temperature in summer near the tropics is greater than under the equator; which is by no means improbable from other considerations, as we have shown above. The snow-line would then be represented, not by a curve of continuous curvature, but by one of this form.



These observations on the elevation of the snow-line above the level of the sea, are however only applicable to mountains which rise with a steep ascent, and are not contiguous to table-lands. High table-lands have a higher temperature than isolated mountains of the same height. Humboldt observed that the elevated plains on which the towns of Bogotà, Popayan, Quito, and Mexico are built, have a much warmer climate than they would have if elevation above the sea were the only element that determined the temperature when the latitude is given. In comparing the mean temperature of these plains with that of the adjacent coast, he found that the thermometer, instead of descending one degree for every 343 feet, had only sunk so much for every 400 feet of perpendicular elevation. He thinks that this difference may be accounted for by supposing that the temperature of the atmosphere, under these circumstances, is considerably raised by the reflection of the solar rays from a plain of considerable extent. This supposition is confirmed by the circumstance of the different heights at which the snow-line occurs on the southern and northern declivities of the Himalaya mountains. On the southern declivity of that range, which rises rapidly from the low plains of the Ganges, Mr. Webb found the snow-line at an elevation of about 13,000 feet, corresponding pretty well with its latitude (about 30°); but on the northern declivity, which is about a degree farther north the snow-line ascends to 16,000 feet; an elevation which corresponds to that found under the equator. On this side however, the range, though very steep, does not descend to a low country, but terminates in an immense plain, the surface of which is about 10,000 feet above the level of the sea. There seems hardly to be a doubt that the great difference between the elevation at which the snow-line occurs on the two declivities is principally to be explained by the difference in the height of the plains which are respectively contiguous to them.

Though this subject has lately attracted much attention, we are far from being able to explain all the deviations from the rule which have been observed. Thus the Pyrenees and Mount Caucasus are under the same parallel. The snow-line on Mont Perdu, in the Pyrenees, was found by Raymond at the elevation of 8700 feet; but on Mount Elburz, in the Caucasus, it only occurred at the height of 10,880 feet, according to Englehardt and Parrot. This fact is the more remarkable, as the countries contiguous to the Pyrenees have a much warmer climate than those which enclose the Caucasus. It is conjectured that this difference may probably be explained by the difference in the respective hygrometrical states of the atmosphere; on which however the necessary observations are wanting, especially for Mount Caucasus.

From these considerations it is evident that the temperature of a country, so far as it depends on latitude and on the elevation of its surface above the level of the sea, may be determined with a certain degree of exactness, or at least within certain limits. But temperature is still affected by several other circumstances and phenomena, whose influence cannot be subjected to calculation, and consequently cannot be brought under positive rules; at least not in the present state of our knowledge. Such circumstances and phenomena are, the nature of the soil, the prevailing winds, the quantity of moisture, the electrical state of the atmosphere, and the physical character of the adjacent countries and seas.

With regard to the soil, it is a well-known fact that the temperature of countries whose surface is covered with sand is higher than that of those in which it consists of clay or other compact soils. It is likewise observed, that where the soil has been to a great extent cleared and brought into cultivation, the air is much drier and warmer in summer than in those tracts which for want of cultivation remain covered with swamps and marshy grounds. This, according to Darby, is the case in the cultivated parts of the United States, in which he asserts, contrary to the vulgar notion, that in the cleared and cultivated tracts the summer temperature has been raised, and that of winter diminished. The latter circumstance would seem a natural consequence of clearing the surface and exposing it during the winter months to the full influence of the north-west winds. In fact, as the country becomes more open, the range of the thermometer increases. As far as we know, no attempts have been made to ascertain to what amount such differences in the soil affect the temperature of a country, though our knowledge seems to be quite sufficient to assign the reasons for the existence of such a difference.

The effect of the winds on the temperature of a place is still more obvious. It is a common observation that the thermometer is more or less raised or depressed by every change of the wind. But there is a great difference in this respect between the lower and higher latitudes. In the former a change of wind rarely raises or depresses the thermometer more than a few degrees, while in the higher latitudes it frequently happens that in a few hours a change of ten or twelve degrees, and even more, takes place. Captain Scoresby mentions an instance of this near the polar ice. On a sudden veering of the wind to the north, the thermometer fell, in sixteen hours, 34°, from + 32° to −2°. But changes as great as this, so far as such changes are measured merely by number of degrees, occur in the United States of North America, at some distance from the Atlantic. Again, even in the lower latitudes, the change of the wind has a greater effect on the temperature on high table-lands than on low plains. Mr. Dunn states that on the table-land of Guatemala it sometimes, though very rarely, happens, that during the period of the northern winds a cold current produces a difference of 20 degrees in a few hours. A similar phenomenon has never been observed on the low coasts between the tropics.

It is a very common observation, that both cold and heat are more intense when the sky is clear than when it is overcast with clouds. Hence it may be inferred that countries whose atmosphere is more loaded with clouds and vapours than that of others in the same parallel, must have warmer winters and colder summers. This difference is observed all over the world, and from it arises the difference of climate in maritime and continental countries. It is even observed in countries which are at no great distance from one another, as in England and Holland. In England the mean temperature of the summer and winter is said not to differ more than 22° of Fahrenheit, while on the opposite shores of Holland it amounts to 27°, the winters there being a little colder and the summers somewhat warmer than with us. On this however we must observe that even supposing the mean temperature of a large tract of country to be ascertained, which, as is well known, never has been done, there is no very great propriety in comparing the mean temperature of a country of the form and position of England with one of the form and position of Holland. If two points under the same latitude, and both near the sea, were taken on the opposite coasts of England and Holland, the difference, whatever it might be, would obviously be owing to the difference in the tracts of country contiguous to the respective places, to the winds, and to the hygrometrical state of the atmosphere. Before any safe conclusion could be drawn, all these conditions should be known. There appears no doubt however that the difference in the mean temperature of the two seasons increases as we proceed farther east in the European continent; and it is equally certain that it depends mainly on the hygrometrical state of the atmosphere, which again in a great degree depends on the winds.

Since the time of Franklin, the attention of observers has been drawn to the effects which the temperature of one country has on that of contiguous countries. In calm weather that effect is probably so small as not to be perceptible. But whenever a wind is stirring, it brings the colder or warmer air from one country to the other, and thus lowers or raises the temperature of that country to which it blows. This effect is very perceptible on the eastern shores of England, with respect to the easterly winds. In the latter part of the spring or early in summer, these winds, before they reach England, pass over the still chilled and damp surface of the great plain of Northern Germany, and blight the already advanced vegetation of our eastern counties. On the contrary, in autumn the same winds pass over a sandy soil, which during the summer has acquired a considerable degree of heat, and the air brought over by them is warm enough to raise the thermometer several degrees. A still more remarkable instance is mentioned by Poeppig, in his 'Travels through Chile, Peru, &c.' In the southern districts of Chile, the eastern winds, called there los Puelches, when they blow in spring (September) are so cold that they depress the thermometer in a short time 15 or 18 degrees; but towards the end of the summer (February) they raise it nearly as much. He attributes naturally enough the first effect to the chain of the Andes being covered with deep snow during the spring, and the second to the high temperature to which the air upon the sandy plains of the Pampas of Buenos Ayres is raised during the summer months.

Considering the great effect which the temperature of countries contiguous to one another exercises on their respective climates, we may presume that a similar effect is produced by seas similarly situated. This has been long ago shown by the observations made on the regular change of the land and sea breezes in warm countries, and by the explanation of this phenomenon, which is obvious and simple. But it has only been recently ascertained that the proportion between the temperature of the sea-water and the atmosphere above it is not every where the same, but that in some parts the sea-water is warmer than in others under the same latitude. Now the temperature of the water must in some degree affect the temperature of the atmosphere, and this atmosphere, when brought into contact with the air of the land by the winds, must produce a change in its temperature. This consideration may sufficiently explain why the countries round the Mediterranean enjoy a much milder climate than all others placed under the same parallel. It is now ascertained that the temperature of the water of the Mediterranean Sea is from 4° to 5° higher than that of the Atlantic in the same parallel. This may perhaps lead us to the explanation of the greatest anomaly of climate which exists on the globe—we allude to the great difference of temperature existing between the western countries of Europe and all the other countries of the globe lying in the same parallel.

Those who had the first opportunity of observing the difference in temperature between western Europe and the eastern coasts of North America were natives of western Europe, and of course they considered the climate of their own countries as constituting the rule, and that of North America as the exception. They accordingly attempted to explain this phenomenon by reference to some peculiarities which characterize North America as a continent, such as the increase of its breadth towards the poles, the stretching out of the continent so far to the north, its large rivers and lakes, &c. But when the temperature of Asia and the eastern countries of Europe was ascertained by observation, it appeared that their temperature differed as much, and in many places still more, from that of the western countries of Europe than North America does. The climate of America may therefore be considered as the rule, and that of Europe the exception. Still the question remains, to what peculiar circumstance it is owing that the temperature of Western Europe differs from that of America and the countries lying farther east in the same latitude by 8° or 10°.

We venture to offer an opinion that the Gulf Stream is the most active, if not the only, cause in producing this difference. This remarkable current stretches across the Atlantic between Cape Hatteras, in North America (35° N. lat.), and the Azores, forming nearly in the middle of the Northern Atlantic a lake of warm water, which, according to the calculations of Major Rennell, is not inferior to the Mediterranean in extent. The temperature of its water is from 3° to 10° higher than that of the surrounding sea. The temperature of the superincumbent air is likewise several degrees higher than it is farther to the west and south; but less so when compared with those portions of the Atlantic which lie farther to the east and north-east. We think that this last difference is due to the strong gales which are almost continually experienced in navigating the Gulf Stream, but more especially on its borders; they blow most frequently from the south-west and west. Winds blowing from these quarters are by far the most prevalent in the Northern Atlantic, and it is observed that even on the coast of Western Europe they still preserve the character impressed upon them by the gales of the Gulf Stream. They do not blow equably like the other winds, but in abrupt gusts, with short intervals of calm. These winds appear to waft the warmer air of the Gulf Stream over the whole of the coasts of Western Europe from Cape Finisterre as far as North Cape; they even penetrate through the wide gate between the Harz mountains and the Scandinavian ranges into the recess of the Baltic, and their effects extend to the very plains of Russia, where they are met by the prevailing north-eastern winds and stopped. All the countries within the range of these winds enjoy a much more favourable climate than those to which they do not extend.

It may here be objected, that as the Gulf Stream approaches much nearer the coast of North America than that of Europe, and as the temperature of its water is also highest there, such an effect as is here described should rather apply to the New than to the Old Continent. But, in the first place, the gulf stream along the coast of America is of comparatively inconsiderable width, being opposite Charleston only from 60 to 63 miles across; and, secondly, its waters in their whole course along that coast lose very little of their temperature. At Cape Hatteras, after a course of 900 miles, the stream has only lost 3° Fahr. of warmth. From this point it turns to the east, and the decrease of temperature begins to be somewhat greater. Yet even opposite the great bank of Newfoundland, after a course of 1300 miles through 15° of latitude, its waters have lost only 5° Fahr. of warmth, and the temperature in this part is from 8° to 10° above that of the adjacent seas. The decrease of temperature begins to be most considerable about the middle of the Atlantic. Now, when we consider that on the eastern coasts of North America likewise the western and south-western winds prevail, it follows that by far the greatest portion of the warm air derived from the evaporation of the Gulf Stream must come to those countries which lie to the leeward of these winds. The parts of North America, however, to the east of the Appallachian range, seem also to feel in some degree the heated air of the Gulf Stream; since it has been proved by Darby that they have a temperature by several degrees higher than the parts in the same latitude to the west of that range.

Another anomaly in temperature occurs in the countries which form the most southern part of the American continent. Humboldt has compared a considerable number of observations, from which it appears that south of 48° the mean temperature of South America is from 12° to 18° lower than that of those parts which lie in the same latitude. North of 48° S. lat. this difference is still considerable, but it gradually diminishes as we approach the tropics. At about 30° it seems to disappear entirely. It is not easy to account for this difference. It was formerly supposed that the ice enclosing the South Pole extended to a much greater distance from it than that which surrounds the North Pole. But Captain Weddel found very little ice in 74° 15′ S. lat.; and our whalers always find it in great masses within the same distance from the North Pole. Besides this, in the northern hemisphere, considerable icebergs advance as far as 40° 45′ N. lat., whilst in the southern hemisphere Captain Weddel says that there is no fear of falling in with ice north of 55° 20′. Many persons suppose that the peculiar form of South America, which narrows towards the south, and stretches out in the form of an acute angle, may be sufficient to explain this phenomenon; but though we admit that this diminution of the surface of the land may have some effect, it can only be a slight one, and, in our opinion, is not by any means sufficient to account for so great a difference in temperature.

There are other circumstances, besides those enumerated, which affect the general temperature, but their influence is confined to small tracts. Thus the temperature of some places is considerably raised or lowered from their being situated on the southern or northern declivity of a high range, or in a narrow valley, or from their being entirely or in a great part surrounded by water. Even the existence of large forests has some influence on the temperature of contiguous places. But as the influence of such circumstances is local, it may be sufficient here to indicate it.

The circumstances which tend to increase or to depress the general temperature of a country being so numerous, and their effect (in producing which several of them often co-operate) being in some instances very great, it often happens that the actual temperature of a country differs considerably from that which might be inferred from the latitude in which it lies. To show therefore what countries, situated under different parallels, have an equal or nearly equal temperature, the isothermal lines, or lines of equal temperature, have lately been introduced.

The second chief constituent of climate, the moisture of the air, appears under the form of rain, vapour, fog, and dew. The laws according to which moisture is distributed in the atmosphere of the globe are nearly unknown, few attempts having been made to ascertain them, with the exception of the rain, which is of a more distinct nature than the other phenomena. We shall limit our observations to rain.

There are extensive tracts of this globe on which a drop of rain is never known to fall, or only at intervals of many years, and then only in small quantities. These countries are always found near the tropics, sometimes extending on both sides of these circles, but often only on the side towards the poles, which circumstance is probably to be ascribed to peculiar localities. These countries may be said to run like two belts round the globe, dividing the countries on each side of the equinoctial line from the temperate zones, as Posidonius very correctly stated. It is only where mountain-ranges exist, that these belts of rainless regions are interrupted. Beginning with the Old Continent, we find in Africa the Sahara or Great Desert, on the southern borders of which the rains cease at about 16° N. lat. and on the north begin at about 28°. Proceeding farther east, the southern rains cease in the countries on the banks of the Nile between 18° and 19°, and the northern begin between 27° and 28°. Passing the Gulf of Arabia we find the Tehama, or low coast of Arabia, which is destitute of rains; but we do not yet know how far to the south or north the rainless region extends. The high table-land which backs this coast on the east is said to have annually some rain, but we have no account of this region on which we can rely; it may be that it owes this advantage to local peculiarities, especially to its elevation. Farther east the rainless region extends through Meckran, a province of Beloochistan, the desert of that country, and over the delta of the Indus. Here it appears not to comprehend more than 4° of latitude. From this point it turns to the north-east and extends to 30° N. lat., comprehending the Indian desert to the very base of the Himalaya mountains. Behind this range extends the high table-land of Tibet, which also has no rain. But at the eastern extremity of the Old Continent, in China, there is no rainless region, which may perhaps be owing to the circumstance that all the parts of China between 22° and 30° N. lat. are traversed by the high mountain chains of the Nan-ling and Yoo-ling, and consist of a continual succession of ridges and valleys.

The countries of the Old Continent contiguous to the southern tropic are not well known, but that part of Southern Africa, on the shores of the Atlantic, which extends to the north of the Gareep, or Orange River (between 24° and 28° S. lat.), is said to be a sandy desert, with little or no rain. Towards the Indian Ocean, Africa is traversed by several mountain-ranges, and consequently has there a somewhat moister climate. Australia also appears to be subject to the same disadvantages. The long droughts, sometimes continuing several years together, which occur in our colony in New South Wales, indicate that a great portion of Australia must be reckoned among the countries which are entirely or nearly destitute of rain.

In America the rainless region near the tropics is less distinctly marked, probably on account of the comparatively narrow width of that continent near the tropics, and other local peculiarities; yet such a region exists in both hemispheres. In the northern it seems to occupy the coast of the Gulf of Mexico, between 24° and 26°, and to extend westward, comprehending the arid plains of Monterey and Chihuàhua, till it reaches the northern portion of the Sierra Madre Mountains, whose northern extremity it surrounds. It then stretches along both banks of the Rio Gila to the Gulf of California, where it however does not terminate, as the peninsula of California has no rain north of 23°. The countries of South America, near the tropic of Capricorn, rise suddenly from the Atlantic Ocean to a considerable height, and take the form of high table-land, traversed by mountain ridges. These parts of course are not without rain: but nearly midway between both oceans the country sinks considerably lower, and the Grand Chaco or Great Desert occurs, in which rain seems to be very rare. This extensive plain is divided from the Atlantic by a mountainous country, and from the Pacific by the high range of the Andes. In both these mountainous regions rains are frequent; but on the coast of the Pacific, though it presents a very uneven surface, not a drop of rain is known to fall all the year round between 23° and 27° S. lat. This barren tract consists of the Chilese department of Copiapò and the Bolivian province of Atacama.

These two belts of rainless regions, which on the land are frequently narrowed or interrupted by local circumstances, have a more distinct character on the ocean. Rain seldom falls within the range of the trade winds, except on their very borders, both towards the region of the calms and towards that of the variable winds.

Between the two belts formed by the rainless regions are situated those countries which are subject to the equatorial rains. The ocean also has these rains in a small degree in those parts which constitute the region of calms. Here the phenomena of the atmosphere succeed one another with great regularity. The sun rises in a cloudless sky: towards noon some faint clouds appear near the horizon, which rapidly increase in extent and density, and are soon followed by thunder and violent gusts of wind, accompanied by heavy rains of short duration: towards evening the clouds disappear, and the sun sets in a serene sky of a deep blue hue. It does not appear that this state of the weather is at all affected by the seasons.

Those parts of both continents which lie on each side of the equator between the rainless regions, have the greatest quantity of rain, and this occurs at certain periods of the year, whence these rains are called periodical rains. The season of the rains depends on the position of the sun. It begins some time before the sun reaches the zenith of a place, and continues for some time after it has passed it; hence the rainy season varies with the difference of latitude. Though the observations which are requisite to determine this point are far from being sufficiently numerous, it would appear that those countries which are near the equator are never for many days altogether without rain, and that there the rainy season, which occurs when the sun passes over the zenith, is only distinguished from the other parts of the year by a greater continuance and a greater abundance of the rains. In the countries more than 5° of lat. distant from the equator, the dry and wet seasons are distinctly marked. The rains begin either immediately or not many days after the sun in its progress towards such a place has passed the equator. They are heaviest when the sun approaches the zenith of the place, after which they continue with less abundance for an equal or even longer time. In general the rains are more abundant in the first than in the second half of the season.

Countries that lie between 5° and 10° of lat. have commonly two rainy and two dry seasons. The greater rainy season occurs when the sun in its progress to the nearest tropic passes over the zenith, and lasts from three to four months. The less rainy reason occurs when the sun on its return from the nearest tropic approaches the parallel of the place. The rains then last only from six weeks to two months, and are much less abundant and continual. Countries more than 10° or 12° from the equator have only one rainy and one dry season: the first begins when the sun approaches the nearest tropic, and ends some time after, when in its course from the tropic, it has passed the parallel of the place. It lasts from four to six months. Such is the course of the rainy and dry seasons in these countries when their regularity is not disturbed by local circumstances, which sometimes effect considerable changes. The most remarkable deviation from this order occurs in India, where the period of the rainy and dry season is not regulated by the position of the sun, but by the change of the monsoons.

The periodical rains differ from the variable rains, which occur in the countries that lie without the tropics, not only in the greater regularity of the time at which they fall, but also in their abundance. The quantity of water which pours down between the tropics in one hour is often greater than that which falls in these latitudes in three or four hours. There is however an erroneous opinion prevalent respecting these rains: it is generally supposed that they continue for many days without interruption, but this is not the case: a day in which the rains fall without interruption from morning to evening is of much rarer occurrence between the tropics than with us; the sun usually rises in a cloudless sky: two hours before noon the clouds begin to appear, and at noon the rains set in. They then frequently pour down in torrents for four or five hours; but towards sunset they cease, the clouds suddenly disappear, and not a drop descends during the whole night. As the abundant rains, especially when the rainy season sets in, frequently cover the level and low country a foot deeper with water, the atmosphere of such tracts is continually loaded with vapours and exhalations during that period, which render the stars invisible at night, and are doubtless the principal cause of the unhealthiness of those countries.

The parts which lie between the rainless regions and the pole are subject to the variable rains. There is not a single day in the year in which it has not rained, or may not rain, and the rains are perhaps as common in the night as in the day. There are certainly differences, both in the quantity and in the time of the rains in these countries; but this difference can only be ascertained by comparing long sets of exact observations; and such exact observations are still wanting, except for the western parts of Europe. Comparing these observations, one would suppose that the countries south of 45° N. lat., with few exceptions, have also a kind of rainy and dry season, the former occurring in autumn and winter, and the latter in spring and summer. In summer frequently two or three months pass without a single drop of rain falling. In the countries north of 45° such a difference is not observed: there the greatest quantity of rain seems to fall in the summer, except in England, where the summer is the driest part of the year. The quantity of rain however decreases as we advance from the shores of the Atlantic to the inland parts of the European continent. The rains become again more abundant when we reach the plains of Eastern Europe, near Petersburg and Moscow, which may perhaps be owing to the circumstance, that here the winds proceeding from the Gulf Stream meet those which blow from the Ural Mountains and the great sandy deserts. These rules, derived from observations made in Europe, will probably not hold good for other parts of the globe, because the temperature of Europe forms, as we have observed, a great anomaly. Accordingly we find that the few meteorological observations which have been made in the United States are far from confirming these rules.

In estimating the climate of any given country, there are other phenomena which require notice; but their effect on climate has not been ascertained with any great precision, and there is reason to think that it cannot be very great, though electrical phenomena are thought by some to have considerable influence. They certainly change the condition of the atmosphere for a short time, which is most obvious in those violent thunder-storms within the tropics known by the name of typhons.

CLIMAX, (κλῖμαξ, a step or ladder) commonly called a figure of rhetoric, but properly only an artifice of style; for a figure or trope is a use of words in some other than their natural or literal sense. In accordance with the primary meaning of the Greek word, a climax in composition is a mode of expression by which the writer mounts, as it were, from one clause to another, as if he were climbing a series of steps. In other words, each clause expresses a higher degree of that which is stated in the preceding clause. The three words which Suetonius records to have been uttered on occasion of one of his victories by Julius Cæsar—'Veni, vidi, vici,' form a climax. The following sentence addressed by Cicero to Catiline is another: 'Nihil agis, nihil moliris, nihil cogitas, quod ego non audiam, non videam, planeque sentiam' (You do nothing, you attempt nothing, you conceive nothing, which I do not hear, which I do not see, nay, which I do not even feel). 'A gradual progress from small to great,' observes Lord Kames (*Elements of Criticism*, chap. iv.), 'is not less remarkable in figurative than in real grandeur or elevation. Every one must have observed the delightful effect of a number of thoughts or sentiments, artfully disposed like an ascending series, and making impressions deeper and deeper; such disposition of members in a period, is termed a *climax*.' In another passage he makes an attempt to explain the effect asserted to be thus produced. 'If a number of objects of the same kind,' he says, (chap. xviii. §. 2,) 'differing only in size, are to be ranged along a straight line, the most agreeable order to the eye is that of an increasing series; in surveying a number of such objects, beginning at the least, and proceeding to greater and greater, the mind swells gradually with the successive objects, and in its progress has a very sensible pleasure. Precisely for the same reason, words expressive of such objects ought to be placed in the same order.' The effect of a climax would seem to be more simply accounted for by the consideration of the state into which the mind of a reader or hearer is necessarily thrown by any emphatic assertion in a vehement or impassioned discourse; he naturally expects that the next assertion, if another is to follow, will involve something still stronger or more exciting—that it will constitute some addition to what has been already said—else why should it be uttered at all? He is gratified, of course, when this expectation is fulfilled, and would be the reverse if it were not. The latter effect is produced by what is called an anti-climax, the slight shock of the disappointment occasioned by which is sometimes, in suitable circumstances, made available to produce the emotion of the ludicrous. Lord Kames (chap. xviii. § 1) reckons what he calls a *climax in sound* and defines to be the 'order of words or members gradually increasing in length,' as one of the beauties of language. One example of this which he gives is the following from Cicero: 'Quicum quæstor fueram; quicum me sors consuetudoque majorum; quicum me deorum hominumque judicium conjunxerat.' When the climax in sense and the climax in sound coincide in the same passage, he afterwards observes (chap. xviii. § 3), 'the concordance of sound and sense is delightful; the reader is conscious not only of pleasure from the two climaxes separately, but of an additional pleasure from their concordance, and from finding the sense so justly imitated by the sound.' We may remark that, although an anti-climax, except to produce a ludicrous effect, must always be regarded as a stumble in composition, and is therefore to be avoided, a climax is the favourite ornament of rather an artificial and mouthing style of rhetoric. A natural writer will commonly come out with the strongest thing he has to say at once, instead of cautiously advancing to it by this sort of measured dance. (For an example of climax from Demosthenes, see Demetrius Phal. Περὶ 'Ερμηνείας.)

CLINTON, DE WITT, has a claim to biographical notice chiefly as the persevering promoter of the project for the formation of the great canal from lake Erie to the Atlantic. He was born in 1769, at Little Britain, in the state of New York. His mother was one of the distinguished Dutch family of De Witt; and his father, who was of English extraction, served with great distinction as major-general in the army of the United States during the revolutionary war. De Witt received his education at Colombia College, New York, and was admitted to the bar. In 1797 he was elected, by the democratic party, to the state legislature of New York; having previously officiated for several years as secretary to his uncle George Clinton, as well as to the regents of the university, and board of fortifications, of New York. In 1801 he was elected a member of the senate of the United States. He afterwards filled the office of mayor of New York until 1815, when his retirement was occasioned by the violence of political parties. During the period between 1817 and 1826, he was several times elected governor of the state of New York by the zealous exertions of the democratic party. He was a member of most of the literary and scientific societies of the United States, and of several similar institutions in Europe. His productions consist of his speeches made on various occasions in the performance of his official duties; papers read before literary and benevolent societies; correspondence concerning the canal; judicial opinions, and various fugitive compositions. His services to his native state were important, and his character, as a lover of science and polite literature, was adorned by a generous benevolence. He died suddenly in 1828, and was interred with great public demonstrations of respect.

CLI'NUS, a genus of fishes of the section Acanthopterygii and family Gobiadæ. It forms one of the subdivisions of the Blennies, the species of which may be distinguished by their having several ranges of short pointed teeth, the teeth of the external range being the largest. The dorsal fin is either continuous and even, or, in some, with the anterior rays separated from the posterior by an emargination. Like the true Blennies, these fishes have small fimbriated appendages over the eyes. [BLENNIUS.]

CLIO (Zoology), CLIO TRIBE, CLIO'NIDÆ, a family of naked marine mollusks, placed by Cuvier as the first of his class *Pteropoda*. Lamarck also arranges them under the Pteropods, which he makes an order, but gives them a situation immediately after the *Hyalæidæ*. De Blainville unites the *Pteropoda* and *Gasteropoda* of Cuvier in one class *Paracephalophora*, under which the *Pteropoda* form an order with the name of *Aporobranchiata*, which is divided into two families; the first, *Thecosomata*, being provided with a shell, and the second, *Gymnosomata*, comprising those Pteropods which have none. Rang follows this last arrangement, still retaining Cuvier's term Pteropoda, but not rejecting De Blainville's, and making the *Clios* of Férussac synonymous with the *Gymnosomata* of De Blainville, and the second family of the class *Pteropoda*. The following is De Blainville's definition of his *Gymnosomata*:—

Body of an elongated form, subconical, completely naked; two bundles of tentacular suckers at the mouth; no tooth in the upper lip; a small lingual plate bristled with spines.

Rang thus defines the family:—Animal with the head distinct; no intermediate lobe, but one or more fleshy appendages in place of it; a muscular envelope or mantle.

Genera, Clio. (Clione, Pallas.)

De Blainville, who says that he characterized the genus from his own observations, gives the following definition:

Body free, naked, more or less elongated, a little depressed, attenuated abaft (aminci en arrière), without any other fins than the lateral appendages. *Head* very distinct, provided with six long retractile tentacula, divided into two groups of three each, and capable of being entirely concealed in a species of prepuce bearing a small tentaculum on its external side. *Mouth* entirely terminal and vertical. *Eyes* sessile, nearly supernal. A sort of sucker or rudiment of a foot under the neck, between the roots of the fins. *Vent* and termination of the *generative apparatus* in a single tubercle, situated at the right side of the neck, at the junction of the fin with the trunk. *Organs of Respiration?*

Rang thus describes the genus:—Animal elongated, enveloped *in a membranous and very contractile mantle*, with a head furnished with many long conical tentacula, which are retractile, and separated into two groups, and can be withdrawn at pleasure into small cavities destined for them. *Branchiæ* in form of a vascular net-work carpeting (tapissant) the fins. *Mouth* terminal. *Eyes* sessile? Three membranous appendages to the ventral part, and corresponding to the base of the fins. *Vent* and *organs of generation* situated in a tubercle on the right side.

Cuvier, who paid some attention to the Clios, thus defines the genus in the last edition of the 'Règne Animal:'—The Clios have an oblong membranous body *without a mantle*, the head formed of two rounded lobes, whence spring small tentacula. They have two small fleshy lips and a tongue (languette) at the front of the mouth, and the fins are provided with a vascular net, which performs the office of *branchiæ*. The *vent* and *generative orifice* are under the right gill. Some say that they have eyes. The mass of the viscera does not nearly fill the external envelope. The stomach is large, the intestine short, and the liver voluminous.

The principal discrepancies in the above definitions are the following:—1st. As to the mantle. De Blainville does not notice it; Rang expressly mentions a membranous and very contractile one; and Cuvier directly denies its presence. There is not much real contradiction on this point. It may not be strictly correct to call the contractile sac which envelopes the Clio a mantle, any more than it would be to give that name to the test which is the investing integument of the *Ascididæ;* but all three authors must be taken to mean that the internal parts of Clio are surrounded and protected by a highly contractile integumentary envelope. 2nd. As to the organs of respiration. These appear to have entirely escaped the observation of De Blainville, while Cuvier and Rang point out their position and describe their structure. 3rd. As to the eyes. De Blainville expressly describes these organs and their position. Rang says eyes sessile? with a query, and Cuvier merely observes that some attribute to them eyes. That the Clios may be sensible of light is highly probable; but any thing like a well developed eye properly so called is not very apparent, in *Clio Borealis* at least.

a. Species whose tentacula are well known.

Of these, *Clio Borealis* and *Clio Australis* will serve as examples. The former, which appears to be the same with *Clio limacina* of Phipps, *Clio retusa* of Fabricius, and *Clione papilionacea* of Pallas, is well known to the whale-fishers and others under the name of '*whale's food.*' The species swarms in the northern seas, and indeed so plentiful are they that they form a principal part of the food of the whale-bone whales. Captain (now Sir W. E.) Parry found it in great abundance in all parts of Baffin's Bay and Davis's Strait, in the neighbourhood of ice. (*Supplement to Captain Parry's first Voyage.*) Captain James Ross observes that it is very numerous in most parts of the Arctic Ocean, but less abundant in Regent's Inlet and the Gulf of Boothia. When the weather is calm, they come in myriads to the surface for the purpose of respiration; but scarcely have they reached it, when they again precipitate themselves towards the bottom. Cuvier, who gives this account of their habits, adds, that the sea is so glutted with them in certain seasons, that the whales, so to speak, cannot open their mouths without ingulphing thousands of these small mollusks.

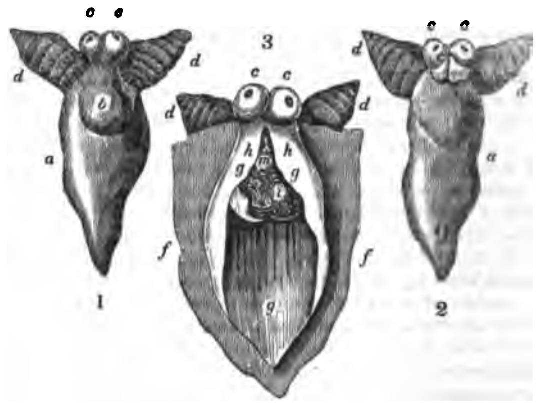
Integument, a delicate, demi-transparent, soft skin which covers a second tunic. This last is thicker, and presents longitudinal and very sensible muscular fibres, which come from two principal bundles attached to the sides of the neck. The effect of these fibres must be to shorten the general envelope of the body, and to approximate its form to a spherical shape. Cuvier, who gives the above description, adds, that he knows not with what the interval between this fleshy tunic and the mass of the viscera is filled in the living state; but observes that it is certain that these do not occupy the half of the area which the tunic incloses; and conjectures that there may be a liquor diffused there, or perhaps only a quantity of air which the animal can compress at pleasure when it would sink in the water, and dilate when it would rise.

Digestive Organs.—The mouth is between the bases of the two tubercles of the head. Below it are two triangular tentacula, which form, as it were, two small wings between the two large ones. The opening of the mouth is triangular; and within are seen some longitudinal wrinkles, which Pallas and Fabricius appear to have taken for teeth, but which have no hardness, and are entirely fleshy. The viscera are connected by vessels and cellulosities which unite them in a small packet situated near the neck. The liver covers the greatest part of them, with the exception of an angle which is occupied by the testicle and ovary. The *œsophagus,* of a fair length, descends from the mouth through the neck, and is dilated into a stomach towards the bottom of the mass. Thence the intestinal canal, after having made one fold, proceeds directly to the vent, situated under the gill of the left side. The *liver* is composed of many lobes and lobules, and envelopes the stomach and a great part of the intestinal canal. Two long and straight salivary glands float at the sides of the œsophagus: their excretory ducts are inserted in the mouth. (Cuvier.)

Brain, Nervous System, and Senses.—The brain consists of two lobes placed at the origin of the œsophagus. From each of these springs a small filament, which swells into a large ganglion that unites itself to its correspondent under the œsophagus. These two ganglions give out each their filaments to the neighbouring parts. Two of these filaments, one on each side, swell again into ganglions, which, uniting together by a new filament that traverses upon the œsophagus, form there a second collar joined to the first beneath: they give out a filament, which is twice swollen or knotted, and it is from these small knots of medullary matter that the different nerves arise. No eye could be perceived, nor any particular organ of the external senses, except the common and general organ of touch. (Cuvier.)

Respiratory and Circulating System.—Each gill gives off a vein, which, uniting to its correspondent in the shape of a Y, forms the trunk which reaches the heart. This last, situated in its pericardium on the left side of the mass of viscera, gives out, doubtless, arteries for the whole body, but they could not be followed out. (Cuvier.)

Organs of Reproduction—Very much resembling the Gastropods, and uniting, like them, the two sexes. The ovary gives off a delicate and short oviduct, which reaches the testicle. This last, which at its origin resembles a cæcum, lessens by degrees into a deferent canal, and terminates at a small round purse, which fills the left tubercle of the head, and has its exit near the neck. It is undetermined whether the straight and firm part which terminates the deferent canal is the penis, or whether that organ is hidden in the small purse above noticed. At the side of this purse is another oblong one, analogous to that which is termed the bladder (la vessie) in the ordinary gastropods. (Cuvier.)



[Clio Borealis.]

Fig. 1, Clio Borealis, view of the back; *a,* the body; *b,* the viscera, seen through the common integuments; *c,* the tubercles of the head, and the holes wherein the three tentacula on each side are withdrawn; *d. d,* gills and fins. Fig. 2, the same, view of the belly; *a, c, d,* indicate the same parts as in fig. 1; *e,* the two tentacula placed before the mouth. Fig. 3, *c, d,* indicate the same parts as in the two former figures; *f, f,* the external tunic or skin; *g, g,* the internal tunic or fleshy pannicle; *h, h,* the principal bundles of its fibres; *i,* the mass of viscera; *m,* the principal vein of the gills.

The finest specimen of *Clio Borealis* we ever saw is in the Museum of the Royal College of Surgeons (*Gallery Nat. Hist.,* 161 A.), presented by Captain (now Sir John) Ross.

The figures and description above given (Cuvier's) are taken from an individual which had its tentacula, &c., withdrawn.

β. Species without tentacula? and whose cephalic enlargement (renflement) is separated from the trunk by a sort of narrow and very distinct thorax. (Genus *Cliodites* of Quoy and Gaimard.)

Example, *Clio* (*Cliodites*) *Caduceus.* De Blainville observes that this species is too incompletely known to allow of a satisfactory conclusion as to what it is; and he even thinks that it may be identical with the *Clio Australis* of Bruguières.

Pneumodermon.

Animal oblong, subcylindrical, divided into two very distinct parts, the anterior conical, the posterior oval. The fins placed near the separation of these two parts, and presenting between them, and on the ventral side, a small membranous appendage. *Mouth* at the extremity of a sort of retractile proboscis, having, at its base, two bundles of tentacula, each terminated by a small disk or sucker. *Gills* situated at the posterior part of the body, and disposed somewhat in the form of two C's placed back to back, ƆC, and separated by two small bars. *Vent* on the right, and a little anterior to the gills. Orifice of the *organs of generation* in a common tubercle, situated at the root of the fin of the right side. Example, *Pneumodermon Peronii.* This is about an inch in length, and was discovered in the Atlantic ocean by Péron. The genus was established by

Cuvier. De Blainville founded his character upon many well-preserved individuals brought home by MM. Quoy and Gaimard from the expedition under Captain Freycinet, and gives Australasia as the locality of the species.

CLIO. [Muses.]

CLITE'LLIO. [Lumbricus.]

CLITHEROE, a market town, a parliamentary borough, and a parochial chapelry in that part of the parish of Whalley which is in the higher division of the hundred of Blackburn, and in the northern division of the county palatine of Lancaster, 216 miles N.N.W. of London, and 26 S.E. of Lancaster. Its population in 1831 was 5213, two-thirds of whom are employed in trade, and the rest in agriculture. Clitheroe is a borough by prescription; its earliest known charter is dated in the time of Henry de Lacy, who died in 1147; but it did not send members to parliament before the first year of Elizabeth. The late Boundary Act extended the parliamentary borough to the neighbouring chapelry of Downham, and the four townships of Whalley, Wiseyall, Pendleton *cum* Henshorn, and Little Milton *cum* Colcoats, and reduced the two members to one. The town is governed by two bailiffs, chosen annually by the burgesses and freemen. Three courts are held here, viz., the court-baron, the court-leet, and a court of inquiry, at which the bailiffs preside. They are held in the New Moot-hall, a modern building of the Gothic order, with a spire sixty-two feet high.

The name of this town, or, as it was antiently spelt, Cliderhaw, is descriptive of its situation, a hill by the waters. The family of De Lacy, who came over with the Conqueror, built the castle, consisting merely of a keep, with a tower and arched gateway, not for a residence, but as a fortress. It was also used for the purpose of receiving tribute from the feudatories within that manorial district, still called the Honor of Clitheroe. Within the walls by which the castle was inclosed, where a handsome house now stands for the bailiff, was a chapel dedicated to St. Michael, which disappeared when the fortress was dismantled in 1649. Prior to this, the Honor of Clitheroe had vested in the crown, and Henry VI., after he was deposed, concealed himself there after the battle of Hexham, but was discovered by the Talbots of Bashall and Colebry, who carried him to London with his legs bound to the stirrups of his horse. The Honor of Clitheroe was, for nearly three centuries, a part of the possessions of the duchy of Lancaster, till Charles II. granted it to General Monk, Duke of Albemarle, from whom it has descended to the present proprietor, the Duke of Buccleuch.

The church of Clitheroe is an ancient structure, with a fine Saxon arch between the nave and choir; it is dedicated to St. Michael, the patron of the castle church. The living is a perpetual curacy under Whalley, of which Earl Howe is patron. Among the monuments of this church is a brass plate to the memory of Dr. John Webster, the astrologer, who obtained celebrity by detecting the impositions of witchcraft in the seventeenth century. One of the incumbents was the Rev. James King, whose son circumnavigated the globe with Captain Cook. The Roman Catholics, the independent dissenters, and the methodists, have places of worship, with Sunday-schools attached, in which nearly 700 children are instructed. Contiguous to the churchyard is a grammar-school, founded and endowed by Philip and Mary in 1554, at the recommendation of Bishop Bridgman, who drew up the statutes. Its concerns are managed by six governors, who appoint the master and usher, subject to the approval of the Bishop of Chester. The income is 452*l*. 8*s*. 8*d*., arising from the rectorial tithes of the parish of Almondbury, and lands and messuages in Yorkshire. There are twenty scholars, who are educated in the classics, and writing and arithmetic, by whom an annual remuneration is made to the masters, under the name of a cockpenny; besides which fees, the salary of the head master is 200*l*., and of the under master 100*l*. The rooms of the grammar-school have been used since 1816 as a church Sunday-school, in which 350 children are instructed on the Madras system.

Clitheroe was until recently a place of little trade; but extensive print works and cotton manufactories have been established, which, along with the lime-kilns, find ample employment for the increasing population. The neighbourhood abounds with limestone, for which there is a great demand, as it can now be conveyed by water to any part of the kingdom. The houses of Clitheroe are built of stone, the streets are well paved, and the town is well supplied with water from springs. There has been a weekly market from the time of the Conquest. It is now held on Tuesday, though Saturday is the day for the chartered market. Every alternate week there is a cattle market. Fairs are held March 24 and July 21, for horned cattle and woollen cloth; and the fourth Saturday after Michaelmas-day for cattle, horses and woollens. (*Communication from Lancashire.*)

CLITHON. [Neritidæ.]

CLITUS, or **CLEITUS.** [Alexander III.]

CLIVE, ROBERT, LORD, was born on the 29th o September, 1725, at Styche, near Market Drayton, Shropshire. His family was respectable, but poor. He was sent to several schools, but distinguished himself in all of them rather by a love of mischief and a fearless disposition than by any aptitude or love for learning. He was sent to India, and arrived at Madras, in the civil service, as a writer, in 1744. Three years after he quitted the civil service of the Company for the military, which suited him much better. In 1748 he distinguished himself at the siege of Pondicherry, and shortly after at the taking of Devi-Cotta, in Tanjore, on which occasion his superior officer recommended him to the notice of the Company and British government. Coming into contact with the French (with whom, and not with the natives of India, the main struggle lay) he beat them under their veteran commanders. The taking of Arcot, and the decisive victory gained by the British there, were chiefly owing to this young and comparatively inexperienced officer. On his return to England in 1753 for the recovery of his health, he was highly complimented by the Directory of the East India Company. In 1755 he went again to India as governor of Fort St. David, and with the rank of lieutenant-colonel in the king's service. Soon after his arrival, in conjunction with the naval commanders, Watson and Pocock, he reduced the dangerous pirate Angria, taking Gheriah his capital, and all his treasures. In the meantime the nabob Sujah-u-Dowlah had attacked the British, destroyed their factories, and barbarously thrown part of his prisoners into the memorable 'Black Hole' of Calcutta. Colonel Clive was then, according to the admission of all parties, the main stay and only hope of the British in India. He sailed at once with Admiral Watson to Calcutta, took Fort St. William, in January, 1757, and following up his advantages, thoroughly defeated and disorganized the Sujah's army. Clive's victories led to a peace highly advantageous to the British power in India, which before this event was dwindling to nothing. A series of intrigues and recriminations followed: Clive accused Dowlah of being wholly devoted to the French interests,—as a cruel tyrant over his subjects,—a man without honour, in whom there could be no faith or confidence. On the other side it was urged that Clive, insatiable of power, influence, and wealth, had from the beginning determined to dethrone that Nabob—that with this view he had engaged in intrigues with Meer Jaffier, one of the Nabob's officers, and with Omichund, a Gentoo merchant, whom, it was said, he afterwards defrauded. In all these transactions the observation of the rigid rule of right is not to be expected on either side. Clive's business was to advance the British power in India, and the Nabob happened to be at once an impediment in his way, and a cruel tyrant, after the fashion of that country. The war that ensued was short and brilliant, for, with a 'handful of men,' Clive gained the great victory of Plassey, and, on the next day, entering Murshedabad in triumph, installed Meer Jaffier, who took the style of Jaffier-Ali-Cawn, in the place of Sujah-u-Dowlah. The deposed Nabob was soon taken, and privately put to death by Meer Jaffier's son. The new Nabob gave Clive a jaghire, or grant of land, which was said to produce 27,000*l*. per annum. Clive being made governor of Calcutta, held the chief command there, and through the rest of British Bengal, for about two years.

In 1759 he destroyed a formidable Dutch armament sent against Bengal. In 1760 he returned to England, where he received the unanimous thanks of the Company, and was created by government an Irish Peer, under the title of Lord Clive, Baron of Plassey. He was returned to parliament for Shrewsbury, and kept his seat in the House of Commons till his death. In politics he was rather liberal, being what was then called a 'moderate Whig,'—but he exercised a prodigious influence on parliamentary elections. Speaking of his title of Lord, he says, in a letter to his friend Major Carnac, 'If health had not deserted me on my arrival in England, in all probability I should have been an English Peer instead of an Irish one, with the promise of a red riband. I know I could have bought the title (which is usual), but that I was above, and the honours I have obtained are free and voluntary.'

After Clive's departure, the affairs of India fell into an apparently hopeless state of confusion, and he was once more sent out (in 1764) as the only man at all likely to retrieve them. Before this last employment he received the order of the Bath, and was promoted to the rank of major-general. In spite of dissensions and intrigues, and an almost general opposition on the part of the *employés* of the Company, both civil and military, he set things in order, and gave security to that broad basis on which the British power has been since raised in India. He, however, made many enemies, whose influence he felt a few years later.

He returned from India on the 14th of July, 1767, with a constitution thoroughly shattered. He was received with the greatest distinction. Five years later (in 1772) his proceedings in India were made the subject of severe animadversion in parliament, and out of doors; and in 1773 a select committee of the House of Commons was appointed to examine into them. The charges presented to the House were most serious, involving even a charge of forgery; but on the great debate, on the 22nd of May, the combat was narrowed into a motion made by Colonel Burgoyne, and seconded by Sir William Meredith—'That in the acquisition of his wealth Lord Clive had abused the powers with which he was intrusted.'

This motion was rejected, and, at five o'clock in the morning, a resolution was passed—'That Lord Clive had rendered great and praise-worthy services to his country.' He was thus acquitted, but the course of the trial was a process of torture to his proud spirit, nor was the form of the acquittal altogether satisfactory. He never held up his head again, and towards the end of the following year he committed suicide. Soon after his first arrival in India, in consequence of a painful disorder, he accustomed himself to take opium, the pernicious doses of which he gradually increased. After his last arrival in England, he suffered from a complication of disorders, and, to alleviate the anguish of the gall-stones, he swallowed opium in greater quantities than ever. His death took place on the 22nd of November, 1774, at his house in Berkeley Square, shortly after completing his forty-ninth year. (*Life of Robert Lord Clive, collected from the Family Papers, &c.*, by Major-General Sir John Malcolm, 3 vols. 8vo., 1836.)

CLIVI'NA, a genus of coleopterous insects of the family Scaritidæ, and section Geodephaga. The technical characters are:—body elongate, somewhat cylindrical; antennæ moniliform, the basal joints rather long (the first longest), the remaining joints short and rounded; palpi with the terminal joint long and pointed; mentum trilobate; thorax nearly square; anterior tibiæ broad and compressed, with two notches externally, leaving three long, pointed, tooth-like processes; the intermediate pair of legs with one of these external processes on the tibia.

Dejean incorporates with this genus that of Dyschirius, but we think without sufficient reason.

These insects are of small size, and live under stones in damp situations, particularly on the margins of rivers, lakes, &c.; their dentated anterior tibiæ enable them to burrow like the Lamellicorn beetles.

Of the genus Clivina but few species are known. In England there are two; the more common is *Clivina fossor* (or *C. arenaria* of some authors). This species is rather more than three-sixteenths of an inch in length, and of a black or brown colour; the legs, antennæ, and palpi, are reddish. *Clivina collaris*, the other British species, is rather less than the one just described. It is black, and has chesnut-red elytra, sometimes with a black dash on the suture.

The species of the genus Dyschirius is distinguished from those of Clivina principally by their having the thorax globular, the terminal joint of the palpi thicker in proportion, and somewhat securiform. The body is generally shorter in proportion, and more convex, or less cylindrical; they are almost always of a brassy metallic colour, whereas the species of Clivina are black or brown, and without any metallic hue.

Of the genus Dyschirius between twenty and thirty species are known. Their habits are much like those of the genus Clivina, but they are less frequently found under stones, and often make cylindrical burrows in the ground in banks at the margin of rivers or other pieces of water. Upwards of twelve species inhabit this country, the largest of which is scarcely more than one-eighth of an inch in length.

CLOA'CÆ, large arched drains, formed under the streets of some antient Roman cities. The most remarkable were the cloacæ of Rome, large portions of which still remain in excellent repair. These cloacæ are doubtless of high antiquity, and tradition assigns their origin to the time of the first Tarquin (Livy, i. 38). According to Livy (v. 55) the chief subterranean passages originally followed the lines of the streets and public places, but in the hurry of rebuilding the city after the Gallic invasion, the old lines of streets were neglected, and the houses were often built across the drains.

The cloacæ of Rome consisted of several branches, which ran in the low parts between the hills; these branches fell into one very large arched drain, constructed of solid blocks of stone, called the Cloaca Maxima, said to have been built by Tarquinius Superbus (Livy, i. 56), and repaired, in latter times, by Cato the Censor and his colleague in office. A portion of this cloaca is visible near the Arch of Janus. It was formerly continued towards the Tiber, passing by the Corinthian peripteral temple, called the Temple of Vesta, close to which it terminated in the Tiber, at a point believed to be the Pulchrum Littus, so called from the sides of the river having a walled embankment, with steps. The arched drain of the Cloaca Maxima is fifteen feet wide, and thirty high (these dimensions include the masonry); with three arches in contact one within another: in some parts there are raised paths along the sides of the cloaca; and in the walls are stone brackets to support the ends of the waste pipes of the fountains. Niebuhr says that the innermost vault forms a semicircle 18 palms* in width, and of the same height. This vault is inclosed within a second, and this again within a third. The stone employed, called peperino, is a greenish stone with black specks. The blocks are 7⅛ palms long and 4⅛ high. The same writer is of opinion that the Cloaca Maxima was only constructed to drain the Velabrum and the valley of the Circus Maximus. (*Hist. of Rome.*) In the year 1742 a part of the Cloaca Maxima was discovered in the Forum, at the depth of thirty feet from the surface, constructed in a similar manner to the part which is seen near the Temple of Janus. (Nardini, p. 210, lib. v., cap. vii., regio viii.) Niebuhr, on the authority of Ficaroni, says it was constructed of travertino stone, and he thinks it of greater antiquity than the peperino construction. The only cloacæ or drains for a city which can be compared with the cloacæ of Rome, are the sewers of London; and no city in the world is better provided with this valuable and healthy convenience.

The maintenance of the Roman cloacæ was originally the business of the censors, but afterwards belonged to the ædiles: Agrippa, during his ædileship, made numerous large cloacæ, of which Pliny (xxxvi. 15) has spoken in terms of unbounded admiration. The emperors created officers called curatores cloacarum. The city of Pompeii had cloacæ on a smaller scale.

The etymology of the word cloaca is doubtful. Festus derives it from the verb *colluo*, 'to wash together,' or 'bring together by washing.' (*Encyclopédie Méthodique*, 'Architecture;' *Plan of Rome*, by the Society for the Diffusion of Useful Knowledge; Nardini's *Rome.*)

CLOCK. [HOROLOGY.]

CLO'DIUS PU'BLIUS, a Roman patrician, the son of Appius, first became notorious by introducing himself, in the disguise of a woman, into Cæsar's house during the celebration of the sacred rites of the Bona Dea. For this offence he was tried, but, by the help of his hirelings and dependents, and by bribing the judices, he was acquitted. (Cicero, *Ep. ad Attic.*, i. 12. 16.) Cicero, who was called to give evidence on this trial, made a very unfavourable statement respecting his character, for which Clodius never forgave him. It was chiefly in order to revenge himself on so formidable an enemy, that Clodius took measures to qualify himself for the office of tribune of the people: with this view he got himself adopted into a plebeian family, though with considerable difficulty, and not without the help of Cæsar and Pompey. No sooner was he elected tribune than he applied all his energies to effect the ruin of Cicero. [CICERO.]

In B.C. 57, when Lentulus had brought before the senate a proposal to recal Cicero from banishment, a day was fixed for taking the sense of the people. Fabricius, one of the tribunes, who favoured the cause of Cicero, endeavoured to possess the place of assembly with armed men, but it had been preoccupied by Clodius. An encounter followed, in which Clodius was victorious, and followed up his advantage by massacring a considerable number of persons. Milo undertook to prosecute him for these outrages, but it was useless to proceed in the regular manner against a man who employed bodies of gladiators in his defence. Milo accordingly provided himself in a similar way, and the two parties had frequent engagements in the streets of Rome. When Cicero was recalled from exile, a question was raised, whether the ground on which his house had stood, and his property, which had been alienated to religious uses, should be restored to him or not. Clodius made a vehement speech against the restoration; but the point being decided in Cicero's favour, enraged Clodius beyond all bounds, and he made an attempt on Cicero's life. He contrived to screen himself from another trial, which he apprehended, by getting himself elected ædile; and no sooner was Milo's tribuneship expired, than he took advantage of the circumstance to prosecute him for acts of violence. Cicero appeared in defence of Milo, who was acquitted. In B. C. 52, Clodius was a candidate for the prætorship. Shortly after, Milo, in his way from Rome to Lanuvium, a distance of about fifteen miles, met Clodius returning from his country seat at Aricia. The meeting appears to have been accidental; but, through the officiousness of a gladiator in Milo's retinue, a fray ensued, in which Clodius received a severe wound. He was carried into an inn at Bovillæ, to be attended to; but Milo, wishing his men to make the most of their victory, Clodius was dragged out of the inn, and killed in the high-road. (Appian, *De Bell. Civ.* ii. 439.) Milo was tried for the murder, and Cicero spoke, though ineffectually, in his defence. Milo withdrew before his condemnation, and retired into exile at Massilia (Marseilles). (Cicero, *Ep. ad Atticum*, *Pro Milone*, *Pro Domo Sua;* Plutarch, *Life of Cicero.*)

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* The Roman palm is equal to 8·79 inches.

CLOGHER, a bishop's see in the archdiocese of Armagh in Ireland. This diocese embraces the greater part of the county of Fermanagh, and the whole of Monaghan, and extends into portions of Donegal, Tyrone, and Louth; its length is 76 miles from N.W. to S.E.; breadth 25 miles from N. to S. It contains 45 parishes, constituting an equal number of benefices, being the only diocese in Ireland in which these divisions coincide. The chapter consists of dean, precentor, chancellor, archdeacon, and five prebendaries. In 1792 there were in this diocese 49 churches of the Establishment. In 1834 the numbers were—churches of the Establishment, 61; Roman Catholic ditto, 81; Presbyterian houses of worship, 32; and other places of Protestant and dissenting worship, 35. In the same year the gross population of the diocese was 399,249; of whom there were 104,359 members of the Established Church; 260,241 Roman Catholics; 34,623 Presbyterians; and 26 Protestant dissenters of other denominations; being in the proportion of 4 Potestants of all denominations to 7½ Roman Catholics nearly. There were at the same time in the diocese 594 daily schools, educating 39,102 young persons, being in the proportion of $9\frac{72}{100}$ per cent. of the entire population under daily instruction, in which respect Clogher stands sixth among the 32 dioceses of Ireland. Of these schools 72 were in connection with the National Board of Education, being in the proportion of 1 to 8¼.

Clogher, from which the bishopric takes its name, is a small town in the barony of Clogher, in the county of Tyrone, so called, it is said, from a golden stone (*Cloch oir*) formerly consulted here for oracular answers by the Druids. It is situated on the Launy, a feeder of the Blackwater, and formerly returned two members to the Irish parliament. The cathedral is the parish church. The bishop's palace, a handsome edifice, with an extensive park, is adjoining.

Saint Patrick is said to have been the first bishop of Clogher, where Jocelyn reports that he founded a see before the erection of the church of Armagh in A. D. 444. Maccartin, the disciple of Patrick, built a cell and monastery here before his death in 506. Prior to this time, Clogher had been the seat of the petty princes of Errigal, a territory which now gives its name to a neighbouring parish. The church was rebuilt A. D. 1041, and again in 1295, by bishop Mathew Mac-Cathasaidh, who enriched it with bells, and various valuables; and again, a century after, by bishop Arthur Mac-Camœil, the former building having been destroyed by fire, together with the cell of Maccartin, the Monastery of the Virgin, two chapels, and thirty-two other houses, including the episcopal court. The first Protestant advanced to this see was Miles Magragh, in 1570: he was afterwards archbishop of Cashel, to which he was translated in the same year, in consequence of the impoverished state of Clogher about this time. The see was afterwards greatly enriched by a grant of the revenues of the abbey of Clogher, annexed to this bishopric by king James I., in whose reign its revenues were returned at the large sum in those days of 700*l.* per annum. Among the names of the more recent bishops of Clogher are those of Spottiswood, Lesly, Boyle, and Doctor Sterne, the munificent founder of the University Printing-house in Dublin.

By the 3rd and 4th Will. IV., c. 37, Clogher, as soon as vacant, becomes united with the archdiocese of Armagh. (Ware's *Bishops;* Beaufort's *Memoir of a Map of Ireland; Reports of Commissioners.*)

CLOGHNAKILTY, a borough town in the barony of East Carberry and county of Cork, in Ireland; situated on a channel about a mile from the harbour of Cloghnakilty, but without navigation for vessels of more than thirty tons. The charter of the corporation, bearing date 5th May, 11th James I., (1613) was procured by Sir Richard Boyle, the first patron of the borough, and in great measure the founder of the town. By the constitution of the corporation, the power to nominate to all offices was vested in the patron, whose representative, the earl of Shannon, accordingly received 15,000*l.* at the union, as compensation for the loss of the franchise, by which the borough had formerly returned two members to the Irish parliament. The principal part of the present town has been built since the year 1790, about which time a rapid improvement took place in trade of all kinds. Previous to this, most articles of consumption were purchased by retail from Cork or Bandon; but the erection of quays and extensive stores, towards the latter end of the last century, created an independent market, and made this part the point of export of heavy goods for the surrounding country. About the same time it became the most frequented linen and yarn market in that district. The manufacture of linen was also carried on to a considerable extent, as well as the brewing business. Like Bandon, in the same district, the town is now declining both in trade and population. Where 600 persons formerly had employment not more than 150 are now at work. The only trade now carried on is a small manufacture of cotton and export of corn.

The sovereign is the nominee of the patron. The recorder and seneschal, the latter with a court having jurisdiction to the amount of 10*l.* Irish, are nominated by him also. The sovereign's court of record is discontinued; but there are petty sessions held here by the county justices, sovereign, and recorder.

The public buildings are, a church, a Roman Catholic chapel, a barrack, a court-house, and a county bridewell. The chapel, erected by subscription, is a handsome building. In 1815 the number of houses was estimated by the Rev. Mr. Townsend at 586, and of inhabitants at 4688. In 1821 the numbers were;—houses inhabited, 640; inhabitants, 4033; which, in 1831, had decreased to, houses 581, inhabitants 3807. In 1834 there were in the parish of Kilgariff, in which Cloghnakilty is situated, 14 schools, educating 823 young persons. Of these schools two were in connection with the Board of National Education. (*Reports of Commissioners; Stat. Surv. of Co. Cork.*)

CLOISTER, from the Anglo-Saxon clauſꞇꞃ or cluſꞇeꞃ, adopted from the Latin *claustrum*, a place inclosed or shut up. The term is more particularly applied to the covered walk or inclosure which was the usual appendage of our antient monasteries, where the religious met to converse and take exercise. In a more general sense, cloister is used for a monastery at large, whether of monks or nuns, the inmates being inclosed or shut up from the world. The German word 'Kloster' retains this original signification.

CLONFERT, a bishop's see in the archdiocese of Tuam, in Ireland. The diocese occupies the S.E. portion of the county of Galway, and extends partially into the borders of Roscommon and King's County, stretching east to west about 30 miles, and north to south about 25 miles. It contains 38 parishes, constituting eleven benefices. The chapter consists of a dean, archdeacon, treasurer, and nine prebendaries. In 1792 there were in Clonfert 10 churches of the Establishment. In 1834 the numbers were—churches of the Establishment, 12; Roman Catholic ditto, 44; and other places of Protestant and dissenting worship, 5. In the latter year, the gross population of this diocese was 123,848, of whom there were 4,761 members of the Established Church; 119,082 Roman Catholics; 2 Presbyterians, and 3 other Protestant dissenters; being in the proportion of one Protestant of whatever denomination, to 25 Roman Catholics nearly. There were at the same time in the diocese 111 schools, educating 8,656 young persons, being in the proportion of $6\frac{99}{100}$, or very nearly 7 per cent of the entire population under daily instruction, in which respect Clonfert stands twenty-second among the thirty-two dioceses of Ireland, and is on a par with the diocese of Ross. Of these schools, 7 are in connection with the Board of National Education, being in the proportion of one to sixteen.

Clonfert, from which the diocese takes its name, is a vicarage in the barony of Longford, and county of Galway. The name of the place signifies a wonderful den, or place of retirement. It stands on an isolated height surrounded by bogs, midway between Shannon Bridge and Eyrecourt. There is no town nor village of any consequence. The ruins of the old cathedral are still standing. The episcopal house was built in 1640 by Bishop Dawson.

An abbey was founded here by St. Brendan, the fellow-student of St. Brendan of Birr, A. D. 558. In his time, the cathedral, which was formerly famous for its seven altars, was first founded. Monenius, who died 571, during the lifetime of Brendan, was the first bishop. He was celebrated for his piety, and in 1161 his remains were here deposited in a separate shrine. Roland Lynch, who succeeded to this see in 1602, was also bishop of Kilmacduagh, a neighbouring diocese, which has ever since been held in commendam with Clonfert. By the 3rd and 4th of Will. IV., cap. 37, § 121, the united bishopric of Clonfert and Kilmacduagh, as soon as vacant, is to merge into the joint see of Killaloe and Kilfenora.

(Ware's *Bishops*; Beaufort's *Memoir of a Map of Ireland*; *Reports of Commissioners*.)

CLONMEL, the assize town of the county of Tipperary, in Ireland; situated chiefly on the north side of the river Suir, in the barony of Iffa and Offa East, in the county of Tipperary, and partly on Moore and Long Islands in the same river, in the barony of Upperthird and county of Waterford; 108 miles from Dublin; 52° 19′ N. lat., and 7° 43 W. long. The limits fixed by the Boundary Act include only 361 statute acres, comprising the town on the north side of the river with the islands. A population of about 1000 are excluded by the new boundary line, which cuts off many mean cabins in the suburbs.

Clonmel is a place of considerable antiquity. It is said to have been walled by the Danes. Otho de Grandison, who had a grant of Tipperary, and a considerable portion of Cork, was the first English possessor. He founded a Franciscan Friary here, A. D. 1269.

Clonmel, from its situation on the frontiers of the pale, was a convenient station for assembling on any emergency. The town appears to have continued faithful to the crown until the rebellion in favour of Simnel and Warbeck. A disposition to revolt was also manifested by the inhabitants on the death of Queen Elizabeth. On the breaking out of the war in 1641, Clonmel declared for the Roman Catholic cause. Clonmel continued a strong hold of the ultra Roman Catholic interest until the end of the war, and made a good defence against Cromwell, who besieged, and finally took it in 1650. Clonmel was now dismantled, but continued to adhere to the losing party until after the conclusion of the wars of the revolution by the treaty of Limerick. Few antiquities remain: a gate-house at one end of the main street is the only part of the old works standing.

The town is governed under charter of the 5th July, 6th James I. The corporation consists of the mayor, five burgesses, and commonalty; and is one of those subject to the regulation of the 'new rules' of the 25th Charles II. The patronage is in the family of Bagwell. Prior to the passing of the Reform Act, the same family had also the return of the member for the borough. The assizes for the county of Tipperary are held here twice a year; petty sessions for the same county, which do not take cognizance of any matters arising in the town or liberties, are held once a fortnight. The mayor's weekly court has jurisdiction to the amount of 10*l.* Irish. The court, in which the mayor also presides, has unlimited jurisdiction in civil, but none in criminal matters. This court has fallen into disuse from the heavy stamp duty on the admission of attorneys to practise in it. There is no corporation gaol, but a county gaol, house of correction, and marshalsea. The corporation has no criminal jurisdiction. The property of the corporation has been mismanaged. Their estate, of 4800 Irish acres, produces only 416*l.* 13*s.* 11½*d.* per annum. Many of the leases under which it is at present held have been executed lately, some of them to the patron, at an under value. There are twelve monthly fairs, ten of them the exclusive property of the patron; and markets twice a week. (*Report of Commissioners on Municipal Corporations in Ireland.*)

The present condition and appearance of the town are highly respectable. Southward from the main street, which runs parallel with the river, diverge three streets, leading to as many bridges, two of which are carried over the islands in the Suir. Adjacent to the lowest bridge are the works which supply the town with gas: a house of instruction stands near the upper. There are barracks for a regiment of foot and two troops of horse, a fever hospital, a parish church built in the form of a cross, a Roman Catholic chapel, and a large cotton manufactory. The market-house is strong and well built. The lunatic asylum for the county of Tipperary, opened here in 1833, cost 16,587*l.* 19*s.* 3*d.*, and is calculated for sixty patients. The cost is to be defrayed by fourteen annual instalments by the county. Commissioners, appointed 25th Sept., 1828, under 9 Geo. IV., c. 82, regulate the lighting and watching of the town: for the last seven years gas has been employed. The amount of watching and lighting tax, levied annually, is 753*l.* 14*s.* 8*d.* The streets are paved and cleansed by the corporation. The expense of paving and cleansing for 1833 amounted to 417*l.* 4*s.* 0*d.* For the last fifteen or sixteen years Clonmel has been steadily advancing in prosperity. 'It is,' says Mr. Inglis, 'the great point of export for Tipperary, which is one great granary, as well as for parts of other counties, for it is the first point at which water-carriage commences.' The exports are chiefly corn, bacon, and butter; of the first article from two to three hundred thousand barrels of wheat are annually brought into the town. The flour mills are very numerous and extensive. The family of Grubb, and other members of the Society of Friends, have been chiefly instrumental in bringing the milling trade to its present importance in this district. The bacon trade is also very extensive; 50,000 pigs per season is the average. The butter trade, though large, has lately been somewhat on the decline. Another considerable source of employment is the great posting establishment of Mr. Bianconi, of which Clonmel is the depôt. There are also several breweries, and an extensive distillery in the vicinity; and a large cotton manufactory, which occupies about 200 persons. There is consequently little want of employment; and the town, up to 1821, rapidly increased. Since 1821 the population has been nearly stationary. There are great facilities for building. Limestone, sand, and good quarries are abundant in the immediate vicinity of the town. An improvement of the navigation of the Suir is very desirable

The borough, as laid down in the Boundary Report for 1831-2, contains 1532 houses; of which 419 are thatched, and 1113 are slated, and 771 have seven windows and upwards; with a population of 12,256, and a probable constituency of 652. The population of the whole town, in 1821, was 1590, consisting of 7272 males and 8318 females: in 1831 the numbers were respectively 6654 and 8480. In 1821 the number of inhabited houses was 2035, and of families 3847: and in 1831 the numbers were respectively 1793 and 2734.

The population of the entire parish of St. Mary, in which Clonmel is situated, was, in 1834, according to the first Report of the commissioners of public instruction, 17,853: of whom there were 1737 members of the Established Church, 15,848 Roman Catholics, 44 Presbyterians, and 206 other Protestant Dissenters. According to the second Report of the same commissioners there were in the same parish, in 1834, 25 daily schools, educating 830 males and 246 females; total, 1172. Of these schools there are two endowed. One is a boarding and day school. The endowment, amounting to 400*l.* Irish annually, is by the families of Mountcashel and Ormond: the other is a parochial school, with a small endowment of 7*l.* Irish per annum. There does not appear to be any free school, except one for ten females, nor are any of the above in connection with the Board of National Education.

(Cox's *History of Ireland*; Carthehaven's *Memoirs*; Inglis's *Ireland in* 1834; *Post Chaise Companion*, *Pub* *lications of the Irish Record Commissioners; Parliamentary Reports and Papers.*)

There is no local history of Clonmel, nor is there any history of the county of Tipperary.

CLONMINES, a decayed borough, situated on a creek in the barony of Shelburne and county of Wexford, in Ireland. It formerly returned two members to the Irish parliament, for the loss of which franchise the earl of Ely and Charles Tottenham, Esq., received 15,000*l.* compensation at the Union. There are now no remains whatever of a town or corporation. (*Reports of Commissioners.*)

CLORO'DIUS. [CRAB.]

CLOSTERI'NUM. [PHYTOZOARIA.]

CLOTAIRE I., the youngest son of Clovis, the conqueror of the Gauls, and of his wife Clotilda. Clovis having divided his territories at his death, A.D. 511, among his four sons, Clotaire became king of Soissons. He joined his brothers in their war against the Burgundians, which ended in the defeat of the Burgundians, and the extinction of the first kingdom of Burgundy, which was divided among the brother kings of the Franks. Clotaire and his brother Childebert, king of Paris, invaded the kingdom of Orleans after the death of their brother Chlodomère, and murdered two of his sons. The third, named Chlodovalde, concealed himself in an hermitage near Paris, where the village of St. Cloud has since risen. After the death of his nephew Theodebert, king of Austrasia, Clotaire took possession of that kingdom also; and after the death of Childebert, Clotaire united in his person the whole monarchy of the Franks, A.D. 558. His natural son, Chranme, having revolted against him, joined the count of Britanny, who maintained his independence against the kings of the Franks. Clotaire defeated his son, and burnt him alive with his family in a hut in which he had taken shelter, A.D. 560. In 562 Clotaire died, and was buried in the church of St. Medard of Soissons. He left four sons, among whom, following the example of his father, he divided the monarchy of the Franks. Caribert was made king of Paris, Gontran king of Orleans and Burgundy, Siegbert king of Metz or Austrasia, and Chilperic king of Soissons.

CLOTAIRE II. was the son of Chilperic, king of Soissons, or of Neustria, and of his wife Fredegonda. His father died, and left him an infant, under the regency of his mother. After many cruel wars, occasioned by the rivalships between Fredegonda and Brunehaut, the wife of Siegbert, king of Austrasia, Clotaire united in his person the whole empire of the Franks, as his grandfather Clotaire I. had done before him, A.D. 613. Having taken Brunehaut prisoner, he put her to a cruel death. Clotaire, in order to conciliate his new subjects of the kingdoms of Burgundy and Austrasia, appointed a Maire du Palais, Major Domus Regiæ, to each, for life. The office previously seems to have been held, as well as in Neustria, during pleasure only. The Maires of Austrasia, in the following reigns, became by degrees independent of the sovereign, and at last usurped the supreme power. At the council of Paris, A.D. 615, Clotaire issued general ordinances, which were called 'Capitularia.' He also convoked at times a kind of temporary parliament (so called from the word *parlié*, or *parler*, 'to speak'), which was an assembly of the chief officers of the Franks. The bishops had not admission into these assemblies till the time of Pepin, the father of Charlemagne. (*Histoire du Parlement de Paris.*) These parliaments were also called 'Placita,' from which term are derived the words *plaids* and *plaider*, 'to plead.' Clotaire had to sustain a war in his German dominions beyond the Rhine against the Saxons, whom he defeated with the loss of their king, A.D. 626. In 628 Clotaire died, aged forty-five years, and was buried at Paris in the church of St. Germain des Prez. His son Dagobert, who succeeded him, gave to his brother Caribert part of Aquitania with Toulouse for his residence. Clotaire II. was a man of abilities and of considerable information for his time: he was brave and popular, but ambitious, unprincipled, and cruel, like most of the Merovingian kings. (Velly, *Histoire de France sous la Première Dynastie.*)

CLOTHO, a genus of fossil bivalve shells, established by Faujas de Saint Fond for a species found in the shells of CYPRICARDIÆ. *Shell* oval, subregular, striated longitudinally, equivalve, subequilateral. *Hinge* formed by a bifid tooth, curved into a hook, a little larger in one valve than in the other. *Ligament* external.

CLOTILDE, MARGUERITE ELEONORE, born at Vallon Chalis, in the Vivarais, on the banks of the Ardèche, about 1405, married Bérenger de Surville, who soon joined the army of the dauphin, afterwards Charles VII., and was killed at the siege of Orléans. During his absence Clotilde is said to have composed and addressed to him her first epistle, which she called 'Héroide,' in imitation of Ovid's compositions of the same name. She afterwards, during her long widowhood, is said to have composed the other poems which bear her name. They consist chiefly of ballads, rondeaux, chansons, epistles, with fragments of an epic poem. The last in date is a chant royal, on the occasion of the battle of Fornovo gained by Charles VIII. But the authenticity of these compositions is very much doubted. It rests merely on the reported assertion of Joseph Etienne de Surville, a descendant of Bérenger, and an officer in the royal army, who emigrated at the time of the French revolution, but who having re-entered France in 1798 was tried and executed. He is said to have discovered Clotilde's autograph MSS. among the family papers, which however were all destroyed at the time when the peasantry went about burning the mansions of the nobility. He entrusted some friends with a copy of the poems, which were first published by Vanderbourg in 1803, with a biography of Clotilde. For the controversy about their authenticity, see *Biographie Universelle*, art. 'Surville' (Clotilde), and the authorities referred to; among others, Raynouard's article in the *Journal des Savans*, July, 1824. The poems are not without merit; and if not written by Clotilde they are a very clever imitation of the old French style of the fifteenth century, although some of the images and expressions appear to betray a later origin. Clotilde is said to have died at a very advanced age. (Biography, prefaced to Vanderbourg's edition).

CLOUD, a mass of vapour or other substance not a necessary constituent of the atmosphere, elevated to a considerable height in it. When very near the surface of the earth, it takes the name of mist; or rather, perhaps we should say, it is presumed as a probable hypothesis that the substances called cloud and mist differ only in position.

Our knowledge of cloud, as long as it is *cloud*, must necessarily be small, though the consideration of the phenomena connected with the appearance and disappearance of clouds, their formation and consequences, is an important, and we may now say an extensive, branch of Meteorology. Writers on this last-named subject do not treat much of clouds, except in connexion with other phenomena, rain, thunder, &c., and we may therefore refer to other articles for the most important facts.

In its permanent state, a cloud is conjectured to be a mass of *vesicular vapour*, that is to say, a collection of minute watery globules filled with air. A mass of vapour, in the strict sense of the term, could not be maintained *in equilibrio* when isolated in the air in the manner of a cloud. But even the preceding explanation is not without its difficulties. The globules (if full of air) must be specifically heavier than air, and it is not easy to see how they can maintain their position. The ascent of currents of heated air, and the retention of solar heat, have been suggested: but we shall content ourselves with the remark of M. Pouillet, that our *data* on this subject are too few to render any attempt at explanation advisable; and that we have nothing but more or less probable conjectures as to the causes which determine the form, the extent, the elevation, colour, &c., of these masses.

The motion of the clouds, though frequently depending on that of the wind, and sometimes proving the existence of a counter-current in the higher regions of the atmosphere, is nevertheless often caused by an action of one mass upon another, which there is every reason to attribute to the difference of their electrical states. Here we have again a branch of meteorology which is yet only beginning. The conjectures relative to weather, formed by observation of the state of clouds, will require a long course of observation before the truth can be separated from fiction. That many persons who are in the habit of observing, and seamen in particular, do acquire a sort of power of prediction which frequently is correct, cannot be denied; but if we except perhaps the general fact, in which all the world is agreed, namely, that collection of clouds promises rain and dispersion fair weather, there are no rules in which even continual observers are agreed.

The height of the clouds varies to upwards of a mile, being much more frequently less than more. Mr. Dalton however asserts that small fleecy patches of cloud are frequently from three to five miles in height. The average height varies at different periods of the year. The following observation (and if the subject had been often studied in this way, we could perhaps have written more definitely upon it) is given by Mr. Dalton in the first edition of his Meteorological Essays (1793), the observer being Mr. Crosthwaite of Keswick. By accurate measurement of Skiddaw, and fixing marks on the side of the mountain, which is 1050 yards high, he was able to ascertain by inspection the height of any cloud, when it did not exceed that of the mountain.

This he did three times each day, morning, noon, and evening, for five years, missing only as many observations as amounted to omitting less than a week per year. The result is as follows, the last column giving the number of times in which either the clouds were above the mountain, or there were no clouds at all, the last circumstance occurring about once out of thirty times.

Month.	0—100 yards.	100—200 ..	200—300 ..	300—400 ..	400—500 ..	500—600 ..	600—700 ..	700—800 ..	800—900 ..	900—1000 ..	1000—1050 ..	Above 1050 ..	Number of Obs.
Jan. .	0	9	12	28	53	39	37	32	30	39	36	116	431
Feb. .	5	10	5	15	41	45	45	27	48	38	29	94	397
Mar. .	2	1	6	11	22	40	32	36	24	32	44	184	434
Apr. .	0	4	5	18	24	34	37	26	23	38	35	206	450
May .	0	1	4	8	13	31	22	25	30	34	27	270	465
June .	0	2	2	6	24	24	29	21	34	41	34	233	450
July .	0	2	2	18	35	36	35	25	35	48	38	191	465
Aug. .	0	4	5	13	27	39	35	26	25	45	30	215	464
Sep. .	0	1	7	13	38	38	32	30	27	51	27	186	450
Oct. .	2	0	5	13	26	49	31	31	46	61	37	164	465
Nov. .	0	0	3	13	30	58	42	38	46	45	47	128	450
Dec. .	1	8	6	23	41	53	39	50	47	46	35	111	460
Total .	10	42	62	179	374	486	416	367	410	518	409	2098	5381

Thus, it appears, that in the month of September, for instance, for seven times that the clouds were between 200 and 300 yards high, there were 38 times in which they were between 500 and 600 yards high, &c. The supposition of the height of the clouds depending on the barometer, was in no degree countenanced by these observations, and though in heavy and continued rains the clouds were mostly below the summit, yet it frequently rained when they were above it.

The most complete classification of clouds, and sketch of their usual forms and arrangements, is to be found in a paper by Mr. Luke Howard, first published in Tilloch's Magazine, then in Rees's Cyclopædia, afterwards in Nicholson's 'Journal of Natural Philosophy,' &c., vol. xxx. p. 35. In this paper Mr. Howard first proposed the nomenclature which is now so frequently used, and of which we give the heads in his own words.

1. *Cirrus.* A cloud resembling a lock of hair, or a feather. Parallel, flexuous, or diverging fibres, unlimited in the direction of their increase.

2. *Cumulus.* A cloud which increases from above in dense, convex, or conical heaps.

3. *Stratus.* An extended continuous level sheet of cloud, increasing from beneath.

4. *Cirro-cumulus.* A connected system of small roundish clouds, placed in close order or contact.

5. *Cirro-stratus.* A horizontal or slightly inclined sheet, attenuated at its circumference, concave downward, or undulated. Groups or patches having these characters.

6. *Cumulo-stratus.* A cloud in which the structure of the cumulus is mixed with that of the cirro-stratus, or cirro-cumulus. The cumulus flattened at top, and overhanging its base.

7. *Nimbus.* A dense cloud spreading out into a crown of cirrus, and passing beneath into a shower.

CLOUD, ST., a small town in the immediate neighbourhood west of Paris. It lies on the left bank of the Seine, not far from Sèvres; the road to it is a branch from the great road by Sèvres to Versailles. It is in the department of Seine et Oise.

This place is said to have been known, in the earlier ages of the Frankish monarchy, by the name of Nogent. Chlodovalde, one of the three sons of Chlodomère, king of Orléans, retired hither in the sixth century, having embraced a monastic life to avoid the fury of his uncles Childebert and Chlothachaire or Clotaire, who had (A.D. 533) murdered his two brothers in order to seize their inheritance. This prince was canonized, and his name, corrupted into St. Cloud, has been given to the town where he passed his life and where he was buried.

The claims of this place to notice are founded upon its park and palace, the favourite residence of Napoleon, and now the usual summer residence of the king of the French. Within the limits of this park was formerly a château belonging to a Florentine, Jerome de Gondi, in which Henry III. of France took up his quarters during the siege of Paris by his own forces and those of Henry IV., the king of Navarre. Here he was killed, A.D. 1589, by the monk Jacques or James Clément. The heart of the unfortunate prince was deposited in the parish church of St. Cloud, with this inscription, 'Passenger, pity the lot of kings!' The church, which had long been in a decayed condition, was demolished a little before the revolution by the queen Marie Antoinette, who commenced the erection of a new one at her own cost; but the breaking out of the revolution put a stop to it. The domain with an adjacent one was purchased by Louis XIV., and given to his brother the duke of Orléans. The present palace, built by the duke, has engaged the talents of several architects, among whom is Mansard. It was purchased a little before the revolution by Marie Antoinette, who much enlarged it, and rendered it more magnificent. Bonaparte, on his return from Egypt (A.D. 1799), assembled the Council of the Five Hundred in the palace of St. Cloud, and dissolved them by force.

The park of St. Cloud extends from Sèvres to the town of St. Cloud, on a hill which rises above the bank of the Seine. The lower part of the park, along the bank of the river (from which it is separated by a road and towing path), is occupied by a magnificent plantation of elms and by green lawns: it is the part most frequented by those on foot, as being the nearest to Paris, and the most commodious for walking. But the upper part of the park, and the wooded slope of the hill on which it lies, excel the lower part in picturesque beauty. The slope, skilfully planted, is adorned by masses of foliage, by frequent steep declivities, and by pleasant recesses. Down this slope falls the cascade of St. Cloud, the water tumbling from one basin to another carved in the form of shells, and adorned with grotto-work, statues of marble and figures cast in lead; at the bottom of the cascade, the 'giant jet' spouts up a column of water to the height of more than a hundred feet. The upper part of the park has spacious lawns and alleys of trees stretching beyond the reach of the eye, but the turf is not so fresh nor are the trees so vigorous as in the lower part. At the edge of the slope, a platform called 'La Balustrade' commands an extensive view, including the long meanderings of the Seine, the whole extent of the capital, and a considerable part of the surrounding country. From this platform rises a lofty square tower, from the top of which is a prospect still more extensive. This tower was built by Bonaparte A.D. 1801, and on the top of it is a copy of the lantern of Demosthenes.

The château of St. Cloud is equally admired for the beauty of its situation and the elegance of its architecture. It has not indeed the vast magnificence of Versailles, but it is as beautiful with less pretension. It consists of a principal front and two wings at right angles, inclosing three sides of a square, the fourth side of which is formed by a terrace and balustrade, from which there is a view of the park and of the same objects which the platform commands. There are three porticos of the Corinthian order, one in the centre of the principal front, and one at the extremity of each wing; the intervals are adorned with statues and reliefs. The most remarkable parts of the interior are the gallery painted by Mignard, and the room called the 'Salon de Mars,' the ceiling of which was painted by the same artist; but the chief ornament of it is four superb marble columns. The pictures are not numerous, but they are well chosen. The château was much improved and splendidly furnished by Napoleon.

The town of St. Cloud abounds with houses of public entertainment, tea gardens, cafés, &c. The population in 1832 was 1935. There is an annual fair in September, which lasts three weeks, and attracts a number of persons from Paris on the Sundays which fall during its continuance. (Vaysse de Villiers.)

CLOUDBERRY, a dwarf kind of bramble, with herbaceous stems, and orange-yellow fruit, found in turfy alpine bogs; it is the *Rubus chamæmorus* of botanists. Its fruit is excellently well flavoured when newly gathered.

CLOVE PINK, a species of Dianthus, so called from a supposed resemblance in odour between its flowers and the cloves of the shops.

CLOVER, a name given to different species of Trifolium. Dutch clover is T. repens; purple clover is T. pratense; cowgrass, or perennial clover is T. medium.

Clover was introduced into the agriculture of Great Britain about the sixteenth century, from the Low Countries, where it had been long cultivated as green food for cattle in situations where natural pastures were scarce. It was the first step towards the improvement of the old triennial system. Its abundant produce, its destruction of annual weeds, which it smothers by its broad foliage, and especially the beauty of the wheat sown after it, soon recommended it as an indispensable part of an improved rotation of crops. It is not too much to say, that the profit of any farm may be considered as proportionate to the quantity of clover which is produced upon it on an average of years. There are various kinds of clover, which all go under the botanical name of trifolium, from the three leaves which grow together, or rather the form of the leaf, which has three heart-shaped parts. They are annual, biennial, or perennial plants. The annual clovers, with the exception of the trifolium incarnatum (*Trèfle incarnat* or *farouche*), introduced from the south of France, are not so generally cultivated as the biennial, which produces a greater crop, and being sown along with the spring corn comes up the first year under its shade, and gives a full crop in the second. In good land it will sometimes stand another year, but it falls off in quantity; and unless other artificial grasses or perennial clovers have been sown amongst it, to fill up the places where the biennial clover has failed, it is seldom profitable to allow it to remain on the ground more than one year after that in which it is sown.

The most approved variety of the biennial clovers is the common red or broad clover (*Trifolium pratense*), which is usually sown with barley or oats, or sometimes among wheat or rye in spring. When these are drilled and hoed there is an advantage in sowing the clover seed among a crop which is already advanced in growth, because it is kept under, and there is no danger of its injuring the chief crop by its too great luxuriance. There is however some risk of the clover not coming up so well, if the wheat or rye is very close on the ground. In Scotland clover is often sown among wheat, in Norfolk invariably with barley, and in Belgium among rye. This depends on the various rotations adopted in different countries. The first crop is generally mown and made into hay. In this process great care is taken not to break off the tender leaves of the plant in drying; the swarth is not shaken out as is done with meadow grass, but merely turned over; and if the clover can be dried and put in a stack without any shaking, it is so much the more valuable. When clover is soaked with rain, no hope of an improvement in the stack must induce the farmer to carry it together, so long as the least moisture remains. If it is allowed to stay in the field till it is perfectly dry, even when it has been soaked repeatedly and is nearly black, and is then trod hard in a rick with a sprinkling of salt over each layer, it will be readily eaten by cattle in winter, and be far more nutritious than that which, having been stacked in a moist state, will infallibly come out musty. A very good method in those seasons when a continuance of dry weather cannot be reckoned upon—particularly when the second crop is cut in September—is to take advantage of two or three dry days to cut the clover, and turn it as soon as the dew is completely dried off the upper side; the next day do the same, and in the evening carry the green dry clover and lay it in alternate layers with sweet straw, so as to form a moderately sized stack. A fermentation will soon arise, but the dry straw will prevent all danger from too much heating, and, acquiring the flavour of the clover, will be eaten with avidity by the cattle. To those who make clover-hay for the use of their own stock in winter, we recommend this as preferable to the common method, even when there is less danger from the weather. In northern climates it would probably save the crop two years out of three.

It is usual to sow rye-grass (*Lolium perenne*) in a small proportion with clover seed, especially where clover, having been often repeated on the same land, is apt to fail. It is a good practice; and although in the neighbourhood of London the unmixed clover obtains a better price, there is no reason why it should be preferred, unless the rye-grass has been allowed to stand too long and has grown hard. Young rye-grass is a good corrective of the heating qualities of clover-hay. A very extensive use of clover-hay in London is to cut it into chaff, and to mix this with oats and beans for dray horses, which have little or no hay given them in any other way; but the most profitable use of clover is to cut it green for horses and cattle. With a little management and the assistance of tares, green food may be given to all the stock from the first day of May to the end of November.

The land which has borne clover, although in a very good state for producing corn, will not bear a repetition of that crop until several other crops have intervened. In the regular Norfolk rotation, clover should recur every fourth year; but after a few rotations this is found to be too quick a recurrence, and other grass seeds or pulse are substituted. The Flemish do not sow clover again on the same ground sooner than in eight or ten years.

The white or Dutch clover (*Trifolium repens*) is a perennial, which grows rapidly, and forms excellent pasture; but its bulk is not sufficient to make it profitable to mow it for hay. It is excellent for sheep, which thrive well upon it. A light calcareous soil is best adapted for white clover; but it also grows well on heavy land, provided the bottom be sound and dry. When land is laid down for permanent pasture, white clover is always sown in a considerable proportion with other grasses.

Another perennial clover, called cow grass (*Trifolium medium*), is found in all rich meadows: it is often sown in conjunction with the white clover in laying down arable land to grass. The lesser yellow trefoil (*Trifolium minus*) and the hop trefoil (*Trifolium procumbens*) are also valuable varieties found in good pastures.

The only annual clover which is cultivated is the French clover (*Trifolium incarnatum*), mentioned before. It is a most valuable addition to the plants usually sown for fodder, from the short time in which it arrives at perfection if sown in spring; so that where clover has failed, this may be sown to fill up the bare places. Its principal use is to raise very early food for ewes and lambs, which it does with very little trouble or expense. Immediately after harvest the stubble is scarified and harrowed so as to raise a mould; the Trifolium is sown at the rate of 16 to 20 lbs. per acre, and well rolled in. It springs up and stands the winter well, and with the first genial weather in spring it grows rapidly. It makes excellent hay, and what is left produces seed most abundantly in the end of May or beginning of June, being off the ground in good time to plough the land and clean it for turnips. It is far superior to stubble turnips as an intervening crop, and more rapid in its growth than tares. On light land a crop of buckwheat is readily obtained after it. It has the property of smothering annual weeds by its rapid growth, and for this reason is not so well adapted for sowing with a crop of corn. The Italian rye-grass (*Lolium perenne Italicum*) may be sown with it, and will grow as rapidly. After the Trifolium has been cut, this will continue and give an excellent second crop. It is advisable to have fresh seeds from southern climates from time to time, or it will probably become later every year by assimilation to the climate. English seed of the first year after importation seems the best, being heavier and more free from weeds than the foreign.

Some agriculturists have objected to the practice of sowing clover with a crop of corn; they prefer hoeing the intervals between the rows of the drilled crops, by which the weeds are better kept down. They plough the land immediately after harvest, and harrowing it well, they sow clover and grass seeds, which come in nearly as soon the next year as if they had been sown in the preceding spring; and the land, when broken up, is in a much cleaner state than if the clover had been sown with the corn. If this be not an improvement in the system, it is at least worthy of notice, and experience alone can decide whether the additional expense of ploughing is repaid by the improvement in the crop.

In France and in the United States of North America gypsum is considered as a specific manure for clover. It is sown by hand over the plant in spring, and in some situations the advantage is evident, in others scarcely observable. The quantity used is from three to eight bushels of finely powdered gypsum per acre.

On good land an acre of clover will produce as much as three tons and a half of dry hay; that is, two tons the first cutting, and one and a half the second. Greater crops are obtained on very highly manured land. The value of a ton of clover-hay to feed horses with is about 15 or 20 per cent. more than good meadow-hay. It is not however so good for milch cows. The price in London is from 4*l.* to 5*l.* per ton on an average.

When clover is intended to be left to ripen its seeds it should be mown early, or fed off by sheep in May. The first crop is seldom free from various seeds of other plants which rise among the clover: by feeding it down or mowing it these are destroyed, and the clover, which grows more rapidly than most other plants, rises again without any mixture of weeds. When the blossom is thoroughly withered, and the seed is nearly ripe, the clover is mown and left to dry on the ground without much shaking. In very dry weather it may be housed or stacked in a week; but the process is much retarded by showers and want of sunshine. It is therefore only in the drier parts of the island that clover seed repays the expense and risk of cultivation, especially as it is well known that the subsequent crop suffers if the clover is allowed to stand for seed. It is seldom therefore that more seed is saved, even in the most favourable situations and seasons, than is required for the farm or immediate neighbourhood. The demand from the North, where clover is sown to a great extent, could not be supplied without a considerable importation from abroad: and this has caused an outcry against the duty of 20*s.* per cwt. on foreign seed, as a tax on agriculture. Notwithstanding this high duty, the importation of clover-seed from Belgium and Holland is very considerable, as it is more advantageous to purchase foreign seed than to raise it; except in the case of the *Trifolium incarnatum*, which produces early and abundant seed. Foreign clover-seed should be well examined when it is purchased, as it frequently contains the seeds of docks and other noxious weeds. The usual mode of doing this is very simple. The thumb is moistened and pressed on the sample, some of the seeds adhere, and when it is turned up the quality is distinctly seen by the colour and plumpness of the seeds. If any seeds of weeds are in it, they must be detected after a few insertions of the thumb. As the calyx of the flower of clover envelops the seed closely, it is difficult to separate them. In Holland they have various machines for this purpose, one of which consists of two fine-rodded hurdles made to rub on each other whilst the heads pass between them. In England it is generally threshed on the floor. But if the heads, after being separated from the haulm, are put together in a heap and pressed, a slight fermentation takes place, and this makes the calyx brittle, so that it breaks into dust, and the seed comes out readily; it is then easily cleared by the fan.

When the seed is not intended for the market, the trouble of clearing it of the husk may be saved, especially in the *Trifolium incarnatum*. It will grow as well when sown with the husk as when cleaned; and it is easy to find the proportion required to be sown in that state by allowing for the weight of the husk.

CLOVES, the dried flower buds of Caryophyllus aromaticus.

CLOVIS, CLODOVEUS, and CHLODWIG in old German, from whence Ludwig, the Latinized form Ludovicus, and Louis are derived, was born A.D. 467. He was the son of Childeric, and grandson of Merowig, who gave his name to the Merovingian dynasty. Tournay was then the capital of the Salian Franks, who had occupied the north-east part of Gaul, and extended their incursions as far as Paris. After the death of Childeric, A.D. 481, Clovis attacked Siagrius, the Roman commander, defeated him near Soissons, took him prisoner, and beheaded him. Having conquered the whole country, south and west, as far as the Seine, he fixed his residence at Soissons. He afterwards got rid, by force or treachery, of the other Frankish chiefs, his own relatives, who held various parts of North Gaul: Siegbert, king of Cologne, Cararic, king of the Morini, Ranacarius, king of Cambrai, and others, all perished by his hand.

In 493 Clovis married Clotilda, the daughter of Chilperic, king of the Burgundians, who was a Christian. Clovis and most of the Franks were still Pagans. In 496 Clovis fought a great battle at Tolbiac, near Cologne, against the Alemanni, who had advanced to the Rhine and threatened Gaul. In the most critical moment of the fight, it is said that he made a vow to acknowledge the God of Clotilda if he remained conqueror. The Alemanni were completely defeated, and Clovis and most of his soldiers were christened on Christmas day of the same year, by Remi, archbishop of Rheims. The Gauls and Romans of the western provinces, as far as the mouth of the Loire, submitted voluntarily to Clovis.

He next turned his arms against Alaric II., king of the Visigoths, in the south-west part of Gaul, whom he defeated in the battle of Vouilli, near Poictiers, A.D. 507; Alaric fell, and Clovis took possession of the whole country as far as the Pyrenees. Theodoric, king of the Goths in Italy, coming to the assistance of his countrymen, defeated Clovis near Arles, 509, after which peace was made between the Goths and the Franks. Anastasius I., emperor of Constantinople, bestowed upon Clovis the titles of Patrician and Augustus, and sent him a crown of gold and a mantle of purple, A.D. 510. Clovis now fixed his residence at Paris. In 511, at the Council of Orleans, the rights called Regalia were acknowledged by the bishops as vested in the kings of the Franks. By these rights, on every vacancy of a See, the revenues devolved on the king, who had the right of nomination. Clovis caused the laws and customs of the Salian Franks to be compiled and arranged to serve as a code for his Frankish subjects. His Gaulish and Roman subjects were subject to the Theodosian Code. In 511 Clovis died at Paris, after a reign of 30 years, and was buried in the Church of St. Peter and Paul, afterwards called Sainte Geneviève. When the old church of Sainte Genevieve was pulled down on May 10, 1807, two sarcophagi of stone were found with the remains of Clovis and his wife Clotilda, as well as an epitaph upon the former, written long after his death. They are preserved in the 'Musée des Monumens Français,' as well as a statue of Clovis, erected to his memory by King Robert, towards the beginning of the 11th century. Clovis left four sons, among whom he divided his monarchy. [CLOTAIRE I.] Clovis first reduced the Franks to the condition of a united and partly civilized nation. His conversion to Christianity conciliated the clergy as well as his Roman and Gaulish subjects, most of whom had embraced that faith.

CLOYNE, a Bishop's see, in the archdiocese of Cashel, in Ireland. The chapter consists of a dean, chanter, chancellor, treasurer, archdeacon, and fourteen prebendaries. The diocese occupies the greater part of the county of Cork, from the river Lee northward, and lies wholly within this county, with the exception of a part of one parish, which is in the county of Waterford. It extends from E. to W. 63 miles, and from N. to S. 29 miles. In 1792 the number of parishes was 137, and of benefices 69, with 51 churches of the Establishment. It now contains 122 parishes, constituting 84 benefices. In 1834 the places of worship were—churches of the Establishment, 64; Roman Catholic ditto, 89; other places of Protestant and Dissenting worship, 30. In the same year the gross population of this diocese was 342,477; of whom there were 13,866 members of the Established Church; 328,402 Roman Catholics; 14 Presbyterians; and 195 other Protestant Dissenters; being in the proportion of one Protestant of whatever denomination to 23⅓ Roman Catholics nearly. There were at the same time in this diocese 379 daily schools, educating 21,043 young persons; being in the proportion of $6\frac{14}{100}$ per cent. of the entire population under daily instruction, in which respect Cloyne is on a par with Kilfenora, and stands 25th among the 32 dioceses of Ireland. Of these schools, 19 were in connection with the Board of National Education, being in the proportion of 1 to 20 nearly.

Cloyne, from which the bishopric takes its name, is a vicarage and small town in the barony of Imokilly, and county of Cork. The name may signify a place of retirement: by some it is derived from cluaine, a cave, from the number of caves with which the limestone strata of Imokilly abound. The chief object of interest here is a round tower, 92 feet in height, surmounted by a modern battlement, the original conical roof having been destroyed by lightning in 1749. East of the round tower, on the opposite of the street, stands the cathedral, a small heavy building, supposed to have been raised about the end of the thirteenth century. The episcopal palace adjoins the town: it is a plain mansion, built in the early part of the last century by Bishop Crowe, and stands in a handsome demesne. The town itself is an inconsiderable place, consisting of one principal street of mean houses. It was estimated in 1800 to contain 308 houses, and rather more than 1600 inhabitants. The number of inhabitants is now about 2000. Being the only market-town in a considerable extent of country, its fairs are usually well attended. In 1834 there were in Cloyne 8 schools, educating 556 young persons: of these schools there was one endowed, and one a free-school.

The founder of the bishopric was Colman, son of Lenin, the chief bard of Aedh, king of Munster. He died A. D. 604. There are few records of the see prior to the arrival of the English, about which time one Mathew was bishop; he is supposed to have been the same with the then legate of Ireland. About the year 1327 this see had become so impoverished, that king Edward III. wrote to Pope John XXII. for the purpose of uniting it with the diocese of Cork, also at that time much reduced: but the contemplated union did not take place till more than a century after, when, both sees happening to be vacant, they were consolidated by Pope Martin V. in the person of Bishop Jordan, about A. D. 1430.

About the time of the Reformation, this see, in common with almost every other diocese in Ireland, had suffered severely in its temporalities, part being forcibly seized on by lawless neighbours, and part being fraudulently made away with by lay prebends and dishonest bishops, insomuch that, says Harris, 'there was not one bishopric in the province of Cashel that had not the print of the sacrilegious paw upon it; and on some of them *vestigia nulla retrorsum*.' To so low a state was Cloyne reduced at this time, that the bishop of it was called '*Episcopus quinque marcarum*,' five marks being the whole of its annual revenue.

Cork and Cloyne continued united until, in 1638, Doctor George Synge was consecrated Bishop of Cloyne, separately, by Usher, at Drogheda. Bishop Synge dying in 1653, the see was vacant until, on the cessation of the civil wars in 1660, it was bestowed on Michael Boyle, who held it again united with Cork, and also with Ross, as did his next successor, Bishop Edward Synge, since whose death in 1678 these sees have been in separate hands. Bishop Crewe, one of his successors, in 1702 recovered to the see upwards of 8000 Irish acres of land which had been fraudulently conveyed away by some of his predecessors; he was besides a munificent benefactor to the town, in which he founded a free-school, at present enjoying 190*l.* 8*s.* per annum, and educating 35 boys by his bequest.

Among the distinguished prelates of the see are the names of Berkeley, and the late Bishop Brinkeley.

By the 3rd and 4th Wm. IV., c. 37, sec. 121, Cloyne is to be reunited to Cork and Ross as soon as these latter sees become void.

(Ware's *Bishops*; Beaufort's *Memoir of a Map of Ireland*; *Reports of Commissioners*; Croker's *Sketches in the South of Ireland*.)

CLUB is defined by Johnson to be 'an assembly of good fellows, meeting under certain conditions;' but by Todd, 'an association of persons subjected to particular rules.' It is plain that the latter definition is at least not that of a club as distinguished from any other kind of association, although it may not be more comprehensive than is necessary to take in all the associations that in modern times have assumed the name of clubs. Johnson's however is the more exact account of the true old English club.

It might not be quite safe to make a positive assertion as to the antiquity either of the name or the thing in England. But the earliest clubs remembered in our popular literature date about the end of the sixteenth or the beginning of the seventeenth century. It was then that there was established the famous club at the Mermaid Tavern, in Friday Street, of which Shakspeare, Beaumont, Fletcher, Raleigh, Selden, Donne, &c., were members.

Ben Jonson had another club, of which he appears to have been the founder, that met at another well-known tavern, called the Devil Tavern. It stood between the Temple Gates and Temple Bar. It was for this club that Jonson wrote the 'Leges Convivales,' which are printed among his works.

It seems to have been not till a considerable time after this that political clubs first came into vogue.

In the 'Spectator,' No. 78, Addison makes mention of 'the club, or rather the confederacy, of the Kings.' 'This grand alliance,' he observes, 'was formed a little after the return of King Charles II., and admitted into it men of all qualities and professions, provided they agreed in this surname of King, which, as they imagined, sufficiently declared the owners of it to be altogether untainted with republican and anti-monarchical principles.' A famous political club of those days was the King's Head Club, which is alluded to in Tate's continuation of Dryden's 'Absalom and Ahithophel.' It was a whig club; and the badge of its members was a green riband, in opposition to the tories, who wore a scarlet riband in their hats. (See Dryden's Works, by Scott, vol. vii., p. 154, and vol. ix., p. 380.)

The great age of clubs, political, literary, and of every other description, was the early part of the last century. Then flourished, among many others, the Brothers' Club, in which were associated Harley, Bolingbroke, Swift, and the other most distinguished literary and political characters of the day: the famous Scriblerus Club, of which Pope, Swift, and Arbuthnot were the leading members: the October Club, of the original institution and subsequent history of which an account may be found in Swift's 'Four last Years of the Reign of Queen Anne,' and also in a satirical pamphlet entitled 'The Secret History of the October Club, from its original to this time, by a Member,' 8vo., London, 1711: the Hanoverian Club: the first Beef-Steak Club, of which Mrs. Woffington, the actress, was president, being the only female member, and Richard Estcourt, the comedian, provisor, wearing in that character a small gridiron of gold, hung round his neck with a green silk riband: and, above all, the celebrated Kit-Cat Club, which is said indeed to have been instituted at the time of the trial of the seven bishops, in the reign of James II., but was in its greatest glory in that of Queen Anne.

In 1735 the second Beef-Steak Club, being that which still exists, and which has embraced among its members the most eminent public characters that have appeared since its institution, originated with Rich, the pantomimist, and the Earl of Peterborough. For an account of the circumstances, see an entertaining work entitled *The Clubs of London*, 2 vols., 8vo., London, 1828.

Of clubs of more recent institution, the most famous is the Literary Club, established in the year 1764, of which Johnson, Boswell, Burke, Reynolds, Goldsmith, and other well-known names, formed the list of members. Along with this may be mentioned the Essex Head Club, also founded a few years after by Johnson. It took its name from the tavern at which it met, in Essex Street. One of the most successful literary clubs of modern times was that called the King of Clubs, which began about the year 1801, and used to meet at the Crown and Anchor, in the Strand. An account of it is given in the second volume of the 'Clubs of London.'

The modern subscription houses which go by the name of clubs, such as the Athenæum, the University, the Senior and Junior United Service, and others of the same description, are in no other respect clubs, according to the antient English understanding of the term, except that every member must be balloted for, or admitted by the consent of the rest. And little more of the true character of a club belongs to those numerous political associations known as the Whig Club of Brookes's, the club at White's, the Carlton Club, &c. Political associations, in imitation of those existing in England, were formed at Paris in the earliest stage of the French revolution, and assumed the English name of clubs. The Breton Club, the Jacobin Club, the Club des Feuillans, and others, performed an important part in the various scenes of that extraordinary drama.

CLUB-MOSS, or **SNAKE-MOSS**, is a prostrate moss-like plant, with small scaly imbricated leaves, found in alpine or damp situations in most parts of the world. Its fructification consists of little two-valved cases, containing powdery matter. All the species belong to the genus Lycopodium; that to which the name is most commonly applied is L. clavatum.

CLUNY, a town in France, in the department of Saône et Loire; it is on the little river Grône, in a by-road, 200 miles in a direct line S.S.E. of Paris, in 46° 26′ N. lat., and 4° 39′ E. long.

Until the early part of the tenth century, Cluny was a mere village in the Mâconnois. In 910 Guillaume (William) I., duke of Aquitaine and count of Auvergne, who had purchased the village, founded an abbey of the Benedictine order. About twenty years afterwards St. Odon, second abbot of Cluny, introduced a reform into the Benedictine order, which reform spread very widely; and in course of time two thousand religious houses adopted the discipline of Cluny, which alone of those in which the rule was observed retained the rank of an abbey; the others were all simple priories, the abbots laying aside their title and rank. The Cluniac monks were divided into reformed and non-reformed, and the abbot of Cluny was the recognised superior of the whole order. The abbey was very extensive, and the number of the religious in the middle ages very large. The increase of the establishment may be judged of by the fact, that when, in A.D. 1245, Pope Innocent IV., accompanied by twelve cardinals, a patriarch, three archbishops, the two generals of the Carthusians and Cistertians [CHARTREUSE, CITEAUX], and the king of France (St. Louis) and three of his sons, the Queen Mother, Baudouin, count of Flanders and emperor of Constantinople, the duke of Bourgogne and six lords, visited the abbey, the whole party, ecclesiastical, royal, and noble, were lodged in the building of the monastery without disarranging the order of the monks, who amounted to four hundred. The abbot had the disposal of a great number of benefices, and of the priories of the different houses of the order. His archdeacon exercised all the functions of a bishop in the three parishes of the town of Cluny, except those of confirmation and ordination, until 1744, when the episcopal jurisdiction was transferred to the bishop of Mâcon The revenues of the abbot were stated by Expilly (1762) at 50,000 livres (about 2000*l.*) at least, and the revenue of the establishment (*la mense conventuelle*) at 70,000 livres (nearly 3000*l.*). The church of the monastery was one of the largest in the kingdom, built in the form of a cross, above 600 feet in length. The monastery was three times plundered by the Huguenots: before the last pillage the library contained 1800 manuscripts, and even after this event it was one of the richest in France; but it was dispersed or transferred elsewhere at the revolution, and the church destroyed. The monastery itself, a handsome modern building, has been appropriated to several public establishments, among which is a college or high school.

The town of Cluny is in a valley; it occupies as much ground as Mâcon, though far less populous. There is a stone bridge over the Grône, and before the revolution there was one religious establishment, besides the abbey, and two hospitals, one for the poor and one for the sick. The inhabitants in 1832 amounted to 3368 for the town, or 4152 for the whole commune: they manufacture coarse woollens, articles of furriery, and gloves; they trade in corn, wine, leather, and wicker-work. The valley affords pasturage, and produces grain and wine: alabaster and jasper are obtained from the neighbouring mountains.

CLUNY, ORDER OF MONKS OF; a branch of the Benedictines. William, Earl of Warren, son-in-law to William the Conqueror, brought these monks into England, and built their first house at Lewes, in Sussex, about A.D. 1077 or 1078. Tanner (*Notit. Monast.*, edit. Nasm. p. ix.) says there were twenty-seven priories and cells of this order in England. But a deputation of certain monks from the parent abbey of Cluny sent to King Henry VI., in 1457, to ask for the restitution of possessions in England, which they stated had been long detained from them, complained that they had been deprived of the obedience of thirty-eight. The number, of which an account is given in the new edition of Dugdale's 'Monasticon,' certainly amounts to forty-two, exclusive of three cells whose existence is not very distinctly known.

All the monasteries of this order in England were governed by foreigners, had more French than English monks in them, and were not only subject to the foreign houses of Cluny, La Charité sur Loire, and St. Martin des Champs at Paris, but could be visited by them only. None of their priors were elected by the respective convents, but were named by the above-mentioned foreign houses. They could not receive the profession of their novices in England. To have their differences determined, they were obliged, in almost all cases, to go to their superiors beyond sea; by which means the greatest part of their revenues were carried to those foreign houses: and upon that account, during the wars with France, the different establishments of this order were generally seized into the king's hands as alien priories. After a petition from a large number of the English Cluniac monks to the parliament at Winchester in the 4th Edward III., these inconveniences were by degrees removed; and some of their houses were in that and the following reign made denizen. Bermondsey, one of the greater houses of this order, was made an abbey; and all of them were at last discharged from all manner of subjection and obedience to the foreign abbeys. Tanner says this did not take place till 1457, when the deputation already mentioned, in addition to claiming the restitution of their possessions generally, desired leave to enter all places depending upon their houses; but instead of obtaining what they asked, they were deprived of the subjection of all houses of their order in England.

The houses of Cluny abroad had pensions from the houses of their order in England, called *Apportus*, which probably amounted in the whole to a large sum; for Cotton, in his 'Abridgement,' p. 51, says, the abbot of Cluny had a pension from England of 2000*l.* per annum; and according to Rymer, old edit., vol. iii. p. 1009, and Prynne's 'Records,' vol. iii. pp. 386, 858, the foreigners sometimes demanded occasional supplies from their houses here; and even ran them into debt, as stated by Prynne, vol. iii. p. 750.

The prior of Lewes, in Sussex, was accounted high chamberlain to the abbot of Cluny, and was often his vicar-general in England, Ireland, and Scotland. (See Rymer, old edit., vol. xi. p. 464.)

The greater part of the houses of the Cluniac order were founded prior to the reign of King Henry II. Slevesholm, in Norfolk, was the last founded, about A.D. 1222. Four houses of this order were among those which Cardinal Wolsey dissolved in 1525.

In D'Achery's 'Spicilegium,' fol. par. 1723, tom. i. p. 641, are the 'Antiquiores Consuetudines Cluniacensis Monasterii, collectore S. Udalrico Monacho Benedictino.' A detailed history of the origin and progress of this order abroad will be found in the 'Histoire des Ordres Monastiques,' tom. v. p. 184, which is translated in Stevens's Continuation of Dugdale's Monasticon. (Tanner, *Notit. Monast.* ut supra; Dugdale's *Monasticon Anglic.*, last edit. vol. v. p. 3.)

CLUPE'IDÆ, a family of fishes of the section Abdominales. The Clupeidæ are placed by Cuvier between the Salmonidæ and the Gadidæ: in fact they form the fifth and last division of his section 'Malacopterygiens Abdominaux.' The fishes of this division may be distinguished by their wanting the adipose fin, by having the upper jaw composed of the intermaxillary bones in the middle, and the maxillaries at the sides, and by the body being always covered with scales. Some of the species ascend rivers.

The genus Clupea, as now restricted by Cuvier, may be thus characterized:—maxillaries arched in front; opening of the mouth moderate; upper jaw entire; body compressed and covered with large scales; teeth minute or wanting. To this genus belong the Herring, Sprat, Whitebait, Pilchard, &c.

Clupea Harengus, Linn., the *Herring* (French, *Le Hareng commun*) is a fish well known; its characters however will be useful to distinguish it from some allied species; they are as follows:—

Small teeth in both jaws; suboperculum rounded; veins on the infra-orbitals and gill-covers; dorsal fin behind the centre of gravity; this fin commences about half way between the point of the upper jaw and the end of the fleshy portion of the tail; ventrals placed beneath the middle of the dorsal fin; tail forked; length of the head one fifth of that of the body; the greatest depth of the body one fifth of the whole length. The upper part of the fish is blue or green, according to the light; the sides, belly, and gill-covers are silvery white; ordinary length, ten to twelve inches.

The term Herring is the same as the German Häring, which, according to some, is derived from Heer, an army, and is applied to these fishes from their visiting the coasts in such immense numbers.

'The Herring inhabits the deep waters all round the British coasts, and approaches the shores in the months of August and September for the purpose of depositing its spawn, which takes place in October, or the beginning of November. It is during these months that the great fishing is carried on, for after the spawning is over it returns to deep water. The mode of fishing for Herrings is by drift-nets, very similar to those employed for taking mackerel and pilchard, with a slight difference in the size of the mesh. The net is suspended by its upper edge from the drift-rope by various shorter and smaller ropes, called buoy-ropes; and considerable practical skill is required in the arrangement, that the net may hang with the meshes square, smooth and even, in the water, and at the proper depth; for according to the wind, tide, situation of their food, and other causes, the herrings swim at various distances below the surface.'

'The size of the boat used depends on the distance from shore at which the fishery is carried on; but whether in deep or in shallow water, the nets are only in actual use during the night. It is found that the fish strike the nets in much greater numbers when it is dark than when it is light: the darkest nights therefore and those in which the surface of the water is ruffled by a breeze, are considered the most favourable. It is supposed that nets stretched in the daytime alarm the fish, and cause them to quit the places where that practice is followed; it is therefore strictly forbidden[*].'

The young are found on our coast during the summer months in great abundance, and are often taken in small-meshed nets used for catching other fishes.

The food of the herring consists principally of small crustacea, but they have been known to devour the fry of their own species.

Clupea Leachii (Leach's Herring). This second species of herring was discovered by Mr. Yarrell, and described in the proceedings of the Zoological Society for 1831, p. 34. An account by the same gentleman is also given in the Zoological Journal, vol. v. p. 278, where a figure of the species will be found. We will therefore give the distinguishing characters in Mr. Yarrell's own words.

'The length of the head compared to that of the body alone, without the head or caudal rays, is as one to three; the depth of the body greater than the length of the head, and compared to the length of the head and body together, is as one to three and a half; it is therefore much deeper in proportion to its length than our common herring, and has both the dorsal and abdominal lines much more convex: the under jaw longer than the upper, and provided with three or four prominent teeth just within the angle formed by the symphasis; the superior maxillary bones have their edges slightly crenated; the eye is large, in breadth full one-fourth of the length of the whole head; irides pale yellow; the dorsal fin is placed behind the centre of gravity, but not so much so as in the common herring; the scales are smaller; the sides without any distinct lateral line; the edge of the belly carinated, but not serrated; the fins small. The fin-rays in number are—dorsal, eighteen; pectoral, seventeen; ventral, nine; anal, sixteen; and caudal, twenty. Vertebræ, fifty-four.

'The back and upper part of the sides are deep blue, with green reflections, passing into silvery white beneath. The flesh of this species differs from that of the common herring in flavour, and is much more mild.'

Mr. Yarrell first discovered this species when examining the various kinds of fishes caught by the fishermen whilst engaged in taking sprats.

Clupea Sprattus, the *Sprat*, called in France *Le Melet*, *Esprot*, or *Harenguet*. This fish has by many authors been confounded with the young of the herring; it is however distinct, and its characters were first pointed out by Pennant; they are as follows:—proportions nearly the same as those of the herring, but the depth of the body is greater in proportion than in the young of that species; the gill-covers are not veined; the teeth of the lower jaw are so minute as to be scarcely visible to the touch. The dorsal fin is placed farther back, and the keel to the abdomen is more acutely serrated than in the herring.

Sprat-fishing commences in the early part of November; hence in season they immediately follow herrings, and the markets continue to be supplied with them during the winter months. Like the herrings, these fishes inhabit the deep water during the summer: they are so plentiful as to be frequently used for manuring the land, and are often sold as low as sixpence per bushel.

Clupea alba (Yarrell), the *White-Bait;* French, *Blanquette;* German, *Bristling*. This fish has been supposed to be the young of the shad: Mr. Yarrell, however, upon a careful investigation of the subject, ascertained it to be a distinct species: its distinguishing characters are—length of the head compared with that of the body, and not including the tail, as two to five; depth, as compared to the whole length of the fish, as one to five; keel of the abdomen distinctly serrated, but not so sharp as in the *shad*. The dorsal fin commences half way between the tip of the muzzle and the end of the tail; the upper jaw is slightly crenated, the lower jaw is the longer and smooth. Its colour is silvery white, growing greenish on the back; the body is more compressed than in the herring, and the keel to the abdomen is more sharply serrated than in either that fish or the sprat.

The White-bait is caught in great abundance in the Thames as high up as Woolwich and Blackwall; the fishing commences about the beginning of April, and is continued to September. 'When fishing as high as Woolwich,' says Mr. Yarrell, 'the tide must have flowed from three to four hours, and the water become sensibly brackish to the taste, before the white-bait will be found to make their appearance. They return down the river with the first ebb-tide; and various attempts to preserve them in well-boats in pure fresh water have uniformly failed.' The food of the white-bait consists of small crustacea.

Clupea pilchardus, the *Pilchard; Le Célan*, in France. In size this fish resembles the herring; it is also nearly of the same form, but rather thicker, and of greater proportionate depth; the scales are larger, the head is shorter, the suboperculum is square, and the dorsal fin is more forward in position: the gill-covers are distinctly veined.

This fish is caught off the coast of Cornwall in great abundance; the fishing commences in July[*]. The food of the pilchard consists of small shrimps, and other crustaceous animals.

The *Shad* is another fish belonging to this group; it is however placed in a sub-genus called by Cuvier *Alosa*. He separated this, together with several other species, from the true Clupeæ, from the circumstance of their having the upper jaw deeply notched in the middle.

Two species of shad are found off the British coast; the first (the *Twaite Shad*, Yarrell) known generally by the name of *Shad* (Alosa finta), is about fourteen inches in length; its colour is brownish-green on the back, or inclining to blue in certain lights; the rest of the body is silvery; five or six dusky spots are observed on each side, and are disposed longitudinally, the first close to the head, and the others at short intervals; the length of the head as compared with the body is as one to five; the body rather exceeds this measurement in depth; the jaws are furnished with distinct teeth, and the tail is deeply forked.

This fish is found in the Severn and Thames in tolerable abundance. The principal fishing season for the shad in the Thames is about the second week of July: they begin to ascend the river about May for the purpose of depositing their spawn, and this being done they return to the sea about the end of July.

In former times the shad was caught as high up the river as Putney: it now rarely passes London Bridge, and is caught in the greatest abundance a little below Greenwich. Its flesh is dry, and therefore not much esteemed for the table.

The second species of shad, the Allice, or Allice Shad of Mr. Yarrell (*Alosa communis*), is considerably larger than the one just described, being from two to three feet in length: it may moreover be distinguished by its having only one spot on the side of the body, near the head, and that is sometimes scarcely visible: the jaws have no distinct teeth, and the scales of the body are rather smaller in proportion, though they are large in both species.

The Allice Shad is plentiful in the Severn, but of rather rare occurrence in the Thames.

CLUVE'RIUS (CLUWER), PHILIP, was born at Danzig, in 1580. His father intending him for the profession of the law, sent him to study at Leyden: but Cluverius showed more disposition for the study of geography and antiquities, and was encouraged in his bias by his acquaintance with Joseph Scaliger. In a journey which he made to Louvain and Antwerp, for the purpose of meeting Justus Lipsius, he fell in with some marauding soldiers, who stripped him of everything. On his return to Holland, finding that his father, being dissatisfied with his conduct, had stopped all remittances for his support, he joined the troops of the emperor, and served for two years in Hungary and Bohemia. In the latter country he made the acquaintance of a Baron Popel, who being arrested by order of the emperor, had written a pamphlet in his defence, which Cluverius undertook to translate into Latin, and published it on his return to Holland. The pamphlet being considered offensive, Cluverius was imprisoned, at the request of the imperial ambassador to the States General. He was soon after released, and his mother having sent him some supply of money, he set out on his travels to England, where he wrote 'De Tribus Rheni Alveis,' 4to. Returning to the continent, he travelled through France and Germany, and published his 'Germania Antiqua,' fol., Leyden, 1616. It is a work of considerable research, intermixed with much conjecture. Having made a journey into Italy, he was well received there, especially at Rome and Bologna, where his familiar acquaintance with most of the European languages excited great admiration. His next work, 'Siciliæ Antiquæ Libri Duo,' to which he added a short description of Sardinia and Corsica, fol., 1619, has been considered by many as his best work. On his return to Holland from Italy he suffered severe domestic losses, and his health rapidly declined. It was under these circumstances that he wrote his 'Italia Antiqua,' which was published after his death. It is a work of great research, and is still one of the best on the geography of antient Italy, although it occasionally requires correction from the more exact observations or discoveries of later geographers and antiquarians. Cluverius's friend and fellow traveller, Lucas Holstenius, added to it his own observations. Cluverius wrote also 'An Introduction to Universal Geography,' which has been repeatedly published. He died at Leyden in 1623, forty-three years of age. Danielis Heinsii *Oratio in obitum P. Cluverii*, at the end of the 'Introduction to Geography,' Leyden, 1624, gives an account of the principal incidents of Cluverius's life.

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[*] From Yarrell's 'History of British Fishes,' to which we refer our readers for a more detailed and interesting account of this and the other species here noticed.

[*] 'The number of fish taken by a drift boat in a night's fishing varies exceedingly: from five to ten thousand is considered moderate; it often amounts to twenty thousand. For the season's fishing, about one hundred and fifty thousand fish would be deemed favourable.'—Yarrell's 'British Fishes.'

CLWYD, a river in North Wales, in the counties of Flint and Denbigh. It rises on the eastern declivity of the Bronbanog hills, a ridge belonging to the Hiraetog hills, and its upper course for a few miles is to the S. It then suddenly turns E.N.E., and continues nearly eight miles in that direction. About three miles above Ruthyn it declines to the N., and preserves this course to its mouth. The upper third of its course is through a narrow valley, which presents some very fine views. Below Ruthyn it enters the fertile vale of Clwyd, which extends upwards of fifteen miles in length, and is a pretty level tract from five to seven miles wide. Being studded with towns, villages, and seats, covered with verdant meadows and luxuriant fields, and enclosed on every side by brown and barren hills, this vale offers by the contrast a very pleasant view. A little below St. Asaph, the Clwyd is joined by the Elwy, which traversing a hilly tract brings to it a large mass of water, and the river below this town increases considerably in breadth. It soon afterwards enters the fertile and extensive marsh of Rhuddlan, called Morva Rhuddlan: three miles below the town of Rhuddlan it enters the sea through a small æstuary opening northward, and forming a port for small coasting vessels. The whole course of the river may be about thirty miles; it is navigable for flat-bottomed boats of about seventy tons up to Rhuddlan quay.

CLYDE, a river in Scotland, the third in magnitude, but the most important for its navigation. Its sources lie between 55° 18′ and 55° 28′ N. lat., where the highest summits of the mountain-range traversing South Scotland, the Lowthers (3150 feet), the Lead Hills, Queensberry Hill (2259 feet), and the range connecting the latter with Hart Fell (2790 feet), form nearly a semicircle. The rivulets which descend from this range unite in one stream about 55° 27′, and thus the Clyde is formed. The most southern and largest of these streams is the Daer; but another smaller stream is called Clyde, before the union. After the junction of these streams, the Clyde continues in the direction of the Daer northwards to Roberton, twelve miles lower down: in the whole of this part of its course the current is very rapid, and preserves the character of a mountain-stream. North of Roberton, the Tintoe Hills (2310 feet high) direct its course north-east; at Biggar its course is changed to the north-west and north, but below Roberton it flows west-south-west to its confluence with the Douglas Water, and accordingly it makes a large bend round the Tintoe Hills. Its course in this distance is little short of twenty miles, though Roberton and the mouth of the Douglas Water are only six or seven miles distant in a straight line. The valley through which it flows is wide, and the current is so gentle that in some places it is hardly perceptible. After the junction with the Douglas Water the rapidity of the stream increases, and the falls commence. The first is the Bonniton Linn, a cascade about thirty feet high, which is followed by the Corra Linn, where three waterfalls occur near one another, each apparently as high as Bonniton Linn. The rocks on both sides narrow the bed of the river so much, that the waters in some places rush down a chasm not more than four feet wide. Corra Linn is two miles above the town of Lanark. Two miles lower down is Stonebyres Fall, which also consists of three distinct falls, altogether measuring about seventy feet in height. The scenery near the falls has considerable beauty. It is probable that the river in a space of about six miles descends not less than 230 feet, and the valley of the river above the falls may be about 400 feet above the sea. Below the falls, the river, continuing its north-west course, runs in a fine valley to Blantyre and Bothwell, the lands rising in a gentle ascent on both sides Farther down its banks are sometimes bold and richly wooded: sometimes they extend in level plains. At Glasgow the Clyde has a considerable width, and vessels ascend to the Lower Bridge of Glasgow. From Glasgow to the vicinity of Dumbarton it runs through a level country. At no great distance from the castle of Dumbarton the Kilpatrick Hills rise on the north, and the Renfrew Hills on the south. Between these ranges the Clyde forms a wide æstuary, which at Dumbarton is about a mile across, and widens in its progress to the west, being at Greenock more than two miles in breadth. To the west of the latter place at Cloch Point it turns abruptly to the south, and reaches the sea by the two straits which lie between the island of Bute, the Cambray islands, and the coast of Ayrshire. The river south of Cloch Point is called the Firth of Clyde, a term which is frequently extended to that part of the sea which lies between the island of Arran and the coast of Ayrshire. The whole course of the Clyde, from the source of the Daer to the southern extremity of the island of Bute, may be about 100 miles.

CLY'MENE. (Zoology.) [NAIDÆ.]

CLY'PEAS. (Zoology.) [ECHINIDÆ.]

CLYPEASTER. [ECHINIDÆ.]

CLY'PEUS SOBIESKI (the shield of Sobieski), a constellation formed by Hevelius out of some small stars below Aquila, and passing the meridian about an hour before *α* Aquilæ. The name was given in honour of John Sobieski III., king of Poland.

Character.	No. in Catalogue of		Magnitude.
	Piazzi ( ), Bradley [ ].	Astron. Society.	
	(25)	2104	7
s^1	(101)	2137	6½
s^2	(107)	2142	6½
q	(114)	2145	6
	(128)	2151	7
	(144)	2159	7
	[2296]	2106	6
	[2313]	2125	5
	[2314]	2127	6½

CLYSTERS (the Greek *κλυστήρ*), lavemens, or enemata, terms bestowed upon medicinal agents introduced into the rectum, or lower bowel, with the intention of expelling its contents, or producing other local effects, but also occasionally to influence the system generally. The intestinal canal, from its commencement at the mouth to its termination in the rectum, is endowed with peculiar sensibilities; and though each portion of it has some special office, yet the whole responds to certain stimulants, whatever part they may be applied to. Thus purgative medicines may be introduced into it either by the mouth or by the rectum, and to a certain extent their action is the same, *i.e.* both will occasion an expulsion of the contents of the lower bowel; but the secondary influence on the system will be different, inasmuch as when the purgative is given by the mouth, during the whole course of its descent it produces, according to its nature, a special action on each portion as it passes, frequently causing an increased secretion of serum, and so materially affecting the general system. But when the same substance is introduced by the rectum, it only produces a local effect, by bringing about the expulsion of the contents, and influencing the system generally only when these were of such a nature as to occasion irritation by their retention. Clysters are also employed to assist in retaining the contents of the bowels when they are expelled too frequently, as in many cases of diarrhœa. Clysters of this latter kind are likewise used to aid in retaining the contents of some of the neighbouring organs, such as of the uterus, in cases where abortion is threatened; and are also employed to allay pain and irritation in the bladder, kidneys, &c. Further, when the mouth or upper part of the throat is closed, as in spasmodic diseases, such as lock-jaw, or from tumours or paralysis, they are frequently made the vehicle for introducing either food or medicine into the system. The only other point requiring notice here is the fact that as the sensibility of the rectum is considerably less than that of the stomach, the doses of most articles given as clysters must be greater than when administered by the mouth.

Clysters are rarely, except in two instances, taken or administered without the order or superintendence of a competent medical attendant, and therefore we shall confine our observations chiefly to those two cases. The first and most common is where persons employ them for the relief of constipation; for this purpose tepid water or gruel is, by means of a proper instrument, thrown up into the rectum, and when a suitable quantity (about a pint) is used, it is generally speedily returned, bringing with it the other contents of the lower bowel. To the occasional use of such means no objection can be urged; but if employed habitually, and as a substitute for the efforts of nature, the greatest injury will result. Constipation does not in general depend upon a want of power in the rectum to expel its contents, but upon the use of improper diet, or a deficiency of the secretions of the upper part of the intestinal canal, such as the bile, which furnishes the natural stimulus to the intestines; and clysters never can effectually supply the want of these secretions. By the abuse of clysters, the tone of the whole alimentary canal may be lost, and the process of nutrition so impaired that wasting and other serious consequences have followed. Clysters even of the mildest kind should therefore be restricted to the accomplishment of temporary and occasional purposes. At the commencement of fevers and other inflammatory complaints, the speedy evacuation of the contents of the rectum is desirable; and where medicines cannot be taken by the mouth, owing to the irritability of the stomach causing their rejection, clysters of purgative substances, such as castor oil, or infusion of senna with sulphate of soda, may be used. For the relief of spasmodic diseases, clysters of the fetid gums, such as assafœtida, or of oil of turpentine, may be used. Sometimes tobacco in the form of infusion or of smoke is employed; but this requires the greatest care. The second case to which we have alluded, in which clysters are employed without medical superintendence, is that of tobacco-smoke thrown into the rectum of drowned persons: a more hurtful measure cannot be adopted; it is now abandoned by all intelligent persons.

Where clysters are employed to allay pain, or arrest premature action of the uterus, they generally contain tincture of opium, and are of small bulk; about a quarter of a pint of starch serves as the vehicle. Where nourishment is the object, they are also of small bulk; about half a pint of beef-tea alone, or with powdered cinchona bark, and a few drops of laudanum. Substances introduced into the rectum in a solid form are called suppositories.

CLY'THRA, a genus of Coleopterous insects, of the family Chrysomelidæ. The insects of this genus generally have the body more or less cylindrical; the antennæ short, with the basal joint thick, the two following joints short, and the remaining (with the exception of the apical joint) serrated, *i. e.*, produced internally, so as to resemble the teeth of a saw. The head is placed vertically, and inserted into the thorax, so as to be scarcely visible from above: often larger in the male than the female. The legs are moderately long, rather thick; in the males the anterior pair are often considerably larger than the two posterior pairs: the penultimate joint of the tarsi is bilobed.

The larvæ of these insects (at least those that are known) inhabit a coriaceous tube, which they drag about with them.

The Clythræ reside on trees and shrubs, and those found in this country appear in the beginning of the summer. The species are very abundant, and seldom adorned with metallic colours. In England we have five species, the most common of which is *Clythra quadripunctata:* this is not quite half an inch in length, and black; the elytra ochre-coloured, with four black spots, two near the base, and two near the middle. The next species which is not uncommonly met with is *Clythra tridentata*. This beetle is rather less than the last, and of a blue-green colour, thickly and finely punctured above; the elytra are pale-yellow and immaculate; the anterior pair of legs in the male are elongated.

CLY'TUS, a genus of Coleopterous insects of the section Longicornes, and family Cerambycidæ.

The species of the genus Clytus (a genus established by Fabricius) form a well-marked group among the Cerambycidæ, and are chiefly distinguished by their having the palpi short and nearly equal, the terminal joint thicker than the others, and truncated at the apex; the head narrower than the thorax, and the latter nearly globular or approaching to a cylinder. The body is elongate, and nearly cylindrical; the antennæ are shorter than the body, and filiform; the basal joint is rather thick; and the terminal joints are sometimes incrassated; the legs are moderately long.

These insects are generally of moderate size, and have the elytra adorned with arcuated fasciæ; their ground colour is usually black or brown, and the markings yellow.

About ninety species of this genus have been discovered, and they appear to inhabit every quarter of the globe: five are recorded as British, of which the more common are *Clytus mysticus*, *C. Arietis*, and *C. arcuatus*. *Clytus mysticus* is about half an inch in length; colour black; the base of the elytra red-brown; three bent white fasciæ are situated near the middle of the elytra; and there is a white patch at the apex. This species is common in the neighbourhood of London. We have frequently found its larva in the rotten wood of old blackthorns.

C. Arietis is about the same size as the last; its colour is black; legs and base of the antennæ reddish; the former with the thighs of the two anterior pairs blackish; thorax with a yellow band on the anterior part, and another on the posterior; scutellum yellow; elytra with four yellow bands.

This insect is frequently met with in gardens and woods in the neighbourhood of London and elsewhere. When handled it makes a peculiar noise, which seems to be produced by the friction of the thorax against the smooth part of the abdomen which is inserted in that part. Many of the Cerambycidæ have this power.

C. arcuatus is less common than either of the preceding species; it somewhat resembles *C. Arietis*, but is considerably larger and broader in proportion. The antennæ are entirely of a reddish-yellow colour; the legs are coloured as in the last-mentioned species; the thorax has a yellow band on the fore part, and an interrupted band in the middle; the elytra have three yellow bands, and towards the base three spots of the same colour; the scutellum is, also yellow.

CNIDUS was a city of Caria on the S.W. coast of Asia Minor, at the extremity of a peninsula between the Sinus Ceramicus, or gulf of Cos, and the gulf of Syme, and facing the south part of the island of Cos, which is 10 miles west of Cape Crio, or Triopium, near which Cnidus stood. (Leake's *Asia Minor;* and Beaufort's *Survey of the Coast of Caramania.*) Cnidus is about 25 miles south of Halicarnassus. It was a Dorian colony, like Cos, Halicarnassus, and the other towns which formed the Dorian confederation of the Hexapolis. (Herod. i. 144.) It had two harbours divided by a narrow isthmus which joins Cape Crio to the mainland. The remains of two moles which enclosed the south or larger harbour are still visible, as well as those of the city walls, and a multitude of other ruins. (Beaufort's *Plan of Cape Crio*, in the last plate of his *Survey*.) Leake says, that 'there is hardly any ruined Greek city in existence which contains specimens of Greek architecture in so many different branches. There are still to be seen remains of the city walls, of the closed ports, of several temples, Stoæ, artificial terraces for public and private buildings, of three theatres, one of which is 400 feet in diameter, and of a great number of sepulchral monuments. Designs of the most important of these curious remains are about to be published by the Society of Dilettanti.' (Leake's *Asia Minor* 1824.)

Strabo (xiv.) speaks of an observatory at Cnidus, and he mentions among the distinguished natives of the place, Eudoxus the mathematician, a contemporary of Plato; Ctesias, physician to Artaxerxes, who wrote on Syrian and Persian history; and the peripatetic Agatharchides, a friend of Julius Cæsar. He also says that Lipara, near Sicily, was a colony of Cnidus. He says nothing about the celebrated temple of Venus, said by some to have existed at Cnidus, but Cicero mentions, among the numerous works of art seized by Verres, a marble Venus from Cnidus. (*In Verrem*, iv. 60.)

COACH. It is stated by Stow, that in '1564, Boonen, a Dutchman, became the queen's coachmanne, and was the first that brought the use of coaches into England.' Anderson (*Hist. of Com.*), on the other hand, says that 'about 1580 the use of coaches was introduced by the earl of Arundel.' 'Before that time (Hume, *Hist. of Eng.*) the queen (Elizabeth) on public occasions rode behind her chamberlain.' A long time elapsed before this luxury was attained by more than a few very rich and distinguished individuals, and a very much longer time before coaches became general. Coaches let for hire were first established (Anderson) in England in 1625. They did not stand in the streets, but at the principal inns. In 1637 there were, in London and Westminster, 50 hackney coaches. Stage coaches were first used in England soon after the introduction of hired carriages. In Scotland, in 1678 (Cleland, *Statis. of Glasgow*), Provost Campbell established a coach to run from Glasgow to Edinburgh, 'drawn by sax able horses, to leave Edinboro' ilk Monday morning, and return again (God willing) ilk Saturday night.' The first mail coach travelled from London to Edinburgh about 1785, and to Glasgow in 1788. The Scotch custom of the male passengers treating the female to breakfast and dinner on the road continued till these coaches were established.

The public are now so familiarized with the use of stage coaches that they are apt to forget that their origin is so recent. At the present time there is scarcely any small town through which some stage-coach does not pass, and no considerable road which is not travelled by many. Until the invention of springs, a man's endurance was the measure of his journey: it was impossible to travel fast, on account of the weight of the carriage; it was equally impossible to travel far, since no one could long bear the direct and unmitigated jar. Springs were the first means towards better travelling; since their invention, the increased speed and better appointment of English stage-coaches have been caused by the improvement of roads in conjunction with the great demand for rapid travelling. In this country the best stage-coaches are very perfect machines, and the arrangements by which they are conducted, when the number of persons and animals that are engaged comes to be considered, are extremely complete. The attendant expenses are very large, but are defrayed wholly by private speculators, excepting in the case of *mail* coaches, which convey the letters, the contractors for which, in consideration of certain services, receive an allowance from the state. The stage-coaches themselves usually belong to a coachmaker, who contracts with the speculators who 'work' them, for the supply of new carriages at certain intervals, and is liable to the expense of all repairs: for this he receives 2½d. or 3d. for every mile they travel. There is a duty per mile according to the number of passengers to be carried, rising from 1d. a mile for 4 persons, to 4d. a mile for 21[*]. For each coachman a duty of 1l. 5s. is annually paid, and for each guard, excepting those of mails. The expense of *horsing* a four-horse coach running at the speed of from nine to ten miles an hour, may be stated at 3l. a double mile for 28 days (a lunar month); so that a person horsing ten miles of a coach passing backwards and forwards each day, should earn or receive by way of remuneration 13 times 30l., or 390l. a year for his work. This may be considered a high rather than a low estimate, unless in a district where wages and rent of stables are high, and hay and corn dear. In a cheap neighbourhood, or where a large number of horses are kept, the expense will not be so great. Nevertheless a great many articles are to be provided: harness, which for four horses costs from 16l. to 20l.: horses, of which, for ten miles of ground, at least eight in summer and nine in winter will be required; their price will be from 5l. to 20l. each: corn and beans, of which each horse will eat little less than two bushels a week, together with hay and straw cut into chaff. Straw, shoeing, physic, and farriery, must also be reckoned, as well as stabling, stable utensils, and horsekeepers' wages, which for each man are from twelve to fifteen shillings a week. The firm must also defray the wages of coachmen, who receive about ten shillings a week, unless they drive backwards and forwards, and take fees from two sets of passengers each day, when they get no wages. The charge for washing the coaches must also be reckoned. To this long list must be added the heavy item of turnpikes. Mails are exempt from turnpike tolls, but a tax is paid for them to the government, and mileage to the contractor for the use of the coach. The Post-office allows them, according to their speed and the country through which they travel, from 4d. to 6d. a mile for carrying the letters; in consideration of this, it claims a right to limit their number of passengers, and regulate their speed and time of starting: the guard is the servant of the Post-office. Booking-offices and bookkeepers and advertisements are also to be paid for, as well as way-bills. One of these, on which the name and destination of each passenger and the direction of each parcel are inserted, is carried by the coachman, and delivered as soon as the coach stops to each proprietor or book-keeper, that he may examine its correctness and make any requisite entries. In the country nothing is paid to the booking-offices, but in London this is not the case: from 3l. to 4l. a (lunar) month is charged when the office is a mere shop for the purpose of booking, and does not belong to any coachmaster: if it is the property of a coachmaster, he takes 1s. for booking out of the fare of each passenger booked at his offices.

Some approximation to the expenses of coaching may be made from the above statement. The returns will not so easily be calculated. They consist of the fares, which are usually, for the outside passengers, at the rate of from 2½d. to 3d. a mile; for the inside somewhat less than twice this amount: the fares of mails are usually higher. Very arbitrary charges are made for parcels according to their size and weight. These however are not all the profits arising from stage coaches: the custom which they bring to inns must be reckoned a large item, when the proprietor is the owner or renter of an inn; and especially when the coach 'ends' at his house; and thus, though a coach may itself be worked at a loss, all things considered, to some of its proprietors at least it may be a remunerating speculation. The proprietors at the ends have obviously the greatest chance of profit; for nearly every passenger must spend something, however small, at their inn. They have likewise a greater advantage in porterage, and often get a profit from advertising, printing way-bills, and washing coaches, all of which are managed by them: they also get interest for the money that is earned by the coach, which remains in their hands until the monthly division among the proprietors.

The fastest coaches now travelling are between—

London and Shrewsbury . .	154	miles,	in one day.
„ Exeter . . .	171	„	„
„ Manchester . .	187	„	„
London and Manchester (mail)	187	„	19h. 0m.
„ Holyhead (mail)	261	„	26 55
„ Liverpool (mail)	203	„	20 50

The Edinburgh, the Leeds, and the Devonport mails are also very rapid.

Short stage coaches, plying in the neighbourhood of towns, have been nearly superseded by omnibuses.

By an Act passed in 1833, coaches and omnibuses are allowed to ply for hire in the streets of London.

The coaches which form the trains upon rail-roads are of very different construction from those used on common roads: they are stronger, larger, heavier, and lower, the wheels being of smaller diameter: they are fastened together with links of chain, and there is attached to the back and front of each a 'fender,' acting on a spiral spring, by which concussion is prevented when the train is stopped. Some carriages adopted on the Greenwich Rail-Road seem to be of an improved construction: they are lower than those hitherto used; and as long as they remain upon the rail it would be very difficult to overturn them, even though the axles were to break, or the wheels come off.

Upon the continent, travelling in public carriages is not so rapid or so commodious as in England. The state of the road is in general such as to preclude any considerable speed, and to require great strength in the coaches.

In France the diligences are conducted by private speculators, who are obliged to use the horses of the Poste Royale. They are clumsy carriages, generally consisting of three bodies, and are drawn by five or six horses, usually driven by one postilion from his saddle. The first body, called the 'coupé,' formed like a chariot, contains three people; the second, which is like a coach, the 'interieur,' holds six persons; the third, which is similar to a coach turned sideways, carries six or eight passengers, and is called the 'rotonde.' In addition to these, there is on the roof, before the place appropriated to the luggage, the 'banquette,' a bench sometimes furnished with a hood for the accommodation of four passengers. Should all these places be filled, the 'conducteur,' or guard, sits upon the luggage. The speed of these carriages is from four to five (English) miles an hour: the fares vary according to the part of the vehicle in which the place is taken; the 'coupé' being the dearest; the 'intérieur' the next; and then the 'rotonde' and the 'banquette.' The fare in the 'coupé' is rather more than half that of an outside place in England; but a large additional charge is often made to each passenger for all luggage above 30lbs. in weight. The malle-postes, by which the letters are conveyed, are conducted by the government. They are the fastest and best appointed public carriages on the continent. Their speed is at least eight miles an hour: they are drawn by horses of the Poste Royale, and carry one person in the cabriolet, with the courier, and two persons in the second body, or calêche. The fares are considerably higher than in the diligences.

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[*] The duty was formerly levied according to the number of miles travelled, without regard to the number of passengers. It would have been well, when the law was altered, either to have limited the capability of accommodating on each coach more persons than it was licensed to carry, or to have increased the penalties for a breach of the statute. The revenue is now greatly defrauded.

Stage coaches (Schnell-posten) in Prussia are entirely in the hands of the government, which imposes a number of regulations, some of which cause considerable inconvenience. They consist of a 'cabriolet' in front, containing three persons; and an 'intérieur,' which holds nine people on three rows: the conducteur sits inside. These are the best foreign conveyances, excepting the mails: they stop less than the French, and travel about six miles an hour. The fares are about the same as for the outside of an English coach: luggage above 20lbs. is paid for extra, and if above 40lbs. weight, is sent in a slower and separate conveyance from the passenger. The letters are carried by the common coaches. In Italy the diligences are the property of individuals who purchase from the government the monopoly of a certain road. The mails, which are very similar to the French, are nearly as fast, and rather more expensive. Travelling by 'Vetturino' is the most common and cheapest method. In this case the driver agrees to carry the passenger from place to place in a given time, and for a given sum, all expenses on the road being generally included.

In Belgium the diligences are similar to, though faster than the French. In Spain there are not above six or seven roads on which diligences travel. They are monopolized by a privileged company, in which Ferdinand, the late king of Spain, and his queen, had shares. The carriages consist of a coupé and intérieur similar to the French: there are also two places on the back of the roof, on which are seated two guards armed with carbines; the conductor is called the 'mayoral.' Their speed is from five to six miles an hour. The mails travel faster: a person leaving Bayonne (1833) at twelve o'clock on a Friday, reached Vittoria the next morning, and remained there till the afternoon; at daybreak on Sunday he reached Burgos, and arrived at Madrid on Monday morning. The cabriolet in front contains one passenger, the courier, and the mayoral, and the calêche two more passengers.

In the United States of America the travelling has improved rapidly of late years, and on the best roads the public conveyances are superior to any other except the English. Some of the coaches contain accommodation for nine persons, six of whom sit on two opposite benches as in our coaches, and the other three on a seat parallel to and between the other two benches, with a leather strap drawn tight across the coach to support their backs. The body of these coaches is consequently larger than in the English coaches. Other coaches contain only two seats like the English, but no places for passengers on the top. In 1792 Mr. Jefferson, then secretary of state, wrote to the post-master-general to know if the post, which was then carried at the rate of fifty miles a day, could not be expedited to one hundred; but even this latter rate would now be considered intolerably slow on the great post-roads. (Tucker's *Life of Jefferson*, vol. i., p. 376.)

COAGULATION, the solidification of a liquid produced without evaporation and without crystallization. It is also often effected without reducing the temperature of the substance coagulated, in which it differs from mere congelation.

Coagulation occurs in various ways in different fluids. Thus when albumen, or the white of egg, is heated, it is rendered solid or it coagulates; but when a solution of gelatin cools, it undergoes a similar change. The cause of the spontaneous coagulation of the blood, by which it is resolved into serum and coagulum has not been explained, and we are equally in the dark as to the immediate cause of the coagulation of cheese by the action of rennet; the separation of butter is attended with heat, and the immediate cause is mechanical action.

There are some cases of pure chemical action which resemble coagulation in appearance; when, for example, solutions of sulphate of soda and nitrate of lime are mixed, a sudden solidification takes place: but this is probably a case of confused crystallization, and not, strictly speaking, of coagulation.

COAITA. [ATELES, Species 1, vol. ii. p. 547.]

COAL, COMPOSITION OF. From the very different qualities of the several varieties of coal, it might naturally be expected that they would vary in composition, and this is actually found to be the case. They generally agree however in containing a much larger proportion of carbon than of the other elements, which are chiefly oxygen and hydrogen, and frequently a small portion of azote.

The composition of coal may be regarded under three different points of view: first, as to the quantities of combustible matter and earthy impurity; secondly, as to the mode in which the pure constituents of the coal are combined; and thirdly, as to its ultimate analysis.

With respect to the first, we shall state a few of the results obtained by Mr. Mushet.

	Volatile Matter.	Charcoal.	Ashes.
Derbyshire cannel coal .	47·000	48·362	4·638
Scotch · ditto .	56·570	39·430	4·000
Welsh furnace ditto .	8·500	88·068	3·432
Ditto stone ditto .	8·000	89·700	2·300
Kilkenny coal . .	4·250	92·877	2·873

Macquer had observed that nitre does not detonate with oily or inflammable matter till it is reduced to coal, and then only in proportion to the carbonaceous matter which it contains. Following this opinion, Kirwan imagined that he might be able to distinguish the quantity of bitumen and maltha from that of mere carbon which the coal contained by deflagration with nitre. The method is not susceptible of great precision, but the following results are worth recording:—

	Charcoal.	Bitumen.		Earth.
Kilkenny coal .	97·3	0		3·7
Compact cannel .	75·2	21·68	Maltha	3·1
Swansea . .	73·53	23·14	mixt.	3·33
Wigan . .	61·73	36·7	do.	1·57
Newcastle . .	58·00	40·0	do.	—
Whitehaven .	57·00	41·3		1·7

The following are the results of the analyses of some varieties of coal:—

Analyst.		Carbon.	Oxygen.	Hydrogen.	Azote
Karsten.	Newcastle coal	84·99	11·78	3·23	
Ditto.	Cannel coal .	74·83	19·72	5·45	
Crum.	ditto ditto .	70·9	24·80	4·30	
Ure.	ditto ditto .	72·22	21·05	3·93	2·8

As during the preparing of carburetted hydrogen gas from the decomposition of coal, a quantity of ammonia is generally, if not always, produced, it must in these cases contain ammonia, as shown in Dr. Ure's analysis. According to Dr. Thomson, indeed, who seems however to have overrated the quantity, caking or bituminous coal gives nearly 16 per cent. azote, and cannel coal above 13 per cent. of the same element; whereas Karsten and Crum find none, and Dr. Ure only 2·8 per cent. It is therefore probable that different kinds of coal have been analyzed under the same name; and the subject requires further investigation.

COAL-FIELDS, a term used to express those extensive carbonaceous deposits which are found in many parts of the world, but more especially in our own island. The following article is limited to a description of the various coal-fields of the United Kingdom, together with a short notice of the locality of coal-fields in other parts of the world.

The following general arrangement of the coal-fields of England and Wales, which is offered by Messrs. Conybeare and Phillips, seems to be as good and natural a classification as can be adopted. 1. The great northern district, including all the coal-fields north of the Trent. 2. The central district, including Leicester, Warwick, Stafford, and Shropshire. 3. The western district, which may be subdivided into north-western, including North Wales, and south-western, including South Wales Gloucester, and Somersetshire.

Coal is found in these fields in strata of various thickness, alternating with slate-clay and sandstone; the alternations being frequently and indefinitely repeated. The coal-beds, which are of various qualities, are principally distinguished by the proportion of bitumen in the coal. Three species are enumerated, in each of which the quantity of bitumen has been ascertained. 1. The caking coal, likewise distinguished by many other provincial names, yields about forty per cent. of bitumen: this is the prevailing kind in the Northumberland and Durham mines. 2. The cannel coal, called parrot coal in Scotland, contains about twenty per cent. of bitumen: this coal occurs in Lancashire also. 3. The stone coal, likewise known under many other names, contains little or no bitumen: this is the ordinary coal of the Staffordshire and Scotch collieries. The coal seams, together with their alternating strata, called the *coal-measures*, usually lie on beds of millstone grit and shale (hard coarse-grained sandstone and slate-clay), which sometimes exceed 120 fathoms in thickness. Under this series is the mountain or carboniferous limestone, an assemblage of calcareous strata, of variable thickness, sometimes exceeding 900 feet. This limestone is frequently characterized by caverns* and fissures. The carboniferous limestone rests on a bed of old red sandstone, varying in thickness from 200 to 2000 feet. These four different series of strata are usually comprehended under the term 'coal formation.' Though in general the coal-measures lie above the three beds just enumerated, these beds do not form an essential part of the coal formation; for sometimes the coal-measures occur without these intermediate series, and repose immediately on the transition rock: such is the case in the coal-fields of Coalbrook Dale and of Dudley.

A general resemblance in structure appears in all the English coal-fields, but still with considerable local varieties. The phenomena by which dykes or faults are produced have sometimes uplifted the strata on one side of the dyke many fathoms above those on the other side, and occasioned irregularities extremely perplexing to the miner. These dykes are fissures which traverse the strata, often extending several miles, and penetrating generally to an unknown depth. These fissures are usually filled with clay, with the debris of the dislocated strata, or sometimes by basaltic rocks

COAL-DISTRICT NORTH OF THE TRENT.—This great coal formation encircles the whole Penine chain on the east, south, and north; not however in one uninterrupted line, but in a series of detached coal-fields. 1. The coal-field of Northumberland and Durham. 2. Some small detached coal-fields in the North of Yorkshire. 3. The coal-field of South Yorkshire, Nottingham, and Derby. 4. The coal-field of North Stafford. 5. The South Lancashire coal-field. 6. The North Lancashire coal-field. 7. The Whitehaven coal-field.

1. *The Coal-field of Northumberland and Durham* commences near the mouth of the river Coquet on the north, and extends nearly to the Tees on the south. As far as Shields the sea is its boundary on the east; from that point it leaves a margin of a few miles between it and the sea, and extends about ten miles west from Newcastle. Its greatest length is fifty-eight miles, and its greatest breadth about twenty-four. The coal-measures of this field rest on the series of strata of the millstone grit and shale, and are in part under the magnesian limestone, the northernmost point of which is near the mouth of the Tyne. The beds of which this coal formation is composed dip towards the east and crop out towards the west, so that a section of them gives the idea of a form of a boat. In consequence of this disposition, the beds of coal in some places appear at the surface, while in the middle of the basin they are at great depths. At Yarrow, about five miles from the mouth of the Tyne, one of the thickest beds, called the High Main, is 960 feet deep, and rises on all sides; the dip of the strata averages one inch in twenty, but this is not uniform throughout; and therefore that bed does not rise to the surface at equal distances around Yarrow. The beds of the coal-measures are eighty-two in number, and consist of alternating beds of coal, sandstone, and slate-clay; making an aggregate thickness of 1620 feet, which varies however in different parts. The irregularities of the surface do not affect the dip or inclination of the strata; so that when a valley intervenes, they are found in the sides of the opposite hills at the same levels as if the respective strata had once been continuous. It is difficult to determine the exact number of beds of coal, in consequence of the different depths at which the same bed occurs, the numerous faults, and the varying thickness of the beds of coal and other strata. These strata occasionally enlarge and contract so much, that it is only by extensive observation that the identity of the seams can be ascertained. Dr. Thomson supposes the whole number of beds of coal in this field to be twenty-five; Messrs. Conybeare and Phillips state that forty beds of coal have been seen; a considerable number however of these are very thin. The two most important beds are those distinguished by the names of High Main and Low Main. The thickness of the first is six feet, and of the second six feet six inches. The Low Main is about sixty fathoms below the High Main. Eight other beds of coal occur between these: one called Bensham is four feet thick, and another called Coal Yard is three feet thick. Seven beds of coal have been observed under the Low Main, some of which are of considerable thickness, but of an inferior quality. The aggregate thickness of the whole number of seams is about forty-four feet; but there are eleven beds not workable, the thickness of some of them being only a few inches. Five others amount together to only six feet. Making proper deductions for these, it may be considered that the available beds amount to thirty feet in thickness. The different strata which occur in the G. Pit, Wall's End colliery, are given in the Parliamentary Report on Accidents in Mines, 1835. The space which it would occupy prevents our inserting this tabular view of the strata.

The whole surface of the coal-field is calculated by Dr. Thomson at 180 square miles, on the assumption that its length is twenty-three miles, and mean breadth eight. But according to the latest geological maps, these dimensions appear very far below the actual length and breadth, and it is perhaps nearer the truth to estimate the area at double that number of square miles. The greatest number of mines are on both sides of the Tyne, and not far from its banks. There are several in the northern part of the field, and many about five miles south of the Tyne, about midway between Newcastle and Durham.

The number of dykes or faults which traverse this field is very considerable. They appear to run in all directions. The most remarkable, called the Great Dyke, or 90-fathom dyke, has received the latter name because the beds on the north side of it have been thrown down 90 fathoms. Its direction is N.N.E. and S.S.W. It enters the sea a little to the south of Hartley, or about three miles north of Shields, and running westward crosses the Tyne at Lemington, about four miles west of Newcastle bridge. In some places it is only a few inches wide, but in Montagu colliery it is 22 yards wide, and is filled with hard and soft sandstone. From the southern side of this dyke two others branch off, one to the S.E. and the other to the S.W. The latter, called from its breadth the 70-yard dyke, is also filled with hard and soft sandstone. This dyke intersects the upper or Beaumont seam of coal, but does not alter the level on either side. The thickness of the seam however decreases, beginning at the distance of 15 or 16 yards from the dyke; and the coal first becomes sooty, and at length assumes the appearance of coke. The south-eastern branch is only 20 yards in breadth. Another dyke, which passes through Coaley Hill, about four miles west of Newcastle, is about 24 feet wide. It is filled with basalt in detached masses, which are coated with yellow ochre; a thin layer of indurated clay is interposed between the sides of the fissure and the basalt. The upper seam of coal is here about 35 feet from the surface, and where it is in contact with the dyke is completely charred. Another dyke, which crosses the Tyne at Walker, and traverses the Walker colliery, does not alter the level of the strata, but on each side of it the coal is converted into coke, which on one side in some places was found to be 18 feet thick, and on the opposite side only about 9 feet. (Conybeare and Phillips, p. 447.) At Walbottle Dean, 5½ miles west of Newcastle, a double vein of basalt crosses the ravine in a diagonal direction, passing nearly due east and west; it underlies at an angle of 78 degrees, and cuts the coal strata without altering their dip, but the seam of coal is charred. A dyke, called the Cockfield Dyke, 17 feet wide, throws up the coal-measures on the south 18 feet. The Low Main coal, contiguous to the basalt, is only 9 inches thick, but enlarges to 6 feet at the distance of 150 feet from it; the coal contiguous to the dyke is reduced to a cinder The dykes, if not large, are locally called *troubles*, *slips*, or *hitches*. These minor faults are numerous and extensive, and are a perpetual source of difficulty and expense to the coal-owner by disturbing the level of the strata and by the disengagement of carburetted hydrogen gas. They are not however without their use, being often filled with a tenacious water-proof clay, by which numerous springs are dammed up and brought to the surface. The faults which depress the strata have kept valuable seams within the basin, which would otherwise have cropped out and have been lost.

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* The Derbyshire caverns are in this limestone.

The coal-field of Northumberland and Durham supplies an enormous quantity of coal. Besides being consumed in its own district, London depends nearly altogether on it, as well as all the southern coast counties, with the exception of Cornwall. It is consumed along the eastern coast, including all the eastern counties as far west as Hull, Boston, Peterborough, Bedford, and Windsor. Shields, Stockton, Seaham, and Sunderland, are the ports from which the coal is shipped: the Tyne vessels, being the larger, are laden for the London market; those of the Wear, which are much smaller, sail to the small rivers and harbours along the coast, and carry coal as far west as Plymouth. An inquiry as to the probable duration of this supply is one of no small interest. Dr. Thomson calculates that this coal-field may fairly be expected to yield coal for 1000 years, at the annual consumption of two millions of chaldrons; but as we have no data by which to discover how much coal has been already consumed, we cannot tell how much of these 1000 years has already elapsed. Besides this, Dr. Thomson has taken the average annual consumption much too low for the present time. The coals shipped from the Tyne, the Wear, and the Tees, in 1835, amounted to 4,368,144 tons. The quantity of waste coal is estimated at one-third of the whole. Without therefore taking into account the consumption of the immediate district, the annual quantity of coal taken from the mines is more than 6,552,216 tons.

On the other hand it appears that in this calculation the area of the coal-field is very much under-estimated, being taken at 180 square miles. Professor Buckland, in his examination before the House of Commons, limits the period of supply at the present rate of consumption to about 400 years. Mr. Baily, in his Survey of Durham, states the period for the exhaustion of the coal to be about 200 years hence. Some proprietors of the coal-mines, when examined before the House of Commons, in 1830, extended the period of exhaustion to 1727 years. They assumed that there are 837 square miles of coal strata in this field, and that only 105 miles had been worked out. The small coal taken out of the pits is not considered worth shipment; large quantities of it are therefore often piled up near the mouths of the pits. These masses of coal are frequently set on fire, and burn for several years. Dr. Thomson describes two of these immense fires which were burning in 1814. About three miles to the north of Newcastle and three miles off the road from Berwick, on the left hand, 'one has been burning these eight years. The heap of coal is said to cover twelve acres. The other, on the right hand, is nearer the road and therefore appears more bright: it has been burning these three or four years (1814).' Of late years many more manufactories have been established in this district, by which a great quantity of the small coal is consumed.

Besides this coal-field there is another coal formation in the northern counties, which is minutely described by Dr. Thomson in the 'Annals of Philosophy,' November, 1814, under the name of the Independent Coal Formation. This tract terminates westward at Cross Fell, in Cumberland, is supposed to occupy the whole of Durham, and constitutes the whole of that part of Northumberland east of the Cheviots, exclusive of the coal-field already described. The different strata of this coal formation amount to about 147. The coal-measures here differ from those we have just noticed, in having limestone as well as sandstone and slate-clay alternating with the beds of coal; the coal worked in this formation is slate-coal, and is considered inferior in quality to the Newcastle coal. There are several collieries, but the coal is only employed for home consumption. The lowest bed of these measures crops out near Cross Fell. The coal of which it is composed, provincially called crow-coal, falls into powder when exposed to the air, and cannot be burnt by itself. The poorer class make it up into balls with clay, and use it for fuel. This bed is 387 fathoms below the lowest of the Newcastle beds. (*Ann. of Phil.*, vol. iv.) There are numerous lead mines in this tract.

2. *Detached Coal-fields in the North of Yorkshire.*—These are very limited in extent, being small insulated coal basins, lying in hollows in the gritstone. They occur near Middleham, Leyburne, Thorpefell, near Burnsell, and as far west as Kettlewell. The seam is seldom more than twenty inches thick. At Thedswell Moor the lowest seam is one yard, but the stratum diminishes and vanishes at the edges. Messrs. Conybeare and Phillips doubt whether these beds should not be referred to the thin coal seams subordinate to the millstone grit series rather than to the principal coal-measures.

Coal is wrought in some parts of the great carboniferous chain extending from Penigent to Kirkby Stephen. Here the great 'Craven fault' occurs, described by Professor Sedgwick ('On the Carboniferous Chain from Penigent to Kirkby Stephen,' *Geol. Trans.*, vol. iv. series 2) as ranging along the line of junction of the central chain with the skirts of the Cumbrian system, passing along the south flank of Casterton Low Fell, up Barbondale, thence across the valley of Dent through the upper part of the valley of Sedbergh, and along the flanks of Bowe Fell, and Wildboar Fell, to the ridge which flanks Ravenstone Dale. Throughout the whole of this line there are enormous and most complex dislocations, which affect the strata of the coal formation and produce other phenomena. Only one of the coal strata in the lowest part of the coal-measures is sufficiently valuable to be worked; it varies from eighteen inches to nearly four feet in thickness. At Turna Fell, near Hawes, in Yorkshire, and at Tan Hill, near the highest part of the road from Brough to Argengarthdale, this coal is extensively worked, and is of good quality. The same seam is found near Kirkby Stephen. Horizontal drifts have been carried into this bed near the top of Penigent, of Whernside, and of Great Colm; but in these parts it is of bad quality and not fit for domestic use, being mixed with ferruginous and pyritous shale. This coal varies in thickness from a mere trace to two feet. It was once worked to some extent on the south side of the valley of Dent, by means of horizontal drifts under Great Colm. It was only a few inches in thickness, but said to be of so good a quality as to be in great request. About 70 or 80 years ago it was sent on pack-horses from this place as far as Kendal, for the use of blacksmiths' forges, &c. Kendal has long been supplied with fuel from the Lancashire coal-fields; but this fact, of comparatively so recent a date, strongly illustrates the astonishing progress we have made in our modes of internal communication.

At the Barbon coal-pit in Westmoreland, a coal-bed of this series is likewise wrought; the lower part of it is however so impure as to be unfit for ordinary purposes, and is chiefly consumed in lime-works. The following is a section of the strata as occurring in the Barbon colliery:—

		feet.	in.
1.	Alluvial soil	52	6
2.	Plate (calcareous shale)	1	6
3	Limestone, the 4th or Mosdale Moor limestone of the great section	27	0
4	Gritstone	27	0
5	Alternations of shale and gritstone	12	0
6	Shale	30	0
7	Crow limestone	2	0
8	Plate with a 3-inch crow-coal	1	6
9	Gritstone	27	0
10	Coal	1	2

The strata of the coal are in general much less regularly continuous than the strata of limestone. This however is not always the case. Some of the thin bands of coal here appear to continue with astonishing regularity. The following example is quoted from Professor Sedgwick. 'At Cross Pits, in the valley of Dent, the coal seam under th 12-fathom limestone is divided, by a band of clay half an inch thick, into two parts, with distinct mineral characters; and the same coal seam, with exactly the same subdivisions, has been found in the mountain on the opposite side of the valley at the distance of three or four miles measured in a straight line. This seems to prove that a bed not more than a fraction of an inch thick was originally continuous throughout an area probably several miles in diameter.' (*Geol. Trans.* vol. iv. sec. 2, p. 101.)

3. *Coal-field of South Yorkshire, Nottingham, and Derbyshire.*—This extensive field, which in character is closely allied to that of Newcastle, is considered by some geologists as a re-emergence of the same strata from beneath the covering of magnesian limestone under which it is concealed through the intervening space. This coal-field occupies an area extending north and south from a little to the N.E. of Leeds nearly to Derby, a distance of more than sixty-five miles; its greatest width, 23 miles, is on the north, reaching nearly as far as Halifax to the west. On the south it extends towards the east to Nottingham, and is here about 12 miles wide; but in some parts it is much narrower. The strata of these coal-measures range in the same manner as in the Northumberland coal-field, from north to south, dip to the east and rise to the west and N.W., in which directions the lowest measures at length crop out against the rocks of the millstone-grit series, which constitute the higher ridges of the Penine chain. The strata of this coal formation are very numerous. There are twenty beds of gritstone at the least, some of great thickness. Most of these beds consist of grains of semi-transparent silex united by an argillaceous cement; the lowest of these beds is termed the millstone grit, beneath which no workable coal is found. Besides these gritstone beds there are numerous strata of shale (slate-clay), bind (indurated loam), and clunch (indurated clay), alternating with several beds of coal of different thickness and value. A hard argillaceous rock called crow-stone forms in some places the floor of the coal beds, and is supposed to be a variety of the clunch still more highly indurated. The numerous faults in this coal-field render it extremely difficult to ascertain the exact number and order of the coal beds. Mr. Bakewell (p. 384) states their number at thirty, varying from six inches to eleven feet, and the total thickness of coal at twenty-six yards. This however he considers as only an approximation. Three varieties of coal occur in these measures: *hard*, or stone, which burns to a white ash; *soft*, or bright, which burns to a white ash; *caking*, or crozling, which usually burns to a red ash. The first is esteemed the best, and is in much greater demand than the others. The thickest bed is worked near Barnsby. In a pit near Middleton, the property of the Reverend Ralph Henry Brambling, three seams are being worked; one at the depth of about forty to seventy yards from the surface, another thirty-eight yards lower, and the deepest from twenty-eight to thirty-two yards deeper, making the whole depth from one hundred and ten to one hundred and forty yards. The upper seam is about two feet eight inches thick, the middle seam from two feet ten inches to three feet four inches, and the lower one from four feet six inches to five feet.

The strata of this field, according to Mr. Farey, are traversed by an immense fault commencing from Allestry, in the south, and running in a zigzag direction through the south and east part of the field; the rise of the strata is said to be much more rapid on the western than the eastern side of the fault. Besides this great fault there are many others which traverse the field in various directions, and create an inextricable confusion by the rise and fall of the different strata, rendering it almost impossible to trace distinctly the continuation of each bed. This coal-field supplies the coal for the important manufactures which surround it, and also, by means of inland navigation, the midland counties south and east of Derbyshire.

A little to the west of the coal-field already described, coal has been found in two places about half way between Ashborne and Derby, but it has not been worked.

4. *Coal-fields of North Stafford.*—There are two detached coal-fields: the one situated on the N.E. of Newcastle-under-Lyme, distinguished as the Pottery coal-field; the other at Cheadle, to the east of the first. The form of the Pottery coal-field is triangular. Its vertex is near Congleton, from which point the sides diverge to the S.S.E. and S.S.W., running in each direction about ten miles; the base is estimated at about seven miles: Newcastle is nearly in the centre of the base. The strata dip from the two sides to the centre of the area. On the eastern side the inclination westward is estimated at one foot in four; on the other side it is still more rapid. Between Burslem and its eastern limit, nearly in the centre of the coal-field, it has been ascertained that there are thirty-two beds of coal of various thickness, generally from about three to ten feet each; but the strata are in general much dislocated in this field.

In the principal mines in this district coal is found at various depths, from fifty to three hundred yards and more; there has been a mine worked at the depth of more than four hundred yards. Some seams only twenty inches thick have occasionally been worked, but they are seldom worked under three or four feet thickness.

The Cheadle coal-field is an insulated basin surrounded by and reposing upon millstone grit; it is about five miles long and three miles broad, and is of little importance.

5. *The Manchester or South-Lancashire Coal-field* is separated from that of South Yorkshire and Derbyshire by the range of lofty hills extending from near Colne to Blackstone Edge, and thence to Ax Edge in Derbyshire. It commences near the western side of this range in the north-west of Derbyshire, and continues thence to the south-western part of Lancashire, forming an area somewhat in the shape of a crescent, having Manchester nearly in the centre. The chord or span between the opposite horns is about forty miles. It runs nearly due north from Macclesfield to a few miles beyond Rochdale, a distance of thirty miles; the part between Macclesfield and Manchester is however very narrow, being in some places not two miles in width. From Rochdale it extends westward to Bolton and Chorley, south-west to Leigh and Prescot, north-west to Preston, and north to Colne. Viewing it as a whole, the strata rise towards the exterior edge of this crescent-shaped coal-field, along which the strata of millstone grit, on which they repose, crop out from beneath them, and dip towards its inner edge, where they are covered by the superior strata of the newer sandstone formation, which contain occasionally beds of calcareo-magnesian conglomerate. Great disturbances have however interrupted the regularity of this arrangement, and caused divisions of the coal-measures which render it difficult to trace out the exact dimensions of the field. At Disley, in Cheshire, it 'bifurcates' into two branches, having an intermediate ridge or 'saddle of millstone grit, the eastern branch forming a trough, of which the strata crop out on both sides against the millstone grit.' This part of the field is a long narrow strip joined to the main field at Disley, and extending thence southwards fifteen miles to near Mearbrooke in Staffordshire. The strata of the western branch of this bifurcation, extending from Disley to Macclesfield, dip again to the west, but not at so great an angle as they rose, on the east side of the intermediate ridge. In other parts of the coal-field great faults occur, but it has not been sufficiently investigated by the geologist for them to be distinctly traced. Mr. Bakewell has investigated a small portion, which he distinguishes as the coal-field of Bradford: the result of his observations is found in the second volume of the *Geological Transactions*. This tract is rather more than two miles long, and little more than one mile and a furlong wide. It is situated on the river Medlock, a shore distance E.S.E. of Manchester. It is surrounded on every side, except the east, by the red sandstone which prevails in the environs of Manchester. Beds of limestone pass under this, and overlay the coal-measures, in which there are several beds of coal rising to the north, under an angle of 30°. One of these, near the centre of the field, is four feet in thickness. To the north of these inclined beds there is a considerable disturbance, and the direction of the beds becomes suddenly vertical. One of the vertical beds, together with its accompanying strata, bears so close a resemblance to the four-feet coal above mentioned, that there is no doubt of their identity, and that the vertical stratum was, before the dislocation which severed them took place, a continuation of the first. With these vertical beds the coal-measures terminate: on the north an interval of the red sandstone succeeds for about 1400 yards, when coal-beds again appear, rising as before towards the north. All this indicates considerable faults and subsidences, which however cannot be accurately traced at present. The coal from the Lancashire field supplies Manchester, Liverpool, and the surrounding district.

6. *The North Lancashire Coal-field* is one of little importance. It lies midway between Lancaster and Ingleton; it is about eight miles long and six miles wide, but it has never been thoroughly examined, and its strata cannot be distinctly stated.

7. *The Whitehaven Coal-field* is situated on the west coast of Cumberland, and extends from near Egremont, south of Whitehaven, to Allonby on the north.

Mr. Buddle, in his examination before the House of Commons, states that the thickest seam in this coal-field is nine feet; and in speaking of the Whitehaven colliery calls it 'the finest in England, both in point of thickness of the seams and in extent.' The shafts in the mines belonging to this field are usually very deep: there are several 100 fathoms and upwards. The Workington mines, in which the same seam is worked as in those of Whitehaven, go to a considerable extent under the sea, but not so far as the Whitehaven collieries.

Central Coal District.—Under this division are classed the coal-fields of Ashby-de-la-Zouch, of Warwickshire, and South Staffordshire.

1. *The Coal-field of Ashby-de-la-Zouch* is of a very irregular figure, and so much dislocated, that it rather forms two small basins than one continuous whole. The greatest length from north-west to south-east is about ten miles, the greatest breadth about eight miles. The eastern extremity of this area approaches almost close to the transition district of Charnwood Forest. This coal-field is described by Mr. Farey 'as one of the highly curious but perhaps not uncommon occurrences, in the red marl districts; a tract entirely surrounded by a fault, or a series of faults, which unite, seem lifted up through the red marl strata, and denudated, the coal strata having rapid dips in various directions, while the surrounding strata of red marl are horizontal, or as nearly so as may be.' Of the two portions of the field, one ranges by Ashby Wold, about three miles on the west of Ashby; the other by Cole Orton, about the same distance on the east.

The Ashby Wold portion ranges from Swepston, four miles south of Ashby, to Bretby in Derbyshire: the inclination of the strata is towards Ashby; but between the out-crop of the beds and that town another crop has been traced near Brothorpe, dipping in a contrary direction. More than twenty coal-works have been opened on this line. The lowest shaft sunk is to the depth of 246 yards. One of the seams is from 17 to 21 feet thick. This great thickness is caused, it is supposed, by the running together of two or more seams—a circumstance which is known to occur in the coal-fields of South Staffordshire. The eastern portion of this district commences about a mile and a half north-east of Ashby, and extends about six miles in length, running parallel to the larger portion. The strata dip to E.N.E. In the pits belonging to Sir George Beaumont two coal-beds, each a yard and a half thick, are worked. On Cole Orton Moor several coal-seams, which have been proved to lie above these, have been worked at the depth of 116 feet.

2. *The Warwickshire Coal-field* commences at Wyken and Sow, two villages about three miles east of Coventry, and continues in a north-west direction to Polesworth and Wareston, about five miles east of Tamworth, a distance of sixteen miles: its average breadth is about three miles. All the strata rise to the E.N.E., the inclination becoming greater towards the eastern edge of the field, where in many parts it makes an angle of more than 45° with the horizon: towards the west it decreases to about one foot in three, and lastly in five. The principal collieries are near the south of the field, at Griff and Bedworth. The depth of the first is 117 yards, and the principal seam three yards in thickness. The same seams are worked in the Bedworth mines, but there the first and second coal-seams of Griff run together and form a five-yard seam. The intermediate strata of shale which separate them at Griff are found in the eastern shaft to be thirty-three, and in the western twenty-five yards thick; but they gradually decrease as they proceed westwards, till at length they entirely vanish.

3. *South Staffordshire* or *Dudley Coal-field*, the principal in the central district, extends from Beverton, near Badgely, on the N.E., to near Stourbridge on the S.W. The greatest length is about twenty miles, and its greatest breadth, from Walsall to Wolverhampton is about seven miles, but it is very irregular towards the south, being almost divided into two parts. The area from actual survey has been found to be about sixty square miles. The southern portion, extending from Stourbridge to Bilston, about seven or eight miles in length and four in breadth, has been fully investigated by Mr. Keirs, and described by him in Shaw's 'History of Staffordshire.' No satisfactory account of the northern portions of this field has hitherto been published; many coal seams, of eight, six, and four feet in thickness, are worked in it. The southern portion is of much more importance, as it contains seams from 30 to 45 feet in thickness. This enormous thickness is however not one continuous seam, but a number of seams, divided by layers of what the miners call band, which are very thin beds of clay-slate. The working of these thick seams is not so profitable as might be supposed. The pillars left standing in order to support the high roof are estimated at about one-third of the whole coal in the bed, and the small coal left in the mine is about equal to another third, so that only one-third of the whole is at present taken out of the mine.

In the coal-measures of this district there is an absence of the millstone grit, carboniferous limestone, and old red sandstone, which usually lie under the coal-measures. The coal-measures rest, in the Dudley Coal-field, on the transition rock at once, without any intermediate strata: this singularity is likewise observed in the Coalbrook Dale coal formation.

The coal district in South Staffordshire is traversed from N. W. to S. E. by apparently a line of hills, but they are not absolutely continuous, though they have a uniform general direction. On examination, the hills on the north and those on the south of Dudley are found to differ entirely in their character. The northern chain consists of highly inclined strata of limestone, against the sides of which all the coal-measures crop out at a considerable angle, but come nearer a horizontal position as they recede from these hills. The other chain of hills, on the S. of Dudley, are entirely composed of one mass of basalt and amygdaloid, and the coal-measures preserve their usual level in approaching the hills, not cropping out as they do upon the limestone chain. Two opinions are entertained with regard to these basalt elevations · 'they may be either the protruding edge of a vast basaltic dyke traversing the coal-field, or an overlying mass:' the latter is considered the more probable. The coal-measures on the south, near Stourbridge, appear to dip beneath the beds of the newer red sandstone formation: the beds of this and of the Warwickshire coal-field dipping in opposite directions under the super-strata give reason for supposing that they may extend continuously below this through the intervening space. The eastern side of the field, which extends a little beyond Walsall, is bounded by the same limestone with that of Dudley, and the coal-measures are observed again to crop out against it, thus lying in a basin between these two towns. That the coal-beds rise towards the north, and the upper ones crop out while others continue under the surface, is very satisfactorily shown by the comparison of the strata in different collieries. At Tividale the main coal is sixty and a half fathoms below the surface; at Bradley it is only twenty and a third; and the greater number of beds which cover the main coal at the former place have entirely disappeared before the main seam reaches Bradley; and farther to the north the main seam also crops out and disappears altogether. A very curious phenomenon takes place at Bloomfield Colliery, to the S. Bilston, thus described in the 'Geology of England,' p. 412 'The two upper beds of the main coal, called the roof, floor, and top slipper, separate from the rest, and are distinguished by the name of the *flying reed*. This separation grows wider, and at Bradley Colliery amounts to twelve feet, four beds of shale (slate-clay), and ironstone, being interposed. These two upper beds crop out, while the rest of the main coal goes on to Bilston, and is only eight yards thick.'

This district supplies coals to the numerous iron-works in the immediate neighbourhood, and the manufactories of Birmingham and its vicinity; besides which, all the neighbouring counties, as far south as Reading and Gloucester, are supplied by means of inland navigation

The clay ironstone occurs in various beds, but is only wrought in two: one of these is the bed under the main coal, and is wrought for iron ore.

Many faults or dykes occur in this field; they are usually fissures in the beds, filled up with clay, and very frequently the levels of the different strata vary in consequence

There is a great fault near Bilston, which causes the dip of the strata to be reversed, the beds on the south side dipping south, and on the north side dipping north: this is however an unusual circumstance.

Dr. Buckland has observed indications of coal near the Lickey Hill, a few miles south of this coal-field.

Western Coal Districts.—The coal-fields of this division are disposed around the transition district of North and South Wales. The north-western district includes the coal-fields of Anglesey and Flintshire, the western those of Shropshire, the south-western those of South Wales, of South Gloucester and Somerset, and of the Forest of Dean.

1. *Isle of Anglesey.*—At the distance of about six miles from the Menai Straits, and running nearly parallel to them, a remarkable valley stretches across the whole island. This valley opens on the north into Red Wharf Bay, and on the south into the æstuary of Maltraeth; it is flanked on both sides by parallel bands of carboniferous limestone, in the depression between which coal has been found, and it is thought probable that the coal-measures may extend through the whole line. Coal has been worked near the Maltraeth æstuary; and a few years since shafts were sunk in the neighbourhood of Trefdaeth. Successful trials have likewise been made at Pentreberen, about five miles north-east of the former pits: the beds are said to be of a tolerable thickness, and the coals of a good quality.

2. *Flintshire.*—The coal-field of this county extends north and south from Llanassa, near the western cape of the æstuary of the Dee, to near Oswestry, in Shropshire, forming an exterior belt co-extensive with the range of the mountain line from the north of the Clwyd. Where the carboniferous limestone is partially interrupted by the mountain of Selattyn the coal shales rest immediately on the transition slate, of which that mountain is composed. (Conybeare and Phillips, p. 419.) The greatest length of the district in which the coal-measures are found is about thirty miles, but it must by no means be understood that coal is worked throughout. At Oswestry there is a very small detached piece, not more than three miles long and half a mile broad; there is then an interval of some miles. Near Chirk another coal tract commences, and runs north for about five miles; then another interval occurs; and a little to the north of Wrexham the principal portion begins, and thence extends to the coast and forms a narrow belt along it to the termination at the west cape of the Dee. The beds dip from one yard in four to two in three, sink beneath the æstuary of the Dee, re-appear on its opposite side, and finally sink beneath the strata of the newer red sandstone. This position of the coal-measures has led to the conjecture that they are connected with the beds of the Lancashire coal-field. The coal formation here commences with the same strata as those of Derbyshire. The beds of coal vary in thickness from three quarters of a yard to five yards. In the Baggalt mines three seams are worked, varying from three feet and a half to seven foet. Common, cannel, and peacock coal are found.

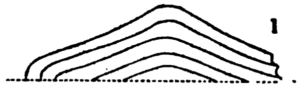
3. *The Coalbrook Dale Coal-field* rests on transition rock: it extends from Wombridge, in the parallel of Wellington, to Coal Port, on the Severn, a length of about six miles; its greatest breadth is about two miles. The coal-measures are composed of the usual alternating strata, which occur without much regularity, except that each bed of coal is always immediately covered by indurated or slaty clay, and not by sandstone. The strata are eighty-six in number. In Madely colliery a shaft is sunk 729 feet through all the beds. The first coal seam, which occurs at the depth of 102 feet, is very sulphureous, and not more than four inches thick; nine other beds of a similar nature, but rather thicker, occur between this and the depth of 396 feet. This coal is called 'stinking coal,' and is only employed in the burning of lime. The first seam of coal that is worked is 496 feet deep and five feet thick. Two other beds of coal occur, one ten inches and the other three feet thick, before the bed of 'big flint' sandstone, which is found at the depth of 576 feet: nine beds of coal occur, of the aggregate thickness of 16 feet, between the 'great flint' and the 'little flint' bed (an interval of 100 feet). Beneath the 'little flint' and the lowest bed of the whole formation, there is a sulphureous eight-inch coal. This account of the strata refers more particularly to the Madely colliery. The coal of this field is usually a mixture of slate-coal and pitch-coal.

West of the Coalbrook Dale field there are a few detached, narrow, and broken coal-fields in the plain of Shrewsbury, at the other side of the Wrekin.

Several small coal-fields occur in the Brown Clee Hill and the Titterstone Clee Hill, which rise a few miles south of the Coalbrook Dale-field; the latter hill is about four miles south of the former. The coals in the Brown Clee Hill only lie in thin strata, while the principal stratum in the Titterstone Clee Hill is six feet thick. The coal-fields on the Titterstone Clee Hill are represented as six detached portions, or separate basins, cut asunder and rendered irregular by a vast basaltic dyke, more than 100 yards wide, which intersects the hill. These coal-measures are more interesting to the geologist than the miner.

On the east of these hills, and between them and the Severn, a coal-field extends from Dense Hill and Billingsley on the north, to the borders of Shropshire and Worcestershire on the south, a length of about eight miles, coal being worked in several points along this line. Coal is also worked near Over Arley, on the Severn, adjoining this tract on the west. Only a few miles from the Billingsley coal-field at Pensex, near the foot of the Abberley Hills, is 'a small patch (rather than field) of coal-measures,' and another similar piece about three miles to the west.

The South-Western Coal District comprehends the several coal-fields near the æstuary of the Severn and the Bristol Channel, including parts of the adjacent counties of Gloucester, Somerset, Monmouth, and Glamorgan. The various coal-fields distributed over this district are apparently insulated, yet they have several points of connection. 'They all rest on one common base of old red sandstone; they all appear to have been formed by similar agency, and at the same era, to have been subject at a later period to the same revolutions, and lastly to have been covered partially by similar overlying deposits.' (*Geol. Trans.*, vol. i., 2nd series.) Messrs. Buckland and Conybeare have found that the several basins in the coal formation are divided by lines (which they term '*anticlinal*') formed by the saddles of the strata or meetings at the surface of their vertical angles, on each side of which the strata dip in opposite directions.*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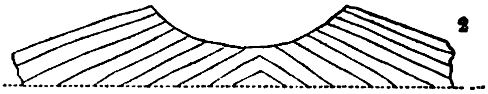
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The coal-measures are thus surrounded by exterior bands of mountain limestone and old red sandstone, in the order of the outcrop of the subjacent beds. This district includes three principal coal basins, together with some smaller ones, adjacent to and closely connected with the two last. First, the South Welsh coal basin; second, that of South Gloucester and Somerset; third, that of the Forest of Dean.

1. *The Coal-field of South Wales* is upwards of 100 miles in length, and the average breadth in the counties of Monmouth, Glamorgan, Caermarthen, and part of Brecon, is from eighteen to twenty miles; it becomes much narrower in Pembrokeshire, being there only from three to five miles. This area extends from Pontypool on the east, to St. Bride's Bay on the west, and forms a vast basin of limestone, in which all the strata of coal and ironstone are deposited. The deepest part of the basin is between Neath and Llanelly: from a line ranging nearly east and west through Neath, all the strata rise on the south towards the south, and on the north towards the north, cropping out at the edges. The limestone crops out at the surface all round the coal, except where its continuity is interrupted by Swansea and Caermarthen Bays. The depths from the surface to the various strata depend upon local situations. The upper coal seam does not extend a mile either north or south beyond Neath, and not many miles in an east or west direction, and its utmost depth is not above fifty or sixty fathoms; the next stratum of coal and those likewise beneath, being deeper, crop out at greater distance from the centre, and so of the rest in proportion to their depth. The lowest bed is 700 fathoms deep at the

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* 'Sometimes these lines follow the crests of the chains of hills (*fig.* 1); sometimes they are to be traced along the course of valleys (*fig.* 2): the hills in the latter case being formed not by the saddles of the strata, but by the escarpments cutting through them.'

centre, and all the principal strata lie from 500 fathoms deep to this depth. But this district is intersected by deep valleys, which generally run in a north and south direction, intersecting the coal. By driving levels in the hills, the beds of coal are found without the labour and expense of sinking shafts; there are also many pits in the low valleys. (Martin, *Phil. Trans.* for 1806.) This basin contains twelve beds of coal, from 3 to 9 feet thick, making an aggregate of 70½ feet; and there are eleven more, from 18 inches to 3 feet, together equal to 24¼ feet; the whole thickness is therefore 95 feet. A number of smaller seams likewise occur. On the south side of the basin, from Pontypool to Caermarthen Bay, the coal is principally of a bituminous nature; on the north-east it is a coking coal; on the north-west, stone coal. Great faults occur in this field, which traverse it generally in a north and south direction, and throw the strata out of their level 40, 60, 80, or 100 fathoms. These dislocations are not often shown on the surface. A principal fault occurs at Cribbath, where the strata of limestone stand erect: another of considerable magnitude lies between Ystradvellte and Penderryn. These dykes are usually filled with clay, but one of some magnitude has been observed near Swansea, which is many fathoms wide, and filled with fragments of the disrupted strata, the level of which differs by more than 240 feet. The rich ironstone of this basin supplies extensive iron-works in the neighbourhood. The principal beds of ironstone occur in the lower part of the coal-measures; the most valuable bed is found beneath the lowest coal. The strata of this coal formation dip much more rapidly on the south than on the north; on the south they make an angle of 45° with the horizon, and on the north dipping only 10°. The coal from the South Wales basin supplies the whole of Wales with the exception of the more northern counties, the whole of Cornwall, and the western half of Devonshire.

2. *South Gloucester and Somerset Basin.*—This basin occupies an irregular triangular space, bounded on the south by the Mendip Hills, which are a high range of mountain limestone resting on an arch of old red sandstone. The vertex of the triangle is on the north, at the village of Tortworth in Gloucestershire: the western side from the Mendips to the vertex is formed by three insulated masses of high land, separated by narrow intervals, the widest of which is less than three miles. Near Tortworth the range extending from Almondsbury is deflected suddenly to the south, and this may be considered the north-eastern frontier of the basin; it may also be traced through Wickwar to Sodbury. The south-eastern limit, from Sodbury to near Mells, the eastern extremity of the Mendips, is mostly concealed by overlying deposits. Partial denudations occur at Lansdown, near Wick Rock, where the limestone can be traced in the valleys dipping towards the centre of the coal basin. From Lansdown to the Mendips the continuity of the basin can be well ascertained, the coal-measures being uncovered in some of the valleys in which the principal collieries are situated. In other places shafts have been sunk through the overlying horizontal deposits, beneath which the coal is worked. The greatest length of this area is 25 miles: the width, from the collieries near Bath to those of Bedminster near Bristol on the west, is about 11 miles. In this district there is much local irregularity, and the stratification of the coal-measures is so deranged that they have very different and varying levels. In some parts the beds are denuded, in others concealed by the more recent horizontal deposits, and thus the whole basin is divided into several detached coal-fields.

The uncovered areas are distinguished by Messrs. Buckland and Conybeare ('Observations on the South-west Coal District of England,' *Geol. Trans.*, 1st vol., 2nd series) into the northern, the central, the southern, the eastern, and the western coal-tracts. The northern is the most extensive and elevated: its greatest length, from the vertex of the basin near Tortworth to the village of Brislington on the left bank of the Avon near Bristol, is 12 miles; its greatest breadth from east to west is nearly four miles. The collieries of Iron Acton, Sodbury, and Kingswood, are in this coal-tract. Along the northern limits of the basin, from Sodbury to Cromehall and Titherington, the coal-measures are exposed in immediate contact with the limestone; on the western, southern, and great part of the eastern border of the tract they are skirted by hills of red marl capped by lias. At Pucklechurch shafts are sunk to the coal through both the latter formations.

The central tract, which begins on the south of Dundry Hill, is divided into two parts by a narrow valley; the northern portion, about six miles in length, extends from Burnet on the north-east to Knowl-hill, near Stanton Drew, on the south-west; near Pensford it is about two miles in breadth. The southern division, extending from Temple Cloud on the west to between High Littleton and Timsbury on the east, is about three miles in length. To the south-east of this central coal-tract the coal-measures are entirely concealed by superjacent deposits through a distance of six miles. Throughout this space however many shafts are sunk, some through the red marl of the valleys, and some through the lias which occurs on higher ground. There are several of the latter description in the parishes of Timsbury and Poulton; but the deepest is on Clan Down near Radstock, which is sunk 200 fathoms before its horizontal adits are driven. Another shaft, beginning in the oolite, is sunk on the edge of the same Down near Paulton, but it is not so deep as the former, since here there is a rise in the strata, and the coal seams are in consequence much nearer the surface. On the ascent of the hill above Chilcompton the coal-measures are again exposed to the extent of about an acre.

The southern coal-tract commences near the point where the road between Bath and Shepton Mallet crosses the Nettlebridge stream, and ends between Vobster and Mells; its greatest length is six miles, and greatest breadth two and a half miles. The coal-measures of the eastern coal-tract are laid open in the vale of the Buoyd at Wick and Upton, both in Gloucestershire; they are likewise exposed at Newton St. Leo, on the left bank of the Avon below Bath, dipping towards the interior of the basin. Several seams are worked at Upton and Newton. The western coal-tract lies at the south-east of Leigh Down, near Bristol. Beds of red marl form the upper strata in the shafts of all the coal-pits of this tract between Long Ashton and Bedminster. The coal-field of Nailsea, lying more to the west, is a continuation of this tract.

A great undulation in the strata of the coal-measures which form the coal-basin of Somersetshire and the south of Gloucestershire alters the apparent position of the seams so much that it is very difficult to ascertain the identity of each throughout the various collieries. The local names of the several seams also tend to confuse the geologist.

The chain of hills which limits the western boundary of this coal district presents remarkable anomalies between Clevedon and Portbury, along its northern escarpment. A great fault ranging along the edge effects a very considerable subsidence of the strata. In consequence of this 'the coal-measures, depressed to the level of the old red sandstone, appear to occupy its place, and seem to dip beneath the mountain limestone, on which, in fact, they repose.' (*Geol. Trans.*, vol. iv., 2nd series.)

The following are the principal subdivisions of the coal-measures in this basin, beginning with the highest. The upper coal shale; the Pennant grit (sandstone), the lower coal shale; and the millstone grit. We refer the reader to the Memoir already quoted for a minute description of the various sections of this coal basin.

In the Bedminster colliery on the S.W. of Bristol, there are three seams of good bituminous coal: the deepest and uppermost are wrought; the former is four feet three inches, the latter two feet and a half to three feet thick; the middle seam is only one foot. The interval between the two principal seams is twenty-three fathoms; the lowest shaft sunk is 127 fathoms deep. These beds are obviously referrible to the lower coal shale. Works were established at Cromhall, a few miles north of Acton, about forty-five years ago, but were soon abandoned, in consequence, it is supposed, of the numerous derangements of the strata. They were again resumed, but not very profitably. The coal differed extremely in thickness in different places, varying from thirty to six inches; while in some parts no coal at all was to be seen. It never retained a regular thickness for many yards together, and in some places it diminished gradually in the line of the dip until it disappeared altogether.

The following is a section of the Cromhall colliery, as given in Mr. Weaver's 'Geological Observations on parts of Gloucestershire and Somersetshire,' *Geol. Trans*, vol. i. series 2:—

	yds.	ft.	in.
Soil and clay	2	0	0
Gritstone or sandstone	23	0	0
Clunchy bind, or indurated slate-clay	1	0	0
Coal, bituminous, very binding, yielding only small coal	0	2	3
Stony clunch, or sandy indurated clay	2	0	0
Rock or sandstone, partly compact and quartzy	15	0	0
Duns, or slate-clay	2	2	3
Black duns, being the immediate roof (very tender), or bituminous shale	0	0	9
Coal, bituminous, yielding large coal 16 inches, small coal 14 inches	0	2	6
	47	1	9

The floor consists of clunch, more or less stony; that is, indurated clay, more or less sandy.

In the meridian of Pitcot, situated a little to the N.E. of Nettlebridge, all the strata are vertical: a perpendicular shaft is there sunk to the depth of eighty fathoms in one bed of coal.

The total number of mines worked in this district is probably less than it was formerly, but the whole produce is certainly much greater, owing to improved methods in working. The seams of coal are very thin in comparison with those which are worked in the principal coal-fields of England, and in most of those would be rejected as not worth the working. The aggregate thickness of the seams worked in any single coal-pit scarcely exceeds one of the ordinary seams in the principal district. However, most of the old pits might again be worked to advantage by the present improved methods, and much of the area is still untouched, and ready for future speculation.

3. *The Forest of Dean Coal-basin* occupies an irregular elliptical area, circumscribed by the triangle formed by the Wye, the Severn, and the road from Gloucester to Ross; the largest diameter from N.N.E. to S.S.W. is about ten, the shorter about six miles. All the strata dip uniformly towards the centre of the basin. The whole of this coal tract, together with the high land that surrounds it, constitutes a mountain group, the average height of which above the level of the sea is about 900 feet. The aggregate thickness of the whole strata of the coal-measures is, according to Mr. Mushet, 500 fathoms; he divides the different strata into seven series, in which there are 27 beds of coal.

On the north of the Forest of Dean basin, and at the distance of a few miles, is the Newent coal-field, a very small tract surrounded and concealed by overlying strata of the newer red sandstone. This field has not been sufficiently explored to enable us to give an accurate account of it.

This description of the coal-fields of England contains sufficient examples both of the general position and distribution of the coal-beds, and of the variations to which they have been subjected, to give the reader a pretty complete view of the subject. Many matters of detail however, and some of the highest interest, are necessarily omitted in such a rapid sketch.

SCOTCH COAL-FIELDS.—Several small coal-fields occur in Dumfriesshire, forming narrow basins in the valleys of the great southern transition chain of Scotland. In the valley of the Nith, in the parishes of Sanquhar and Kirkconnel, there is one of these coal-basins, about seven miles in length, and two and a half in breadth. Three seams of workable coal have been discovered, averaging in thickness from three to four feet and a half. The range of the seams is in the direction of the Nith; the measures are disturbed by a dyke running north and south, by which the strata are much depressed on the east side. In the parish of Canobie, adjoining Cumberland, coal is worked in two pits: the principal seam is five feet ten inches thick.

The principal coal-district of Scotland occupies the tract which forms the great central lowland of Scotland, and lies between the great transition chain on the south, and the still loftier primitive mountains of the Highlands on the north. 'The whole of this wide tract is occupied by the coal-measures, the carboniferous limestone, and the old red sandstone, associated in every possible manner with vast accumulations of every variety of trap.' (Conyb. and Phil.)

To begin with the most eastern county in this tract in which coal is found: in the parish of Dunbar, on the east coast of Haddington, there are indications of coal, but no seams have yet been found of sufficient thickness for working. In the parish of Ormiston, in the west of the same county, coal is found in abundance; there are three workable seams of coal, varying from twenty-eight to forty-three inches in thickness, and the coal is of good quality.

Coal occurs in Fifeshire, on the north side of the Forth, but it is not at present much wrought. There are mines in the parish of Dysart, where coals were first raised in Scotland more than 350 years ago. There are fourteen beds of coal, three of which are now being worked; they are of the respective thicknesses of five, eight, and five feet. The pits are about sixty or seventy fathoms in depth.

Coal is wrought in several places in Mid Lothian.

In Lanark the coal-fields are numerous and extensive. The Wilsontown coal-basin and the Climpy basin both occur in the parish of Carnwath; the latter is on the west side of the first, the crop of the one nearly approaching the other. There are several seams of coal in these basins. The main coal, or lowest, is called the four-feet coal; another seam is about two feet in thickness. The accompanying strata are sandstone, varying in composition and hardness; bituminous shale, slate-clay, and thin beds of ironstone alternate with the coal. Several small faults, or hitches, as they are here called, traverse the field. On the S.W. part of the field, the main coal is generally fourteen feet below the crow coal, which is the next superior bed; on the N.E. the space between the same beds is only about two feet. These basins form part of the great coal-basin of the Clyde, which extends on both sides of that river, and the centre of which is near Dalziel. On the same side of the river, in the parish of Monkland, there are many collieries, in which the thickest bed of coal is nine feet, and it is of good quality. On the left bank of the river coal is wrought in several places. Five mines are worked in the parish of Rutherglen, and others in the adjoining parish of Cambuslang. There are several also in Hamilton, Stonehouse, and Douglass. Throughout this district seven seams of coal are usually found within 415 feet of the surface; five of these seams are of sufficient thickness and good quality to be wrought. The following shows the situation and thickness of the seams of coal in the pits in the parish of Cambuslang:—

	feet.	in.
Upper soil (earth and clay) from 20 to	30	0
Argillaceous white freestone	20	0
Shale, with vegetable impressions, from 30 ft. to 40 ft.	35	0
1st seam, soft coal	4	6
Interval (hard freestone, &c.)	26	6
2nd seam, soft coal	3	6
Interval (shale)	63	6
3rd seam, shaft coal	5	0
Interval: shale, 20 feet hard ironstone, from 6 to 18 in. shale and freestone	65	2
4th seam, soft coal	6	0
Interval: shale freestone	83	0
5th seam, soft coal	3	0
Interval: ironstone shale	10	0
6th seam, hard coal, good for iron-works, forges, &c.	3	6
Interval (shale)	1	6
7th seam, soft coal	1	6
Till, &c., with thin seams of coal	84	0
	445	8

The thickness of the coal and of the freestone varies considerably in different parts, and the numbers here given must be taken only as an approximation. The strata are frequently deranged by faults, several of which run from east to west. In their general arrangement the strata usually run nearly parallel to each other, although they have always a considerable angle of elevation, and uniformly dip towards the Clyde. A great fault occurs between Hamilton and Quarter, and none of the principal seams are wrought for some miles north of this spot, the coal-beds being sunk nearly 100 fathoms lower than those out of the fault. The main seam worked at Quarter is five feet six inches thick, and consists of four distinct varieties of coal.

This coal-basin of the Clyde extends into Renfrew, where there are many collieries. Coal is wrought in the parish of Eastwood, in that county, in several seams of various thickness; but none exceed two feet six inches. The whole are of good quality. Five of them are wrought in pits varying in depth from ten to forty fathoms. The coal measures here consist of the usual series of freestone, shale, &c., dipping generally to the S.W. This coal formation partly surrounds the loch of Castle Semple, and continues without interruption into Ayrshire, around Kilbirnie Loch, and onward to Ardrossan. Coal occurs in different places in Dumbarton, where, among other parishes, it is wrought in Easter Kilpatrick. It is also found abundantly in Stirlingshire, along the southern base of the Lennox hills. Coal likewise occurs throughout Linlithgow, and is worked extensively in that county; it is likewise found in Clackmannan, and in the south of the counties of Perth and Kinross.

IRISH COAL-FIELDS.—Mr. Griffiths, in his 'Report on the Leinster Coal District,' gives an excellent summary of the Irish coal-fields, from which what follows is taken. 'If we except the Leinster district, my knowledge of the coal-fields of Ireland is as yet very limited: and though each in its turn will form the subject of a separate report, I think it right to draw attention to them in this place, by giving such general information as I possess respecting their situation and circumstances. Coal has been discovered in more or less quantity in seventeen counties[*] of Ireland; but I believe the island contains but four principal coal-districts, viz., the Leinster, the Munster, the Connaught, and the Ulster. The two former contain carbonaceous or stone-coal, and the latter bituminous or blazing coal.

'The Leinster coal-district is situated in the counties of Kilkenny, Queen's county, and county of Carlow. It also extends a short distance into the county of Tipperary, as far as Killenaule. This is the principal carbonaceous coal-district. It is divided into three detached parts, separated from each other by a secondary limestone country, which not only envelops, but in continuation passes under the whole of the coal-district; a fact which was indisputably, though accidentally, proved by the Grand Canal Company, who sank a pit through eighteen yards of black slate-clay and flinty slate into the limestone in search of coal. The Leinster coal-district is therefore of subsequent formation to the limestone.

'The Munster coal-district occupies a considerable portion of the counties of Limerick and Kerry, and a large part of the county of Cork. It is by much the most extensive in Ireland; but as yet there is not sufficient information respecting the number, extent, or thickness of the beds of coal it may contain.

'Coal and culm have been raised for near a century in the neighbourhood of Kanturk, in the county of Cork. At Dromagh colliery, I understand, the work has been carried on to a very considerable extent, and its annual supplies of coal and culm have materially contributed to the agricultural improvement of an immense extent of the great maritime and commercial counties of Cork and Limerick, which must otherwise have continued neglected and unreclaimed.

'Many circumstances combine to make the examination of this district of peculiar interest and importance; and as a recent application has been made by the Cork Institution to the Dublin Society to aid the undertaking, it is probable that this immense district will shortly be minutely explored. From all that has been ascertained, it is very clear that the dip of the beds and the quality of the coal differ materially from those of the Leinster district. In the Munster district the beds run east and west, and dip to the south, forming an angle of 45°. In the Dromagh colliery, where all the beds which have been discovered have been successively and in general successfully wrought, four beds incline on each other, and at no greater distance than 200 yards. The first of these beds is a three-feet stone-coal, and is the leading bed. All faults, checks, and dislocations, similar to those which are discoverable in this bed, are in general to be encountered in the other three. The names of the four beds are, the *coal-bed*—this lies farthest to the north; the *rock-coal*, so called from its being comparatively of harder quality than the other beds; the *bulk-bed*, so called from its contents being found in large masses or bulks; and *Bath's bed*, so called from the name of a celebrated English miner, by whom it had been many years ago discovered and worked. The coal-bed consists of three-feet solid coal, and is not sulphureous; the rock-coal is nearly of the same thickness with the leading bed, but is very sulphureous, and, having the soundest roof, is the most easily wrought. The other beds are of the culm species, but of peculiar strength. * * * The bulk-bed forms immense bulks and masses of culm, in which the miners have frequently been unable to retain the ordinary directions of roof and seat.

'No work has been undertaken in the Munster coal-district to a greater depth than 80 yards. The present work at the Dromagh colliery is at that depth; it is heavily watered, and consequently expensively wrought. The quality of the coal and culm improves as the work descends. * * *

'The Connaught coal-district stands next in order of value and importance to the Leinster and Munster, and possibly may be found to deserve the first place when its subterranean treasures shall be explored. At present nothing is known, except that the outer edges of several beds of coal have been observed, but they have not been traced to any distance, so that their extent is by no means ascertained. The coal is of the bituminous species. This coal is particularly adapted to the purposes of iron-works, foundries, &c. &c.

'The Ulster coal-district is of trifling importance when compared with the foregoing. It commences near Dungannon, in the county of Tyrone, and extends in a northern direction to Coal Island, and in continuation to the neighbourhood of Cookstown. No beds of coal worth working have hitherto been discovered between Coal Island and Cookstown, but certainly the coal strata extend there. The principal collieries are at Coal Island and at Dungannon. The coal of this district is bituminous. I understand that indications of coal have been observed at Drumquin, in the county of Tyrone; and also at Petigoe, to the north of Lough Erne. Possibly the coal-formation may extend from the neighbourhood of Cookstown westward to the north of Lough Erne.

'Besides the foregoing principal coal-districts, there are others of less consequence. Bituminous coal has been found in the neighbourhood of Belturbet, in the county of Cavan, and at the collieries of Ballycastle, in the county of Antrim; but the Antrim coal-district is not very extensive. These collieries have been wrought for a number of years. The coals are of a slaty nature, and greatly resemble both the coal and the accompanying rocks which occur in Ayrshire, and probably they belong to the same formation.'

Continental Europe.—In the centre and south of France some small coal-fields occur in the valleys of the Loire, the Allier, the Creuse, and the Dordogne, the Aveyron [AVEYRON], and the Ardèche, between ridges proceeding from the primitive central group connected with the Cevennes; and, in a few localities, some of the thickest beds of coal yet discovered have been found. In the north of France, the coal-formation occupies a very large tract of country, running westward from Hardinghen, near Boulogne, by Valenciennes, and thence up the Scheldt and down the Meuse to Eschweiler, beyond Aix-la-Chapelle [BELGIUM.] The district along the Meuse, between Namur and Liege, is said to resemble in its geological structure, as well as picturesque features, the Somersetshire and South Gloucester district: the strata being broken and deranged, exhibit, if possible, still more contorted and inverted positions of the respective beds. The defiles of the Sambre and the Meuse (*Geol. Trans.*, vol. i., 2nd series) present an exact counterpart of those of the Avon and the Wye. The coal-districts in the north of Germany are probably the prolongation of the Belgium formation. On the north-east and south-east of the Harz mountains, near Ballenstadt and Neustadt, the coal-formation occurs resting on the transition rock of that group In Saxony coal is found in many places along the northern foot of the Erzegebirge. It is extensively worked near Zwickau and near Dresden. There is a very extensive coal-district in Bohemia, extending into Upper Silesia. This district lies between the great primitive chain of the Erzegebirge and the Riesengebirge, on the north, and the great district of primitive slate which occupies the larger part of Bohemia south of the Beraun and Upper Elbe. More than forty beds of coal are supposed to be worked in this district.

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[*] The counties are Antrim, near Ballycastle; Donegal, north of Mount Charles; Tyrone, in the Ulster coal-district, and at Drumquin; Fermanagh, north continuation of the Connaught coal-district, and at Petigoe; Monaghan, near Carrickmacross; Cavan, near Belturbet; Leitrim and Roscommon, in the Connaught coal-district; Westmeath, near Athlone; Queen's county, Kilkenny, and Carlow, in the Leinster coal-district; Tipperary, continuation of the same; and Clare, Limerick, Kerry, and Cork, in the Munster coal-district.

Good coal has been found in Southern Russia, near Toula, lat. 54°, long. 37°, where it is worked; but the quantity is so small, and the difficulty of working it beneath a loose and half-liquid bed of quicksand is so great, that it seems unlikely to be of much utility. Coal has also been worked at Bakhmont, lat. 48°, long. 38°, in the government of Katerinoslaf. (Mr. Strangways on the Geology of Russia. *Geol. Trans.*, vol. i., 2nd series, p. 35.) In Sweden coal occurs to the south of the primitive tract, near Helsingborg, at the entrance to the Baltic. Coal is also worked in the island of Bornholm. [BORNHOLM.]

Laborde mentions coal as occurring in Spain; in eight places in Catalonia, in three in Aragon, and one in New Castile. Coal, it is conjectured, will be found in several parts of continental Greece. On the north of Constantinople coal is said to be found.

Asia.—In Asia coal has long been worked in China, but what has hitherto been obtained is said to be very slaty. Coal is likewise found in the countries immediately around the Persian Gulf, but of a very indifferent description. In most parts of Cutch, coal occurs in abundance, and of good quality; it ignites quickly, and burns to a white ash. Coals are also found in Bundelcund. There are large mines in a district called Burdwan, 130 miles from Calcutta, now worked to the extent of 14,000 or 15,000 tons annually. They are situated on the banks of a river connected with the Hooghly, and were first worked about eighteen years ago, but they have not been in extensive operation more than ten or eleven years; the principal seam is about 9 feet thick, and is about 90 feet from the surface. Coal has likewise been got from a mine opened near Bhaugulpoor, on the Ganges, about 300 miles from Burdwan. Another coal-field has been discovered on the banks of the Hooghly, at a place called Merzipore, about 40 miles from Calcutta; the coal is found close to the surface, and the thickness of the principal seam is said to be two feet. Coal of good quality likewise occurs in the Birman empire.

In the United States of North America, east of the Appalachian range, there is an extensive coal-field in Virginia, twelve miles west of Richmond: it is about ten miles wide, and has been traced near forty miles. It is surrounded by primitive rocks, and said to lie also on primitive rock. This coal-field supplies the town of Richmond, and also Washington and other places to which it can be taken by land-carriage. In the great secondary formation west of the Appalachians, which consist of limestone, sandstone, slate-clay, and freestone, with vegetable impressions, a bed of coal is said to extend from the Ohio to the Tombigbee in Alabama. The coal commences at Cumberland, in the state of Maryland, between the Alleghany and Tuscarora ranges; and west of this town it occurs generally in beds varying from an inch to ten feet in thickness. About Wheeling, on the Ohio, a great quantity of coal is used for manufacturing purposes. The sandstone in this part is considered as the lowest member of the formation. The consumption at Pittsburg is also considerable. West of the Mississippi the argillaceous sandstone is associated with beds of coal and ironstone. The Ozarks contain beds of coal.

In the southern provinces of Chile there is an extensive coal-field, that is partially worked.

Nova Scotia contains a great quantity of coal. The great coal-field of Pictou has been traced from Carriboo Harbour to Merigomish, comprising an area of more than 100 square miles. The seams of coal resemble much more those of Staffordshire than those in the north of England. One bed is described by a practical miner, who went to Nova Scotia to superintend the opening of the mines, as 40 feet in thickness; it is not however equally good throughout, and it was thought advisable to work only 10 feet of the upper part. According to Bouchette the seams of this field vary in thickness from 1 foot to 50 feet. The coal is highly bituminous and burns well. There is another coal-field, also of considerable extent, in the north-west part of the county of Northumberland, between the river Macan and the shores of the Chignecti Channel. In this district there are eight strata of coal, varying from one to four feet in thickness. This coal is not considered so good as that of Pictou. There are also indications of coal in the township of Londonderry and at Onslow; on the north shore of the Mina's basin; at the head of Pomket Harbour, in the upper district of the county of Sydney; and on the south shore of Wallace Harbour, in the county of Cumberland. (Bouchette.)

Coals of excellent quality are got in Cape Breton. The coal-measures have been traced in the western part of the island, on Inhabitants River, at Port Hood, and at Mabou. On the east the Sydney coal-field is of great extent; it commences at Miray Bay and runs along the coast to the Great Bras d'Or, being in length about 40 miles, and averaging 5 miles in breadth. 'From a minute calculation, after deducting harbours, bays, and all other interpositions, it appears that there are 120 square miles of land, containing available veins of coal.' (Bouchette.) The measures in this district contain fourteen beds of coal, varying from 3 to 11 feet in thickness. The coal is wrought at Sydney Harbour and at Lingan.

Coal is found very abundantly in Australia, and is worked extensively in the Newcastle district, on the Hunter's River A coal formation likewise occurs in Van Diemen's Land.

COAL PLANTS. That coal is the result of the mineralization of vegetable remains is abundantly proved, both by the numerous impressions of plants found in connection with it, and by the traces of organization which are still discoverable in it. Mr. Hutton has shown that it is possible to prepare the different varieties of bituminous coal in such a way as to render slices of them partially transparent, when the microscope shows the elementary tissue of the plants which have produced them. Cannel coal, he says, seems to retain traces of its structure through its whole mass, while it exists in fine coal in small patches only, which appear as if mechanically entangled. (*Fossil Flora*, ii., 25.)

In general the impressions of plants occur chiefly in the shale of the coal-measures, that is, in the mud which separates the seams of coal, or in the sandstone or ironstone associated with the coal formation; and as such impressions are much more distinct than any that occur in the coal itself, it is chiefly from them that our ideas of the vegetation from which coal has been produced have been derived. They are often present in inconceivable beauty and abundance, as may be imagined from Professor Buckland's graphic account of those in the coal-mines of Bohemia. In his 'Bridgewater Treatise,' he says, 'The finest example I have ever witnessed is that of the coal-mines of Bohemia just mentioned. The most elaborate imitations of living foliage upon the painted ceilings of Italian palaces bear no comparison with the beauteous profusion of extinct vegetable forms with which the galleries of these instructive coal-mines are overhung. The roof is covered as with a canopy of gorgeous tapestry, enriched with festoons of most graceful foliage, flung in wild irregular profusion over every portion of its surface. The effect is heightened by the contrast of the coal-black colour of these vegetables with the light ground-work of the rock to which they are attached. The spectator feels himself transported, as if by enchantment, into the forests of another world; he beholds trees, of forms and characters now unknown upon the surface of the earth, presented to his senses almost in the beauty and vigour of their primeval life; their scaly stems and bending branches, with their delicate apparatus of foliage, are all spread forth before him, little impaired by the lapse of countless ages, and bearing faithful records of extinct systems of vegetation, which began and terminated in times of which these relics are the infallible historians.'

Such remains consist chiefly of impressions of leaves separated from their branches, and of casts of trunks more or less in a broken state; and with them occur now and then pieces of wood or remains of trees, in which the vegetable texture is to some extent preserved. Of the leaves the greater part is more or less mutilated; those of ferns, which are extremely numerous, have lost their fructification in the majority of instances; and it frequently happens that the leaflets of compound leaves have been disarticulated either wholly or partially. Stems or trunks are in all cases in a state which must be supposed to result from decay previously to their conversion into coal; destitute of bark, or with the principal part of that envelope gone, and often pressed quite flat, so that all trace of their original convexity is destroyed. Where ripe fruits are met with, they are not in clusters as they probably were when alive, but separated into single individuals. Of flowers there is no trace that can be satisfactorily identified; for Antholithes Pitcairniæ, the most perfect that has yet been discovered, is altogether of a doubtful nature. The authors of the 'Fossil Flora' represent it as having been so much decayed at the time it was imbedded in the shale, that all its parts are blended together, and no longer distinguishable as separate organs.

If remains such as these, although of recent plants, were submitted to a botanist for examination, he would find it impossible to form any other than a general idea of their nature, and he would be unable to speak with any confidence as to the precise plants which produced them. Such being the case with recent fragments, where colour, texture, odour, flavour, and many other points would exist, of which a skilful botanist would avail himself, independently of the more important points of structure of which systematic writers principally make use, it is obvious that the difficulty of determining the nature of the fossil remains of plants must be far greater; for with them the evidence upon which an opinion is to be formed is of the most circumscribed and sometimes doubtful nature: so great indeed is the difficulty, that a French botanist of no mean reputation is known to have declared that all speculations upon the nature of antient vegetation ought to be referred to the romance of natural history, and have no concern with science. There is little doubt now that some of the theories to which the study of the vegetable remains of the coal-measures has given rise are romantic enough; but on the other hand it is equally certain that they furnish some most important and precise evidence as to the nature of the vegetation with which our planet was clothed in the earliest ages of the existence of organic matter.

Coal plants may be divided for practical purposes into three classes: 1, those of which only wood still containing organic structure has been found; 2, those which have an obvious analogy with recent plants; 3, those with which no existing analogy has been traced. We select a few of the most remarkable cases under each of these heads.

1. *Coal plants of which wood only containing organic structure has been found.*

The existence of wood in the coal formation with its texture still preserved, is a discovery of very modern date. Mr. Nicol, of Edinburgh, claims the credit of having first invented the art of preparing fossil wood so as to show its structure microscopically; Mr. Witham has investigated the subject extensively, and he has been followed by Messrs. Lindley, Hutton, and others. The result of these inquiries has been, that wood still preserving its texture exists in a mineral state extensively throughout the coal-mines of the North of England; that it in most cases has a structure analogous to, although not identical with, that of recent coniferous wood; and that in those cases in which its structure is not coniferous, it is unlike that of any existing trees.

Coniferous wood is known among other things by the presence of small disks upon the sides of its woody tubes; differences in the arrangement of these disks have given rise to the formation of the genera *Peuce* and *Pinites*, to one or other of which all the coniferous coal-wood seems referrible. Mr. Nicol believes that it may all be referred to either the existing genera Pinus or Araucaria. Specimens of this kind of wood occur sometimes of considerable size. A trunk of Pinites Brandlingi has been found 72 feet long, and another of Pinites Withami 36 feet long.

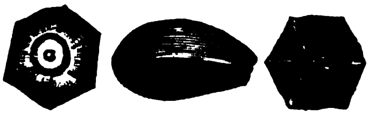
The wood, to which Mr. Witham's genus *Anabathra* apparently belongs, is known by its longitudinal section representing tubes marked by parallel transverse lines resembling the steps of a ladder. This is very uncommon, and is stated by Messrs. Lindley and Hutton to belong to the genus *Stigmaria*, which will be mentioned hereafter.

One specimen in iron-stone also has occurred of the wood of the genus Lepidodendron; it consists principally of loose cellular tissue, having near the centre a zone of spiral vessels, connected with the bases of the leaves by arcs of spiral vessels, and having rudiments of wood on the outside of the zone. (*Fossil Flora*, 2. tt. 98 and 99.)

2. *Coal plants which have an obvious analogy with recent plants.*

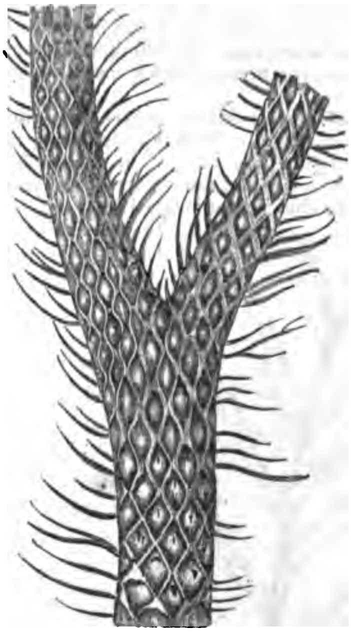
Coniferous plants have left few remains, except wood, by which they can be recognised. A cone of *Pinus anthracina* has been met with, and there is reason to believe that certain stems called *Bothrodendron*, having numerous minute dots upon their surface, and deep circular oblique concavities, four or five inches across, at intervals of ten or eleven inches, are also remains of trees of this description. It is probable moreover that some of the fossils referred to the genus *Lepidodendron* are really coniferous plants, especially *Lep. longifolium;* but upon this point nothing certain is known.

Palms occur occasionally, but in solitary fragments; they are among the rarest of well-identified coal plants. Their trunks have not been discovered; their leaflets are mostly of a wedge-shaped figure, resembling those of Caryota or Wallichia: their fruit, to which the name of *Trigonocarpum* is given, are more frequent, and are always found in clusters, but separate from each other. It would seem as if the bunches of their fruit had lain in water till the pulpy parts rotted away, and the nuts fell asunder and settled down into the mud, where they were finally imbedded. These remains are generally oblong, three-sided or six-sided bodies, not more than an inch long. The following represents some states of Trigonocarpum Nöggerathi.

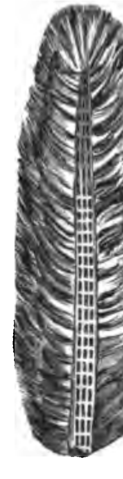


[Trigonocarpum Nöggerathi.]

Lycopodiaceous plants, or what are considered analogous to them, form a very large proportion of the vegetable remains of the north of England coal-field. They are represented by impressions closely covered either with lozenge-shaped spaces disposed in a spiral manner, or by small scale-like leaves, which are supposed to have produced those spaces by falling off. When they branch, they have often been observed to do so in a forked or dichotomous manner. Sometimes they are minute, and no larger than existing Lycopodia, but they are occasionally found of considerable size, some having been seen which, although mere fragments, were between forty and fifty feet long, and more than four feet in diameter. An idea of their appearance will be gained from the accompanying figure of Lepidodendron Sternbergii.



[Lepidodendron Sternbergii.]



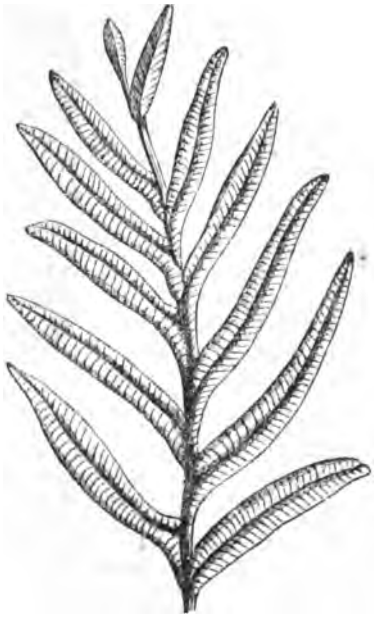
[Lepidostrobus variabilis.]

Associated with them are narrow sharp-pointed leaves resembling scales, which no doubt belonged to them, but which are distinguished by the name of *Lepidophyllum* In the same formations are found cones of different sizes, consisting of small sharp-pointed lax scales, in the axils of which were seeds: these have been supposed to be the fructification of Lepidodendron, but as there is no actual certainty of the fact, they bear the name of *Lepidostrobi* The above figure represents Lepidostrobus variabilis.

Lepidodendra are usually quoted as an instance of antient species belonging to the same genus as modern plants of very humble stature (for existing Lycopodia, although they acquire sometimes the length or height of three or four feet, are always more like mosses than trees), having arrived at gigantic dimensions in the remote ages when coal was deposited. But it is highly probable that this notion is altogether unfounded; for, in the first place, there is no certainty whatever that the most gigantic Lepidodendra were not fir-trees, analogous to Araucaria; a conjecture which is rendered the more probable by Mr. Nicol's discovery that some of the specimens of fossil coniferous wood are nearly identical with the wood of that genus. Now the Norfolk Island pine, which is a species of Araucaria, is one of the largest of known trees. In the second place, it has been proved that Lepidodendron Harcourtii at least is not a Lycopodiaceous plant at all, but an extinct genus, intermediate in organization between Coniferæ and Lycopodiaceæ, connecting Gymnosperms and Acrogens more directly and satisfactorily than any known plant. It is impossible to say how many other species of Lepidodendron may not agree with L. Harcourtii, and it must be obvious that, being an extinct form, we have no more reason to be surprised at its being larger than the genus Lycopodium now is, than we should have at finding a tree fern, like Alsophila brunoniana, whose stem is between forty and fifty feet high, in the same natural order with the common Polypodium of our hedges. With regard to the small species of Lepidodendron, it is more probable that they belonged to the genus Lycopodium; but there is nothing remarkable in their stature.

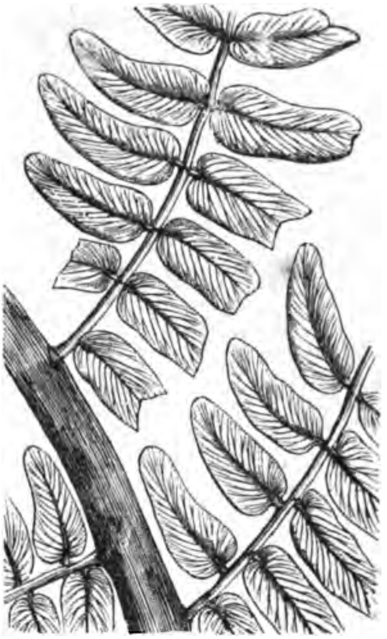
Ferns are the most abundant of all plants in the shale of the coal, almost every yard of it being more or less marked by their impressions, and very often containing them in great multitudes. It has been estimated that of the vegetable remains belonging to the Coal Flora, one-half at least of the species are ferns. They are in most cases destitute of fructification, so that they cannot be arranged according to the system in use for recent species; and consequently M. Adolphe Brongniart, the great writer upon these subjects, has divided them into genera characterized chiefly by the way in which the veins are disposed. The number of ferns renders it convenient that some such classification should be formed, and M. Brongniart's plan has been adopted by all other writers. It is no part of our object to go into such details in this place, but it will be useful to many of our readers to know what the differences are between some of the most common of these fossil genera. Such are the following:—

Pecopteris consists of species whose leaves are once, twice, or thrice pinnated, with the leaflets either adhering by the whole breadth of their base, or by the centre only. The midrib runs quite through to the point, and the veins are planted upon it somewhat perpendicularly.



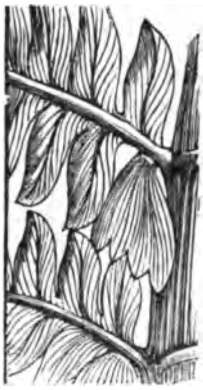
[Pecopteris lonchitica, a little magnified.]

Neuropteris has leaves divided like those of Pecopteris, but the midrib does not reach the apex of the leaflets; on the contrary, it divides off right and left into veins, and gradually disappears.



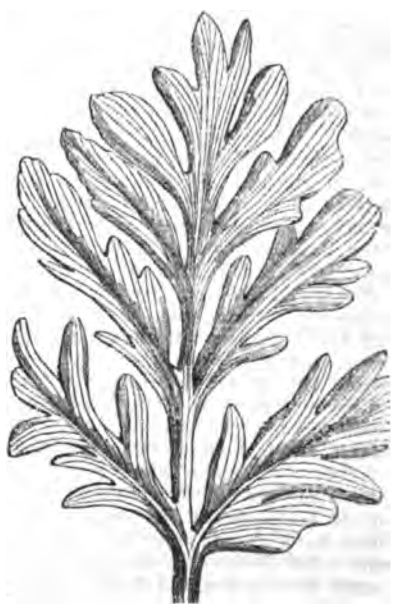
[Neuropteris gigantea.]

Odontopteris has leaves like the last, but its leaflets adhere to the stalk by their whole base; there is no midrib; and the veins spring side by side at once from the base of the leaflet, passing onwards towards the point.



[Odontopteris Brardii.]

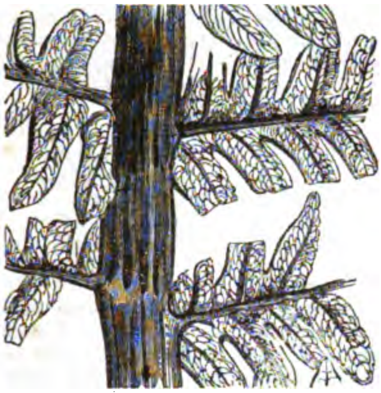
Sphenopteris has twice or thrice pinnatifid leaves; the leaflets are narrowest at the base, and the veins generally



Sphenopteris artemisiæfolia, magnified.

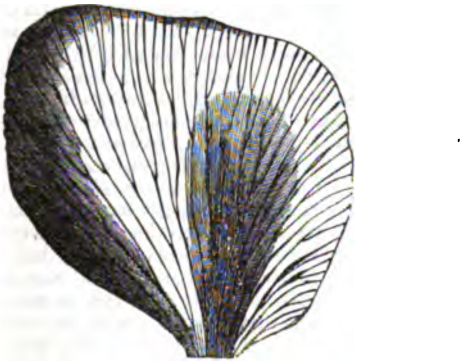
arranged as if they radiated from the base; the leaflets are more frequently wedge-shaped than any other figure.

Lonchopteris has the leaves several times pinnatifid, and the leaflets more or less united to one another at the base; there is a distinct midrib, and the veins are reticulated.



[Lonchopteris Bricii.]

Cyclopteris has the leaves simple, and either altogether undivided, or only lobed at the margin; they are more or less orbicular, and are filled with veins radiating from the base; there is no midrib. Specimens of this genus are common in ironstone nodules.



[Cyclopteris orbicularis.]

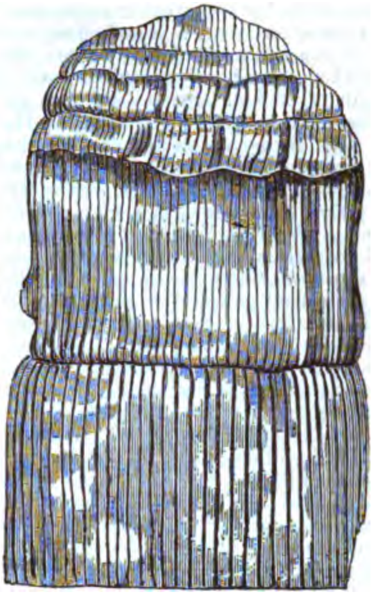
Schizopteris is like the last, except that the leaf is deeply divided into numerous unequal segments, which are usually lobed and taper-pointed.

Under the name of *Caulopteris* are comprehended all the kinds of stems of tree ferns. They are found in the form of short, round, or compressed truncheons, marked externally by oblong scars of considerable size, much wider than the spaces that separate them, and having their surface irregularly interrupted by projecting points. Such appearances are owing to the manner in which the woody parts of the leaf when fresh were connected with the stem. The fragments to which this name is given no doubt belong to leaves bearing other names; but as the stems and leaves are never found united, it is impossible to identify them. Remains of tree-fern stems are of such rare occurrence, that up to the present time not more than two or three specimens have been found in the rich coal-fields of Great Britain.

3. *Coal plants with which no existing analogy has been satisfactorily traced.*

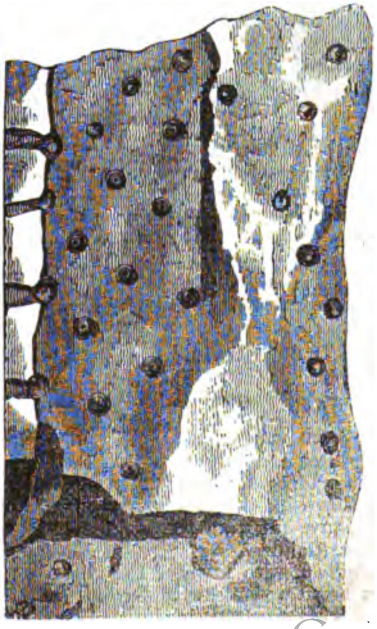
Calamites are fossils found in short, jointed, cylindrical, or compressed fragments, with channels furrowed in their sides, and sometimes partially surrounded by a bituminous coating, the remains of a cortical integument.

They were originally hollow, but the cavity is usually filled up with the substance into which they themselves are converted. They were separable at their articulations, and, when broken across at that part, show a number of striæ originating in the furrows of the sides, and turning inwards towards the centre of the stem, which however they do not reach. It is not known whether this structure was connected with an imperfect diaphragm stretched across the hollow of the stem at each joint, or whether it merely represents the ends of woody plates of which the solid part of the stem was composed. Their extremites have been discovered either to taper gradually to a point, or to end abruptly, the intervals becoming shorter and smaller. The latter are believed to have been the root end of these plants, the others the extremity of their branches. Various speculations upon the nature of these plants are to be found in M. Adolphe Brongniart's works, and in the 'Fossil Flora.' The former botanist concludes that they were plants allied to Equisetum, only of a more gigantic stature. (Equiseta are slender, weak-stemmed, erect plants, not more than two or three feet high; while Calamites have been found with a diameter of fourteen inches.) Later botanists, on the contrary, adduce what they consider ample evidence to show the supposition that Calamites were analogous to Equiseta to be unfounded; and that they more probably were a race of plants which have now become extinct. It is particularly urged that the presence of bark in Calamites, the existence of which M. Adolphe Brongniart admits, is quite conclusive that those plants did not even belong to the same natural class.



[Calamites dubius.]

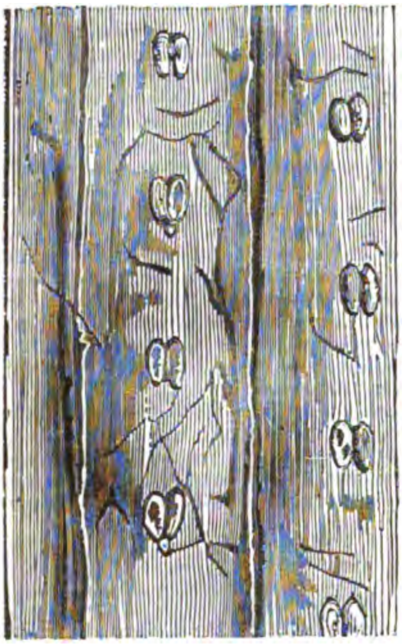
Stigmaria is one of the most common of all plants in the coal formation; not a mine is opened, nor a heap of shale thrown out, but there occur fragments of an irregularly compressed roundish form, apparently portions of a stem, marked externally with small cavities in the centre of slight tubercles



[Stigmaria Ficoides.]

arranged irregularly, but somewhat in a quincuncial manner. The axis of these fragments is often hollow, or different in texture from the surrounding part. From the tubercles arise long ribbon-shaped bodies, said to have been traced to the length of 20 feet. For a long time no more was known of these plants. A few years ago Mr. Hutton discovered that such fragments as we have just described are portions of the extremity of the arms of a huge dome-shaped body which divides into twelve limbs, each of which spreads horizontally from the edge of the dome, usually dividing into two arms. From more recent observations it has been ascertained that the arms of this plant consisted of a mass of cellular substance, having in its centre a hollow cylinder composed exclusively of spiral or scalariform vessels, and destitute of medullary processes. It is useless to enumerate the conjectures which have been formed concerning the real nature of this strange production; all that can safely be asserted about it is, that it was unquestionably a vegetable, for even that might have been doubted in the absence of some of the evidence that now exists. We are very much of opinion that it will eventually be ascertained to be something altogether different from any plant with which it has been yet contrasted : see observations further on.

Sigillaria comprehends all those columnar gigantic stems which occur commonly in the sand-stone of the coal in an erect or nearly erect position, but which are prostrate and crushed flat in the coal-shale, and which are marked by flutings with a single row of small scars between them. In diameter they vary from 6 to 36 inches, and they must have sometimes been full 40 or 50 feet high.

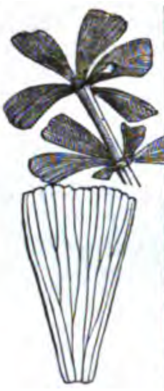


[Sigillaria reniformis.]

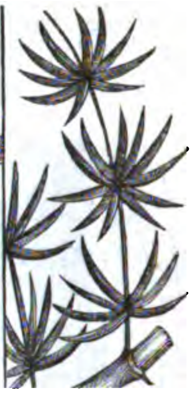
It is believed, from the very compressed state of many specimens, that these plants must have been of a soft nature, and, from the general absence of scars of large size, that they must have been very little branched. The presence of a distinct bark proves them to have been Exogens of some kind. They have been supposed to be tree-ferns, but that is highly improbable; again, they have been conjectured to be analogous to the torch-thistles (Cacti) of the Tropics, which is far more probable. But in fact no evidence exists upon which a precise opinion can be formed. Is it quite impossible that Sigillarias and Stigmarias are both the same thing, the former being the stem, the latter the roots? Compare with each other tab. 54, the base of *fig.* 1 and *fig.* 2, with tab. 31, *fig.* 2, of the ‘Fossil Flora.’

Asterophyllites are very common plants, with narrow pointed, whorled leaves, which vary in figure and in size, but which, together with the slenderness of the stem to which they belong, give the plants much the appearance of the modern genus Galium.

Sphenophyllum, with many of the characters of the last genus, has broad wedge-shaped leaves, the veins of which are forked. That circumstance has led to the notion that it was related to ferns, especially to the genus Marsilea.



[Sphenophyllum Schlotheimii.]



[Asterophyllites foliosa.]

Such are the more common of the plants whose remains are traced in the coal-measures. One of the first things which strikes us in casting the eye on the list is the little variety of form apparent in the old Flora. Instead of the infinite diversity of plants which are contained in a modern forest, nothing here presents itself except fir trees, ferns, a very few palms, and a small number of species whose nature is unknown. Not a trace is found of grasses, or the numerous herbs and shrubs that are now met with in all regions clothed with vegetation; and of the vast class of Exogens not one authentic instance occurs. Ferns, too, would seem to have constituted in themselves one-half of the entire Flora, and yet it is only in a few rare cases that they have been met with in a state of fructification. These circumstances have led to the hasty inference that in the beginning nature was in reality but little diversified; that a few forms of organization of the lower kind only were all that clothed the face of the earth; and that it was only in after ages that Nature assumed her many-coloured ever-varying robe. And yet it has been at the same time admitted that in those early days vegetation was more luxuriant and vigorous than at the present hour. It is not a little singular that the true explanation of this circumstance should not have been hit upon without any direct experiment having been instituted for the purpose of demonstrating how it is really to be explained; for considering that all geologists are of accord in the opinion that the plants which formed coal were for a period of some duration floating in water, a partial destruction of them might easily have been supposed to be the result. Professor Lindley has recently proved that plants are capable of enduring suspension in water in very different degrees, some resisting a long suspension almost without change, others rapidly decomposing and disappearing. One hundred and seventy-seven plants were thrown into a vessel containing fresh water; among them were species belonging to the natural orders of which the Flora of the coal-measures consists, and also to the common orders, which, from their general dispersion over the globe at the present day, it might have been expected should be found there. In two years one hundred and twenty-one species had entirely disappeared; and of the fifty-six which still remained, the most perfect specimens were those of coniferous plants, palms, lycopodiaceæ, and the like; thus showing in the clearest manner that the meagre character of the Coal Flora may be owing to the different capabilities of different plants of resisting destruction in water. The same experiment accounts for the want of fructification in fossil ferns; for it showed that one of the consequences of long immersion in water is a destruction of the fructification of those plants.

A much more important fact is the presence of certain tropical forms of vegetation, such as palms and tree-ferns, in the coal; and the quasi-tropical character of other species, as Araucaria-like Coniferæ. This is the more startling when connected with another fact, that the coal-measures of Newcastle are of the same age as those of Newfoundland, and even of Melville Island, in 75° N. lat.

From this it has been inferred that the northern parts of the world enjoyed in remote ages a climate where frost and snow, and the inclement seasons of Arctic regions, were unknown; that they were at least as hot as equinoctial countries now are; and that the inhospitable hyperborean plains of Melville Island at one time displayed the noble scene of a luxuriant and stately vegetation. Palms, it has been said, were there, and they are the especial and princely denizens of the tropics; tree-ferns occur, and they now only exist in the primeval forests of the torrid zone, haunting their deepest recesses, breathing a damp and equable atmosphere, and living, like vegetable eremites, without even a parasite to fix itself upon their trunks and keep them company. Stigmarias, Sigillarias, and even Calamites, have been enlisted in the cause of this theory, notwithstanding that no one can say what they may have been. And in confirmation of all this, the preponderance of ferns has been appealed to as having its parallel no where except in the hottest and dampest islands of Polynesia.

The advocates of these opinions have not however been permitted to hold their ground in peace. It has been asserted that the presence of these tropical forms of vegetation in northern latitudes is no proof of what the climate in which they were deposited formerly was, because they may have been drifted to their present situations by currents. The perfect state of many of the remains offers however great difficulties in the way of this supposition; for although they are very much broken, yet the angles of most fossil plants are by no means water worn, and in Sigillarias, &c., are as sharp as they ever were. Nor is the state of those tropical stems and fruits, which in modern times reach the coasts of Ireland and Norway, at all like that of the buried plants of the coal-measures.

Another difficulty in the way of admitting a high temperature in northern regions in former days is suggested by considering the duration of the days. Without a diurnal change of light and darkness plants cannot exist: absence of light blanches them, by the accumulation of undecomposed carbonic acid; absence of darkness destroys or dwarfs and deforms them, by the incessant decomposition of their carbonic acid. Now, however this may be reconciled with a country like England, in which the winter days are of moderate length, it is less reconcilable with the northern parts of North America, and not at all with Melville Island, in which there are 94 days when the sun is never above the horizon, and 104 days that he never sets; and it will hardly satisfy the objection to call in the aid of long-continued auroræ boreales, because it is solar light, and solar light only, which, so far as we know, will stimulate the digestive functions of plants. To admit therefore the presence of a tropical vegetation in former days in Melville Island, or Baffin's Bay, seems to carry with it the necessity of also admitting that a change has occurred in the position of the earth's axis of rotation—an assumption for which we have no evidence at all.

These points were adverted to in a lecture given by Professor Lindley at the London University on the 16th March, 1836, and at the same time some views of his own were sketched out, with which we conclude the present article.

He, in the first place, adopted entirely the opinion that the plants of the English coal-measures had not been drifted from any considerable distance, but had grown at the most within a few hundred miles of the places where they are now deposited, and probably in their very vicinity. But from this statement was excepted the coal of Melville Island; for he asserted that, although the vegetable impressions in the English coal-measures were by no means water worn, yet those in the British Museum from Melville Island were so rubbed and damaged, that they might have travelled from the very equator before they were deposited. This rendered it unnecessary to discuss the question of the possibility of plants growing without light under a supposed high temperature, and to a considerable size, because it cannot be denied that an English winter at the present day has light enough to answer all the purposes of a vigorous vegetation; and the same is true of Newfoundland, and those parts of the United States of America in which the coal plants are most unequivocally of the same nature as those of Newcastle.

The great point for consideration was the evidence which, it is asserted, the coal-measure plants afford of the climate of Great Britain, and the north of Europe generally, having formerly been tropical. This opinion has been founded upon three classes of facts, each of which requires separate examination: the one, the excessive development of certain forms of vegetation; another, the presence of the remains of palms and tree-ferns, which are usually considered incapable of existing unless in a tropical atmosphere; the third, the excessive disproportion of ferns to other plants.

Sigillarias, Stigmarias, Lepidodendra, and Calamites, have been asserted to be enormous forms of natural orders, now known only in a comparatively pigmy state. Sigillarias have been called huge tree-ferns, Stigmarias and Lepidodendra have been described as gigantic Lycopodiaceæ, and Calamites have been considered an excessively developed ultra-tropical form of Equisetum. But these assertions are of the most gratuitous kind, and are incapable of being maintained upon admissible botanical reasoning. Whatever Sigillarias, Stigmarias, and Calamites may really have been, there is no reason for supposing them either related to tree-ferns, Lycopodia, or Horsetails; and Lepidodendron has been demonstrated to have been a genus intermediate between Lycopodia and fir-trees. It is almost certain that all these plants are in reality destitute of living analogies; and therefore as we do not know what they were, we have no means of judging what kind of climate they required. Supposing that some of the Lepidodendra were closely allied to the modern genus Araucaria, as is highly probable, yet that fact does not afford any proof of a tropical climate; for Araucaria Dombeyi now inhabits the cold mountains of Southern Chile, and is at this day uninjured in the severest of our English winters; while Cunninghamia sinensis, and species of Callitris or Dacrydium, with which other remains of Lepidodendra may be compared, although not European, are by no means of tropical habits, but are found on the mountains of New Zealand and Van Diemen's Land, where they are exposed to a far from temperate climate. Moreover Salisburia adiantifolia, which would certainly be considered a tropical form of Coniferæ, if found in an extinct state only, is one of the hardiest of trees, and a native of the rigorous climate of Japan. Further than this, it was observed that supposing Sigillarias and Stigmarias could be found to have been succulent plants, allied to Cactaceæ or Euphorbiaceæ, as some think, still no real evidence of their having required a tropical climate for their development would be afforded by them, because there is nothing in the mere organization of succulent plants which unfits them for cold climates. A capability of enduring cold is something immaterial and independent of organization, about which nothing can be judged *à priori;* for turnips, cabbages, Jerusalem artichokes, houseleek, and many other hardy plants, are in parts as succulent as Cactaceæ. All arguments therefore to prove that the north of Europe was formerly tropical, deduced from the presence of such plants as those now mentioned, are inadmissible.

Nor are those derived from the presence of palms and tree-ferns of much greater force. For, in the first place, it is to be remembered that such remains are exceedingly rare; secondly, that they are much damaged, as if they had been dashed about a good deal before they were deposited; and thirdly, that such plants are among those which are capable of resisting the action of water for a considerable period. Independently however of these considerations, there are others which are of more importance. Neither palms nor tree-ferns are exclusively tropical: it is true that at the present day the principal part of such species do inhabit the tropics, but there is a sufficient number of exceptions to justify the opinion that others may have existed of still more hardy habits. To say nothing of the date-palm itself, which is cultivated in Sicily, and even at Bordighiera, in Liguria; or of the palmetto (Chamærops humilis), found as far north as Nice; or of the New Zealand Areca, which is seen in places where the ground is sometimes covered with snow for several days; or of the doubtful Palma magellanica, which Humboldt states certain Spanish voyagers to have seen in 53° S. lat.—there is the gigantic wax-palm of the Andes [CEROXYLON], which rears its lofty trunk in climates too inhospitable for any other palm. It is chiefly, says Bonpland, among the snow-clad summits of Tolima, San Juan, and Quindiu, that this palm occurs. 'The elevation above the sea of this species presents a very striking phenomenon with reference to botanical geography. Usually in the tropics, palms are not found at elevations exceeding 3000 feet, the cold of higher regions preventing them from approaching nearer to the limits of perpetual snow. The palm of Quindiu offers a very rare exception to this law of nature. It is hardly seen in the plains; it first begins to appear at an elevation of 5400 feet, which is about that of the Puy de Dôme, or the Passage of Mont Cenis. It therefore appears to shun the excessive heats of less elevated localities. Its lowest limit is higher than that of the Cinchona. We observed it plentifully at the height of

5700 feet, which is 6000 feet higher than species of palms are usually met with, and not more than 2400 feet from the region where the soil is occasionally covered with snow.' (Humb. and Bonp., *Pl. Æquinoct.*, vol. i.)

As for tree ferns, we have them in New Zealand, and especially on the south side of Van Diemen's Land, where the mean temperature probably does not exceed 54° Fahrenheit. So that, all things considered, it is by no means safe to take the remains of these plants as good evidence of a tropical climate, or indeed of a climate materially unlike that which we now experience.

The only remaining argument to be considered is that derived from the great preponderance of ferns in the Coal Flora. It is said by Adolphe Brongniart, that as it is only in damp tropical regions that we now find ferns equal in the number of their species to all the species of other plants, and as this same proportion is found in the Coal Flora, that therefore the climate under which the Coal Flora was produced must have been damp and tropical. But as, by the experiment already mentioned, it was shown that when a given number of plants of entirely different habits are plunged into the same vessel of water, by far the greater part is decomposed before ferns begin to be affected, it is obvious that no estimate of what the proportion of ferns to other plants really was can now be formed; and consequently this argument also falls to the ground.

These statements must, we think, render it apparent that geologists have been too hasty in coming to the conclusion that the north of Europe was formerly tropical; and that if the facts we actually possess are soberly examined, they do not amount to more than this:

1. That coal is of vegetable origin.
2. That at the period of its deposit, the earth was covered with a rich vegetation, of which only a small portion has been preserved, and that of this portion all the species and several of the races are totally unknown at the present day.
3. That the climate may possibly have been something milder than it now is, but that there is no evidence in the vegetable kingdom to show that it was materially different from that of the present day.

It may possibly have been expected that in the course of these remarks we should have touched upon the modern theory that species have been gradually becoming more and more completely organized from the earliest period of the creation to the present day; that the simplest forms were those which first appeared; that they were succeeded by others of a more complicated structure, and that it is only in these later days that the most perfectly constructed species have appeared. Upon this subject we have only to remark, that so far as the vegetable kingdom is concerned, the theory is not supported by a shade of evidence; and we therefore do not think it necessary to give it further notice.

COAL TRADE. The quantity of coals shipped coastwise from ports of Great Britain to other ports of Great Britain and to Ireland amounted, in the year 1835, to 6,117,993 tons; and the quantity exported to the British colonies and to foreign countries, in the same year, was 736,060 tons; making an aggregate of 6,854,053 tons of coals sea-borne from the maritime districts. The market of London alone required a supply of 2,298,811 tons, for the conveyance of which 7958 ships (which make repeated voyages) were employed. The great towns of Lancashire, of the three Ridings of Yorkshire, of Nottinghamshire, Derbyshire, Leicestershire, Warwickshire, and Staffordshire, are supplied by canals or by land-carriage from collieries in the respective counties here enumerated. In 1816 a committee of the coal-owners of Northumberland and Durham was commissioned to inquire as to the quantity of coals then sent by inland navigation and by land-carriage to different parts of the kingdom. The result of their inquiries was that 10,808,046 tons were annually so sent. There can be no doubt that if this estmate were correct at the time, the quantity must have been greatly increased during the last twenty years. In estimating the annual consumption of the country, it is also necessary to take into account the quantities used upon the spots where the collieries are situated. The town of Sheffield alone requires for manufacturing and domestic purposes more than half a million of tons annually drawn from collieries on the spot; and it has been estimated that the iron-works of Great Britain, most of which are situated in spots where coal is found, require every year, for smelting the ore and converting the raw material into bars, plates, &c., more than five millions of tons. The total consumption of coals within the United Kingdom has been variously stated at from fifteen to thirty millions of tons per annum; recent parliamentary inquiries lead us to conclude that the larger estimate is not much, if at all, exaggerated. Mr. Taylor, whose experience in the various branches of mining operations is equal to that of any person living, has given the following estimate, which agrees substantially with estimates formed by Mr. Stevenson and Mr. Bakewell, previously to the inquiries to which reference has just been made:—

	Tons.
'The annual vend of coals carried coastwise from Durham and Northumberland is . .	3,300,000
Home consumption, say one-fifth . .	660,000
	3,960,000
Which quantity supplies about 5,000,000 persons; and supposing the whole population of Great Britain to be 15,000,000, this must be trebled; for though these two-thirds of population are perhaps less able to afford fuel, yet, taking into consideration the manufacturing districts and the cheapness of coal in the interior, the estimate will not be too high .	11,880,000
Consumed by iron-works, say 600,000 tons of metal, to produce which requires at least four times the quantity of coal in making even pig metal; and the extraordinary consumption in the Cornwall, &c. mines . .	3,000,000
Consumed in Great Britain . . .	14,880,000
Exported to Ireland, say . . .	700,000
Total tons, exclusive of foreign exportation	15,580,000'

It is probable that the foregoing estimate is considerably short of the present consumption, which has increased with the increasing population, and with the growth of the manufacturing interests. The following estimate, which can still only be offered as an approximation, is made upon the same principle as that assumed by Mr. Taylor, but applying to it the actual quantities ascertained from recent parliamentary returns:—

	Tons.
The quantity of coals carried coastwise from Durham and Northumberland, in 1835, was	43,68,144
Home consumption, one-fifth, which is probably much under the truth, from the recent multiplication, in those counties, of manufactures in which the cost of fuel is a principal consideration	873,629
	5,241,773
This quantity trebled, upon the principle assumed by Mr. Taylor, will amount to .	15,725,319
Consumed by iron-works and mines, double the quantity estimated by Mr. Taylor, who has taken no account of that consumption as regards iron-works beyond the first process, in which alone, because of increased production, the full allowance of 3,000,000 tons are now used, say	6,000,000
Consumed by Great Britain . .	21,725,319
The shipments to Ireland in 1829, the last year as to which any specific parliamentary return has been made, were 840,246 tons. These shipments had then (1829) been for some years steadily increasing at the rate of 100,000 tons annually; and as the causes for that increase have since continued to operate, it may be fairly assumed that the shipments now amount to	1,000,000
Waste by screening, as explained below . . .	6,628,218
Total, exclusive of foreign exportation .	29,353,537

It was long considered politic to check the exportation of coals to other countries, both through fear of exhausting the mines, and because it was imagined that our superiority as manufacturers might be endangered. A heavy export duty was accordingly levied, amounting to 17*s.* the chaldron Newcastle measure, or 6*s.* 5*d.* per ton upon large, and 4*s.* 6*d.* the chaldron, or 1*s.* 8*d.* per ton, upon small coals.

In 1831 these duties were modified to 3*s.* 4*d.* per ton upon large, and 2*s.* per ton upon small coals; and in 1835 they were repealed, with the exception of an ad valorem duty of 10*s.* per cent. A considerable revenue was for many years raised from all coal carried coastwise by sea from one part of the kingdom to another. When first imposed, in the reign of William III., this tax was 5*s.* per chaldron, but was raised during the war of the French revolution to 9*s.* 4*d.*, at which rate it was continued until 1824; it was then reduced to 6*s.*, and in 1831 was wholly repealed. Although the government has remedied the evil so far as the public revenue is concerned, the consumer is still burthened in some places with local or municipal duties, &c. Thus in the city of London the corporation was empowered, by the Acts 10 Geo. IV., c. 136, and 11 Geo. IV., c. 64, to levy eight pence per ton 'for providing for the payment of the interest and ultimate liquidation of monies borrowed for making the approaches to London bridge.' One penny per ton is also levied under the Act 47 Geo. III. for establishing a market for the sale of coals; and under the Act 1 and 2 William IV., c. 76, four pence per ton 'for metage by prescription and charters,' making together 1*s.* 1*d.* per ton upon all coals brought coastwise to the port of London. By letters patent granted by Charles II., the duke of Richmond was entitled to receive 1*s.* per chaldron, Newcastle measure, on all coals shipped in the river Tyne to be consumed in England; and on the average of ten years ending 1799, the amount of that duty had been 21,000*l.* a year. On the 19th of August, 1799, the Treasury agreed with the duke for the purchase of this duty by an annuity of 19,000*l.*, which sum was charged upon the consolidated fund, to be paid quarterly. The sum issued by the Exchequer at three several periods for the purchase of a perpetual annuity of 19,000*l.* instead of those Exchequer payments was 490,833*l.* 11*s.* 6*d.*; but the bargain has proved by no means an improvident one on the part of the public, the sums received by the Custom House, as the representative of the duke of Richmond, from August, 1799, up to March, 1831, when all coasting duties ceased, having exceeded the payments made from the Exchequer by 315,000*l.* The total revenue derived from the coasting duties on coals in 1830, the year preceding its repeal, was 1,021,862*l.*

The quantity and declared value of coals, culm, and cinders exported from the United Kingdom to British colonies and foreign countries, in each year from 1827 to 1835, have been as follows:—

	Tons.	£.		Tons.	£.
1827	368,679	153,387	1832	588,446	228,615
1828	357,864	145,943	1833	634,448	231,344
1829	371,271	147,309	1834	615,255	220,746
1830	504,419	184,464	1835	736,060	244,898
1831	510,831	199,760			

The British colonies and foreign countries to which shipments were made in 1835, together with the quantity and value sent to each, were as follows:—

	Tons.	Value.		Tons.	Value.
Russia	42,061	£.11,425	Mauritius	1,039	£. 650
Norway	5,602	1,697	East India Company's Territories and Ceylon	2,775	1,784
Sweden	16,076	3,741	Indian Islands	126	50
Denmark	83,109	20,658	Philippine Islands	201	126
Prussia	43,675	9,336	China	429	175
Germany	66,055	15,177	N. S. Wales and V. D. Land	20	8
Holland	115,138	35,032	Brit. N. A. Colonies	38,565	16,359
Belgium	599	178	Brit. W. Indies	61,054	36,872
France	104,138	31,647	Hayti	43	23
Portugal	11,981	2,894	Cuba and Foreign W. Indies	339	52
Spain	2,393	1,049	United States of America	19,585	10,015
Gibraltar	8,378	3,145	Mexico	11	5
Italy	8,377	3,320	Brazil	5,352	2,043
Malta	4,865	1,833	Rio de la Plata	1,544	751
Ionian Islands	3,004	1,291	Chili	137	82
Turkey and Continental Greece	6,098	2,301	Peru	58	43
Morea and Greek Islands	60	20	Guernsey, Jersey, Alderney, and Man	68,482	25,154
Egypt	6,910	2,589			
Tripoli, Barbary, and Morocco	5,154	1,770			
W. Coast of Africa	30	25			
Cape of Good Hope	1,828	1,021			
Saint Helena	297	270			

The owners of the greater part of the collieries in the counties of Durham and Northumberland have entered into a mutual agreement under the denomination of 'The Limitation of the Vends,' which has continued in operation with some interruptions from the year 1771 to the present time. The object of this compact is to apportion among the different collieries the quantity to be raised and sold, according to the quality of the coal and the power of raising it, and with reference also to the probable demands of the different markets in the kingdom. The nature of the regulation was explained by Mr. Brandling to a committee of the House of Commons, in 1830, in the following terms —

'When it is understood by the coal-owners that all the parties interested in the coal trade on the Tyne and Wear are willing to enter into an arrangement of this nature, a representative is named for each of the collieries; these representatives meet together, and from amongst them choose a committee of nine for the Tyne, and seven for the Wear. This being done, the proprietors of the best coals are called upon to name the price at which they intend to sell their coals for the succeeding twelve months; according to this price the remaining proprietors fix their prices: this being accomplished, each colliery is requested to send in a statement of the different sorts of coal they raise, and the powers of the colliery, that is, the quantity that each particular colliery could raise at full work; and upon these statements the committee, assuming an imaginary basis, fix the relative proportions as to quantity between all the collieries, which proportions are observed, whatever quantity the markets may demand. The committee then meet once a month, and according to the probable demand of the ensuing month they issue so much per 1000 to the different collieries; that is, if they give me an imaginary basis of 30,000, and my neighbour 20,000, according to the quality of our coals and our power of raising them in the monthly quantity, if they issue 100 to the 1000, I raise and sell 3000 during the month, and my neighbour 2000; but in fixing the relative quantities, if we take 800,000 chaldrons as the probable demand of the different markets for the year, if the markets should require more, an increased quantity would be given out monthly, so as to raise the annual quantity to meet the demand, were it double the original quantity assumed.'

The single circumstance upon which the committee forms its estimate of the quantity to be issued, is the price in the London market. If this has been greater during the previous month than the price fixed by the coal-owners, as already explained, added to the freight and other charges of conveyance to London, permission is given to raise a larger quantity; and on the contrary, if the price has been below a remunerative one, thus calculated, then the supply is limited till the requisite price is reached. In the agreement entered into among the owners of collieries, it is stipulated that no one without leave of the committee shall sell below the fixed price agreed on as the price to be charged by such colliery, under a penalty of 5*s.* for every chaldron so sold in excess; and every colliery giving overweight, and in that way evading the terms of the agreement, is to forfeit 2*s.* 6*d.* for every hundredweight of excess. It has been usual for each of the parties to deposit in the hands of the chairman of the committee a promissory note for a considerable amount, proportioned to the quantity allotted as the annual vend of the particular colliery, as a security for the payment of any fines that may be incurred; but during the last two years this part of the plan has not been insisted on.

This combination on the part of the coal-owners is defended on the plea that if through the free competition of the collieries a glut should be created in the market, so that any great reduction in the price should be occasioned, many of the collieries must soon cease to be worked; the effect of which would be, that those collieries which should survive the shock would then raise the price so as to indemnify themselves for the loss they may have sustained, by which means the consumer might be permanently injured. In support of this position, it is urged that in those years when the trade was free, low prices uniformly prevailed to such a degree as to involve the coal-owners in great losses, which must have ruined the weak parties, and have led to the results just described, had not the whole body felt it much for their advantage again to have recourse to the regulation of the vend. It seems however that the competition of coal-owners in other districts, when there is any failure of supply from Durham and Northumberland, would, in a considerable degree, prevent that great rise in price which has been looked for as an indemnification for previous losses. The regulation made by the committee for the year 1828 fixed the prices too high, the consequence of which was an immediate influx of coals from Scotland, Wales, and Yorkshire, into London; so that when the engagement was entered into for 1829, the price was fixed 1*s.* per chaldron lower. Had this reduction been made at first, it might have prevented the competition, which, having been once created, still exists, and has been constantly increasing. The existence of competitors, who are continually creating greater facility of communication with the great London market, must in time altogether break up the monopoly which the coal-owners of Durham and Northumberland are attempting to perpetuate. The manner and degree in which the consumers, and especially the London consumers, of the coals of Durham and Northumberland are affected by the regulation of the vend, and the impolicy to the coal-owners themselves of its continuance, may be understood from the evidence of Mr. Wood, the managing partner in an extensive colliery, given before a committee of the House of Commons, in June, 1836. Mr. Wood is of opinion, 'that the effect of the regulation is, that an inferior coal is sold at the price a better one would be supplied at in an open trade; that by abolishing the regulation the present price would be reduced 1*s.* 6*d.* per ton by the coal-owner, and many of the inferior sorts, in that case, could not be worked at a profit; there would consequently be a larger proportion of good coals, and not so much risk of admixture as at the present time; that there are no peculiarities in the coal market to prevent its adjusting itself to an open trade; no peculiarity in the application of capital in the coal trade to prevent a regular and ample supply: that an open trade would urge to economy in working; and as a case in point, he states that the manager of a colliery who in 1827 thought that the price of 24*s.* per Newcastle chaldron was the lowest at which he could supply them, now sells the same coals at 17*s.* 6*d.*; that in fact a low steady price would be ultimately better for the coal-owner than the great changes which have taken place. Under an open trade, he doubts whether there would be any profit for some time; but it would settle down to a remunerative price, as all other trades do, and the supply would then be made by those who could sell the best coals cheapest; that the best effects would follow from the most unrestricted and free exercise of every man's discretion in conducting his own trade, both at the place of purchase and of sale: and that the present prices leave an extravagant profit to the coal-owners; more than a fair remuneration.'

Another regulation affecting the coal trade from the Tyne and the Wear has been established by Act of Parliament (6 Geo. IV. c. 32), under the provisions of which every ship must be loaded in her turn; and if any colliery refuse to sell, a penalty is imposed of 100*l.*; but this regulation may be and has been evaded by the coal-owners towards ships the owners of which refuse to be bound by their regulations in the port of discharge, and the mode of evading it is to fix an exorbitant price upon their coal, which may be done although a price below the regulation is not allowed, and by this means the vessels are either brought into conformity with the regulations in the port of discharge, or forced out of the trade. The regulations here alluded to were made in June, 1834, at a meeting of the coal-factors in London, and are to this effect:—'That whenever a greater number than eighty ships reach market on any one day, the factors shall offer them for sale according to the rotation of entry; and that not more than forty of such ships shall be offered for sale on one market-day, unless the prices of best coals be 20*s.* or upwards, and in that case to be at liberty to sell such further number of ships as each factor may think proper, giving to every vessel with the same coals her fair and regular turn of sale, by which arrangements the ships will experience little or no detention, and the evil be avoided of pressing for sale at a reduced price a larger quantity of coals than the average demand of the market requires.' This rule was altered as follows in January, 1835, as far as regards the number of ships, the cargoes of which may be offered for sale in one market-day:—

'When the price of the best Sunderland coals has been on the previous market-day 21*s.* or less, the number of cargoes to be offered for sale shall be .. 40
When 21*s.* 3*d.* or 21*s.* 6*d.* 50
21*s.* 9*d.* or 22*s.* 60
22*s.* 3*d.* .. .. 70.'

Some alteration has since been made in this scale, but on the 3rd of March, 1836, it was again adopted, and has since been acted upon. Vessels loaded with coal for gas companies begin to work upon arrival, and also all vessels whose cargoes are for the use of the Government.

The effect of the regulation which fixes the minimum prices at which the different qualities of coals are to be sold, is further injurious to the public, because, in order to raise the actual value more nearly to the prescribed rates, it induces the owners to screen the coal. By thus separating the least valuable part an immense waste is occasioned. The managers of collieries sell as much of the small coal as possible at the mouth of the pit, but the demand being necessarily limited to the wants of the surrounding district, a great proportion is wholly unsaleable, and is actually set on fire to clear the ground. This loss would of course be saved if the trade were made permanently free. The waste by screening is said to be always from one-fourth to one-third of the total quantity raised, and was greater even than this proportion before January, 1832, when the sale of coals by measure was abolished in and about London. Coals that are shipped to other parts, or exported to foreign countries, are less screened than those sent to London, and are consequently sold at 4*s.* to 6*s.* per chaldron cheaper.

		No. included in regulation.
The number of collieries on the Tyne, in June, 1836, was	47	41
on the Wear	17	9
on the Tees	16	9

The basis of the regulation for the vend, as settled in the preceding April, was—

			Tons.
on the Tyne	959,500	Newcastle chal., or	2,542,675
on the Wear	564,000	„	1,494,600
on the Tees	176,000	„	466,400

The coals sent from the Tees are all carried down from the collieries to the place of shipment by the Stockton and Darlington Railway. When this work was first projected, the coal-owners of Newcastle and the Wear petitioned against it on the ground that it would exonerate the owners of the collieries through or near to which it was to pass from a great portion of the expense of transport to the ship. Their opposition at that time was fruitless; but, acting upon the same principle, a meeting of the coal-owners of the Tyne, Wear, and Tees, was held at Newcastle in April, 1836, at which it was determined to oppose the progress of the Durham Junction and South Durham Railway bills, and a subscription was entered into to defray the expense of such opposition. These bills were both thrown out by the House of Lords.

The following statement shows the price per ton of the best Newcastle and Sunderland coals at the place of shipment and in London, in June and July of each year from 1813 to 1835:

	Year.	Price at Newcastle.	Price in London.		Year.	Price at Newcastle.	Price in London.
Duty 7*s.* 6*d.* per Ton.	1813	13*s.* 0*d.*	42*s.* 0*d.*	Duty 4*s.* per Ton.	1824	13*s.* 0*d.*	33*s.* 4*d*
	1814	13 0	44 8		1825	12 8	23 6
	1815	13 0	39 0		1826	13 6	25 3
	1816	13 0	34 8		1827	13 6	28 3
	1817	13 0	31 9		1828	13 6	27 6
	1818	13 0	32 9		1829	12 9	23 6
	1819	13 0	30 7		1830	12 4	27 6
	1820	13 0	30 7	Duty repealed.	1831	12 4	22 9
	1821	12 8	32 6		1832	12 3	19 6
	1822	11 11	30 4		1833	10 6	15 9
	1823	12 8	33 4		1834	10 9	19 0
					1835	11 0	20 3

The charges upon the transmission of a cargo of coals from Sunderland and upon the delivery in London, as well as the proportions in which the price paid by the dealer is divided between the coal-owner and the ship-owner, will be seen in the following account sales: viz.,

	£.	s.	d.	£	s.	d.
Night office and entry	0	4	6			
City dues on 298 tons, at 1*s.* 1*d.* per ton	16	2	10			
Metage on 293 tons, at 3*d.* (half borne by ship-owners)	1	16	7			
				18	3	11
Tret, discount, and scorage, allowed the buyer				9	6	6
Factorage, 3*d.* per ton	3	13	3			
Del Credere commission, 10*s.* per cent.	1	10	11			
				5	4	2
Insurance 160*l.*, at 15*s.* per cent.	1	4	0			
Policy duty	0	2	6			
				1	6	6
				34	1	1
Paid coal-owner for 112 chaldrons of 53 cwt., at 28*s.* 6*d.* per chaldron (10*s.* 9*d.* per ton)				159	12	0
Balance for freight to the ship on 293 tons				115	15	11
				309	9	0
293 tons sold at 21*s.* per ton, with 1½*d.* per ton metage				£309	9	0

Out of the freight, which in this case amounted to 7*s.* 11*d* per ton, the ship-owner had to pay 9*d.* per ton delivery charges, and 1½*d.* per ton half metage.

The quantity of coals and the number of ships, including their repeated voyages, in which the same was brought into the port of London in each year from 1825 to 1835, were as follows.—

Years.	Ships.	Tons.
1825	6,564	1,856,606
1826	6,810	2,040,291
1827	6,491	1,882,321
1828	6,750	1,960,569
1829	6,992	2,018,975
1830	7,108	2,079,275
1831	7,006	2,045,292
1832	7,528	2,139,078
1833	7,077	2,010,409
1834	7,404	2,078,685
1835	7,958	2,298,812

The ports from which the above shipments were made in 1835 were—

	Ships.	Tons.
Newcastle	3,897	1,266,300
Sunderland	2,182	629,544
Stockton	965	229,885
Blyth	251	65,046
Scotland	249	40,956
Wales	142	35,420
Yorkshire	251	27,334
Sundry Places	6	367
Small Coal	4	744
Culm	11	3,147
	7,958	2,298,812

COALBROOK DALE. [COAL.]

COAST, GOLD, is a part of Upper Guinea, but its boundary is not exactly determined. Geographers state that Cape Three Points (2° 30′ W. long.) constitutes its western boundary; but our navigators extend it farther west to the small river Assinee (about 5° W. long.), nearly 70 miles east of Cape Lahoo. On the east, the eastern mouth of the river Lagos (4° 20′ E. long.) is generally considered as constituting its boundary towards Benin, though the most eastern districts are often distinguished by the name of the Slave Coast. In the interior are the powerful kingdoms of the Ashantees and Dahomey, on which most of the small states along the coast are dependent.

Nearly in the centre of the coast is the English fortress of Accra. The country west of it has an undulating surface, with a small proportion of level ground: the hills are covered with shrubs and timber of small growth. The coast, though rarely high, is rocky and bold. At Accra the low country begins, and extends without interruption to the eastern boundary and still farther. It is a fertile, open, and level plain, which contains extensive savannahs covered with high grass; but in some parts it is thickly wooded with fine trees. The shores here are flat and sandy. There are no harbours along the whole line of the coast, not even for vessels of a moderate size; and as the surf is very violent, the trading vessels are obliged to anchor four or six miles from the beach. In many places landing can only be effected in calm weather; in others there are reefs, from 100 to 1000 yards from the shore, upon which the surf breaks its force, and consequently the intermediate space offers facility for landing at all times. The principal European settlements are built near such places.

The whole of this coast being near 5° N. lat., is considered one of the hottest countries on the globe; yet, according to Adams, the mean temperature is only 78°, and in the cold season the thermometer sometimes falls to 73° or 74°. Monrad also states, that on the coast it rarely attains 90°, though in the interior it reaches 94° or 95°, and in some ill-ventilated places even 100°. This comparatively low degree of heat is attributed to the circumstance that the sky is nearly always clouded. Adams says that the prevailing south-western and western winds load the atmosphere with moisture, so as to give it a haziness, which diminishes the intensity of the sun's rays and renders them more supportable than in the West Indies, where the sun shines with a brilliancy seldom seen in this part of Africa. Monrad attributes the same haziness during the eastern winds to a fine dust with which the air is filled. It is further observed, that the nights are commonly cloudless, except in the rainy season, and that the moon and the stars shine with unusual brightness in a clear blue sky.

During the Hamattan season, which begins about the middle of December and lasts to March, and is the driest and coolest part of the year, the wind blows from north-east. This wind takes the skin off, yet Monrad thinks this more healthy than the other seasons. The great rainy season begins in March and continues to the beginning of June. At first the rain pours down continually, and as the dry earth cannot absorb it quick enough, the whole country is covered with water. The rain however gradually diminishes; but during the whole season it is frequent and heavy From June to the end of September is the warm season, which is the most unhealthy, especially the month of August, when the fogs are denser than at other times, and generate fevers. September however and October, which are the hottest months, are considered healthy. In October and November showers of rain are frequent, and hence this part of the year is called the little rainy season. Except during the Hamattan season, the winds blow from the west in the middle of the day, from eleven to three o'clock, but in the evening from south-west, and in the morning from north-west.

The climate is in general unhealthy, especially to Europeans on their arrival. Every person is attacked by a fever, which is called the seasoning, and many die of it; but when Europeans have become acclimatized, and adopt a regular manner of life, they may enjoy good health for many years. Monrad however observes, that he never saw a European who had attained the age of fifty.

This coast was formerly much resorted to by European and American vessels for slaves. When we consider that during more than a century nearly 100,000 persons were annually removed from this country as slaves, we must admit that the interior of this portion of Africa is much more populous than is commonly supposed. Many of the slaves however were brought from distant parts of the interior. At present a few vessels fetch gold and ivory: they give in exchange fire-arms, iron and iron ware, tobacco, rum, and some other articles. Many of the numerous factories and forts formerly erected on this coast for the protection of the slave-trade, have, since its abolition, been broken up and abandoned.

West of Cape Three Points the Dutch had three forts, and the English had one, Apollonia, which have all been abandoned, except the Dutch forts of Axim or S. Antony, which is the second best of the Dutch forts on this coast, and affords good landing. East of Cape Three Points is the English fort Dixcove, with a small cove under the guns of the fort, capable of sheltering a few small boats: it is the only place on the whole coast where craft can be repaired. East of it were five Dutch forts, Boutry or Boutrou, Tacorary, Succondee, Chama, and Comenda, all of which are now abandoned, as well as the English fort at Comenda.

Farther east is the Dutch fortress Elmina, or S. George della Mina, the oldest European establishment on the coast It was erected in 1411, by the Portuguese, under the command of Don Diego d'Azambuja: the Dutch took it from the Portuguese in the beginning of the seventeenth century. It is the best fortified place on the coast, and is defended by the castle of S. Jago. The reefs along the coast form a harbour for small vessels, and the Dutch have built piers and wharfs for landing goods. The town is the only one on the coast built of stone, and the only one that is paved, but it is badly laid out, the houses being all built close together. The population is about 8000

A few miles farther east is the principal English fortress, Cape Coast Castle, which covers a considerable space, and contains comfortable apartments for the officers, and good barracks for the privates. There are some spacious warehouses. It is built on a rock close to the sea. The town, which is behind the fortress, is considerable; but the houses are of mud, and huddled together.

East of Cape Coast Castle is the Dutch fortress of Mouree, which is now abandoned; and the next, which is the English fortress Annamabo, has a safe landing-place, and is surrounded by a town with 4000 inhabitants. The English forts Tantum and Winnebah are abandoned, and also the Dutch fortress of Berku. Near it is the English fortress of Accra, which is situated in a fine open plain several miles in length. The Dutch fortress of Crevecœur, near it, is abandoned.

East of Accra, but at no great distance from it, is the Danish fortress of Christiansburg, and farther east Friedensburg, which also belongs to the Danes. The smaller Danish forts, as Prinzerstein, have been abandoned. At a considerable distance from them, on the Slave Coast, is the last of these fortified settlements, the English fort of Whydah. In its neighbourhood the Portuguese had two small fortresses, but we do not know if they are still retained by them. The possessions of the Europeans are entirely limited to the fortresses, and their governors have no authority over the places near them, which are almost entirely inhabited by natives.

(Robertson's *Notes on Africa;* Hutton's *Voyage to Africa*, Adams's *Remarks on the Countries extending from Cap*

Palmas to the River Congo; Monrad's *Gemählde der Küste von Guinea.*)

COBALT. This metal is said to have been employed as early as 1540 for the purpose of giving a blue colour to glass. It was however first procured in a separate state by a Swedish chemist named Brandt, in 1733. Various processes have been recommended for obtaining this metal in a state of purity, which however is not a matter of importance for the various purposes to which it is applied. The following may perhaps answer the purpose as well as any on the small scale. Suppose the ore to contain cobalt, arsenic, copper, and nickel, dissolve it, after roasting to get rid of the greater part of the arsenic, in nitric acid; immerse a plate of iron, to precipitate the copper; then boil the solution with excess of soda, which will throw down the cobalt, nickel, and iron: dissolve this in muriatic acid, and add the solution to excess of ammonia, which will dissolve the oxides of nickel and cobalt; to the solution add potash, which will throw down the oxide of nickel, and after some days' exposure to the air, or more quickly by heat, the cobalt will be precipitated nearly or quite pure in the state of oxide. By heating it very strongly mixed with black flux it will be reduced to the metallic state. The properties of cobalt are, that it is of a reddish-grey colour, and weak metallic lustre. Its specific gravity is 7·834, according to Dr. Turner. It is not acted upon by exposure to air or water, but together they oxidize it. It fuses at a high temperature, probably rather below that of iron, and when cooling it crystallizes. It is stated that it obeys the magnet, but this is questionable.

Oxygen and Cobalt combine to form two distinctly-marked compounds; and a third, which, if not regarded as a compound of them, is a ⁴⁄₃ oxide. The protoxide of cobalt may be obtained by calcining the metal at a high temperature in the air, or by dissolving it in nitric acid.

Protoxide of Cobalt is obtained by dissolving the metal in nitric acid, and decomposing the solution, or that of any other salt of the metal, by carbonate of potash; the carbonate precipitated, after due washing, is to be dried, and then decomposed at a red heat without the access of air. This oxide is of an ash-grey colour; it is insoluble in water, but readily dissolved by acids, and by ammonia and its carbonate, forming with them a solution of a fine red colour. It is not soluble in the alkalis, potash or soda, or in their carbonates. When exposed to a red heat in the air, it gradually absorbs oxygen and becomes peroxide. It is the basis of all the salts of cobalt, and they usually have a red colour. It is composed of

1 equivalent of cobalt	30
1 „ oxygen	8
equivalent	38

When a solution of nitrate of cobalt is decomposed by potash, a blue hydrate is precipitated, which absorbs oxygen from the air, and becomes of a dirty green colour, and this is stated to be a hydrate of the ⁴⁄₃ oxide.

Peroxide of Cobalt.—When a solution of chloride of cobalt is mixed with one of hypochlorite (or chloride) of lime, a black precipitate is obtained, which consists of peroxide of cobalt combined with two equivalents of water; the water may be expelled at a heat of about 600°, but it is difficult to expel the whole of the water, without at the same time getting rid of some of the oxygen. It does not combine with any acids; and when treated with hydrochloric acid, chloride of cobalt is formed, and chlorine gas evolved. This oxide is applied to no use, and consists of

2 equivalents of cobalt	60	or 1	30
3 „ oxygen	24	1½	12
equivalent as peroxide	84	as sesquioxide	42

Oxide of Cobalt is procured when carbonate of cobalt is gently heated in an open fire. It is of a dark brown colour. The same oxide is obtained by heating the peroxide to redness, by which such a portion of its oxygen is expelled as reduces it to a compound of

3 equivalents of cobalt	90
4 „ oxygen	32
	122

It suffers no change by continued heat, and is therefore the most stable oxide of cobalt.

Chlorine and Cobalt may be made to unite by direct action, but the best method of forming this salt is to dissolve the protoxide of the metal in hydrochloric acid, when water and the chloride are formed. By evaporation small pink-coloured crystals are obtained, which are a hydrate. By evaporation to dryness a white scaly chloride is obtained: it is volatile at about a red heat; but when air is present, it is decomposed, chlorine is expelled, and peroxide formed. The solution when concentrated is of a deep green colour, but by dilution with water it becomes of a pale pink; when a dilute red solution is heated so as to evaporate the water, a green chloride is left, which by exposure to the air attracts moisture and becomes again colourless. This has been called Hellot's sympathetic ink.

Chloride of cobalt consists of

1 equivalent of cobalt	30
1 „ chlorine	36
equivalent	66

The bromide, fluoride, and iodide of cobalt, are but little known, and are unimportant compounds.

Sulphur and Cobalt unite in three different proportions, forming the sulphuret, sesquisulphuret, and bisulphuret. The sulphuret may be obtained by heating to redness a mixture of oxide of cobalt and sulphur: light is disengaged during their combination, and the sulphuret which is formed fuses. It is of a yellowish-grey colour, crystalline, and has a metallic lustre. It may also be formed by passing a current of hydrosulphuric acid gas into a solution of a neutral salt of cobalt.

Sulphuret of cobalt is composed of

1 equivalent of cobalt	30
1 „ sulphur	16
equivalent	46

Sesquisulphuret of Cobalt.—When sesquioxide of cobalt is heated in hydrosulphuric acid gas, taking care not to carry the heat to redness, sesquisulphuret of cobalt of a deep grey colour is obtained. This compound also occurs in nature. It consists of

1 equivalent of cobalt	30
1½ „ sulphur	24
equivalent	54

Bisulphuret of Cobalt may be formed by heating the sesquioxide with three times its weight of sulphur to about the temperature at which sulphur is volatilized. When hydrochloric acid is added to the residue, it decomposes any protosulphuret which may have been formed; by a solution of potash any excess of sulphur may be dissolved, and pulverulent bisulphuret of cobalt of a black colour, but no metallic lustre, is left. Hydrochloric acid does not act upon it. It consists of

1 equivalent of cobalt	30
2 „ sulphur	32
equivalent	62

Phosphuret of Cobalt is obtained by adding phosphorus to the ignited metal, or by heating a mixture of superphosphate of lime, oxide of cobalt, and charcoal. It is very fusible, brittle, of a bluish-white colour, and tarnishes on exposure to the air. Its exact composition has not been determined.

Selenium and Cobalt combine very readily with the production of heat; when the mass is heated to redness, the excess of selenium is expelled, it liquefies, and yields a product of a metallic appearance, a grey colour, and laminated fracture.

Cobalt and the metals combine, or at least cobalt unites with several of them, but the resulting alloys are by no means important.

Arsenic and Cobalt combine with facility; and the compound occurs in some of the ores. The arseniuret of cobalt fuses at a high temperature into a white brittle mass. It occurs in nature.

Antimony and Cobalt form a brittle alloy.

Tin and Cobalt yield a bluish-white alloy, which is somewhat ductile.

Zinc and Cobalt combine, if at all, with so great difficulty, that some chemists have denied the possibility of it.

Bismuth and Cobalt do not combine.

Lead and Cobalt unite with difficulty. The alloys in general possess the characters of the predominating metal; they are all but slightly malleable, and are harder than lead.

Mercury and Cobalt do not amalgamate.

Silver and Cobalt do not combine, and when they are melted together they separate on cooling. Still however the silver retains a little cobalt, which renders it brittle, and the cobalt a little silver, which gives it a lighter colour.

Gold and Cobalt may be combined in several proportions. Gold, with $\frac{1}{12}$ of cobalt, gives a dull yellow alloy, which is not at all malleable, nor is it when it contains only $\frac{1}{65}$, but when it amounts to only $\frac{1}{150}$ the alloy may be forged.

Platinum and Cobalt form a fusible alloy.

Acids and Cobalt form various salts, of which the protoxide is always the base. As they are not very important compounds, we shall describe only a few of them.

Nitrate of Cobalt.—This salt is easily procured by dissolving either the metal or the protoxide in dilute nitric acid. The solution is of a red colour, and by evaporation yields crystals of a deep brownish-red colour, the form of which does not appear to have been ascertained. Their taste is bitter and acrid, and they redden litmus paper; they are deliquescent, very soluble in water, and dissolved also by alcohol. When moderately heated the crystals fuse, and part with their water of crystallization; afterwards, when the heat is increased, they become blue, but the red colour returns on cooling; if still more strongly heated, the nitric acid is decomposed, and peroxide of cobalt remains. This salt is composed of

1 equivalent of	nitric acid .	54
1 „	oxide of cobalt .	38
6 „	water . .	54
	Equivalent .	146

Carbonate of Cobalt may be prepared by adding a solution of carbonate of potash to one of nitrate of cobalt, washing and drying the precipitate, which is the carbonate of cobalt. It is of a light pink colour, tasteless, unaltered by exposure to the air, and insoluble in water, but readily decomposed by acids. It consists of

1 equivalent of	carbonic acid .	22
1 „	oxide of cobalt .	38
1 „	water . .	9
	Equivalent .	69

A sesquicarbonate may probably be formed.

Sulphates of Cobalt, of which there appear to be three, viz. the neutral sulphate, bisulphate, and subsulphate. The neutral sulphate is obtained by adding carbonate of cobalt to dilute sulphuric acid; the solution is of a red colour, and by evaporation yields rhombic prismatic crystals of sulphate of cobalt, which are of a deep red colour. This salt has a sharp, bitterish, metalline taste; it is soluble in twenty-four parts of cold water, but insoluble in alcohol. When moderately heated the crystals lose their water of crystallization, and become opaque without melting, and may be made red-hot without suffering decomposition. This salt is constituted of

1 equivalent of	sulphuric acid .	40
1 „	oxide of cobalt .	38
6 „	water . .	54
	Equivalent .	132

The *Bisulphate of Cobalt* is prepared by adding acid to the neutral sulphate; the crystals are red four-sided prisms, which effloresce when exposed to the air; they contain twice as much acid and half as much water as the sulphate.

Subsulphate of Cobalt is formed when a quantity of soda or potash is added to the sulphate insufficient totally to decompose it. It is a flesh-red powder, insoluble in water; its exact composition does not appear to have been ascertained.

Phosphate of Cobalt is prepared by double decomposition. When phosphate of soda is added to sulphate of cobalt, a violet-coloured precipitate is formed, which becomes rose-coloured on drying in the air. It is insoluble in water, not decomposable by heat, but is so when charcoal is mixed with it. Its composition has not been accurately ascertained. It is used in making a pigment known by the name of Thenard's or Cobalt Blue.

The distinguishing characters of the salts of cobalt are, their red or brownish-red colour; they are not decomposed by hydrosulphuric acid, but the hydrosulphites throw down black sulphuret of cobalt; the caustic alkalis give a blue or green precipitate, ferrocyanide of potassium a greyish-green, and the alkaline carbonates a bright red. Cobalt is not precipitated by zinc.

Cobalt is very extensively employed. Its oxide gives an intense and beautiful blue colour to glass, and hence is used in colouring both glass and porcelain. Blue glass reduced to a fine powder is called *smalts* or powder blue, and is used for relieving the yellow tint of writing-paper and linen. Phosphate of cobalt has been already mentioned as entering into the composition of a blue pigment.

COBALT ORES. Cobalt is not found in the native state, and its ores, though not numerous, require a more minute examination than they have hitherto received. We shall notice those which are best known.

Bright White Cobalt or White Cobalt occurs crystalline and massive; the primary form is a cube, the planes of which are usually striated; colour silver-white; streak greyish-black; lustre metallic; hardness 5·5, yielding with difficulty to the knife, and not very frangible; specific gravity 6·3—6·5; fracture uneven; cleavage parallel to the faces of the cube; before the blowpipe on charcoal gives arsenical fumes; and tinges borax of a deep blue.

It is found in fine crystals at Tunaberg in Sweden, in Norway, Silesia, and Cornwall.

It is met with also amorphous, arborescent, botryoidal, and stalactitic.

Analysis of the crystals from Tunaberg by

	Klaproth.	Stromeyer.
Cobalt . .	44	36·7
Arsenic . .	55	49·0
Sulphur . .	00·5	5·6
		6·5
	99·5	97·8

Tin-White Cobalt or Hard White Cobalt occurs massive and crystallized in cubes and octohedrons; colour tin-white, but sometimes externally tarnished; fracture fine-grained and uneven; lustre metallic; it yields with difficulty to the knife, and is hard and brittle; specific gravity variously stated, from 6·74 to 7·7; yields arsenical vapour when heated with the blowpipe, and tinges borax deep blue.

The massive is amorphous, arborescent, botryoidal, &c. The amorphous occurs in Cornwall, and the crystallized at Skutterud in Norway. Analysis of the crystals by Stromeyer:—

Cobalt . .	33·10
Arsenic . .	43·46
Iron . .	3·23
Sulphur . .	20·00
	99·79

Grey Cobalt occurs massive and crystallized; primary form a cube; colour greyish tin-white; streak greyish-black; lustre metallic; hardness 5·5; specific gravity 6·466; fracture uneven; cleavage indistinct.

The massive occurs amorphous and reticulated. It is found principally at Schneeberg in Saxony, and is used in the manufacture of smalt.

Earthy Cobalt occurs massive, amorphous, botryoidal, pulverulent, &c.; colour yellowish-brown and bluish-black; specific gravity 2—2·4; the fracture of the massive is earthy and dull, but polished by friction, and yields to the knife readily; when heated on charcoal gives an arsenical odour, and a deep blue colour with borax: it is found in Hesse, Saxony, Bohemia, and also in Cheshire and Cornwall.

Sulphuret of Cobalt occurs yellowish-white and steel-grey; streak grey; it is amorphous or botryoidal, and externally brilliant; fracture uneven. According to Hisinger it consists of

Cobalt . .	43·2
Copper . .	14·4
Iron . . .	3·53
Sulphur . .	38·50
Earthy matter . .	·33
	99·96

Arseniate of Cobalt—Cobalt Bloom—Red Cobalt—occurs fibrous, massive, and crystallized; primary form an obtique rhombic prism; colour various shades of red passing into crimson; sometimes greyish; translucent, transparent; it is soft, light, and flexible; specific gravity 2·948; the massive variety amorphous, botryoidal: structure fibrous, radiating; below the blow-pipe emits arsenical odours, and tinges borax blue: it occurs in Saxony, Bohemia, Scotland, and Cornwall, &c.

Analysis by Bucholz:—

Arsenic acid . .	37·9
Oxide of cobalt .	39·2
Water . . .	22·9
	100

Sulphate of Cobalt—Red Vitriol—is of a pale rose-red colour, and occurs investing other minerals, in small masses and in stalactites; the masses are semi-transparent and crystalline; it is soluble in water; translucent; lustre vitreous, often dull externally: it occurs among the mining heaps near Hanau and in Salzburg.

COBB. [GULL.]

COBBETT, WILLIAM, was the son of a farmer and publican at Farnham, in Surrey, where he was born, it is supposed, in 1762. He has himself related the incidents of the first portion of his life in 'The Life and Adventures of Peter Porcupine,' first published in 1796. This tract contains a most interesting account of his self-education, carried on under circumstances of difficulty, and with an ardour and steadiness of purpose that have never been surpassed. He was trained up to country work, and so employed from an early age till the autumn of 1782, when, on a visit to the neighbourhood of Portsmouth, he first beheld the sea, and the next day made an unsuccessful attempt to get employment on board a man of war. In May, the following year, on the impulse of a sudden thought which took him at Guildford fair, he came to London, and soon, by the assistance of a friend, obtained a situation as copying clerk to Mr. Holland, of Gray's Inn. After remaining here nine months, he went to Chatham, where he enlisted in a regiment of foot, which was sent out to Nova Scotia, and was eventually ordered to New Brunswick. For his excellent conduct he was made a corporal before the regiment left England; and soon after its arrival in America he was raised at once, over the heads of thirty serjeants, to the rank of serjeant-major. In New Brunswick he made his acquaintance with his future wife, then a girl of thirteen, the daughter of a serjeant-major of artillery. His own account of his courtship and marriage is, it may be fairly said, one of the most beautiful moral pictures ever drawn. Cobbett's regiment did not get back to England till the end of the year 1791, when, at his earnest request, he obtained his discharge, with a testimonial from his commanding officer, declaring that he had served honestly and faithfully for the space of eight years, and was discharged 'in consideration of his good behaviour and the services he had rendered the regiment.' He now engaged in a proceeding, of his conduct in which and the motives by which he was actuated no intelligible explanation has ever been given; we mean his bringing charges of peculation against four officers of his late regiment, and then, when a court-martial was appointed to try them, and every arrangement connected with it made in the manner he himself required, declining to come forward to prosecute. When, on the day of trial, to the surprise of all concerned, he did not make his appearance, after forty-seven witnesses named by him had been brought up from Portsmouth to London, the court, in the notion that some accident might possibly have happened to him, adjourned to the third day after, and in the mean time search was made for him in all directions; but he had crossed over to France. He remained in that country for six months, and then sailed from Hâvre de Grace for New York, where he arrived in October, 1792. About two years after this date he made his first appearance as a public writer, in an attack upon Dr. Priestley, then newly arrived in the United States from England, under the title of 'Observations on the Emigration of a Martyr to the Cause of Liberty, by Peter Porcupine.' This pamphlet attracted much notice, and was followed by a long succession of others in the same violent anti-democratic strain, and with the same signature. The whole were afterwards collected and reprinted in England in 1801, in twelve volumes octavo. The outrageous recklessness and personality of his invective, however, at length exposed him to several prosecutions for libel; and the inconveniences in which he was thus involved induced him, in June, 1800, to quit America for England. On arriving in London, he immediately started a Tory daily paper, under the title of 'The Porcupine;' but it was discontinued after an existence of only a few months. Upon this he commenced his 'Weekly Register,' which rapidly attained a large circulation, and which he kept up without the failure of a single week from its first publication till his death, a period of above thirty-three years. In the course of this time, however, it wholly changed its politics, having eventually become the most determined among the assailants of the government and the champions of democracy. The first indications of this change appeared in the course of 1803; but it was not till some years later that the conductor of the Register had completely reversed his original position. In the year 1804 two verdicts had been given against him for libel; in consequence of the first of which (for libels on the Earl of Hardwicke, then lord lieutenant of Ireland, Lord Redesdale, lord chancellor of that country, and other persons connected with the Irish government) he was fined 500*l.*; and by the second of which he was cast in 500*l.* damages to Mr. (now Lord) Plunket, then the Irish solicitor-general. In 1810 he was again tried on an information at the instance of the government for certain observations in the Register of the 10th July, 1809, on the flogging of some local militia-men at Ely; and the result was a conviction, on which he was sentenced to pay a fine of 1000*l.* to the king and to be imprisoned for two years. When he came out of prison, he set in motion a new engine for the annoyance of the administration, in the series of papers which he called his 'Twopenny Trash,' the circulation of which is said at one time to have amounted to 100,000 copies. In April, 1817, however, professedly to escape from the operation of the Six Acts, but partly also, as it is believed, in consequence of certain pecuniary embarrassments, he again visited America. While there he still continued the publication of his Register in London, the manuscript being regularly transmitted across the Atlantic. He returned to England in 1819, and soon after commenced a daily paper, which lasted only two months, involving him in further losses. Other two actions for libel immediately followed, in both of which he was cast; the damages awarded in the first (brought by Mr. Cleary) being only 40*s.*, but in the second (brought by Mr. John Wright) 1000*l.* Amidst all these troubles, neither the regularity nor the spirit of his literary labours ever relaxed. His Register was only one of many productions which his untiring and ever vigorous pen was constantly giving to the world. In 1820 he made his first attempt to get into parliament, by standing a contest for the city of Coventry, in which he was defeated. In 1826 he was again unsuccessful in a similar attempt at Preston. In 1829 and 1830 he attracted much attention by a number of political lectures which he delivered in several of the principal towns of England and Scotland. In July, 1831, he was again tried on a prosecution for libel, the charge being grounded on an article which had appeared in the Register, and which was alleged to have been published with the intent of exciting the agricultural labourers to acts of violence and to destroy property. He defended himself on this occasion in a speech of six hours; and, the jury not being able to agree in a verdict, the trial ended in his discharge.

In 1832 Cobbett was returned to the first reformed parliament as one of the members for Oldham. In the course of his parliamentary career he made several effective speeches; but his success in this new field did not, on the whole, come up to expectation, and on more than one occasion he damaged himself by those strange blunders which here and there mark every portion of his history. His death took place unexpectedly, and after a very short illness, on Thursday, the 18th of June, 1835.

A complete catalogue of Cobbett's publications would occupy more space than we can afford. Among those not already mentioned that have attracted most attention, are his 'Year's Residence in America;' his 'Emigrant's Guide;' his 'Poor Man's Friend;' his 'Cottage Economy;' his 'Village Sermons;' his 'History of the Protestant Reformation in England and Ireland;' his 'Advice to Young Men and Women,' his 'Grammar of the French Language;' his 'English Grammar,' in a Series of Letters to his Son; and his 'Rural Rides;' reprinted from the 'Register.' He also translated from the French Marten's Treatise on the 'Law of Nations;' and is understood to have been the projector and original conductor of the 'Parliamentary History,' which, for some years, bore his name.

On the subject of the intellectual character of this remarkable man, there is already a more general agreement of opinion than might have been expected, considering the vehement partisanship of the greater portion of what he has written. His mind was one of extraordinary native vigour, but apparently not well fitted by original endowment any more than by acquirement for speculations of the highest kind. Cobbett's power lay in wielding more effectively perhaps than they ever were wielded before, those weapons of controversy which tell upon what in the literal acceptation of the words may be called the common sense of mankind, that is, those feelings and capacities which nearly all men possess in contradistinction to those of a more refined and exquisite character which belong to a comparatively small number. To these higher feelings and powers he has nothing to say; they and all things that they delight in are uniformly treated by him with a scorn, real or affected, more frank and reckless certainly in its expression than they have met with from any other great writer. He cares for nothing but what is cared for by the multitude, and by the multitude, too, only of his own day, and, it may be even said, of his own country. Shakspeare, the British Museum, antiquity, posterity, America, France, Germany, are, one and all, either wholly indifferent to him, or the objects of his bitter contempt. But in his proper line he is matchless. When he has a subject that suits him, he handles it, not so much with the artificial skill of an accomplished writer, as with the perfect and inimitable natural art with which a dog picks a bone. There are many things that other men can do, which he cannot attempt; but this he can do as none but himself can or ever could do it.

COBBLE. [Diver.]

COBI. [Gobi.]

COBITIS, a genus of fishes belonging to the Abdominal Malacopterygii and family Cyprinidæ. This genus includes the *loaches*, fishes generally of diminutive size, which may be distinguished by their having the head small; mouth but slightly cleft, without teeth, and furnished with barbules on the upper lip; body elongated, covered with small scales, and invested with a mucous secretion; ventral fins situated far back, dorsal fin placed above them; gill openings small; branchiostegous rays three in number.

The loach, which is common in most of our running waters, will afford a good illustration of this genus. It is about four inches in length, and of a dirty pale-yellow colour, mottled with brown; its upper lip is furnished with six barbules, one of which springs from each corner of the mouth, and the others are situated on the fore part.

Like fishes in general which have barbules, the loaches feed at the bottom of the water. The species above described spawns in March or early in April, and is very prolific.

The *spined loach* (*Cobitis tænia*, Linn.) is a far less common species than the above; its form is more compressed; the barbules are very short, and consequently less conspicuous: the principal character however consists in its having two spines, one before each eye. From this character and some other differences of minor importance, this fish, with several others having the same structure, have been separated from the true loaches, and now constitute the genus Botia of Mr. Gray.

The loaches are extremely restless during stormy weather, when they generally rise to the surface of the water, which from their restlessness is kept in constant agitation.

COBLENZ, an administrative circle or division in the province of the Lower Rhine, belonging to Prussia. It is divided by the Rhine into two unequal parts, the larger portion being on the south bank. It lies between 50° and 51° of N. lat. and 6° and 9° E. long.; it is bounded in part on the east by the grand duchy of Hesse and the duchy of Nassau, and on the south by Rhenish Bavaria, Oldenburg, and Hesse Homburg. Its area is about 2300 square miles, of which about 567,000 acres are arable land; 16,900 gardens; 123,000 meadow and pasture land; 17,300 vineyards, and 556,000 forests and woods. Coblenz contains 12 minor circles, 34 towns, 19 market-towns, 917 villages, and 463 hamlets. The population, including the military, was, in 1817, 359,204; in 1825, 399,235; and in 1831, 436,828. The number of Roman Catholics, in 1828, was 268,329; of Protestants 129,682 and Jews 6724. The surface of the country is generally hilly. The left bank of the Rhine, which is the most fertile, is traversed by a portion of the Eifel, and the Hundrachen, of which the highest summit is the Druidenstein, on the north bank of the Rhine, a basalt rock 1579 feet above the sea. The rivers of this circle are:—On the left bank of the Rhine, the Nahe, the Moselle, and the Nette; on the right, the Lahn, Sayn, and Wied. The breadth of the Rhine between Coblenz and Bingen is 1160 feet; between Coblenz and Neuwied 1230; and at Neuwied 1400. The average breadth of the Moselle, between Trarbach and Coblenz, is 595 feet.

The circle is well cultivated, and the landscape is agreeably diversified with deep valleys, fertile plains, vineyards, and naked rocks. The hills, along the banks of the Rhine and Moselle, are covered with vineyards, and the declivities with corn fields and meadows. The stock of cattle in 1831 was 12,590 horses; 169,753 horned cattle; 143,070 sheep; 11,478 goats, and 49,630 swine. The chief manufactures are woollen yarn, leather, iron and iron ware, potashes, earthenware, tobacco, mill-stones, &c.

The circle consists of 12 minor circles:—

Coblenz, cap. Coblenz, 14,724; St. Goar—Boppart, 3700; Kreuznach—Kreuznach, 7900; Simmern—Simmern, 2700; Zell—Zell, 1890; Kocheim—Kocheim, 2350; Mayen—Mayen, 3920; Adenau—No town; Ahrweiler—Ahrweiler, 2450; Neuwied—Neuwied, 5350; Altenkirchen—No town; Wetzlar—Wetzlar, 4500.

The seat of the provincial administration is at Coblenz. The ecclesiastical affairs of the Protestants are distributed among eleven superintendentships, under the provincial consistory at Coblenz; the Roman Catholics, among eleven deaconries, under the bishop of Treves.

COBLENZ, the capital of the circle of the same name, and of the whole province of the Lower Rhine, lies in a beautiful situation at the conflux of the Moselle and Rhine, whence the city obtained its antient name of Confluens, Confluentia, or Confluentes. After the conquest of Gaul by Cæsar, it came under the dominion of the Romans. Drusus erected, on the right bank of the Moselle, a castle called Confluens, which subsequently came into the possession of the Frankish monarchs. After the division of the monarchy among the sons of Lewis, in 843, Coblenz fell to the share of Lotharius, and was included in Lothringia, which province was alternately in the possession of the French and Germans till it was finally annexed to the Germanic empire by Henry I.

In 1018 the Emperor Henry II. gave this city, with its many privileges, to the archbishop of Treves; since which period Coblenz has remained attached to that archbishopric, though no longer among its temporalities. It was the occasional residence of many of the German emperors, and it was here that Conrad of Hohenstaufen was elected emperor in 1150. Here also (1338) Edward III. of England, when he laid claim to the throne of France and sought the assistance of Germany, met the Emperor Louis with other princes and several archbishops.

Coblenz was antiently fortified with walls and ramparts, traces of which still exist, and this part retained, for many centuries after it had been considerably extended, the name of Old Town. Coblenz is very irregularly built, with narrow streets and old houses. In what is still denominated 'the Old Court' stood the Roman castle, which became subsequently the palace of the Frankish monarchs, the German emperors, and the Archbishops of Treves. The 'Clement,' or New Town, which is very handsome, was built by the last electoral prince, Clement Wenceslaus of Metternich. Coblenz contains at present four Roman Catholic and two Protestant churches, and one synagogue: among the former the principal is the collegiate church of Saint Castor, built in 836, which was the place of meeting of the Council of 860, when three kings were present. The collegiate church of St. Florian, said to have been founded by the Empress Helena, has been fitted up for Protestant worship. The antient residence of the electoral princes is now the palace of justice; its chapel is built in a style of noble simplicity and adorned with paintings. There is a theatre. The castle yard is planted with trees and decorated with a pyramid 60 feet in height; the castle in the New Town has, since the French revolution, been converted into an hospital and magazines, &c. There are two bridges: one of stone, over the Moselle, 480 paces long, consisting of 14 arches, which was commenced in 1344 by Archbishop Baldwin; the other of wood, built in 1819 across the Rhine to the valley of Ehrenbreitstein, is 485 feet in length, and rests on 38 pontoons. The old Jesuits' College, now the Gymnasium, has 300 scholars, besides 200 in the elementary school attached to it; it has a considerable revenue, and a fine library formed out of the remains of the monastic libraries. There are various schools for children, a Catholic seminary for schoolmasters, a musical institution, house of industry, ladies' benevolent association, savings' bank, an orphan asylum, and various other charitable institutions. Besides the valuable town library, there are many private collections of paintings, coins, and antiquities.

Coblenz is the head-quarters of the 8th corps of the army, the residence of the superior president (ober-president) or lieutenant-governor of the province, and the seat of the provincial administration. It has a linen and a cotton manufactory and an extensive one of Japan wares; besides manufactories of furniture, carriages, and other articles. There is scarcely any wholesale business carried on, and its trade is confined to exporting the productions of the neighbouring provinces, the importation of articles of home consumption, and the transport of goods along the Rhine and Moselle. Many of the inhabitants are engaged in the cultivation of the vine.

In connection with Ehrenbreitstein, Coblenz is strongly fortified, and an important military post. The population in 1817 was, including the military, 12,238; in 1822, 13,689; in 1825, 14,333; in 1828, 14,724 (of whom 13,888 were Catholics, 576 Protestants, and 260 Jews); and, in 1831, exclusive of the military, 12,214. 50° 21′ N. lat. and 7° 30′ E. long.

COBRA CAPELLO. [Asp. Viperidæ.]

COBURG, the most southern of the independent principalities of Saxony, is bounded by the territories of Schwarzburg, Meiningen, Hildburghausen, and Bavaria; it lies between 50° 9′ and 50° 24′ N. lat., and 10° 30′ and 11° 13′ E. long., including the newly acquired territories of Königsberg and Sonnenfeld: its area is about 200 square miles, about one-fourth more than the area of Rutlandshire. It is composed of the great valley of the Itz, which is bordered on the north by the Thuringian mountains, and is traversed by the rivers Itz, Rodach, Steinach, Nasslach, Lanter, and others. Besides Coburg, properly so called, the principality now comprehends the whole of the duchy of Gotha, and the principality of Lichtenberg, which lies on the left bank of the Rhine: the whole constitutes the duchy of Saxe-Coburg-Gotha. 'Coburg Proper' belonged formerly to the counts of Henneberg; it came by marriage to the house of Saxony, whence it passed into the Ernestine line, and in 1735 to the branch of Saalfeld. The principality of Lichtenberg was added to it in 1816, and the duchy of Gotha (with the exception of some small districts) in 1826, in consequence of that house having become extinct by the death of Duke Frederic IV., when it was made over to the house of Saxe-Coburg-Saalfeld, by virtue of a family compact among the ducal-Saxon branches, in exchange for the duchy of Saalfeld and several other districts. Thus arose the present duchy of Saxe-Coburg-Gotha, containing altogether about 1000 square miles, nearly as large as Dorsetshire, and 153,700 inhabitants, which shows an increase of upwards of 8000 since the year 1826, when their numbers were 145,893; it has eleven towns, ten market-towns, 253 villages and hamlets, and about 28,100 houses.

Coburg Proper contains 32,000 inhabitants; and, including the lately acquired districts of Königsberg and Sonnenfeld, 38,000, of whom the majority are Lutherans: the Catholics (about 11,000) enjoy the free exercise of their religion. By the constitution of the 8th of August, 1821, the right of citizenship is enjoyed by natives only, who are all equal in the eye of the law, without regard to their religious profession. The legislative body consists of a single chamber, composed of six deputies from the nobility, and eleven from the magistracy, towns, and rural districts.

The climate is mild, especially in the fruitful valley of the Itz. The agricultural products are timber and fuel, grain, particularly peas, beans, hops, vegetables, &c. Iron, copper, cobalt, coals (but none of them in large quantities), limestone, sandstone, marble, alabaster, gypsum, porcelain earth, &c. are found here. The inhabitants are chiefly occupied in the manufacture of linen, woollens, and cotton, wooden toys, and the rearing of cattle. The principal articles of export are fatted cattle and grain; besides butter, leather, wood, wool, linen, and other manufactured goods. The duke takes the fifth rank among the Saxon dukes, and with them has the twelfth place at the diet, and a separate voice at the Plenum, or in the full assemblies of the diet.

Besides Coburg, the principality contains Rodach, a town on the river of the same name, with a ducal mansion, a church, 300 houses, and about 1430 inhabitants; Sonnenfeld, a market-town of about 600 inhabitants; Königsberg, upon a hill, and on the Nasslach, with a grammar-school, and about 750 inhabitants; and Neustadt, at the foot of Mount Mupp, with about 230 houses and 1400 inhabitants, having a tobacco-manufactory, hop-grounds, and some trade. [Saxe-Coburg-Gotha.]

COBURG, a bailiwick (Amt), in the principality of the same name, situated on both banks of the Itz. Exclusive of the precinct of Coburg the capital, it occupies about 66 square miles, has one market-town, 69 villages and hamlets, 1688 houses, and about 9700 inhabitants.

COBURG, the capital of the principality of the same name, in a picturesque valley on the banks of the Itz, is surrounded by walls, and, with its long suburbs, is divided into nine quarters, which have two market-places, 36 streets, 752 houses, and about 9060 inhabitants. It is far from being a handsome town; the houses are small, the streets rough, and in many places overgrown with grass. The ducal palace of Ehrenburg (burg of honour), which name it received from Charles V., has been made into a very elegant residence by the reigning duke, and has a library of 26,000 volumes, and a collection of natural history, minerals, coins, and prints. There are also the government buildings, in the Italian style of architecture; the town hall; five churches, of which Saint Maurice's church contains the ducal vault and some good monuments; the arsenal, orphan asylum, three hospitals, &c. The gymnasium, founded in 1605, by Duke John Casimir, hence called Casimirianum, has all the rights and privileges of a university. There are besides two public libraries, a collection of natural history, an observatory, with a normal school (pädagogium) attached to it; various schools, a Sunday school for mechanics and apprentices, which, in 1823, was attended by 25 mechanics and 175 apprentices; a technological society; a society of the arts and sciences, &c. There are likewise two infirmaries, a savings' bank, a ladies' benevolent association, and other charitable institutions.

The inhabitants carry on manufactures of woollens, cottons, linen, furniture, buckles, dyeing, especially the real Turkey red; gold and silver articles, chocolate, salammoniac, tools, &c. They have also a considerable trade in wool, cloth, cottons, horse-hair, flour, seeds, &c. There are several pleasure-grounds round the town, as well as many delightful rides and walks—among other places, to the ducal country seat, Rosenau, which was an old baronial castle, and has been restored in the Gothic style. Near the town are marble-polishing mills, and iron and copper works. On a lofty hill in the vicinity, which commands a beautiful prospect, is the antient fortress of Coburg, surrounded with a strong wall and five bastions. It contains many interesting remains of antiquity, arms, armour, &c. It was for some time the residence of Luther, where he delivered many of his discourses; it now contains a well-conducted house of correction, the inmates of which are employed in grinding spectacles. There are also, in the neighbourhood of Coburg, the picturesque ruins of the castles of Callenberg and Lauterberg. 50° 15′ N. lat., 10° 50′ E. long.

COCA, the dried leaf of Erythroxylon Coca, is one of those stimulating narcotics which belong to the same class with tobacco and opium, but is more remarkable than either of them in its effects upon the human system. The plant is found wild in Peru, according to Pöppig, in the environs of Cuchero, and on the stony summit of Cerro de San Cristobal. It is cultivated extensively in the mild but very moist climate of the Andes of Peru, at from 2000 to 5000 feet above the sea: in colder situations it is apt to be killed, and in warmer districts the leaf loses its flavour.

A detailed account of it is given by Pöppig and Sir William Hooker in the 'Companion to the Botanical Magazine,' whence we extract the following information. It forms a shrub from four to eight feet high, the stem covered with whitish tubercles, which appear to be formed of two curved lines set face to face. The leaves are oblong, acute at each end, three-ribbed, on short petioles, with a pair of intrapetiolary brown acute stipules. Flowers in little fascicles; peduncles sharply angled; calyx five-cleft; petals oblong, concave, wavy with a jagged plaited membrane arising from within their base; stamens ten; styles three; fruit a one-seeded oblong drupe

[Erythroxylon Coca.]

The effects of this drug are said to be of the most pernicious nature, exceeding even opium in the destruction of mental and bodily powers. The coca leaf is chewed by the Peruvian, mixed with finely-powdered chalk, and brings on a state of apathy and indifference to all surrounding objects, the desire for which increases so much with indulgence in it, that a confirmed coca-chewer is said never to have been reclaimed. Pöppig describes such a person in his usual graphic manner:—

'Useless for every active pursuit in life, and the slave of his passions, even more than the drunkard, he exposes himself to the greatest dangers for the sake of gratifying this propensity. As the stimulus of the coca is most fully developed when the body is exhausted with toil, or the mind with conversation, the poor victim then hastens to some retreat in a gloomy native wood, and flinging himself under a tree, remains stretched out there, heedless of night or of storms, unprotected by covering or by fire, unconscious of the floods of rain and of the tremendous winds which sweep the forest; and after yielding himself, for two or three entire days, to the occupation of chewing coca, returns home to his abode, with trembling limbs and a pallid countenance, the miserable spectacle of unnatural enjoyment. Whoever accidentally meets the *coquero* under such circumstances, and by speaking interrupts the effect of this intoxication, is sure to draw upon himself the hatred of the half-maddened creature. The man who is once seized with the passion for this practice, if placed in circumstances which favour its indulgence, is a ruined being. Many instances are related to us in Peru, where young people of the best families, by occasional visiting of the forests, have begun using the coca for the sake of passing the time away, and, acquiring a relish for it, have, from that period, been lost to civilization; as if seized by some malevolent instinct, they refuse to return to their homes; and, resisting the entreaties of their friends, who occasionally discover the haunts of these unhappy fugitives, either retire to some more distant solitude, or take the first opportunity of escaping when they have been brought back to the towns.'

The immoderate addiction of the Peruvians to the use of this drug is such that their forests have long since ceased to be able to supply their wants, and the cultivation of the plant has been carried to a very great extent, not only under the Incas, but beneath the local government of the Spaniards, who seem to have been no more able to resist the temptation of a large revenue from the monopoly of this article than European nations from the consumption of ardent spirits. It is said that in the year 1583 the government of Potosi derived a sum of not less than 500,000 pesos duros from the consumption of 90 to 100,000 baskets of the leaf. The cultivation of coca is therefore an important feature in Peruvian husbandry, and, it is added, so lucrative that a coca plantation, whose original cost and current expenses amounted to 2500 pesos duros during the first twenty months, will, at the end of ten months more, bring a clear income of 1700 pesos duros. Pöppig states that coca has now become a sort of necessary evil; that thousands of persons would be deprived of their means of existence if its consumption were put a stop to; and that the value of it in Peru and Bolivia amounts to above 2½ millions of pesos duros a year.

The exciting principle of the coca has not yet been inquired into. It is stated by Pöppig to be of so very volatile a nature that leaves only 12 months old become perfectly inert and good for nothing. 'Large heaps of the freshly-dried leaves, particularly while the warm rays of the sun are upon them, diffuse a very strong smell, resembling that of hay in which there is a quantity of *melilot*. The natives never permit strangers to sleep near them, as they would suffer violent head-aches in consequence. When kept in small portions, and after a few months, the coca loses its scent and becomes weak in proportion. The novice thinks that the grassy smell and fresh hue are as perceptible in the old state as when new, and this is to be expected with the Peruvian, who never uses it without the addition of burnt lime. Without this, which always excoriates the mouth of a stranger, the natives declare that *coca* has not *its true taste*, a flavour, by the bye, which can only be detected after a long use of it. It then tinges green the carefully-swallowed spittle, and yields an infusion of the same colour. Of the latter alone I made trial, and found that it had a flat grass-like taste, but I experienced the full power of its stimulating principles. When taken in the evening it was followed by great restlessness, loss of sleep, and generally uncomfortable sensations; while, from its exhibition in the morning, a similar effect, though to a slight degree, arose, accompanied with loss of appetite. The English physician, Dr. Archibald Smith, who has a sugar plantation near Huanuco, once, when unprovided with Chinese tea, made a trial of the coca as a substitute for it, but experienced such distressing sensations of nervous excitement that he never ventured to use it again. The Peruvian increases its effects by large doses, utter retirement, and the addition of other stimulating substances. The inordinate use of the coca speedily occasions bodily disease, and detriment to the moral powers; but still the custom may be persevered in for many years, especially if frequently intermitted, and a *coquero* sometimes attains the age of fifty, with comparatively few complaints. But the oftener the orgies are celebrated, especially in a warm and moist climate, the sooner are their destructive effects made evident. For this reason the natives of the cold and dry districts of the Andes are more addicted to the consumption of coca than those of the close forests, where, undoubtedly, other stimulants do but take its place. Weakness in the digestive organs, which, like most incurable complaints, increases continually in a greater or less degree, first attacks the unfortunate *coquero*. This complaint, which is called *opilacion*, may be trifling at the beginning, but soon attains an alarming height. Then come bilious obstructions, attended with all those thousand painful symptoms which are so much aggravated by a tropical climate. Jaundice and derangement of the nervous system follow, along with pains in the head, and such a prostration of strength that the patient speedily loses all appetite; the hue of the whites assumes a leaden colour, and a total inability to sleep ensues, which aggravates the mental depression of the unhappy individual who, spite of all his ills, cannot relinquish the use of the herb to which he owes his sufferings, but craves brandy in addition. The appetite becomes quite irregular, sometimes failing altogether, and sometimes assuming quite a wolfish voracity, especially for animal food. Thus do years of misery drag on, succeeded at length by a painful death.' (Pöppig, *Reise in Chile, &c.*, vol. ii.; Hooker, *Compan. to Bot. Mag.* i. and ii.)

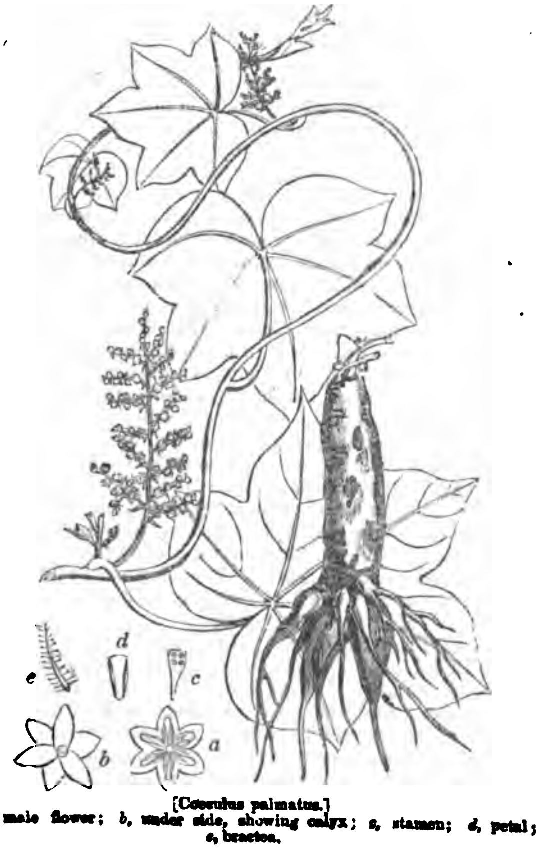
COCCINE'LLA. [TRIMERA.]

COCCOTHRAUSTES. [GROSBEAK.]

CO'CCULUS, a genus of Menispermaceous plants, consisting of climbers, whose leaves are usually more or less heartshaped, and the flowers small, and either white or pale green, in loose panicles or racemes; in most cases they are diœcious, and are always very minute. The most recent character of the genus is given by Messrs. Wight and Arnott, from whom it appears that the essential distinctions are, six sepals in two whorls, a corolla of six petals, three or six distinct stamens, terminal two-celled anthers opening vertically; three, six, or more ovaries; and one-celled one-seeded drupes. The species are usually powerful bitter febrifuges. Cocculus crispus, a twining plant found in Sumatra and the Moluccas, with a tubercled or warted stem, is employed by the Malays for the cure of intermittent fevers. Owing to its intense bitterness and twining habit it was called *Funis felleus* by Rumf. Another plant, the Menispermum fenestratum of Roxburgh, is in great repute among the Cingalese, who slice it, steep it in water, and swallow it along with the infusion as a stomachic.

Cocculus villosus, a plant common in the hedges of Bengal, with variable downy leaves and axillary solitary female flowers, succeeded by deep purple berries the size of peas, is a species of considerable importance to the Hindoos. The juice of its ripe berries makes a good durable bluish-purple ink, according to Roxburgh, who adds some further particulars concerning its uses. 'A decoction of the fresh roots, with a few heads of long pepper, in goats' milk, is administered for rheumatic and old venereal pains; it is reckoned heating, laxative, and sudorific. The fresh leaves taste simply herbaceous; rubbed in water they thicken it into a green jelly, which is sweetened with sugar, and drank when fresh made to the quantity of half a pint twice a day, for the cure of heat of urine in gonorrhœa. If suffered to stand for a few minutes, the gelatinous or mucilaginous parts separate, contract, and float in the centre, leaving the water clear, like Madeira wine, and almost tasteless. Curry is made of the leaves, for people under a course of its roots, or jelly of the leaves.'

The species most important to Europeans is that which produces the celebrated Calumbo root. *Cocculus palmatus*, from which a valuable bitter is procured. This plant is a native of Mozambique and Oibo, abounding in the thick forests that cover the shores of those countries, and extending inland for fifteen or twenty miles. The Africans of those parts call it *Kalumb*. It has a large fleshy deep-yellow root, divided into many irregular forks or fangs, which are amputated by the collectors, cut into slices, strung on cords, and hung to dry in the shade. The stem is covered with a thick whitish-green glandular fur: the leaves are large, roundish, heartshaped, and deeply divided into from five to seven sharp-pointed lobes. The plant is now cultivated in the Isle of France.



[Cocculus palmatus.]
male flower; *b*, under side, showing calyx; *c*, stamen; *d*, petal; *e*, bractea.

The name given to this genus is that of a kind of seed imported from the East Indies under the name of *Cocculus Indicus*, possessing a powerful, bitter, poisonous principle, which, according to Goupil, exists principally in the kernel. It is found in the forests of Malabar, and when transplanted to the botanic garden, Calcutta, grew in a few years so as to extend over a large mango-tree, with a stout woody stem as thick as a man's wrist, covered with deeply cracked, spongy, ash-coloured bark. The leaves were very exactly cordate, entire, obtuse, or emarginate, of a hard texture, shining on the upper surface, and from 4 to 12 inches long, by from 3 to 8 inches broad. This plant is the *Menispermum cocculus* of Linnæus, the *Cocculus suberosus* of De Candolle; but according to Messrs. Wight and Arnott, it does not properly belong to the latter genus, having the stamens combined into a central column and no corolla. They call it *Anamirta cocculus*.

Cocculus Indicus berries are the fruit of the Cocculus suberosus (Decand.), the Menispermum Cocculus (Linn.) 'The medical jurist,' says Dr. Christison, 'should make himself well acquainted with its external characters, because, besides being occasionally used in medicine, it is a familiar poison for destroying fish, and has also been extensively used by brewers as a substitute for hops—an adulteration which is prohibited in Britain by severe statutes.' This fruit is a berried drupe, varying in size from that of a pea to that of a laurel (or bay) berry; subglobose, emarginate, dark-brown, opaque, rough, and wrinkled; the external integument, or husk, is very brittle; within is the seed or kernel, lunulate, oily, with a nauseous and intensely bitter taste. The kernel contains about one part in the hundred of picrotoxia, or menispermia, as some term it. Upon this principle its poisonous properties depend. It seems to act by exhausting the irritability of the heart, and if the dose be considerable, its fatal effects are very speedily displayed. What renders it a more redoubtable agent, is the circumstance of its leaving scarcely any trace of its presence on the coats of the stomach. Cocculus Indicus is never used internally in the practice of medicine, but an ointment formed of the powdered berries is very efficacious in some cutaneous diseases, such as Porrigo capitis, and Sycosis menti. It speedily allays the inflammatory state; but its employment requires great care. Creasote will probably supersede it in such cases.

Calumba is the root of the Cocculus palmatus, a native of the forests on the east coast of Africa, whence it is sent to Ceylon, and thence to Europe. It occurs in the form of transverse sections, the bark of which is thick and easily separable; the woody portion is spongy, of a yellow colour, and when old much perforated by worms. The odour is faintly aromatic, the taste bitter and slightly acrid. It contains much starch, a yellow azotized matter, a yellow bitter principle, traces of a volatile oil, woody fibre, salts (chiefly of lime and potassa), oxide of iron, and silex. The active principle is Calumbine, which may be obtained either by alcohol or æther. As Calumba contains nothing which can decompose the salts of iron, it may be given along with them. The powder is a good form: the infusion soon spoils, but is otherwise a very excellent form; a tincture or extract retains the virtues and keeps a long time.

Other roots are often fraudulently substituted for Calumba. Some of these are supplied by America, others by Africa. The American, which is the most common in England and the north of Europe, is the root of the Frazera Waltera (Mich.), a native of the marshes of Carolina. It may be distinguished from the true by its whiter colour, lighter texture, the presence of longitudinal pieces, and the taste being at first sweetish, and not nearly so bitter as genuine Calumba. Chemical tests further assist in discriminating them: solution of proto-sulphate or of permuriate of iron, does not trouble the tincture of the real, while it gives the false a dark green colour the tincture of the genuine yields with tincture of galls a copious dirty grey precipitate, but the false none. The substance of the true is rendered blue by iodine, the false brown. In large doses the spurious causes vomiting, but the genuine allays that action.

Slices of bryony root are often employed to adulterate Calumba root.

Calumba acts chiefly upon the mucous membrane of the stomach, and upon the secretion and quality of the bile. It is not however without power over the nervous system, as its efficacy in allaying the vomiting of pregnancy testifies. In diarrhœa, after proper evacuants, and in bilious vomiting, it is superior to all other medicines. The vomiting and nausea of the early months of pregnancy are much alleviated by it: while the want of appetite, accompanied with general debility, of feeble children, is often removed by Calumba along with preparations of iron.

Dr. Percival states that infusion of Calumba will remove the disagreeable odour of putrefying ox-gall.

CO'CCUS. [GALLINSECTA.]

COCCUS CACTO. [COCHINEAL.]

COCCYZUS. [CUCULIDÆ.]

COCHABAMBA. [BOLIVIA.]

COCHIN-CHINA is in that part of Eastern Asia which commonly goes by the name of India without the Ganges, of which it forms the eastern portion. It extends from 8° 40′ to about 23° N. lat., and from 102° to 109° 20′ E. long. Its length from north to south is about 980 miles, but in width it varies from 100 to 300 miles. Crawfurd assigns to it an area of only 98,000 square miles; but Berghaus makes its surface one third larger, or about 147,000 square miles. This country, therefore, is about 33,000 square miles more than the British islands.

On the west it borders on the kingdom of Siam, or Shan; on the north-west on the unknown regions of Laos, or Lactho; and on the north on the Chinese provinces of Yunnan, Quang-si, and Quang-tong (Canton). To the east of it extends the sea, called by the Chinese Nan-Hay, or the Southern Sea, which here forms an extensive gulf between the northern province of Cochin-China and the island of Hai-nan, called the Gulf of Ton-kin. To the south of Cochin-China extends the southern part of the China Sea.

The character of the most northern part of the coast is not known; in our charts a great number of islands and cliffs are laid down. At 21° N. lat., or near the mouth of the river Song-ca, and farther to the south, the shores are low, and partly sandy and swampy. Between 20° and 18° N. lat., opposite the island of Hai-nan, there is said to be a number of lagunes near the low shore, connected with one another, so as to form an inland navigation of great extent. These lagunes are not inserted in our maps. Near 17° N. lat. the shores begin to be high, forming capes several hundred feet in elevation, between which large bays run deep into the land. This is the general character of the coast between 17° N. lat. and Cape James (10° 17′ N. lat.) This coast is lined with a great number of small rocky islands and cliffs, but it contains numerous safe and excellent harbours. The remainder of the coast from Cape James to the very boundary of Siam is low and mostly swampy, being formed by the alluvial deposits of the river Maekhaun, or Camboja.

Cape James is the southern extremity of an extensive mountain range, which as far as the parallel of Cape Padaran (11° 20′ N. lat.) runs north-east, and then turns to the north, in which direction it continues to 14° N. lat., whence it continues with a north-north-western course to 16° N. lat. Farther north the range is little known, and it is conjectured that it joins the high mountains in the Chinese province of Yunnan. This range occupies perhaps a hundred miles in width, and seems to consist of a number of parallel ridges. Its height, which is not ascertained, appears to be considerable. A road leads over it between the towns of Sai-gun and Phu-yen, which is described as very difficult and dangerous.

Several short offsets which branch off towards the sea cover the greatest part of the maritime districts between 10° 20′ and 17° N. lat.; some of them are known to attain the height of 4000 feet above the sea. The most remarkable of these lateral ranges is that which forms the boundary between Cochin-China and Ton-kin, in about 17° 30′. It contains a depression, forming a mountain pass, about six miles in width, which is shut in by a wall, traversed by an artificial road, which leads from Huê to Kecho, and is so well made that it is said not to be inferior to any road in Europe; the length of this artificial road is estimated at 400 or 500 miles.

The boundary between Cochin-China and the Chinese province of Quang-si is partly formed by the river Ngannan-kiang, and partly by a mountain range, which seems to be a lateral range of the Yu-ling, a mountain system of southern China. Over this range there is a pass, which constitutes the boundary line of both countries, and is also shut in by a wall, on each side of which a military post is maintained by each country.

The northern part of Cochin-China, which formerly constituted the separate kingdom of Ton-kin, comprehends an extensive plain, surrounded, except where it borders on the gulf of Ton-kin (between 19° 30′ and 21° N. lat.), by mountains, which increase in height as they recede from the sea. This plain appears to extend above 100 miles in length and width. Being very low, a great portion of it is annually inundated by the river Song-ca, which fertilizes the soil, so that two or three crops of rice are annually cut. It is by far the most fertile and populous part of the country. The valleys which run up far into the mountains are equally fertile: the greatest part of them may easily be irrigated, and the mountains themselves are rich in metals. The Song-ca, or Sang-coy, the principal river of this country, rises in the mountain-region of Yunnan in China, in two branches; the Ho-ti-kiang and Li-sien-kiang, which run nearly parallel in a south-eastern direction, till they enter Cochin-China, where they unite, and take the name of Song-ca (Great River). Before this river enters the sea it divides into numerous branches, two of which are navigable. The northern arm, which formerly was visited by large European vessels, is said now to afford access only to vessels of 200 tons burden. The southern arm is navigated by Chinese junks.

The country east of the mountain-range, between 19° 30 and 15° N. lat., consists of an alternation of small plains and intervening mountain ridges. The plains often extend nine or ten miles in width, and terminate in the west with valleys. The mountains, which do not seem to rise to a great height, are in some places bare, and in others covered with forests. In many places cultivation extends to a considerable height on their sides. Most of the plains are irrigated and well cultivated. The rivers which traverse them have a short course, but supply abundance of water for irrigation, and most of them are navigable for some miles. In some places the plains are traversed by canals.

The country which extends from Cape Avarella to the neighbourhood of Cape James may be considered as entirely covered with mountains. The rocky masses approach so close to the sea as to leave a level tract along the beach only in a few places. In its numerous indentations a few narrow valleys of small extent occasionally appear, mostly inhabited by fishermen. But though this country (formerly called Chiampa) is unfit to maintain any great population along the coast, the interior is said to contain much cultivated ground, and to be pretty well peopled.

That portion of Cochin-China which lies to the west of the mountain-range constituted till lately the principal part of the independent kingdom of Camboja. [CAMBODIA.] The southern portion, which is imperfectly known, consists, except near the boundary of Siam, of an immense plain, which appears to be formed of the alluvium of the great river by which it is traversed. The shores and the adjacent country, as far as the tide ascends, which renders the water of the river salt, are covered with trees and bushes. About thirty miles from the sea the ground begins to be cultivated, and is exceedingly fertile. In the interior a great number of fresh-water lakes and swamps are said to cover a considerable part of the plain.

Two large rivers traverse this plain. The Sai-gon or Saung, which runs through its eastern portion, has been navigated by European vessels as far up as the town of Sai-gon, but farther northward its course is not known. Its course is said to be more than a thousand miles. Towards its mouth it sends off two or more branches, which join the eastern arm of the great river of Camboja, or the Maekhaun.

The great river of Camboja, called by the Burmans Maekhaun, is probably that which in the Chinese province of Yun-nan is called Lan-thsang, and rises on the high table-land of Eastern Asia, at no great distance from the upper course of the Yang-tse-kiang. In the province of Yun-nan this river is navigable: but where it descends from that table-land and leaves the territories of China, it breaks through an extensive mountain-region, in which its course, lying between high and steep mountains, is frequently interrupted by rocky ledges and cataracts. Where its valley begins to grow wider, it is said to send off a branch to the right, which joins the Menam, or river of Siam, between 18° and 19° N. lat. Its course farther south is unknown, but it is said to send off various lateral branches, which fertilize the country through which they flow, and then re-unite with the river. About 150 miles from its mouth is the antient capital of Camboja, Pontaipret, to which European vessels ascended in the seventeenth century, but this navigation has been discontinued. Some distance below this town the river sends off to the west and south-west numerous arms, which enclose and traverse an extensive delta, that stretches out into the sea with an acute angle. Most of these arms are navigable for large river-barges during the rainy season. To make the navigation continuous through the whole year, a canal was made from it in 1820, which joins the principal river some miles south of Panompeng, the modern capital of Camboja. The three principal mouths of the Maekhaun lie on the eastern side of the delta, and are all navigable for vessels of considerable burden up to the capital of the country.

The climate of the plain of Camboja resembles that of Bengal. The rainy seasons last from the end of May or the beginning of June to September. In August the thermometer was at six o'clock in the morning 79°, at noon 82°, and at six o'clock in the evening 80°. The climate of the countries east of the mountains is similar to that of Coromandel. The mountains interrupt the clouds brought by the south-west monsoon, and accordingly the dry season prevails in that period: the north-east monsoon brings rain. The wet season sets in at the end of October, and continues until March. In the greatest summer-heat the thermometer never rises above 103°; in the greatest cold it never falls below 57°. In the countries on the shores of the Bay of Tonkin, the south-west monsoon brings the rain, and the wet season begins in May and terminates in August. The heat is occasionally very excessive, and the cold in December, January, and February, very sharp: the weather is often rendered unpleasant by heavy fogs, as in Lower Bengal. Typhons and hurricanes rage with the utmost fury in the Gulf of Tonkin and on the adjacent coasts; more southward, especially below 16° N. lat., they are rarely felt; and west of Cape James the sea and land are entirely exempt from them. They are commonly accompanied with heavy and incessant rains; and Crawfurd mentions that after a continued rain of forty-eight hours, the sea in the bay of Touron was covered with a stratum of fresh water, so that the casks of the vessels were filled with water good enough for the cattle and poultry. All the country seems to have a very healthy climate, for Europeans as well as for natives.

The iron mines of Tonkin are about six days' journey from Cachao, and the gold and silver mines about twelve days' journey, both in a western direction. The annual produce of the silver mines of Tonkin is estimated at about 213,600 ounces; that of the gold mines is unknown. All these mines are worked by Chinese: the number of miners is stated to be between 20,000 and 30,000. Cochin-China is said to have tin, which however is not worked.

Rice, which is the principal article of food, is very extensively cultivated in the plains of Tonkin and Camboja. Indian corn, earth nuts (*Arachis hypogæa*), and the *Convolvulus batatas*, are also cultivated. The sugar-cane is extensively cultivated on the coast, south of 16°; much sugar of an inferior quality is sent to China, and a small quantity to Malacca and Singapore. The true cinnamon (*Laurus Cinnamomum*) is probably indigenous; and though its bark is much thicker than that of Ceylon, it is preferred by the Chinese: from 250,000lbs. to 300,000lbs. are annually exported from Faifo.

Cotton is cultivated every where, and largely exported to China, where it fetches twenty per cent. more than that brought from Bengal. Silk is in Tonkin and Cochin-China a general object of attention with the peasantry; that of Tonkin is of better quality, but still inferior to that of China. Tea of a coarse kind is grown in the neighbourhood of the capital Hué, and called Hué tea. It is largely used by the lower classes.

The French missionary, M. de la Bissachère, states the population of Cochin-China at twenty-two millions, of which he assigns eighteen millions to Tonkin. The French officers at the court of Hué differed considerably in their statements to Crawfurd, one estimating the population at from fifteen to twenty millions, and another at ten millions. Crawfurd thinks all these numbers to be considerably exaggerated; and according to his calculation, Cochin-China contains only 5,194,000 souls. But as all authorities agree in describing the plain of Tonkin as very fertile, and extremely well cultivated and peopled, the estimate of Crawfurd seems too low.

The natives call the eastern part of their country Anam, which seems to be derived from the Chinese name, which is Ngan-nan. They belong to the same race as the Chinese and Mongols. Their language is monosyllabic, and the signification of the words is, in a great measure, regulated by their accentuation. But the Anamese language is totally different from the Chinese language. The Chinese characters are only used in printing; for common purposes they use others.

The inhabitants of Camboja, who call themselves Kammer, constitute a different nation; they extend on both sides of the river Maekhaun to 15° N. lat. They do not differ from the Anamese in their physical character, but, according to Crawfurd and Dr. Leyden, they speak a different language. Klaproth however thinks that it is only a dialect of the Anamese. In manners, laws, religion, and state of civilization, they bear a nearer resemblance to the Siamese than to the inhabitants of Cochin-China Proper.

On the mountain-range live two independent nations. The Loye or Loi extend from Cape James at least as far as 15° N. lat. They once extended to the very coast, and occupied all Chiampa, but having been expelled from it, they retired into the mountain-fastnesses. Their language differs essentially both from the Anamese and Cambojan. To the north of 15° N. lat. the interior districts of the mountain-range are occupied by another independent nation, called Moi, which extends over a tract of country lying between Laos and Cochin-China, about 120 miles in length, and from 20 to 30 in breadth. They are said to be an uncivilized and inoffensive people. Very little is known of them.

The political division coincides nearly with the historical division of the country. Anam, or the eastern portion, is divided into two provinces—Tonkin the northern, and Cochin-China the southern, and the boundary-line between them, at about 19° N. lat., is nearly the same line which separated the antient kingdom of Tonkin from Cochin-China; only two small provinces have been detached from the former, and added to the latter. That portion of Camboja which has been united to Cochin-China constitutes a province by itself.

1. Tonkin or Tongking comprehends the most northern portion of Anam, or the plain which extends on both sides of the river Song-ca, and is bounded by the mountain-ranges within on all sides. It is the most fertile and most populous portion of Cochin-China, producing rice, cotton, and silk, in great abundance, and exporting extensively all these articles. Its mountains abound in gold, silver, and iron. The capital, Cachao or Cecho, called by the natives also Bakthan, is a large town with 150,000 inhabitants, situated on the banks of the Song-ca, about 80 or 90 miles from the sea. Its commerce in the products of the country is very considerable, especially with China. Hean is on the same river, about 18 miles lower down; the largest junks come up to this place.

2. Cochin-China Proper comprehends the coast from about 19° N. lat. to the neighbourhood of Cape James. The name of Cochin-China is not known to the natives, and was introduced by the Portuguese, who on their arrival in the country found that it was called Koe-chen or Cochin in order to distinguish it from Cochin on the coast of Malabar, they added China, calling it as it were Cochin of China. The natives distinguish it by the name of Dong-traoing or Dang-trong (i. e., the interior or central country); and they call Tonkin Dang-ngoai (the external country). The whole surface is covered with mountains, but towards the north the ridges are separated by wide valleys, sometimes extending to moderate plains, which however towards the south grow narrower, till in the vicinity of Cape Pataran and south of it they become narrow glens. Its principal products are sugar, silk, cinnamon, cardamoms, pepper, &c. The harbours along this coast are numerous, safe, and spacious: there is a considerable number of small towns. The capital is Hué, the metropolis of the whole country. The best and most frequented harbour is Touron or Han. To the south of it is the town of Faifo, with from 5000 to 6000 inhabitants, mostly Chinese, who carry on an active trade with their native country. The large towns of Qui-nhon, Phu-yen, and Nhatrang, are not visited by Europeans. The most southern portion of Cochin-China Proper once formed a separate country, under the name of Chiampa.

3. Camboja extends over nearly the whole of the antient

kingdom of Camboja, only one province of it, Batabang, having been united with Siam. The Chinese name of this country is Kan-phu-tche, from which Camboja is derived. As far as this country is known, it is a level formed by the alluvia of its large rivers, and very fertile and well cultivated. Its principal commercial productions are rice, areca-nuts, betel, spices, and timber. It has mines of iron. Sai-gun, on the river of the same name, may be considered as its present capital, being the seat of the provincial government. Pontaipret or Camboja, on the Maekhaun, was antiently the capital, and a very considerable town when visited by the Dutch in the seventeenth century. Nothing is known of its present condition. Panompeng, or Calompe, was at a later period the capital, and is still the residence of the nominal king of Camboja; it is in a populous and well-cultivated country. Kang-kao is about two miles from the mouth of the Kang-kao river, which forms a shallow port; it has some commerce with Singapore and the countries inhabited by the Malays. The population is about 5000.

The Cochin-Chinese have made some progress in most of the arts of civilized life. Barrow says that they excel in naval architecture, and that their row-galleys for pleasure are remarkably fine vessels; and Crawfurd thinks that the lacker-ware made in Tonkin is preferable to that of Japan. They manufacture great quantities of coarse cotton and silk cloth, but both are inferior to those brought from China. Their articles of filigree work are equal to those of the Chinese, and their vessels of cast-iron are also very good. As they are not acquainted with the art of making steel, their tools are not hard enough, and they prefer the copper tools imported by the Chinese. Fire-arms are largely imported from Europe. Their earthenware is much inferior to that of the Chinese.

The great number of excellent harbours and valuable products would seem calculated to attract foreign vessels to this country. But after the feeble attempts of some European nations to establish a regular trade were frustrated by the long internal wars of the eighteenth century, the commerce of Cochin-China was limited to its intercourse with China. Since the establishment of Singapore, however, an intercourse has been established with that colony, especially by Chinese merchants, and this trade seems to be rapidly increasing. The commerce with China is chiefly limited to the harbours of Cachao, Faifo, and Sai-gun, in Cochin-China, and to Canton, Amoy, Fu-cheou-foo, and Ning-po, in China. In 1822 there were employed in this trade, according to Crawfurd, 116 junks, of about 20,000 tons. They export from Cochin-China rice, cotton, silk, eagle-wood, spices, and some other articles; they import tea, the finer kinds of cotton and silk goods, china, and some other articles of less importance; also opium and English broad-cloth. From Singapore are imported iron, fire-arms, opium, catechu, and terra japonica. Before 1822 this commerce employed a shipping of 4000 tons, mostly Chinese junks; but it is now certainly twice if not three times as extensive. A commercial intercourse is also maintained between Faifo and Sai-gun, and Bang-kok, the capital of Siam, which however is not considerable, as only 40 or 50 small junks are engaged in it. They bring to Bang-kok silk, worked and raw, mattings for sails, &c., and take in return iron, tobacco, opium, and some European goods. (Crawfurd; Barrow; White.)

COCHINEAL is extremely rich in the finest red colouring matter, and has been long employed in scarlet dyeing, and in the manufacture of carmine. [CARMINE.]

Cochineal has been analyzed by Pelletier and Caventou, and they find that it contains—

1. A colouring matter to which they have given the name of carmine, or carminium.
2. A peculiar animal matter.
3. Fatty matter, which is soluble in æther, and consisting of stearine, oleine, and an odorous acid.
4. Phosphate of lime and of potash, chloride of potassium, and carbonate of lime; and potash combined with an organic acid.

Carminium was obtained by Pelletier and Caventou by digesting cochineal in æther; treating the residue repeatedly with boiling alcohol, allowing it to cool; treating the deposit formed with pure alcohol, and then adding a volume equal to its own of pure sulphuric æther; a deposit of carminium is thus formed.

The properties of carminium are that it is solid, uncrystallizable, of a perfect red colour, fuses at 104°; very soluble in water, slightly soluble in pure alcohol, insoluble in sulphuric æther, and in the volatile and fixed oils. Sulphuric acid, nitric and hydrochloric acids when concentrated, iodine and chlorine, destroy carminium; but when diluted, the acids render its colour brighter. Nitric acid, and also ammonia, dissolve it perfectly. Alkaline solutions added to a solution of carminium render it purple, but lime water precipitates it. If gelatinous alumina be added to a solution of carminium, these two substances combine, and the solution is completely decolourized. The lake thus obtained is of a very fine red colour, but it may be rendered crimson by heating it in the liquor in which it is formed. The greater number of saline solutions poured into a solution of carminium render it crimson; sulphate of lime, protochloride of tin, protonitrate of mercury, and submuriate of lead, precipitate it. When heated, carminium is decomposed, but unlike most animal matter, it yields no ammonia by decomposition.

The chief use of cochineal is the dyeing of scarlet; the fine colour which it yields is converted to this tint by means of chloride of tin, usually called muriate of tin, and by the dyer, tin spirits.

The insect which constitutes cochineal feeds chiefly upon the Cactus cochenillifera and C. opuntia. The female insect only is collected. Several varieties are distinguished in commerce, and have different degrees of value attached to them, dependent chiefly upon the different methods employed to kill and dry the insects. When dried they resemble small grains, scarcely so large as a pepper-corn, ovate, convex above, plane below, transversely furrowed, externally blackish-brown, but as if dusted with a white powder, light, friable, the internal substance consisting of extremely small grains, obscurely purple, but when reduced to powder, of a rich purple. Inodorous, but with a bitter-sweet acrid taste. They impart to water or alcohol by digestion an intensely red colour. The colouring principle is termed carmine.

Adulterations are effected either by mixing old insects consisting of the mere skin, or grains artificially prepared, with the genuine.

Cochineal has hitherto been employed mostly as a colouring material, either of tinctures, or of other things, the nature of which it is wished to disguise; but lately it has been stated to possess diuretic and antispasmodic powers, and to be useful in pertussis, or hooping cough. Its claim to this character requires yet to be established by further evidence. Some well-authenticated cases are recorded of the utility of a tincture of cochineal in doses of half a drachm or more twice a-day in removing or mitigating tic-douloureux, or neuralgia faciei douloureux.

COCHINEAL TRADE. (French, *Cochenille;* German, *Koschenilje;* Dutch, *Conchenilje;* Italian, *Cocciniglia;* Spanish, *Cochinilla, Grana;* Portuguese, *Cochenilha;* Russia, *Konssenel.*) Previous to the revolt of the Spanish American provinces almost all the trade in cochineal with the different markets of Europe was carried on through Spain, and chiefly through Cadiz; but since that event, and the consequent removal of the shackles which restricted the trade of Mexico, it has taken a more natural course, and the markets of consumption are supplied with cochineal either direct from the places of production, or from neighbouring stations, to which the article has found its way in the natural course of commerce. Representing a considerable value in a small bulk, cochineal is frequently used, with great convenience to merchants, as a medium for making remittances, and hence the comparatively circuitous route by which the greater part of it reaches the places of ultimate consumption. The trade in this article carried on by this country in each year from 1827 to 1835 has been:—

	Imported.	Re-Exported.	Taken for Consumption.
1827	320,722lbs.	145,756lbs.	171,325lbs.
1828	258,032	153,109	147,819
1829	288,456	153,738	127,954
1830	316,589	100,059	182,217
1831	224,371	168,329	134,222
1832	388,478	138,270	166,900
1833	359,381	130,732	178,246
1834	410,387	265,490	139,860
1835	418,320	352,023	162,596

Of the quantity imported in 1835, two thirds or 278,993lbs. came by way of the British West India Colonies; 42,764lbs. by way of the United States of America; 7218lbs. from various countries in Europe, among which Spain was not included; 2183lbs. from Cuba; and 87,172lbs. direct from the countries of production, Mexico and Guatemala. Of the quantity exported in the same year, Russia took from us 112,854lbs.; Turkey, 53,339lbs.; India, 64,178lbs.; China, 23,284lbs.; Germany, 37,992lbs.; Holland, 22,564lbs.; France, 10,315lbs.; Italy, 13,893lbs.; other European countries, 12,032lbs.; and Egypt, 1572lbs. The present price (Nov., 1836) in the London market runs, according to quality, from 6*s.* 6*d.* to 8*s.* 9*d.* per lb., exclusive of the duty: this duty was reduced in 1825 from 2*s.* 6*d.* per lb. to 4*d.* per lb. when brought from British possessions, and 1*s.* per lb. when from foreign countries: a further reduction was made in 1826 to one-half these rates, at which the duty remains at present.

COCHLICELLA. [Helicidæ.]

COCHLIC'OPA. [Helicidæ.]

COCHLIT'OMA. [Helicidæ.]

COCHLODI'NA. [Helicidæ.]

COCHLODONTA. [Helicidæ.]

COCHLO'GENA. [Helicidæ.]

COCHLOHY'DRA. [Helicidæ.]

COCHLO'STYLA. [Helicidæ.]

COCK. [Poultry.]

COCK OF THE ROCK. [Pipradæ.]

COCK OF THE WOOD. [Capercailzie.]

COCKATOO. [Psittacidæ.]

COCHRANE, CAPTAIN JOHN DUNDAS, R.N., distinguished himself by travelling on foot in a very eccentric manner through France, Spain, and Portugal, and afterwards through Russia and Siberia, to the extremity of Kamtchatka. (See 'Narrative of a Pedestrian Journey through Russia and Siberian Tartary, from the Frontiers of China to the Frozen Sea and Kamtchatka,' 2 vols. 8vo. Lond., 1824.) He subsequently engaged in some of the mining companies in the New World, and died in Colombia at a time, it is said, when he was contemplating a journey on foot through the whole of South America. He tells us in his book, that in January, 1820, immediately before he began his journey to Russia, he made an offer of his services to explore the interior of Africa and the course of the Niger, but this offer was declined by Government. His object, when he left London for St. Petersburg, was to travel round the globe, as nearly as can be done by land, crossing from Northern Asia to America at Behring's Straits. 'I also,' he adds, 'determined to perform the journey on foot, for the best of all possible reasons, that my finances allowed of no other.' But at the seaport of St. Peter and St. Paul's, at the end of the Kamtchatkan peninsula, he became enamoured of a young lady of the country, and his marriage, together with some other circumstances, induced him to return to England, whither he brought his wife. The eccentricities of this most hardy and indefatigable traveller frequently approach to insanity, but his book is amusing from its oddness, and not destitute of curious information concerning countries rarely visited by Europeans.

COCK-PIT, the name for the theatre or area in which game-cocks are made to fight their battles. The sittings of his Majesty's privy council at Westminster are usually held in a room which, being the site of what was formerly the cock-pit belonging to the palace at Whitehall, still bears the name. In a man-of-war the name of cock-pit is given to a place on the lower deck, where there are subdivisions or partitions for the purser, the surgeon, and his mates.

COCK'S-COMB. [Celosia.]

COCK'S-FOOT GRASS, a perennial agricultural plant, the *Dactylis glomerata* of botanists, of a coarse, harsh, wiry texture, but capable of growing on the most exposed barren sandy places, and yielding a valuable food for sheep very early in the spring, before its young leaves have had time to become tough.

COCKATRICE. One of the names by which the Basilisk was known. 'Many opinions,' says Dr. Thomas Browne, in his Pseudodoxia Epidemica, 'are passant concerning the basilisk, or little king of serpents, commonly called the *Cockatrice:* some affirming, others denying, most doubting, the relations made hereof.***That such an animal there is, if we evade not the testimony of Scripture and human writers, we cannot safely deny.' This is very true, and it is equally true that the alleged generation of the basilisk, or cockatrice, and the powers attributed to it in antient times, were the most ridiculous fables.

Of basilisks, or cockatrices, there were said to be three, if not four kinds. One species burned up whatever they approached,—a sort of breathing upases, they made a desert wherever they went, for every thing animal and vegetable withered before them; a second were a kind of wandering Medusa's heads, and their look, like Vathek's eye, caused an instant horror, which was immediately followed by death;[*] the touch of a third caused the flesh to fall from the bones of the wretched animal with which they came in contact; and a fourth, a concentration of evil, was said to be produced from the eggs of extremely old cocks (*ova centonina*), hatched under toads or serpents. There are authors who maintain that this parentage did not belong exclusively to one kind only, but that it was the origin of the whole infernal brood.

The Greek word *βασιλισκος* is often translated in Latin by the word *Regulus*. When mention is made of these basilisks, or cockatrices, in the Holy Scriptures, nothing appears to occur in the sacred volume beyond words expressive of a very poisonous and deleterious serpent, intended, in the opinion of many commentators, to typify sin, misery, destruction, God's judgments, and the principle of evil, or Anti-Christ. Thus, in Psalm xci. 13, it is written 'super aspidem et basiliscum ambulabis,' which in the old quarto Bible, 'imprinted at London by Robert Barker, printer to the King's most excellent Majestie, 1615,' is translated, 'Thou shalt walke upon the lion and aspe,' and in the more modern editions, 'Thou shalt tread upon the lion and adder.' In the 'Booke of Common Prayer,' by the same printer (Robert Barker), 1613, the passage stands 'Thou shalt goe upon the lion and adder,' and so in the more modern editions. Again, Proverbs xxiii. 32, speaking of the abuse of the wine-cup, 'Mordebit ut coluber et sicut Regulus venena diffundet,' which in the old edition above alluded to is rendered, 'In the end thereof, it will bite like a serpent and hurt like a cockatrice,' and, in the modern version, 'At the last it biteth like a serpent and stingeth like an adder.' So Isaiah xiv. 29, 'Ne læteris, etc., de radice enim colubri egredietur Regulus,' etc., in the old quarto, 'Rejoyce not (thou whole Palestina) because the rod of him that did beate thee is broken: for out of y^e serpents roote shal come forth a cockatrice, and the fruit thereof shall bee a fiery flying serpent:' and lix. 5, speaking of the wicked, 'Ova aspidis rumpunt et telas aranearum texunt; qui comederit de ovis ejus morietur, et quod fructum erit, erumpet in Regulum:' in the old quarto, 'They hatch cockatrice egges, and weave the spiders webbe: he that eateth of their egges dieth, and that which is trod upon breaketh out into a serpent,' which the commentator thus explains, 'Whatsoever cometh from them is poison and bringeth death. They are profitable to no purpose.' The present edition reads, 'They hatch cockatrice eggs and weave the spider's web: he that eateth of their eggs dieth, and that which is crushed breaketh out into a viper.' Also Jeremiah viii. 17, 'Ecce ego mittam vobis serpentes Regulos, etc.,' which the same old edition renders, 'For behold I will send serpents and cockatrices among you, which will not bee charmed: and they shall sting you, saith the Lord;' which the commentator explains as follows: 'God threatneth to send the Babylonians among them, who shall utterly destroy them in such sort as by no meanes they shall escape.' The modern edition scarcely varies from the old quarto, except in the substitution of the word 'bite' for 'sting.'

These basilisks were called kings of serpents, because all other dragons and snakes, behaving like good subjects, and wisely not wishing either to be burnt up, or struck dead, or to have their flesh fall from their bones, although they were in full feast upon the most delicious prey, were supposed, the moment they heard the distant hiss of their king, to turn tail in a *sauve qui peut* style, leaving the sole enjoyment of the banquet to the royal monster.

Of the antient profane writers, Aristotle, as might be expected, says nothing about the wonders of the cockatrice but Pliny, who dearly loved a fable, mentions the basilisk more than once: thus (*Hist. Nat.* book viii. c. 21, and book xxix. c. 4) he enters at length into its deadly attributes, and records the praises with which magicians celebrate the efficacy of its blood, which was considered an admirable antidote against sorcery (veneficia). Dioscorides, Galen, Solinus, Ælian, and others, are eloquent upon

[*] Lady Anne, in answer to Richard's observation on her eyes, says—
'Would they were basilisks to strike thee dead!'

basilisks, as are Avicenna, Grevinus, Scaliger, and many more.

Browne (*Pseudodoxia*) is of opinion that what 'we vulgarly call a cockatrice, and wherein (but under a different name) we intend a formal identity and adequate conception with the basilisk, is not the basilisk of the ancients, whereof such wonders are delivered. For this of ours is generally described with legs, wings, a serpentine and winding tail, and a crist or comb somewhat like a cock: but the basilisk of elder times was a proper kind of serpent, not above three palms long, as some account; and differenced from other serpents by advancing his head, and some white marks or coronary spots upon the crown; as all authentic writers have delivered.' The following is Pliny's description (*Hist. Nat.* viii. 21). After stating that the basilisk, like the beast catoblepas, slays with its eye, he proceeds:—'The Cyrenaic province produces him of the greatness of not more than twelve fingers, and remarkable for a white spot, like a diadem, on his head. He drives away all serpents by his hissing, nor does he impel his body like the rest by a multiplied flexion, but advances lofty and upright (celsus et erectus in medio). He kills the shrubs, not only by contact, but by breathing on them, scorches up the green herb, and splits the rocks: such power of evil is there in him. It was formerly believed that if killed by a spear from on horseback, the power of the poison conducted through the weapon killed not only the rider, but the horse also.' To this Lucan alludes in these lines:—

> Quid prodest miseri basiliscus cuspide Mauri
> Transactus? velox currit per tela venenum,
> Invaditque manum.'

Such a prodigy was not likely to be passed over in the legends of the saints. Accordingly we find that a good man (vir quidam justus) going to a fountain in the desert suddenly beheld a basilisk. He immediately raised his eyes to heaven, and with a pious appeal to the Deity, laid the monster dead at his feet. A somewhat similar miracle is related of the abbot St. John, who, by prayer, slew a basilisk that lay hid in the bottom of a deep well, and reduced the monks of a monastery built by him to the greatest distress for want of water. Leo IV., by a similar piety, is said to have delivered Rome from a basilisk whose breath afflicted the inhabitants with a terrible pestilence in his pontificate.

Jonston enumerates the attributes of the basilisk in silence, till he comes to its alleged power of annihilating with the eye; when he sagely remarks, 'Intuitu interimere vix crediderim, quis enim primus vidisset?' 'I would scarcely believe that it kills with its look, for who first could have seen it?' The worthy physician was not aware that those who went to hunt the basilisk of this sort, took with them a mirror which reflected back the deadly glare upon its author and, by a kind of poetical justice, slew the basilisk with its own weapon.

It is curious to observe that Browne, who treats most of the fables about the basilisk with contempt, is still unable to resist the story of its killing with the eye. We think we can trace a little of the sympathetic theory maintained by Sir Kenelm Digby and others, in the following passage: 'According to the doctrine of the antients, men still affirm that it killeth at a distance, that it poisoneth by the eye, and by priority of vision. Now that deleterious it may be at some distance, and destructive without corporal contraction, what uncertainty soever there be in the effect, there is no improbability in the relation. For if plagues or pestilential atoms have been conveyed in the air from different regions; if men at a distance have infected each other; if the shadows of some trees be noxious; if torpedoes deliver their opium at a distance, and stupify beyond themselves; we cannot reasonably deny that (besides our gross and restrained poisons, requiring contiguity unto their actions) there may proceed from subtiller seeds more agile emanations, which contemn those laws, and invade at a distance unexpected. That this venenation shooteth from the eye, and that this way a basilisk may empoison, although thus much be not agreed upon by authors, some imputing it unto the breath, others unto the bite, it is not a thing impossible. For eyes receive offensive impressions from their objects, and may have influences destructive to each other. For the visible species of things strike not our senses immaterially, but, streaming in corporal raies, do carry with them the qualities of the object from whence they flow, and the medium through which they pass. Thus, through a green or red glass, all things we behold appear of the same colours; thus, sore eyes affect those which are sound, and themselves also by reflexion, as will happen to an inflamed eye that beholds itself long in a glass; thsu is fascination made out; and thus also it is not impossible what is affirmed of this animal; the visible raies of their eyes carrying forth the subtilest portion of their poison, which, received by the eye of man or beast, infecteth first the brain and is from thence communicated unto the heart.'

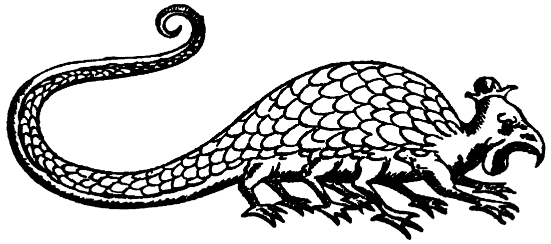
But, if the author of the 'Inquiries into Vulgar and Common Errors' here shows something of the lingering look with which most men regard received prejudices, he makes amends by declaring war against the story of the mode of the cockatrice's production. 'As for the generation,' says he, 'of the basilisk, that it proceedeth from a cock's egg hatched under a toad or serpent, it is a conceit as monstrous as the brood itself.' Jonston, who appears to regard with a proper horror most of the nefarious proceedings of the cockatrice, treats this part of the subject quite professionally. 'Quomodo,' remonstrates the sage doctor of medicine, 'formari a gallo intra ovum possit cum utero destituatur non video.' It is supposed that this idea took its rise from an Egyptian tradition concerning the ibis; 'for an opinion it was of that nation, that the ibis feeding upon serpents, that venomous food so inquinates their ovall conceptions, or eggs within their bodies, that they sometimes came forth in serpentine shapes; and therefore they alwaies brake their eggs, nor would they endure the bird to sit upon them.' (Browne.) Baptista Porta is of opinion that if a hen's egg be placed in a ditch full of serpents, corruption (tabes), arsenic, and other poisons, it will produce an animal noxious to the sight and touch: at the same time he puts the experimentalist on his guard, lest in trying to produce this animal he might (like Frankenstein) give birth to a creature that would do him a mischief.

But what was to attack this terrible and unapproachable monster? There is an old saying 'that every thing hath its enemy;' and the cockatrice quailed before the weasel. (Pliny, Solinus, and others.) The basilisk might look daggers, the weasel cared not;—in he went to the scratch. When it came to biting, the affair became more serious; but the weasel retired for a moment to eat some rue, which, of course, was the only plant the basilisks could not wither, and was always growing where they lay—returned to the charge, and never left the enemy till he was stretched dead before him. So that when men found out the den of a basilisk, they had only to turn in a weasel and the thing was done. The monster, too, as if conscious of the irregular way in which he entered the world, was supposed to have a great antipathy to a cock; and well he might, for, as soon as he heard the cock crow, he expired. This we learn from Ælian; and African travellers, consequently, carried with them the 'bird of dawning' as a specific against cockatrices.

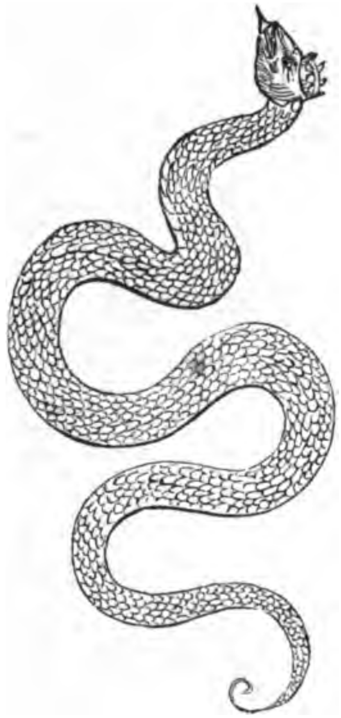
The basilisk was of some use after death. Thus we read that its carcase was suspended in the Temple of Apollo, and in private houses as a sovereign remedy against spiders' webs, and that it was also hung up in the Temple of Diana, for which reason no swallow ever dared to enter the sacred place.

The reader will, we apprehend, by this time, have 'supped full' of absurdities, but still we can imagine his anxiety to know what a cockatrice was like. We therefore subjoin from Aldrovandus, in whose work he will find two others made out of skates (Raia), a couple of figures, one of which he seems to owe to Cardan, and the other to Grevinus. In both it will be seen that

> 'What seemed his head
> The likeness of a kingly crown had on.'



[Basiliscus in solitudine Africæ vivens.]



[Basiliscus, sive Regulus, Grevini.]

In these cuts will be seen an example of the 'Somnia portentaque Thessala,' which have vanished before the light of science. [BASILISK.]

COCKER, EDWARD. This writer, whose name is so well known in England, was born about 1631, as appears from the inscription to one of the portraits cited by Granger in his Biographical History of England. He was an engraver, and a teacher of writing and arithmetic. He is said to have published fourteen books of exercises in penmanship, some of them on silver plates. One of these is in the British Museum, namely, 'Daniel's Copy Book, &c. &c. Ingraven by Edward Cocker, Philomath. London, 1664.' The matter of these exercises in penmanship consists in great part of descriptions of hell-fire, with fiends (or something very like them) in flourishes. We have also 'Cocker's Urania, or the Scholar's Delight,' without date; and 'Cocker's Morals, or the Muses' Spring Garden,' London, 1694 (either a late edition, or a posthumous work). Cocker died before 1677, and certainly later than 1671.

The celebrated work on arithmetic was not published by Cocker himself, but as described in the following title-page:—'Cocker's Arithmetic: being a plain and familiar method, suitable to the meanest capacity for the full understanding of that incomparable art, as it is now taught by the ablest schoolmasters in City and Country. Compos'd by Edward Cocker, late practitioner in the arts of Writing, Arithmetick, and Engraving. Being that so long since promised to the world. Perused and published by John Hawkins, Writing Master near St. George's Church in Southwark, by the Author's correct copy, and commended to the world by many eminent Mathematicians and Writing Masters in and near London.' The first edition was in 1677; the fourth in 1682; the *thirty-seventh* in 1720. We have never seen the first edition: there is no copy of any edition either in the British Museum, the libraries of the Royal Society or London Institution, or (so far as the old catalogues go) in that of Sion College, or of the Faculty of Advocates at Edinburgh. We have copied the title-page from a mutilated copy of the 37th edition, being the only one we ever saw exposed for sale in London.

Cocker's Arithmetic was the first which entirely excluded all demonstration and reasoning, and confined itself to commercial questions only. This was the secret of its extensive circulation. There is no need of describing it; for so closely have nine out of ten of the subsequent school treatises been modelled upon it, that as large a proportion of our readers would be able immediately to turn to any rule in Cocker, and to guess pretty nearly what they would find there. Every method since his time has been 'according to Cocker.'

There are two other works which bear the name of Cocker, and both published by the same John Hawkins. (1.) Decimal Arithmetic, accompanied by Artificial Arithmetic (logarithms) and Algebraical Arithmetic: London, 1684 and 1685. (2.) Cocker's English Dictionary, the second edition of which bears date London, 1715. Now, since in 1677 Cocker had been dead some time, as appears by Hawkins's preface to the Arithmetic, and since Kersey's Algebra, on which Cocker's is professedly founded, was published in 1673, it will appear only just possible that Cocker could have lived to have written this work. Again, the Arithmetic was written by a person who understood Latin, as proved by apt quotations from Oughtred and Gemma Frisius: the Decimal Arithmetic is entirely without quotations, though abounding in subjects on which the author of the Arithmetic might be expected to quote. Lastly, to the preface of the Decimal Arithmetic is annexed a very clumsy attempt at a cipher, which seems utterly unmeaning, unless it be considered as wrapping up a confession of authorship. Deciphered, it is as follows:—'Amico suo amantissimo Johanni Perkes, Ptochotrophii Fohliensis in Comitatu Wigorniensi ludimagistro. Sir, if you pleas to bestow some of your spare hours in perusing the following treatise, you will then be the better able to judg how I have spent mine, and if my paines therein may be profitable to the publick I have my wish, but if not, it is not a good thing now indeed I do say so. Sir, I am your humble servant John Hawkins.' From all that precedes we are inclined to suspect that Hawkins, being in possession of Cocker's papers, and finding the Arithmetic a successful work, published others of his own in Cocker's name, perhaps with some assistance from the manuscripts of the latter.

COCKERMOUTH, a parliamentary borough and market town in the west division of the county of Cumberland. The township is in the parish of Brigham, in the ward of Allerdale above Derwent. Before the alterations effected by the Reform Act, it was co-extensive with the borough; but the borough, since the enlargement of its boundary, includes, besides the township of Cockermouth, those of Brigham, Bridekirk, Papcastle, Eaglesfield, and a portion of the township of Dovenby. The town is 25 miles S.W. from Carlisle, and 299 N.N.W. from London. Its name is derived from its position on the river Cocker, at the point of its confluence with the Derwent. The Cocker flows from Buttermere-water, and after passing through Crummock-water, divides the town of Cockermouth into two equal parts which communicate by a stone bridge. The Derwent, after it has received the Cocker, is also crossed by a handsome bridge, erected in 1822, at a cost of 3000*l*. The township occupies the site of the antient barony of Allerdale. The ruins of the castle which formerly was the baronial seat of the lords of Allerdale, and now the property of the earl of Egremont, stand on the brow of a bold eminence near the confluence of the rivers. It is supposed to have been erected shortly after the Conquest, though the Norman architecture of the remaining walls, which are of prodigious thickness, appears to be of the fourteenth century. The area enclosed by the outer walls consists of two courts. Beneath the gateway between them are two deep and vaulted dungeons capable of containing 100 prisoners: and under a building in the larger court is a spacious chamber with a vaulted roof supported in the centre by a single octagonal pillar. Lysons, in their 'Magna Britannia,' give a detailed description and a drawing of this castle (vol. Cumberland, p. 44. See also Brayley and Britton's *Beauties of England*). It was occupied by the parliament army during the civil war in 1648, and sustained a month's siege by the royalists. Since that time it has gradually been decaying, and is now habitable only in a small part. Among the antiquities which have been found, is a font of green-coloured stone, inscribed with Runic and Saxon characters. It is also worthy of remark that to the north of the town is a tumulus called Foot Hill, and to the west the rampart and ditch of a Roman camp. Cockermouth is pleasantly situated in an agricultural district, and has a promenade a mile in length on the banks of the Derwent, but the streets in some parts are narrow and confined. It is recorded that the plague in 1677 was fatal to nearly 200 of its inhabitants. The number of houses in 1834 was 1002. They are chiefly of stone, with roofs of slate, but only a few are of the better class. The town is well supplied with water, but the streets are deficient in lights and foot-pavements, and the general appearance of the place exhibits no disposition for improvement. The town-house, called Moot Hall, is the only building worthy of particular notice.

The population in 1831 was 4536, of whom 2111 were males, and 2425 females. There were then 128 families employed in agriculture, and 623 families employed in trade, manufactures, and manual labour. The population of the borough, enlarged as stated above, is 6022. Cotton, linen, and woollen fabrics are manufactured; also hats, hosiery, and paper with the tanning and dressing of leather.

The elective franchise was first granted to the borough in the reign of Edward I.; but it appears not to have been exercised until it was renewed under Charles II. It continues to send, as formerly, two representatives to parliament, and it is the place where the court of election is held for the western division of the county of Cumberland. The quarter sessions are alternately held here and at Carlisle. There is a free school which was founded in the time of Charles II., and over the school-house a parochial public library consisting of 500 volumes. There is also a subscription library, a dispensary, a Sunday-school, and four friendly societies. The living is a chapelry, in the diocese of Chester, and places of worship are established by several sects of dissenters. The Rev. John Fell, who wrote on the 'Demoniacs,' 'Rowley's Poems,' &c., was a native of Cockermouth. On the first Monday in May, and on the 10th of October, there are fairs, chiefly for horned cattle and horses. (*Boundary Report*, part i., p. 95; Lysons's *Mag. Brit.*; *Population Report*, 1831.)

COCKLE. [CONCHACEA.]

COCKNEY, a term of contempt for a Londoner, borrowed originally from the kitchen. A cook, in the base Latinity, was called *coquinator* and *coquinarius*, from either of which Cokenay, as Chaucer uses it in the 'Reve's Tale,' might be derived

> 'And when this jape is told another day,
> I shall be halden a daffe or a cokenay.'

In some rhymes ascribed to Hugh Bigot, which Camden published in his 'Britannia,' London itself appears to be alluded to under the name of Cockeney

> 'Were I in my castle of Bungey,
> Upon the river Waveney,
> I would ne care for the king of Cockeney.

The author, says Tyrwhitt, in calling London Cockeney, might possibly allude to that imaginary country of idleness and luxury which was antiently known by the name of *Cokaigne*, or *Cocagne*; a name which Hickes (*Gram. Anglo-Sax.*, p. 231) has shown likewise to be derived from *coquina*. Boileau, in his 'Satires,' speaks as if the French metropolis had the same appellation bestowed upon it (*Sat.* vi.)·

> 'Paris est pour un riche un païs de Cocagne.

The name of the festival of *La Cocagna* at Naples, described by Keysler, vol. ii. p. 369, appears to have the same origin.

(Tyrwhitt's *Notes on Chaucer*, 4th edit. vol. ii. p. 437; Brand's *Popular Antiquities*, vol. i. p. 65; Nares's *Glossary, in voce.*)

COCKROACH, the common name for the Blatta orientalis. [BLATTIDÆ.]

COCKSCOMB. [CELOSIA.]

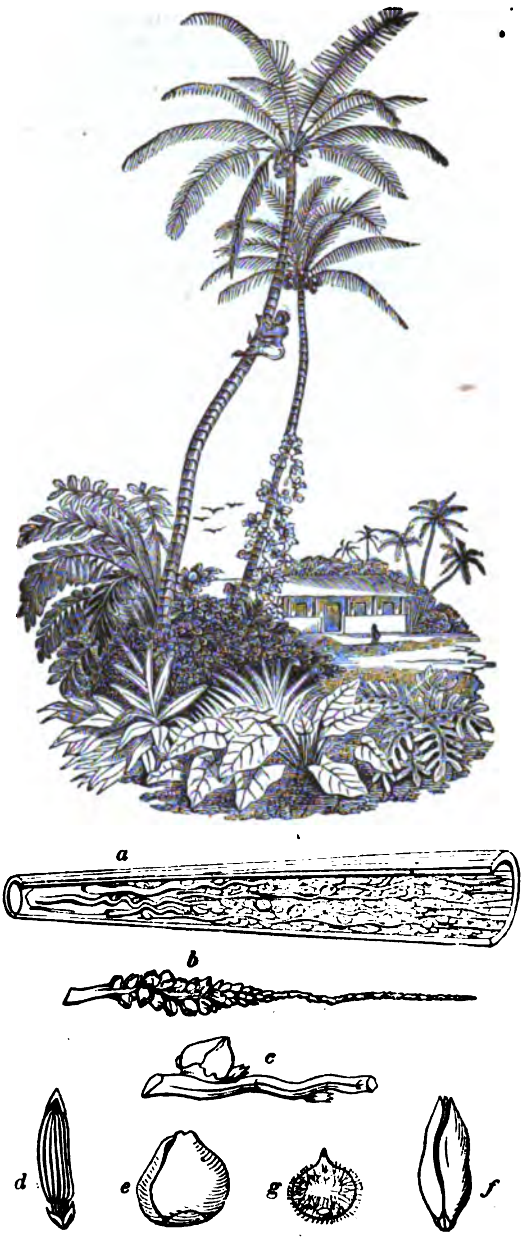
COCOA-NUT. [COCOS.]

COCOA-PLUM, the fruit of *Chrysobalanus Icaco*.

COCOON. [PUPA.]

COCOS, a genus of palms thus defined by Von Martius. Both male and female flowers on the same spadix. Spathe simple; flowers sessile. Males: calyx three-leaved; corolla of three petals; stamens six; a rudiment of a pistil. Females: three sepals and three petals rolled together; ovary three-celled; stigmas three, sessile; drupe fibrous; putamen with three pores at the base; albumen homogeneous, hollow; embryo next one of the pores at the base; stems either lofty or middle-sized, slender, ringed, or crowned by the bases of the petioles, with a pale fibrous wood; leaves pinnated; the pinnæ lanceolate or linear; flowers pale yellow; drupes brown, green, or orange colour, rather dry. The genus contains several species, the most interesting of which is the common cocoa-nut, *Cocos nucifera*.

This plant is found all over the tropical parts of the world, especially in the vicinity of the sea, growing within reach of salt water, and establishing itself upon reefs and sandbanks as soon as they emerge from the ocean. Its principal range is said by Mr. Marshall to be between the equator and the 25th parallel of latitude, and in the equinoctial zone to an altitude of about 2900 feet. Its great importance to man has caused it to be cultivated wherever the climate is favourable to its growth; and accordingly it is sometimes found occupying extensive tracts to the exclusion of all other trees: the whole Brazilian coast from the river San Francisco to the bar of Mamanguape, a distance of 280 miles, is, with few breaks, thus occupied; and it was estimated that in the year 1813 no fewer than 10,000,000 trees were growing on the south-west coast of Ceylon.



Cocos nucifera.

a, lower portion of the spathe opened; *b*, branchlet, with female flowers—the males on the upper end dropped off; *c*, female flower; *d*, stamens *e*, female corolla; *f*, male corolla; *g*, germen.

The cocoa-nut palm rises like a slender column to from 60 to 90 feet in height; its stem is of a soft fibrous nature, and is marked on the outside by rings produced by the fall of its leaves; two such leaves are said to drop off annually, and consequently the age of an individual is equal to half the number of the annular scars of its stem. About a dozen or fifteen leaves, each from 12 to 14 feet long, crown the summit of the stem; and as these are not inaptly compared to gigantic ostrich feathers, they give the plant the air of an enormous tuft of vegetable plumes. A reticulated substance resembling coarse cloth envelops the base of each leaf-stalk, but falls off before the leaf is full grown. The flowers proceed from within a large pointed spathe, which always opens on the under side. In wet seasons the tree blossoms every five or six weeks, so that there are generally fresh flowers and ripe nuts on the tree at the same time; there are commonly from five to fifteen nuts in a bunch; and in good soils a tree may produce from eight to twelve bunches, or from 80 to 100 nuts annually.

In hot countries the uses to which the cocoa-nut tree is applicable are innumerable. The roots are chewed in place of the areca-nut; gutters, drums, and the posts of huts are formed from the trunk; the young buds are a delicate vegetable; shade is furnished by the leaves when growing, and after separation from the tree their large size and hard texture render them invaluable as thatch for cottages; they are moreover manufactured into baskets, buckets, lanterns, articles of head-dress, and even books, upon which writing is traced with an iron stylus. Their ashes yield potash in abundance; their midrib forms oars; and brushes are formed by bruising the end of a leaf with a portion of the midrib adhering to it. From the juice of the stem, a kind of palm wine, and subsequently an ardent spirit, are prepared; the farinaceous matter contained in the stem is a good substitute for sago; and a coarse dark-coloured sugar, called jagghery, is obtained from inspissating the sap. This jagghery, mixed with lime, forms a powerful cement, which resists moisture, endures great solar heat, and will take a fine polish. The ripe fruit is a wholesome food, and the milk it contains a grateful cooling beverage; indeed these together constitute the principal sustenance of the poorer Indians in many countries. The fibrous bark is used to polish furniture, as brushes, and to form a valuable elastic cordage, called *coir;* the fibrous matter is also employed to stuff mattresses. The shell is manufactured into drinking-vessels and vessels of measure; and finally, the albumen, or white solid matter contained within the shell, yields by pressure or decoction an excellent oil; the former is the method usually employed. This oil is not only employed for burning, but in the manufacture of torches, and in the composition of pharmaceutical preparations; and mixed with dammer (the resin of *Shorea robusta*) it forms the substance used in India for paying the seams of boats and ships.

The name cocoa seems to be a contraction of the Portuguese ma*coco* or macaco, a monkey, and to have been given from the resemblance between the end of the shell, where the three black scars are, and the face of a monkey. These three scars indicate the places through which the three embryos of the fruit, if equally and completely developed, would be protruded. But as out of the three ovules originally formed in the cocoa-nut two are constantly abortive, it happens that one only of the scars has to fulfil its destined purpose: that one is known by its being easily pierced by a pin; the others are as hard as the remainder of the shell. It is immediately below the soft scar that the embryo of the cocoa-nut is formed, and the use of the scar is to allow of a passage through the shell of the nut for the germinating embryo, which, without this wise contrivance, would be unable to pierce the hard case in which it is confined.

Cocoa-nuts are brought to Europe as wedges to set fast the casks and other round packages in the cargo of vessels; their freight therefore costs nothing

COCUMI'GLIA, the name of a kind of plum (Prunus Cocumilia) found wild in Calabria, and having the reputation of being a powerful febrifuge. It is described as bearing a general resemblance to the cultivated plum, but with short double peduncles, elliptical-obovate leaves, which are smooth, crenelled, and tapering to each end, the crenelling and the petioles covered with deciduous glands, and with ovate-oblong fruit of a dull tawny yellow colour, with a slightly incurved point, and an austere astringent flavour. It is abundant about Sile, and on the mountains which overlook Monteleone, Staiti, Cotrone, and Mesoraca, on the sides exposed to the sea, as far as the height of about 3000 feet. The bark of this species is in extensive use for the cure of the intermittent fevers of Calabria, both in private practice and in the military hospitals, where it is preferred to cinchona. The bark of the root is principally employed either in decoction or extract; and its valuable qualities are attested by Savaresi, Polizzi, Tenore, and other Neapolitan physicians. The medicinal properties of the Cocumiglia are said to have been discovered by a noble citizen of Monteleone, who annually caused a considerable quantity of the extract to be prepared and distributed among the Calabrian peasantry. It is worthy of notice that febrifugal properties are assigned by Mérat to the bark of the common sloe; and, considering the very close affinity between the cocumiglia, the sloe, the bullace, and the common cultivated plum, it is highly probable that similar qualities are possessed by all of them. The bark should be collected in the months of November, December, or January.

CODDY MODDY, a gull in its first year's plumage. (Montagu.)

CODE, CODEX. Before the use of more convenient materials, wooden tablets were employed by the antients for writing on. Such a written tablet was called codex, of which codicillus is a diminutive. First they wrote by making notches or indents in these tablets, but afterwards they covered them with wax, and used a style to write with.

The notion of the word was then extended, and it has now several significations. 1. Codex may denote any handwriting on parchment or paper. 2. The diminutive codicillus signifies a less solemn last will or testament. [CODICILLUS.] 3. A collection of laws is also called codex, or code in modern languages, as in English and French. In this sense the word is now most commonly used. There are several kinds of codes. A code may be made by merely collecting and arranging in a chronological or systematical order the existing laws of a state, which have been made at various times by the sovereign power. Such a collection is either made by public authority, as was the case with the Codex Theodosianus [THEODOSIAN CODE] and Codex Justinianeus [JUSTINIAN CODE AND ROMAN LAW], or by private individuals, as is the case with the Codex Gregorianus and Hermogenianus. The Germans call collections of old German laws, made in the middle ages, 'Rechts bücher' (books of rights). Very different from a mere compilation of existing laws is a code (in German *Gesetzbuch*, book of laws), by which the legislative power sets up a new system of laws. A mere arrangement and classification of existing laws is more properly called a Digest. If to this classification and arrangement selection be superadded, it would still be properly only a Digest. A code, though it may adopt many existing laws and customs, is now generally used to express a complete new system, founded on new fundamental principles; such principles, for instance, as are set forth in Bentham's 'Leading Principles of a Constitutional Code for any State.' In England, for example, if it were proposed to make a code, it might be found useful or necessary to modify the law of tenures, or to abolish certain kinds of tenures, such as customary tenures; and also to provide positive rules for numerous cases that are still either totally unprovided for or left doubtful by conflicting decisions, or regarded as of little authority.

CODEIA, an alkali existing in OPIUM.

CO'DES, LES CINQ, is the name given to several compilations of laws, civil and criminal, made in France after the revolution, and under Bonaparte's administration. They consist of the Code Civil, Code de Procédure Civile, Code de Commerce, Code d'Instruction Criminelle, and Code Pénal. To these has been added the Code Forestier, or regulations concerning the woods and forests, promulgated under Charles X. in 1827. Hence the whole collection is sometimes called 'Les Six Codes.' But even this number is not correct, as there are also a Code de la Conscription and a Code Militaire, both published under Napoleon. These two last are treated under CONSCRIPTION and MUTINY ACT.

Civil Code.—The old laws of the French monarchy were founded partly on the Roman law, partly on the numerous different customs of the various provinces, and partly on the ordinances of the kings. Having been abrogated at the revolution, several attempts were made, by Cambacères among others, to form a code of laws in accordance with the altered state of society; but the fury of the internal factions, the cares of foreign war, and the frequent changes of rulers, prevented any calm deliberation on the subject during the first years of the revolution. After Bonaparte became first consul, he appointed, in 1800, a commission, consisting of Tronchet, president of the Court of Cassation, Bigot de Préameneu, Portalis, and Malleville, to draw up a project of a civil code. The project was printed early in 1801, and copies were sent to the different courts of France for their observations and suggestions. The observations and suggestions were likewise printed, and the whole was then laid before the section of legislation of the council of state, consisting of Boulay, Berlier, Emmery, Portalis, Roederer, Real, and Thibaudeau. Bonaparte himself, and Cambacères, his colleague in the consulship, took an active part in the debates. The various heads of the code were successively discussed, after which they were laid before the tribunate, where some of the provisions met with considerable opposition. The code however passed at length both the tribunate and the legislative body, and was promulgated in 1804 as the civil law of France, 'Code Civil des Français.' Under the Empire its name was changed into that of Code Napoléon, by which it is still often designated, though it has now officially resumed its original title of Code Civil. This code affects to define the civil rights of Frenchmen, and their legal relations to each other, and to society at large. In its general arrangement and distribution it resembles the Institutions of Justinian; like them, it has adopted the great distinction of laws concerning the person, and laws concerning property. It consists of three books, divided into titles or heads, each of which is subdivided into chapters and sections. Book I., in eleven heads, treats of persons; specifies their civil rights; regulates the means by which their rights are certified; prescribes the mode of registering births, marriages, and deaths; defines the conditions constituting the legal domicile of each individual; and provides for cases of absence. It then treats of marriage as a civil contract, the forms required, the obligations resulting from it, and lastly, of separation and divorce. The articles concerning divorce, which gave rise to much debate and opposition at the time, have been repealed since the Restoration, and separation alone is now allowed. The code proceeds to treat of the relations of father and son, of legitimate and natural children, of adoption and guardianship, and of paternal power. Under this last head the French code, without adopting the rigid principle of the old Roman law in its full extent, gives to a father the right of imprisoning his son during his minority for a term not exceeding six months, by a petition to that effect, addressed to the president of the local court, who, after consulting with the king's attorney, may give the order of arrest without any other judicial forms being required. The remaining heads treat of minority and emancipation; majority, which is fixed, for both sexes, at 21 years complete; of interdiction, and the council of trustees appointed in certain cases to administer the property of a man who is incapable of doing it himself. Book II. treats of property and its various kinds and modifications. The 1st head draws the distinction between *meubles* and *immeubles*, or personal and real property; though these two words do not exactly express, to an English lawyer, the distinction between *meubles* and *immeubles*. The 2nd defines the different rights of ownership. The 3rd treats of usufruct, use, and habitation. The 4th concerns rural servitudes, the *prædiorum servitutes* of the Roman law, excluding all former personal servitudes which were abrogated at the revolution. Book III. treats of the various modes by which property is legally acquired, such as inheritance, donation inter vivos, and wills or testaments. A father can dispose by testament of one-half of his property if he has but one legitimate child, of one-third only if he has two, and of one-fourth if he has three or more. The law then proceeds to treat of contracts or conventional obligations, specifying the modes of proving them by written documents, official or private, or by witness, or lastly by presumption. The 5th head treats of the marriage contract, and the respective rights of husband and wife according to the various stipulations, either by community or separation of property, or by dowry. Next come the heads of sales, exchanges, leases, partnerships, loans, deposits, and sequestration. The 12th head concerns the contracts called aléatoires, which depend in a great measure upon chance, such as insurance, annuities, &c. The law treats next of power of attorney, of bail and security, and of amicable compromise. The 18th head concerns privileged creditors and mortgages. This subject is very elaborately treated, and has been much extolled as a very valuable part of the Civil Code, on account of the security which it gives to property by means of the public offices for registering mortgages, of which there is one in every district. The registration of mortgages has been adopted in most of the Italian states, and other countries besides France; but even this system is not considered perfect, because there is no obligation to register every sale or transmission of property, nor the servitudes affecting property and because the French code admits of sales by private contract, and of mortgages in favour of minors or wives, even without registration. In this particular the Austrian code is considered superior, because it enforces the registration of every transmission of property, and of every burthen or servitude, on the book of census, or cadasto, for each district. (See also Grenier, *Traité des Hypothèques*, 1824: *Introduction*.) The nineteenth head of the French civil code treats of expropriation or seizing, or selling off by execution; and the twentieth, or last, of prescription.

Much has been written on the merits and defects of this celebrated code. In order to judge of its value, we ought to read the reports of the discussions in the council of state by the most distinguished jurists of France. (Locré, *Esprit du Code Napoléon tiré de la Discussion*, 6 vols., 8vo., 1805; and Malleville, *Analyse raisonnée de la Discussion du Code Civil au Conseil d'Etat*, 4 vols., 8vo., 1807.) On the other side, several distinguished German jurists have pointed out its imperfections. (Savigny, *On the Aptitude of our Age for Legislation*, translated from the German by a barrister of Lincoln's Inn; Rehberg, *über den Code Napoleon*, Hanover, 1814; Thibaut, Schmidt, &c.) With regard to the part which Bonaparte took in its discussion, not of course as a professional man, but as a quick-sighted observer and critic, a lively account is given in Thibaudeau's *Mémoires sur le Consulat*, in which his own original expressions are preserved.

Code de Procédure Civile.—The Code Civil having determined what was law, it remained to prescribe the forms of civil process and the practice and rules of the courts. The Code de Procédure is divided into two parts. The first part treats of the various courts: 1st. Of the justices of peace and their jurisdiction. There are about 2840 of these magistrates in France, who decide petty cases not exceeding 300 francs, and also act as conciliators between parties at variance, who are not allowed to plead before a court without having first appeared before the juge de paix. 2nd. Of the process before the tribunaux de première instance, which try civil cases without jury. There is one of these courts in every arrondissement. 3rd. Of appeals to the Cours Royales, of which there are 27 established in the larger towns, each having several departments under its jurisdiction: these courts try cases by jury. 4th. Of various modes of judgment. 5th. Of the execution of judgments. The second part treats of the various processes for the recovery of property, separation between husband and wife, interdiction and cession of property by an insolvent debtor. Foreigners are excluded from the benefit of the *cessio bonorum*. The code then passes to the subject of inheritance, the affixing of seals, taking inventories, &c. The last book treats of arbitration. The Code de Procédure was in great measure founded on the ordonnance of 1667 of Louis XIV., with considerable ameliorations. It was framed by a commission appointed in 1800, then discussed in the council of state and the tribunate, and lastly passed by the legislative body. It was put in force in January, 1807. 'An orator of the government, using the licence of flattery, said in his report that the principal difficulties in definitively settling the code had been cleared up by the emperor himself, who had adapted the forms to the present wants of society. The fact is that Napoleon took no part in the discussion of this code, which was conducted during his journeys to Italy and to the camp of Boulogne, and during the campaign of Austerlitz. Besides, it was a dry and unattractive subject, very unlike that of the Civil Code, and the emperor finding himself a complete novice in it, gave it up entirely to professional lawyers. His general views would have been to simplify the forms, and to check the sources of chicanery, but he was not heeded. One of his ideas was that solicitors and counsellors should not be paid unless they gained the cause. The routine lawyers, however, had too much influence in the work.' (Thibaudeau, *Histoire de France sous Napoléon*, vol. v., p. 124-5.) The government afterwards published a table of the expenses, duties, fees, &c. attending civil process. The table, which is given at the end of the collection of the codes, presents a formidable appearance by the multiplicity and minuteness of the charges which attend every step of legal proceedings. Indeed this is the principal reproach made against the Code de Procédure, the multiplicity of formalities, written acts, registrations, stamps, &c. Another objection is, that in actions in which the state is concerned, it has advantages over private parties. But the publicity of the discussions, the security to all civil proceedings by means of registration, the well-defined authority of the various courts, the independence of the judges, and the establishment of local courts all over the country, and above all the institution of the supreme Court of Cassation—these are essential and lasting advantages.

The *Code de Commerce* was promulgated in January, 1808. It was founded in some measure upon the ordonnances of 1673-81 of Louis XIV. Next to the Civil Code, it is considered the best part of French legislation. The institution of the commercial tribunals has been of great advantage to France, and has been adopted in other countries. These courts, of which there are 213, consist of a president and two or more judges, all chosen by the merchants among themselves, and for a time; they are not paid, but the greffier or registrar receives a salary. The Code de Commerce consists of four books: the first treats of commerce in general, of the various descriptions of commercial men, of the keeping of books, of companies and partnerships, of brokers, commissioners, carriers, &c.; the second treats of maritime commerce, shipping, insurances, &c.; the third concerns bankruptcies; and the fourth treats of the commercial tribunals, their jurisdiction and proceedings. Appeals for cases above 1000 francs lie to the cour royale of the district.

Code d'Instruction Criminelle.—The criminal laws of France under the old monarchy were defective, confused, and arbitrary. There was no penal code, but there were various ordonnances for the punishment of particular offences. The ordonnance of Louis XIV. for regulating proceedings in criminal cases introduced something like uniformity, but it maintained torture, which in some cases was repeated, secret trial, and other anomalies of the legislation of the middle ages. Torture was abolished by Louis XVI. The first National Assembly in 1791 recast the criminal legislation, introduced the jury, and remodelled the criminal courts after those of England. Then came the reign of terror, with its exceptional laws, or rather no laws at all but the caprice of the ruling faction. Bonaparte, when first consul, appointed a commission, consisting of Viellard, Target, Oudard, Treilhard, and Blondel, to frame a project of a criminal code. The fundamental laws were laid down in 1801, and were then discussed in the council of state. Bonaparte took a lively part in these first discussions, especially on the question of the institution of the jury, which he strongly opposed on the ground of the probable incapacity or party spirit of jurors: he looked upon the question in a political rather than a judicial light. Portalis, Simeon, Bigot de Préameneu, and Ségur sided with Bonaparte. Treilhard, Berlier, Defermon, Crétet, Bérenger, Merlin, and Louis Bonaparte defended the jury. There is an interesting account of this discussion in Thibaudeau (vol. vii., pp. 88, &c.). The question being put to the vote, the majority was favourable to the jury. The matter, however, was finally settled by suppressing the jury d'accusation, or grand jury, and retaining the jury de jugement. The jurors are taken from the electors, who are qualified to vote for a member of the legislature, graduates in law, medicine, and other sciences, notaries, &c. A list of persons so qualified is made out by the prefect of the department, from which the President of the Cour Royale, or of the Cour d'Assize, selects the number required to serve. The proceedings in criminal trials are partly written and partly oral. The accused is first brought before the procureur du roi (king's attorney), who examines him and simply reports the case to the juge d'instruction, without giving any opinion upon it. At the same time, if the accused is charged with a crime punishable with personal and degrading penalties, he orders his detention. For mere délits or misdemeanors, bail is allowed. The juge d'instruction summons and examines the witnesses, and then sends back the report to the procureur du roi, who makes his remarks on the case, which is then laid before the chambre de conseil, consisting of three judges of the tribunal de première instance. These judges investigate the case minutely, and decide if there is ground for further proceedings. In such case the report is laid before the chambre d'accusation, composed of five judges of the Cour Royale, who ultimately decide for commitment or acquittal. If committed for a crime punishable by peines afflictives or infamantes, the prisoner takes his trial before the next cour d'assise of the department. If for mere délit or misdemeanor, he is sent before the correctional tribunal. The courts of assize consist of a president and three judges, chosen from among the members of the Cour Royale and of the tribunal de première instance, and their sessions are held every three months in the chef lieu of each department. The jury decide by a majority on the fact of the charge; eight constitute a majority. The court then awards the sentence, having a discretion between a maximum and a minimum penalty. By a law passed since 1830 the court can no longer reconsider the verdict of the jury, as was the case before. The prisoner may challenge twelve jurors. One or two juges d'instruction are attached to each court of assize for criminal cases; they are generally taken from among the juges de première instance, and for a definite time only. The Code d'Instruction Criminelle consists of the following books: 1. Of the judiciary police and the various officers whose duty it is to inquire after offences, collect the evidence, and deliver the prisoners to the proper courts. These officers are very numerous, including the maires and their assistants, the commissaries of police, the ru[illegible] guards and forest-keepers, the justices of the peace, the king's attorneys and their substitutes, the juges d'instruction, &c. It also treats of the manner of proceeding by the king's attorney, as already stated. Of the juge d'instruction and his functions, distinguishing between cases of flagrant crime and others. Book 2 treats of the various courts; tribunaux de simple police, which take cognizance of petty offences, and can inflict imprisonment of not more than five days, and a fine not exceeding fifteen francs; tribunaux en matière correctionnelle, which are composed of at least three judges of the tribunaux de première instance, and take cognizance of délits or misdemeanors, the penalties for which are defined in the Code Pénal; cours d'assise, already mentioned, from which there is an appeal for informality or want of jurisdiction to the Court of Cassation; lastly, the cours spéciales or exceptional courts, which Napoleon insisted upon having at his disposal, and which have been resorted to repeatedly since the Restoration, and still appear on the code. These special courts are assembled in cases of armed rebellion against the authorities, but they also take cognizance of the offence of coining and of crimes committed by vagabonds and convicts who have escaped; they are composed of a president taken from among the judges of the Cour Royale, four judges, and three military officers of the rank of captain or above. They try without jury, judge by majority and without appeal, and the sentence is executed within twenty-four hours. On the subject of the Code d'Instruction, Thibaudeau observes that it retained many of the ameliorations introduced by the National Assembly, especially the publicity of trial and the institution of the jury. Its chief faults are, the great number of officers, some of them merely administrative, who are charged with the pursuit of offenders, by which circumstance the citizens are often exposed to vexatious interference; the too great extent given to the jurisdiction of the correctional courts, by which, in many cases, the citizens are deprived of the guarantee afforded by the jury; the restrictions on the choice of jurors, which is too much in the power of prefects and other local authorities; the institution of the special courts; and, lastly, the frequent abuse of the power of the police, by which its agents could issue warrants of arrest.

'Prefects and commissary-generals of police often had individuals arrested, and left them in prison waiting for the decision of the minister of police, who answered at his leisure, or at times confirmed the order of arrest for an indefinite time. And as by Art. 75 of the Consular Constitution of the year 8, any suit against the agents of government was forbidden without an authorization from the council of state, there was in fact no redress against arbitrary acts.' (*Hist. de France sous Napoléon*, vol. vii. pp. 124—9).

This last abuse is now corrected, or at least greatly mitigated. Other provisions of the Code d'Instruction, as well as of the Penal Code, have been also altered for the better by the law of 28 April, 1832, entitled 'Modifications aux Codes d'Instruction Criminelle et Pénal,' which is found at the end of the later collections of the French codes.

The *Code Pénal*, or laws defining crimes and punishments, was completed in January, 1810. Its discussion occupied forty-one sittings of the council of state. Of these sittings Napoleon attended only one (21 January, 1809). Cambacères presided at all the rest. 'Napoleon was therefore a stranger to its discussions; he only expressed an opinion that the laws ought to be concise, and leave much latitude to the judges and the government in the application of the penalty, 'because,' said he, 'men had feelings of compassion unknown to the law.' He insisted upon the penalty of confiscation being retained in certain cases, because most nations had sanctioned it in cases of conspiracy, rebellion, and false coining. 'But the definition of crimes and offences, the nature of the penalties, and the mode of their application, were the work of criminal jurists, who were generally inclined to severity, and were well acquainted with the ideas of Napoleon, who was persuaded that criminal legislation ought to be very rigorous in order to maintain order and support the authority of the government.' (Thibaudeau, vol. viii. p. 3.) Hence the penalty of death was fixed in numerous cases, and those of perpetual imprisonment, hard work, or transportation for life, in a still greater number. The pillory is also one of the punishments.

If we look at book iii. ch. 1, which treats of the crimes and offences against the safety of the state (a term susceptible of indefinite and arbitrary application), we find that the penalties of death and confiscation are fixed very generally. Confiscation however has been solemnly abolished by a law passed under Louis XVIII. By the head, 'Des critiques, censures ou provocations contre l'autorité publique dans un discours pastoral,' any clergyman found guilty of having, in a pastoral charge, sermon, or other public address, spoken or printed, criticised or censured any act of the government authorities, is subject to banishment, transportation, and even death, according to the consequences which have resulted from his act. The following head, 'Résistance, désobéissance, et autres manquemens envers l'autorité publique,' is equally severe. The article 'Délits commis par la voie d'écrits, images ou gravures, distribués sans nom de l'auteur, &c.' concerns the press, which was under a strict censorship in Napoleon's time. Since the Restoration the censorship has been abolished, and several laws have been enacted to repress abuses of the press, especially in April and October, 1831. The last law on this subject was promulgated in September, 1835, and consists of five heads: 1. Crimes, délits et contraventions. 2. Du gérant (editor) des journaux ou écrits périodiques. 3. Des desseins, gravures, lithographies, et emblêmes. 4. Des théâtres, et pièces de théâtre. 5. De la poursuite et du jugement. It is printed at the end of a collection of codes, laws, &c., published in 1835, and styled 'Les dix-huit Codes du Royaume.' By the section of the Penal Code entitled 'Des Associations ou Réunions illicites,' which continues in force to this day, every association of more than twenty persons for the purpose of meeting on fixed days to discuss either political, religious, literary, or other subjects, is declared illegal, unless it first obtain the approbation of the government, which can prescribe conditions and fix regulations at its pleasure. The chiefs or directors of any such illegal association are punished by fine. If at the meetings of such assemblies there has been any provocation to crimes or délits, as defined in the other articles of the penal code, the chiefs or directors and administrators are liable to imprisonment from three months to two years, besides fine, although they themselves may not have been guilty of the offence. No individual can lend his house or apartments for the meeting even of an authorized association, unless he first obtain the permission of the municipal authorities. By a law which passed the Chambers in April, 1834, the above regulations have been made even more strict. Every member of an illegal association is liable to a fine of 1000 francs, and to imprisonment from two months to one year. Under the heads 'Vagabondage' and 'Mendicité,' vagrants are defined to be all those who have no fixed domicile, nor means of subsistence, and who do not follow habitually any trade or profession. On the legal evidence of being such, they are condemned to an imprisonment of from three to six months, after which they are 'at the disposal of government.' With regard to mendicants or beggars, any person found begging in a place where there is a workhouse or depôt for the poor is subject to from three to six months' imprisonment. But the next article is much more liable to objection on the score of justice and humanity; it runs thus:—In places and cantons where there is no depôt for the poor (which is the case in most rural districts of France), able-bodied beggars shall be imprisoned for a period of from one to three months; and if arrested out of the canton where they reside, they are imprisoned for a term of from six months to two years. By Article 402, bankrupts not fraudulent are liable to imprisonment from one month to two years. Brokers in the same situation are condemned to hard work for a time. The law of France makes a wide distinction between native and foreign insolvents. Foreigners not domiciled in France, having no commercial establishment or real property there, are liable to double the period of imprisonment that a Frenchman is, namely, two years for a debt less than 500 francs; four years for a higher sum under 1000 francs; six under 3000; eight for less than 5000; and ten years for 5000 and upwards. (Okey, *Concise Digest of the Law, Usage, and Custom affecting the Commercial and Civil Intercourse of the Subjects of Great Britain and France.*) By the head 'Violations des réglemens rélatifs aux manufactures, au commerce, et aux arts,' any coalition between masters to lower wages is punished by a fine of from 200 to 3000 francs, besides imprisonment not exceeding a month. Coalition among workmen, followed by an attempt to stop the works of a manufactory, is punished by imprisonment of from one to three months; the leaders or originators of the coalition or attempt are subject to imprisonment from two to five years. By Article 417, any one who, with the view of injuring French industry, has removed to a foreign country the workmen or clerks of a manufactory, may be imprisoned from six months to two years, besides paying a fine of from 50 to 300 francs. Article 418: Any director, clerk, agent, or workman, of a manufactory, who communicates to foreigners or to Frenchmen residing abroad any secret of the fabric in which he is employed, is punished by a fine of from 500 to 20,000 francs, besides imprisonment at the discretion of the court. Article 421: all wagers or bets upon the rise or fall of the public funds are punishable by imprisonment from one month to one year, besides a fine of from 500 to 10,000 francs. The offenders may after the expiration of their imprisonment be placed by sentence of the court under the surveillance of the haute police from two to five years. This sentence, 'placed under the surveillance of the high or government police,' which is added at the end of numerous penalties, means that the person so placed is to give security for his good conduct; in default of which he is 'at the disposal of government,' who may fix a particular place for his residence. All individuals who have undergone the punishment of hard work for a time, or that of banishment or transportation, or those who have suffered a penalty for political crimes, are placed, *de jure*, under the surveillance of the high police for the rest of their lives.

The above extracts are sufficient to show the spirit in which the French criminal code has been framed. It is, in fact, as harsh and illiberal in many of its enactments as that of any absolute government in Europe. In speaking therefore of Napoleon's legislation, it is necessary to discriminate between the civil and the criminal laws; and again between the laws themselves and the practice and rules of proceeding in the courts. The adoption of the French criminal code met with great opposition in Italy. At Milan the legislative body attempted to modify and adapt it to the habits and wants of the Italians. Two commissions were appointed by the minister of justice, one for the code of instruction, and the other for the code pénal. Their reports were sent to Paris, but were rejected by Napoleon, and an answer came with peremptory orders to translate literally, and enforce the two French codes without any alteration. At Naples similar objections were also made, but with no better effect. (Colletta, *Storia del Reame di Napoli*, book vi.)

For comments and strictures by French jurists on the criminal laws of France, see Bérenger *de la Justice Criminelle en France*, 1818; Dupin, *Observations sur plusieurs points importans de notre Législation Criminelle;* and Bavoux, *Leçons préliminaires sur le Code Pénal*, 1821.

There are in France more than 3000 judges, including those of the commercial courts, besides 2840 juges de paix. The judges of the Tribunaux de Premiere Instance have salaries varying from 2000 to 6000 francs; those of the Cours Royales, from 3000 to 8000. The presidents and vice-presidents receive more in proportion. The juges de paix receive about 800 francs, besides certain fees. The various courts, magistrates, greffiers, &c., cost the state about fifteen millions of francs annually. (Goldsmith, *Statistics of France*, 1832.)

For a general view of the judiciary system of France, see Meyer, *Esprit des Institutions Judiciaires*, last vol.; and Rey, *des Institutions Judiciaires de l'Angleterre comparées avec celles de France et de quelques autres Etats*, 1826

CODICIL, in English law. [WILL.]

CODICILLUS, the diminutive of Codex, signifies properly something written on a little wooden tablet. Cicero (*ad Fam.* iv. 12, vi. 18; *ad Attic.* xii. 8; *ad Quint. Fratr.* ii. 10) often uses Codicilli for epistolæ, or letters. Codicilli, in fact, were letters addressed by a testator to the heir or heirs named in his will, as to certain things which the testator wished to be done by his heir or heirs after his decease. (Heinecc. *Antiq.* ii., tit. xxiii and xxv., section xi.)

The difficulty which existed, out of Rome, of procuring the legal number of Roman citizens as witnesses to a solemn will, led to the use of Codicils. It appears from Justinian's 'Institutes' (*de Codic.* ii., 25) that codicils came into use in the time of the Emperor Augustus. Lucius Lentulus, who died in Africa, had addressed a codicil (that is, a letter) to Augustus, his testamentary heir, who complied with the wish of Lentulus, though he was under no obligation to do so. From that time codicils became legal instruments.

The Codicillus has been defined to be a supplement or addition to a testament, which is to be considered as annexed to the will itself, for the purpose of adding, explaining, or altering something in the previous disposition. But such a definition does not give an exact notion of the term, and besides this, it applies only to the cases where the person making the codicil dies testate; consequently it does not take in those cases where no will exists. More correctly, codicil is defined to be a less solemn will, in which, as well as in a solemn will or testament, every disposition that can be effected by a last will may be made, except the appointment of direct heirs, and exheredation, *i.e.*, the disinheriting of sons, daughters, &c. Codicils were commonly used for the purpose of naming bequests or legacies to be paid by the heirs already appointed by a testament, and for explaining and clearing up obscurities and want of precision in a testament.

There are two species of Roman Codicils: *ab intestato*, when a man who made a codicil died intestate; and *codicilli ad testamentum facti*, when he died testate. In the former case the dispositions in the codicil had reference to the heres ab intestato, or the person to whom the law gave the intestate's property. Codicils of the second species were either confirmed by the testament (codicilli confirmati) or not (non confirmati). Before Justinian's time there were several differences between these two sorts of codicils, particularly as to legata and fidei commissa; but the different species of bequests being put on the same footing in the reign of Justinian, the distinctions ceased. In the time of Pliny the Younger, a codicil made before a subsequent will ought to be confirmed by the will (lib. ii. ep. 16); but this was afterwards dispensed with (*Instit.* ii. 26). Sometimes future codicils were confirmed by a prospective will.

Codicils might be written, in which case they were either public or private; or they might be verbal directions given to the heir. In their origin codicils had no particular forms, but the Emperor Constantine required witnesses to codicilli ab intestato, and to codicilli non confirmati; and Justinian required witnesses for all private codicilli.

A testament wanting the legal forms required for such a solemn instrument might be maintained as a codicil if the legal forms for a codicil were observed, and the will contained the codicil-clause (clausula codicillaris). (See Brissonius *De Formul.* lib. viii.; Gaius, lib. ii., Dig. 29, Tit. 7; *De Jure Codicillorum.*)

CODIFICATION. [LAW and LEGISLATION.]

CODRUS (Κόδρος), son of Melanthus, and the last king of Athens, as to whom the following tradition is preserved. When some of the Dorian states had united their forces for the invasion of Attica, they consulted the Delphic oracle concerning the issue of the expedition. The response implied that they would be victorious if the life of the Athenian king was spared. The Athenians being informed of this answer of the oracle by Cleomantis, an inhabitant of Delphi, Codrus heroically determined to devote himself for his country. Accordingly he went out at the gate disguised in a peasant's dress, and falling in with two Dorians, killed one with his hook, and was himself killed by the other. The Athenians demanded and got back the body of their king; and the Dorians, despairing of success, withdrew their forces. The exact spot where Codrus was said to have fallen was shown in the time of Pausanias (i., 19), near the altar of the Muses, on the Ilissus. Codrus had several sons: the two eldest were Medon and Nileus. Cleomantis and his descendants were rewarded with the freedom of the city, and a perpetual right to sit at the public table, which was kept in the Prytaneum at Athens. (*Lycurgus against Leocrates*, sections 194 and 196; Pausanias, vii., 225.)

CO-EFFICIENT (in Algebra). When two or more numbers are multiplied together, each of them is called a factor of the product, and a co-efficient (or co-factor, as it were) of the other factors. Thus the factors of the product $a \times b \times c$ are a, b, and c; and a is the coefficient of $b \times c$, b of $a \times c$, and c of $a \times b$. But the word is most frequently used for that which should be distinguished as a numerical coefficient; thus in $2x + 3y$, 2 and 3 are respectively the coefficients of x and y. This word is as old at least as the writings of Vieta, in which it has its present sense.

When there is a multiplier depending upon the result of experiment connected with any particular property of matter, the number is frequently called the coefficient of that property. Thus by the coefficient of friction for any substance, is meant the fraction of the pressure which is equivalent to the friction of that substance.

COEHORN, MENNON, BARON DE, a celebrated Dutch engineer, who was born in 1632. He commenced his military career at an early age, and spent the leisure which the intervals of active duty afforded in improving the art of fortifying places, with the view of diminishing the inequality which, by the inventions of his contemporary Vauban, began then to be felt in the means of attack and defence. The services which Coehorn rendered to his country, both as an engineer and a commander, at a time when the defence of its military posts was an object of the first importance, procured for him the most honourable appointments which a soldier can attain. He arrived at the rank of general of artillery, and was made director-general of fortifications and governor of Flanders.

At the siege of Namur in 1692, Coehorn gallantly defended the fort which he had before constructed for the purpose of strengthening the citadel of that place, but being dangerously wounded he was at length compelled to surrender. It is honourable to the character of Vauban, who conducted the operations of the attack, that on this occasion he rendered full justice to the talents and valour of his rival.

Coehorn was engaged at the attack of Trarbach, Limburg, Liege, and at that of the citadel of Namur, which three years before he had defended. In the year 1703 he was employed at the siege of Bonn, where, in three days, his heavy and well-directed cannonade caused the surrender of the place. Soon afterwards he forced the French lines at Hanuye, and was appointed with his army to keep in check the Marquis de Bedmar on the right bank of the Scheldt. This was his last service: in the following year (1704) he died at the Hague, at the age of seventy-two.

In 1685 Coehorn published what are called his Three Systems of Fortification; they are adapted to ground elevated but from three to five feet above the surface of water, and consequently they may be considered as applicable only to the towns of Holland. He was appointed to repair or reconstruct the fortifications of Nimeguen, Breda, Mannheim (since destroyed), and Bergen-op-Zoom. The siege of the last place in 1747, by its duration and the losses which the besiegers sustained in its progress, attests the merit of the system on which the works were constructed.

COEHORN, a small mortar for throwing grenades, invented by the engineer of that name.

CŒLINO. [ISOPODA.]

CŒLIUS, or rather **CÆLIUS ANTIPATER (LUCIUS)**, wrote a history of the second Punic war, in a work bearing the name of 'Annals,' and extending to at least seven books. Some indeed are of opinion that the history embraced a much wider period, beginning with the first Punic war, and including the times of the Gracci. It was dedicated to L. Ælius, the same person to whom the poet Lucilius dedicated his 'Satires.' The precise period of his birth or death cannot be fixed, but he is called by Cicero (*De Leg.* i., 2) the contemporary of C. Fannius Strabo, himself an historian, and we know that Fannius was with Scipio at Carthage, in 146 B.C., and Consul in 122. That Cælius lived about this period is confirmed incidentally by an anecdote reported by Cicero (*De Divinat.* i., 26). When Caius Gracchus was a candidate for the quæstorship, his brother Tiberius appeared to him in a dream, and warned him that he would perish by the same violent fate which had befallen himself. And Cælius tells us, says Cicero, that he both heard of this dream and spoke of it to others before Caius Graccus was elected tribune, and consequently several years before it was fulfilled. Now the death of Tiberius Graccus occurred in 133. His brother Caius was quæstor in 126, tribune for the first time in 123, and murdered in 121. Lastly, the orator, L. Crassus, born 140, was one among many pupils of Cælius. We shall therefore not be very wrong if we suppose Cælius to have been born about the middle of the second century B.C.

The historical writings of Cælius were highly valued by his countrymen in the time of Cicero, who assigns to him the credit of having surpassed his predecessors in historic composition by the dignity and eloquence of his style. Though he wanted that knowledge of the jurisprudence of his country which is essential to an accurate historian, yet he was a man of an inquisitive temper, and seems generally to have the advantage in point of credibility where he differs from the historians of the same period. Marcus Brutus so highly prized his writings, that he made an epitome or abridgment of them, as he had before done of the histories composed by Polybius and Fannius. But the more complete work of Livy threw all the historical works of his predecessors into oblivion. Cælius was afterwards seldom read, except by antiquarians and those who sought in his writings examples of quaint words and obsolete phraseology; it is to the grammarians therefore that we are chiefly indebted for the fragments of his works that still exist. These fragments, together with those of other Roman historians, may be found in an appendix to Cort's and Havercamp's editions of Sallust. They have also been edited by Krause (*Vitæ et Fragmenta Veterum Historicorum Romanorum*, Berol., 1833). One of the most interesting among them is that in which he bears testimony to having seen a merchant who had sailed from Spain as far as Ethiopia, by which he probably meant the Coast of Guinea. It is Cælius too who gives the most direct evidence in favour of Hannibal's route across the Alps having been by the Little St. Bernard.

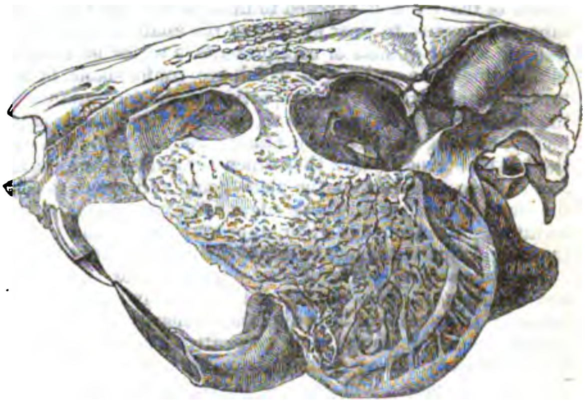
The Greek name Antipater, attached as a cognomen to that of Cælius, has with some reason led to the belief that he or his father was of Greek origin, and becoming a Roman prisoner and slave by the chance of war, was afterwards emancipated, and then took, as was the custom, the name of his Roman master. Such an origin is confirmed by the fact, that the name of one so distinguished by his talents, and especially his eloquence, is nowhere mentioned in connection with any public appointment. Two copious dissertations on L. Cælius, by B. A, Nauta and W. G. Van Prinsterer, will be found in the Annals of the Academy of Leyden for 1821. (See *Krause* as above.)

CŒLIUS, MONS. [ROME.]

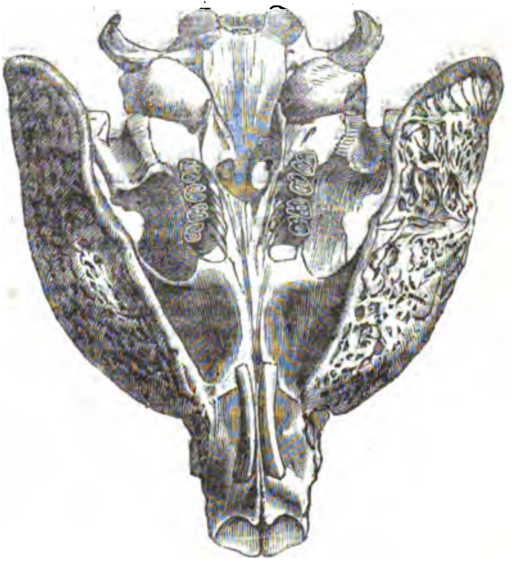
CŒLO'GENUS (F. Cuvier), *Cœlogenys* (Illiger), a genus of Rodent animals, belonging to the division without clavicles. Its place among the older naturalists was either among the Rats (*Mus*) or among the Hares. Linnæus, in his last edition (the 12th), arranges it under his extensive genus *Mus*, with the denomination of *Mus Paca*, and quotes, among others, Ray, who termed it *Mus Brasiliensis*. Klein separated the Cavy, Agouti, and the animal before us from the mass, under the generic appellation of *Cavia*. Gmelin, in his edition of Linnæus (the 13th), followed Klein, and added to the Cavies and Agoutis the Capybara, which Pallas, in his 'Spicilegia,' had termed *Cavia Capybara**, and Linnæus had placed among the Hogs (*Sus*). M. F. Cuvier separated the Paca from the Capybara, the Cavies, and the Agoutis, to which forms it shows a strong approximation, but from which it also presents considerable differences in many points, and especially in the complex structure of the molar teeth.

Dentition, &c.—Two strong incisor teeth in each jaw, the upper ones flattened in front and truncated obliquely, chisel-like; the lower slightly compressed laterally, and rounded on the anterior face. But these incisors, though of some strength, are small when compared to those of the porcupines and of the beaver. Like all the true Rodents, *Cœlogenus* has no canines, and a void space or bar separates the incisors from the molars, which amount to eight in each jaw, and are not unlike those of the Agouti, that is to say they are composed of complicated riband-like plates of enamel set in the interior bony cement, which vary and become more or less visible according to the greater or less attrition which the crowns have undergone. But, in *Cœlogenus*, besides the difference in the complications, the molars augment in size from the first to the last, which is one-third larger than the tooth that precedes it. (F. Cuvier.) There is also a striking peculiarity in the great development and projection of the zygomatic arches, which are enormously large, giving great breadth to the face, and descending unusually low. These were remarked by Daubenton; and Buffon observed that, on each side and towards the lower part of the upper jaw, there existed a sort of longitudinal fold, destitute of hair in the middle, so that, at first sight, it might be mistaken for the mouth of the animal. This fold, which Buffon does not seem to have investigated, is the opening of a shut sac of some extent, extending upwards behind the arch formed by the cheek and temporal bones, whose inner surface, as far as the sac extends within them, is lined by a continuation of the integument of the face, and, in addition to it, the animal is furnished with true cheek-pouches in their usual situation. These last are capable of being greatly dilated, and when filled, they are said to occupy the whole space beneath the zygomatic arches.

Dental formula incisors, $\frac{2}{2}$; molars, $\frac{4}{4}$ = 20



[Skull of Cœlogenus.]



[Upper jaw of the same.]

M. F. Cuvier observes that the Pacas are, among the Omnivorous Rodents, what the Capybaras are among the Herbivorous section. The first possess molars with roots distinct from their crowns, to the number of four on each side of either jaw. Those of the upper jaw are nearly of a size; but, in the lower, they diminish gradually from the last to

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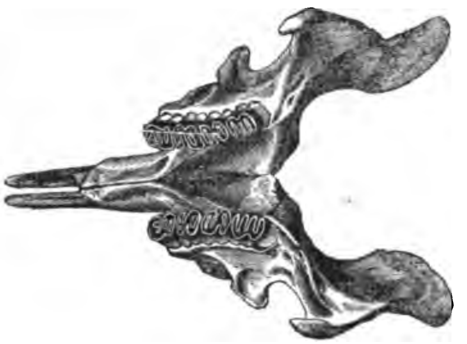
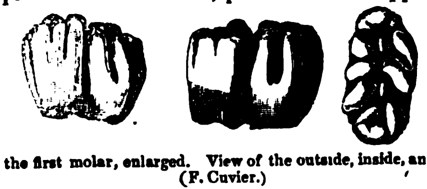
* N.B. There was a reference to Capybara from Cabiäi. The reader will find that animal, whose history was omitted under the title referred to, described in the article HYDROCHŒRUS.



[Under jaw of the same.]

the first. All the molars, before they have been subjected to the process of mastication, present, on the upper surface of the crown, four tubercles, which more or less completely divide the tooth broadwise, and are separated by three transverse furrows, more or less large or deep. When the crown of the tooth is exposed to mastication, the top of the tubercles begins to wear away, and the enamel, instead of forming a sort of hood or cap, presents a series of riband-like foldings, the outlines of which are conformable to the tubercles and furrows. In proportion to the continuance of the abrasion, the tubercles are successively effaced; and, finally, nothing is to be seen but the enamel, which hoops the tooth externally, and that which penetrates the interior and is there complicated, the plaits going very deep, so that the ribands of enamel, whose edges are exposed on the triturating surface, change their appearance with the age of the animal, and terminate by disappearing in great measure.



Germ of the first molar, enlarged. View of the outside, inside, and crown.—(F. Cuvier.)

Approximations.—The Pacas approach the Capybaras and the Agoutis most nearly, and are closely allied to the latter by their general form and the similarity of their organization. The dental and generative systems in both are very nearly alike: neither have clavicles, nor indeed has the Capybara; and though the Agouti has only three toes on the hind feet, the two additional hind toes of the Paca are hardly more than rudiments. The great differences consist in the zygomatic development, the folding back of the skin under the zygomatic arch—and the consequent bluff appearance of the head—the cheek-pouches, and the fur.

Species.—M. F. Cuvier records two species, viz., *Cœlogenus subniger* and *Cœlogenus fulvus;* but Baron Cuvier, in the last edition of the 'Règne Animal,' treats them as varieties of the same species; and he adds in a note, that Dr. Harlan ('Fauna Americ.' p. 126) has founded, on a head preserved in the Philadelphia Museum, a new genus under the name of *Osteopera*, but that it appears to him (Cuvier) that the description is only that of the Paca; and he concludes by stating that M. Desmarest had already made the same observation.

Example, *Cœlogenus subniger.*—Its general appearance reminds the observer of the Pachydermatous animals, for it is thick-set and stubby. The legs are thick, the neck short, the head heavy, the body rounded, the gait clumsy, but the motions of the animal are prompt and sudden. All the feet have five toes, which, anteriorly, have the ordinary proportions, but, posteriorly, the analogues of the little toe and great toe are extremely short in proportion to the rest, and almost rudimentary, like the upper or lateral toes in the hog. The claws are conical, thick, and strong, and proper for digging. The tail is reduced to a naked, immovable tubercle, a few lines in length. The principal male organ is directed backwards, and there is no external appearance of the testicles. The external ear is moderate in size, rounded, and simple. There is nothing particular about the eye, the pupil of which is round. The nostrils, which are large and almost united, open transversely at the muzzle. The tongue is very soft, short, and thick. The upper lip is divided, the interior of the mouth is furnished with cheek-pouches, and, externally, the large area formed by the development of the zygomatic arch is lined on its inner surface with a continuation of the skin of the cheeks, which is reflected from the face, so as to form a hollow pouch, of which there is no other example among mammiferous animals, and the use of which it is difficult to divine, if the great development of the zygomatic arch be not destined to preserve the true cheek-pouches (abajoues) from external shocks. Strong whiskers spring from the sides of the muzzle, and from behind the eye. The fur is composed of silky hairs, very short, very thin, and very stiff, of a blackish-brown on all the upper parts of the body, excepting four rows of parallel spots, which begin at the shoulders and terminate at the buttocks: the spots of each row are so approximated, that when viewed in a particular direction they seem to form an uninterrupted line, and the row nearest the belly is almost confounded with the colour of that part, which is white, as well as the under parts of the lower jaws, the internal surface of the limbs and the claws. Length of the body, from the occiput to the insertion of the tail, sixteen inches: length of the head, from the occiput to the end of the muzzle, five inches. Height, to the shoulders twelve inches—to the top of the buttocks (train de derrière) fourteen inches, French. (F. Cuvier.)

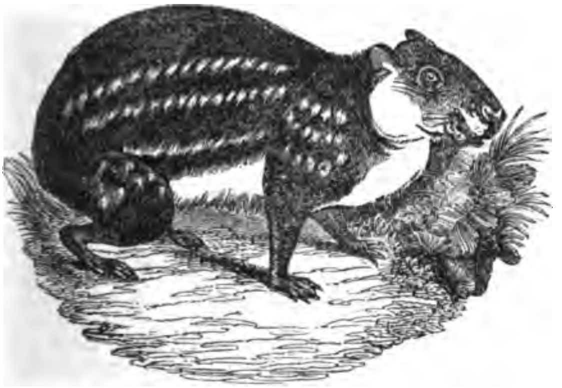
Geographical Distribution.—This animal is better known as the Paca of zoologists generally, and, after the Capybara and Coypu, is one of the largest of the South American Rodents. It is the Spotted Cavy of Pennant and Bewick, the *Pag* of the Brazilians, *Paig* of the inhabitants of Paraguay, *Ourana* of some of the tribes of Guiana and *Pakiri* of others, the *Pak* of the colonists of Cayenne, and the *Water Hare* of those of Surinam. In all these countries it is common, with the exception of Paraguay, where, according to D'Azara, it is very rare. They formerly existed in the islands of the West Indies.

Habits.—In a state of nature the habitation of the Paca is in low humid forests, and in the neighbourhood of water. The animal digs a burrow like the rabbit, but much less deep; indeed it is so near the surface, that the foot of the pedestrian often breaks through, and, sinking into the tunnel, drives out the tenant. There are generally three issues to a burrow, and the aperture of these the animal covers with dry leaves and branches. To take it alive, the hunter stops two of these apertures, and digs into the third; but when the penetralia are reached, the hapless besieged makes a most determined resistance, fighting the enemy with ferocity, and trying to bite. When undisturbed, it often sits up and washes its head and whiskers with its two fore-paws, which it licks and moistens with its saliva at each ablution, like a cat; and with these fore paws, as well as with the hind ones, it often scratches itself and dresses its fur. Though heavy and corpulent, it can run with a good deal of activity, and often takes lively jumps. It swims and dives with great adroitness, and its cry resembles the grunting of a young pig. Its food consists of fruits and tender plants, which it seeks in the night, hardly ever quitting its burrow in the day, the strong light of which, as is the case with other nocturnal animals, is oppressive to its eye: the planter often rues the visits made by these midnight foragers to his sugar-canes. The female is said to bring forth at the rainy season, and to produce but a single young one, which stays a long time with the mother. The Pacas are very cleanly creatures, never dropping their excrements near their dwellings, but going to a considerable distance for that purpose.

In captivity, according to M. F. Cuvier, no animal can exhibit less intelligence. When offended, it throws itself violently at the object which has displeased it, and then makes a grumbling, which breaks out into a kind of barking; and when it is not eating it is sleeping. But it requires a soft and well-made bed; and, to obtain this, it collects with its mouth hay, herbage, straw, anything indeed that suits its purpose, of which it makes a little heap, and then lies down in the centre of it. This bed it never defiles, but goes to the extremity of its cage the farthest removed from it, and constantly resorts to the same spot for the same purpose. If, says M. F. Cuvier, it is but little favoured on the side of intelligence, it appears on the other hand to be recompensed by a large share of instinct, to judge, at least, by appearances. Mr. Bennett, from his observation of one which lived for some months in the garden of the Zoological Society in the Regent's Park, says that it is quiet and contented in captivity. Buffon, who kept one for some time in his house, found it familiar and mild. He gives a detailed account of its manners and mode of life in the 10th vol. of his works, to which we refer the reader.

The Paca has been long known. Marcgrave, Piso, John de Laet, Maffé, Jean de Lery, D'Azara, and Barère all mention it. Jean de Laet describes it in two different places (pp. 551, 618) under the names of *Pag*, or *Pague*, and *Pac*. Marcgrave gave a very bad figure of it, Piso followed, and Jonston copied Piso. Buffon gave a much better representation, copied by Schreber. Bewick's is not without character; and the figures given by M. F. Cuvier (*Histoire Naturelle des Mammifères*, tome 3) and by Mr. Bennett (*Gardens and Menagerie of the Zool. Soc.*, vol. i.) are very good.

Utility to Man.—The flesh is stated to be excellent and of good flavour; but as it is very fat and rich, it soon cloys: it is prepared for cookery by being scalded like a sucking pig. Piso gives the following character of its merits for the table:—'Carne est tenera, pingui lardo non indigens, si assetur, sed inter epulas magnatum, sicut lepores et capreæ in Europâ, habetur.' Its skin is of no value to the furrier; but its thickness might make it available in the useful arts. M. F. Cuvier thinks that it would be possible to introduce this animal into our European rural establishments, and that it would form a very good acquisition in the department of domestic economy



[Cœlogenus subniger.]

CŒLOPTYCHIUM. [Zoophytaria.]

COEMPTIO. [Marriage.]

CŒNOBITES. [Convent.]

CŒREBA. [Nectarinidæ.]

COETHEN, or KOETHEN. The duchy of Anhalt Cöthen (or Köthen), in the territory of Anhalt, is bounded by the dominions of Prussia, Dessau, and Bernburg. It consists of four detached districts: Cöthen Proper, the bailiwick of Warmsdorf, Lindau, and Dornburg. Cöthen Proper is skirted on the north by the Fuhne, and on the east by the Saale. The whole comprise 310 square miles, and contain 4 towns, 1 market-town, 94 villages, and about 6000 houses. The duchy altogether is a level, with the exception of occasional and in considerable eminences. The whole surface is covered with rich corn-fields and meadows, whose fertility is proverbial. Nearly all the roads are planted with fruit-trees. The climate is mild. Besides the Mulde, Eine, and Selke, the duchy is watered by the Elbe, Saale, Wipper, Liethe, Bude, and other streams. A considerable fishery is carried on in the Saale, Bude, and Elbe. The chief products are rye, barley, wheat, buckwheat, vegetables and fruits, hops, potatoes, rapeseed, oil, flax, &c. On the left bank of the Elbe are quarries of lime and gypsum. The inhabitants are chiefly engaged in agriculture and the rearing of cattle, especially oxen and sheep; they are also employed in the manufacture of oil, yarn, linen, wool, and leather, but in very inconsiderable quantities. The population in 1831 was 36,000, of whom two-thirds are employed in agriculture. Of the forty-eight parishes, twenty-eight belong to the Reformed Lutheran, nineteen to the Lutheran, and one to the Roman Catholic church. The principal places of trade, besides Coethen, are Nienburg, at the confluence of the Saale and Bode (about 1900 inhabitants), St. Güsten on the Wipper (about 1640), and Rosslau on the Elbe (about 1400). The income of the duchy is about 320,000 guilders, or 30,700*l.* sterling, exclusive of the duke's large patrimonial revenues. The public debt is about 115,000*l.* The duke has also extensive private property in the Russian province of Taurica, called Ascania Nova, amounting to about 134,000 acres, chiefly pasture ground, on which above 22,000 Merino sheep are fed. It was purchased by him in 1828. The permanent military force of Coethen consists of 329 men. The duchy is under the protection of Prussia.

COETHEN, the capital, lies in a fertile but low situation, at a short distance from the river Zittau, nearly in the centre of the duchy, between the Elbe, Fuhne, Saale, and Mulde, in 51° 45′ N. lat., and 12° 3′ E. long. It was founded by the Sclavonians, and is conjectured to be the Kietni, Kieta, or Gietana, a chief town of the Gietanes: it was devastated in 927 by Henry I. The streets are broad and well paved, and the town upon the whole presents a neat and pleasing appearance. It is the duke's residence, is about half a league in circumference, and surrounded with high walls. It is divided into the old and new town, and the chief buildings are the palace and castle, town-hall, and one Reformed, one Lutheran, and one Roman Catholic church. It also possesses various charitable institutions, particularly an excellent school for the indigent, in an old Carmelite monastery; a grammar and a normal school, a public library and museum of natural history, picture gallery, Bible society, &c. The number of houses is 784, and of inhabitants about 6050; two-thirds of them are Lutherans, and the remainder of the Reformed church.

COFFE'A, a Cinchonaceous genus, consisting of many species of tropical berry-bearing shrubs, one of which, Coffea Arabica, is celebrated for the agreeable stimulating effect of an infusion of its roasted albumen. This substance, the coffee of commerce, is to that plant what the flour is to corn, the white meat to a cocoa-nut, and the aromatic ruminated substance to a nutmeg. It is a secretion formed in the interior of the seed, and enveloping the embryo plant, for whose support it is destined when it first begins to germinate; it constitutes the principal part of the seed, the embryo itself being a minute body lying in a cavity at one end of the albumen. Unskilful observers are often unable to find the embryo; but it may readily be seen by the following simple means:—Take a new sample of small fine unroasted Mocha coffee, and throw it into boiling water; the embryo will, after a little while, be expelled with force from the albumen in a majority of cases.

The genus Coffea is known among Cinchonaceous plants by having a tubular corolla, with four or five spreading divisions; stamens arising from the naked throat of the corolla, and either extending beyond it or inclosed within it; and a succulent berry containing two cells lined with a cartilaginous membrane, of the texture of parchment, in each of which cells there is a single seed, convex at the back and deeply furrowed in front, in consequence of the albumen being rolled inwards.

Coffea Arabica is an ever-green shrub, with oval shining wavy sharp-pointed leaves, white fragrant five-cleft clustered corollas with projecting anthers, and oblong pulpy berries, which are at first of a bright red, but afterwards become purple. It is stated by Niebuhr to have been brought from Abyssinia to Yemen by the Arabs from a country similar to their own plains and mountains. By that people it has for ages been cultivated in the hilly range of Jabal, in a healthy temperate climate, watered by frequent rains, and abounding in wells and water-tanks. Here the plants are grown in grounds that are continually irrigated, and in soil from 1 to 1½ foot deep. Among the plantations are interspersed various kinds of trees, whose shade has a beneficial effect upon the coffee bushes. When in flower, they diffuse a most delicious harmless fragrance, in the midst of which the natives fix their habitations. The fruit begins to ripen in February; and when the seeds are prepared, they are conveyed to the city of *Beit el fakih*, whence part goes to Mocha, and another portion to Hodeida and Loheia, whence it finds its way to Djedda and Suez for the Turkish and European markets.

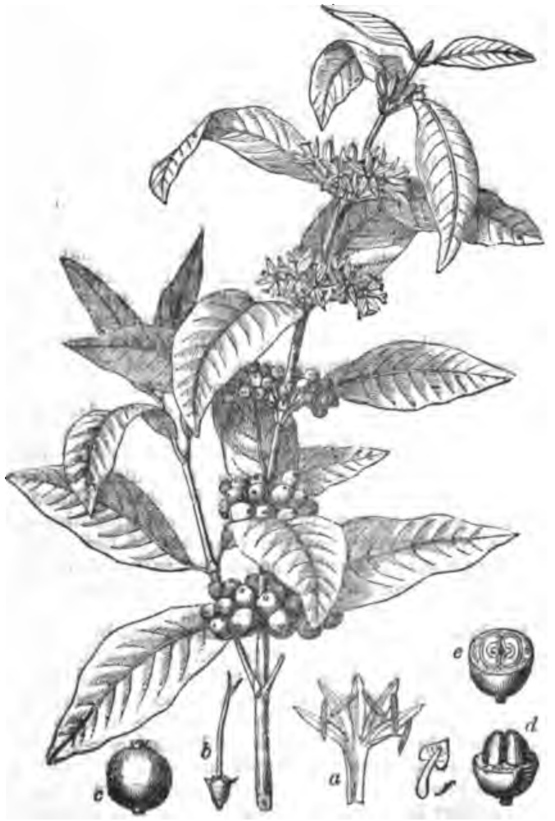
The climate of the Jabal hills is described by Niebuhr as rainy every day from the beginning of June to the end of September, and the quantity of wet is stated to be so great as not only to fill the Wadies, but to soak the earth both of the lowlands and the hills so much as to keep water throughout the year in the rivers Zebid and Suradj. This enables the cultivator to provide abundant irrigation for his coffee plantations during the dry season, while that object is further facilitated by the terrace plan of cultivation. Scarcely anything further is known of the climate in which the fine Arabian coffee is procured, unless we add the meagre statements of Forskähl as to the temperature of two or three coffee districts

Beit el fakih .	Mar. 16,	7 A.M.,	76° Fahr.;	1 P.M.,	95°;	10 P.M.,	81°
	„ 18,	„	77°	„	95°;	„	81°
Hadie . .	„ 18,	„	72°	„	92½°;	„	78°
Bulgosa, a coffee village, 1½ hour's journey into the hills . .	„ 20,	„	69½°	„	85½°	„	73°

and that the summit of the mountain-ridge of Jabal is so high as to be commonly enveloped in clouds, while the valleys below are lying beneath a pure and cloudless sky.

We have been thus particular about the circumstances under which coffee is grown in its greatest state of excellence, because of its importance as an article of consumption, and because of the inferior quality of all the samples that other countries have as yet been able to produce.

Richness of soil in the West Indies has been thought to be the cause of the inferior quality of coffee grown in that part of the world, and to the supposed dryness of Yemen has been ascribed the excellence of Mocha coffee. But it has been shown that the Arabs counteract the effect of any dryness in the air by abundant irrigation; and that moreover it is not in the Tehama or dry parts of the country that it is cultivated, but on hill-sides, where the temperature is much lower, and where it rains daily for four months in the year. What is most essential to attend to in all speculations concerning the cultivation of the plant with a hope of equalling its quality in Arabia, is to select a climate where the heat of tropical plains is counteracted by elevation in the air; where during the dry season water can always be commanded in abundance, and where most especially the air is pure and cloudless, so that there may be no loss of light by the intervention of a cloudy sky. Light would seem, from Forskähl's account—short as it is—to be poured upon the coffee country in an uninterrupted flood; and the excessive stimulus thus communicated to all the functions of vegetation, which under other circumstances would probably prove deleterious, is, by an excellent system of irrigation, and the natural dampness of the soil, not only counteracted, but made the cause of the perfect elaboration of those delicate and subtle principles upon which the aroma and active qualities of coffee and all other plants are so entirely dependent. In this and similar considerations it is always to be borne in mind that it is not temperature, nor atmospheric pressure, nor humidity, whether of air or soil, nor light, that by themselves constitute the conditions under which alone plants arrive at their most perfect state, but the peculiar combination of these influences; a combination which varies from country to country, and may in some cases be actually confined within such very narrow natural limits as not to be exactly paralleled elsewhere, although in the majority of instances it may be readily matched in similar latitudes.



[Coffea Arabica.]

a. Corolla opened, showing the stamens; *b*, pistil; *c*, berry; *d*, *e*, sections of the same; *f*, embryo.

The seed of *Coffea Arabica* consists of much horny albumen, and a peculiar principle or alkaloid, termed *cafeine*, [CAFEINE], which contains more nitrogen than any other known vegetable substance. The seed is used in a raw state in medicine; but when roasted, both as a medicine and still more extensively as an article of diet. The coffee-plant begins to produce fruit when two or two and a half years old; but the quality of the seeds from young stems is not so good as that from stems four or five years old. The size and colour of the bean (as the inner part of the seed is called) vary considerably, those from the West Indies being larger than those from the East. Much more depends upon the manner of roasting and making the coffee, than upon the quality of the bean. The superiority of French coffee, in the preparation of which little or no Mocha coffee is used, proves this position. Beans of a good quality are hard and heavy, sink quickly in water, are of a light yellowish green colour, not discoloured or black, and possess the odour of coffee, which though faint is peculiar, and are free from any damp smell. Beans recently collected, or only two or three months from the tree, are not so good as those about a year old; when older than this they become deteriorated. From the analysis of Seguin and Schrader, coffee consists of coffee-bitter (impure caffein), solid fat, resin, a little aromatic principle, gum, albumen (this albumen, according to Seguin, unites with the yellow coffee-bitter, and forms a green), and lignin. The taste of raw coffee is somewhat sweetish; but the application of heat in the process of roasting produces important changes. The bean increases to nearly twice the original size, while it loses about a third of its weight: a powerful and agreeable odour is evolved, and a large quantity of empyreumatic oil, which appears in small drops on the surface, is formed along with a bitter principle, probably by an alteration in the caffein, and of the saccharine matter. The roasting should take place in a close revolving iron cylinder, over a clear but moderate fire, and should not be carried too far: when the beans have acquired a light chestnut colour, the roasting should be discontinued. The beans are then to be cooled quickly by being tossed up into the air, and the grinding, or rather rough pounding, should be performed in a covered mortar or mill. The drink should be prepared from it as soon as possible, by infusion, which is preferable, unless some apparatus be employed by which a kind of decoction is made in a close vessel, such as Parker's steam-fountain coffee-pot. About half an ounce of coffee powder should be used for every eight ounces (half a pint) of water. In Britain the roasting is generally carried too far; and the subsequent parts of the process, instead of being performed immediately, are often postponed for days or even weeks, by which the aroma is dissipated: when made, the liquid is generally deficient in strength and clearness. The employment of white of egg or fish-skin to clarify is decidedly objectionable: clearness is thus purchased, but at the expense of the strength.

The addition of milk (which should always be hot) and of sugar heighten the nourishing qualities of this beverage, and in the morning render it a more substantial article for breakfast. When taken after dinner to promote digestion it should be without milk, and, where the palate can be reconciled to it, without sugar.

The action of coffee on the human system is due chiefly to the empyreumatic oil, and consequently is greatest when roasted; but its extractive and also highly nitrogenous principle must exert considerable influence upon the organs of digestion.

Coffee acts powerfully and peculiarly on the ganglionic system of nerves and their ramifications, and all the organs which are supplied by them. It elevates the vitality of these nerves, and quickens all their actions. The brain is likewise markedly acted upon by it; and hence the increased sensibility and greater energy of that organ during the use of coffee, and the removal of all sense of fatigue or disposition to sleep. Upon this depends, in addition to local influence upon the organs of digestion, the utility of coffee in counteracting the effects of narcotic poisons, such as opium or belladonna, and the favour it has found among literary persons from enabling them to carry on their studies through the midnight hour without feeling oppressed by sleepiness. It greatly promotes digestion if taken after dinner, and also checks the disturbance of the nervous system arising from the too free use of wine. It excites the vascular system, and renders more powerful the contractions of all the muscles, both voluntary and involuntary. It fits the system therefore to resist the influences of cold and damp, and is proper for night travellers and the inhabitants of humid climates, such as Holland. In warm climates it removes the languor which oppresses those who are exposed to the excessive heat, and helps the stomach to perform its office.

It is not without its counterbalancing disadvantages. For plethoric persons, and those who have a tendency to abdominal congestions, it is unsuited; and for persons subject to piles it is in general improper, as well as for females under certain states of their system. It is likewise hurtful to persons having a very excitable vascular system, being upon the whole more suitable for slender persons or those advanced in life, than for the young or very robust.

Coffee, like all stimulants, when used to an injurious extent, gives rise to disturbances of the nervous system, particularly painful twitchings of the upper eye-lid, to congestion or hæmorrhages, loss of digesting power, and obstruction of the liver and *vena porta*. Unlike the nervous symptoms caused by tea, the greatest number of these complaints subside or disappear on discontinuing the use of the strong beverage.

Coffee is much more extensively used as an article of diet than of medicine. Raw coffee, either in the form of powder or of infusion, has been found very serviceable in the cure of intermittent fevers. (*Edinburgh Medical and Surgical Journal*, No. lxii.) A strong infusion of coffee without sugar or milk often removes megrim or hemicrania; and also in some cases of asthma, either alone or with tincture of opium, it has kept off the paroxysm. Strong coffee is the best and safest means which can be employed by unprofessional persons to obviate the effects of all vegetable poisons which act upon the brain, and induce a fatal sleepiness and torpor. It is much more proper than vinegar, which should never be given till all the poisonous substance has been removed from the stomach.

In some affections of the kidney and bladder, such as laxity and debility of these organs, coffee is of much service; and it has been stated by some writers that calculous complaints have diminished since its more extensive use.

Cafeine has not yet been used in medicine, but Geiger justly anticipates that a principle so rich in nitrogen will be found to be an important medicinal agent.

A beautiful green, which is unchangeable, and resists the action of acids, light, and moisture, may be precipitated from a decoction of decayed coffee, by means of pure soda. [Caffeic Acid.]

COFFEE TRADE. (French, *Café;* German, *Koffa, Koffebohnen;* Dutch, *Koffy, Koffebomen;* Italian, *Caffè;* Spanish, *Café;* Turkish, *Chaube;* Swedish, *Koffe;* Russian, *Kofé.*) It appears from estimates carefully formed, that the quantity of coffee annually exported from the various countries where it is grown cannot be much under 120,000 tons. This great branch of commerce has been wholly created since the beginning of the eighteenth century. Nearly all the coffee which now comes to Europe is the produce of trees propagated from a single plant, which having been raised from seed procured from Mocha in Arabia by Van Hoorn, governor of Batavia, was sent by him to the botanical garden at Amsterdam, and the progeny of which was, in the year 1718, twenty years after its reception from Java, sent to Surinam. The following statement exhibits as near an approximation as can be made to the quantities which on an average are shipped from the different places of its production:—Brazil, 72,000,000 lbs.; Cuba, 64,000,000; Hayti, 40,000,000; Java, 32,000,000; British West Indies, 25,000,000; Dutch Guiana, 10,000,000; States of South America, 8,000,000; French West India Colonies, 4,000,000; Porto Rico, 4,000,000; Sumatra, 3,000,000; Ceylon, 2,000,000; Bourbon, 2,000,000; Manilla, 2,000,000; Mocha, 1,000,000:—total, 269,000,000 lbs., or 120,000 tons.

The quantities ascertained by official documents to have been imported in one year into different countries are—France, 29,650 tons; United States of America, 46,070, Trieste, 9000; Hamburg, 20,620; Antwerp, 10,000; Amsterdam and Rotterdam, 8530; Bremen, 4,500; St. Petersburg, 2000; Norway and Sweden, 1470; Denmark, 1400; Spain (from Cuba only), 1000; Prussian Ports, 930; Naples and Sicily, 640; Venice, 320; Fiume, 170; United Kingdom, 18,250 (average of ten years):—total, 154,550 tons.

These quantities evidently do not comprise the whole amount of coffee that passes annually between different countries; it is not possible to ascertain that total quantity, because no records of their trade are published by some governments. On the other hand some proportion of the imports as given above are again exported, and appear more than once in the list; which for this reason, deficient as it is, yet exhibits a larger quantity than the whole presumed exports from the countries of production.

The imports, exports, and consumption of coffee in and from the United Kingdom in each year, from 1820 to 1835, have been as follows:—

	Imported. lbs.	Exported. lbs.	Taken for Consumption. lbs.	Rate of Duty, per lb.	s.	d.
1820	48,841,626	44,440,869	7,103,409			
1821	45,237,869	41,635,956	7,593,001	On Foreign Coffee	2	6
1822	44,003,124	35,825,535	7,669,351	,, East India .	1	6
1823	45,053,373	30,025,691	8,454,920	,, Brit. Plant. .	1	0
1824	50,674,249	39,517,736	8,262,943			
1825	52,597,518	27,392,389	11,082,970			
1826	42,017,103	31,894,278	13,203,323			
1827	47,938,047	29,475,870	15,566,376			
1828	41,069,731	23,785,980	17,127,633			
1829	39,071,215	23,023,410	19,476,180	On Foreign Coffee	1	3
1830	40,952,163	20,087,994	22,691,522	,, East India .	0	9
1831	43,007,828	22,485,474	22,740,627	,, Brit. Plant. .	0	6
1832	50,225,939	25,719,742	22,952,527			
1833	34,426,109	15,349,578	22,741,984			
1834	41,865,111	15,250,480	23,785,095			
1835	28,398,493	13,346,537	23,295,046			

It appears from these figures that the reduction of the duty in 1825 was followed by an immediate and rapid increase in the consumption, which rose from 8¼ millions of pounds in 1824 to more than 22½ millions in 1830. At this point, the consumption having overtaken the supply of those kinds which were admissible at the lowest rate of duty, the progress stopped short, and the consumption has since remained almost stationary. To remedy this disadvantage, the duty on coffee, the produce of British possessions in India, was at the end of 1835 reduced to an equality with the rate charged on coffee of the British plantations; but it appears doubtful whether the benefit of the revenue will not before long require that the duty on coffee of foreign growth should also be brought more nearly to an equality with that charged on other kinds, which are now effectually shut out from the English market by a discriminating duty of 84*s.* per cwt.

The effect of equalizing the duties upon East India and British plantation coffee has been to increase the total consumption of the kingdom to the extent of 1,783,244 lbs. during the first eight months of 1836, as compared with the corresponding period of 1835; which rate of increase, if continued throughout the year, will raise the annual consumption to 26 millions of pounds, or more than three times the quantity used before the reduction in 1825.

The price in London of fine Jamaica coffee in the beginning of each year, from 1820 to 1836, has been as follows:

1820 .	133*s.*	per cwt.	1826 .	100*s.*	per cwt.	1832 .	100*s.*	per cwt.
1821 .	121	,,	1827 .	95	,,	1833 .	84	,,
1822 .	109	,,	1828 .	80	,,	1834 .	112	,,
1823 .	134	,,	1829 .	76	,,	1835 .	125	,,
1824 .	120	,,	1830 .	78	,,	1836 .	120	,,
1825 .	102	,,	1831 .	78	,,			

The quantities of coffee subject to different rates of duty, which were imported, re-exported, and consumed in 1835, were as under:

	Imported. lbs.	Re-exported. lbs.	Consumed. lbs.
Of British Plantations .	14,617,046	200,258	17,696,129
,, East India . .	7,167,914	2,616,881	5,596,791
,, Foreign Plantations .	6,613,533	10,529,398	2,126
Total . .	28,398,493	13,346,537	23,295,046

The net revenue derived from this source in 1835 was 652,123*l.*

Nearly one half of the exports in that year were made to the Netherlands viz., to Belgium 4,671,861 lbs., and to

Holland 1,777,931 lbs. Italy took 1,735,103 lbs., other ports in the Mediterranean 1,301,836 lbs.; Germany, 1,263,447 lbs.; Russia, 1,342,254 lbs.; Denmark, 629,167 lbs.; and Norway, 310,459 lbs. The shipments to other countries were individually of inconsiderable amount.

COFFERDAM, called by the French Batardeau, is a wooden enclosure formed in a river in order to obtain a firm and dry foundation for the piers of a bridge. The Cofferdam consists of piles, which are squared beams of wood, pointed at one end and shod with iron, and surrounded at the top with an iron collar; these piles are driven into the bed of the river, and being braced together, form a wall of wood. The piles are sometimes grooved and tongued together; in other cases they are driven at short distances apart, and boards are let into the grooves formed down their sides. Two such enclosures are formed, one within the other, and the space between the two is filled with clay or chalk rammed down hard. The water in the inner enclosure is then pumped out, and the object for which the cofferdam was constructed is attained.

If the river is rapid and deep, it will be necessary to use several rows of piles in forming these wooden walls. Cofferdams have been constructed of the depth of forty-five feet in the water.

In lieu of cofferdams, caissons have been sometimes employed. Caissons are enormous boxes framed of wood, and made water-tight; the sides are so constructed, that after the piers are built they can be detached, the bottom only remaining as a foundation. The largest caissons ever constructed were those of Westminster Bridge, framed with 150 load of fir timber each. For a correct view of the interior of a cofferdam, see No. 275 of the 'Penny Magazine,' in which there is a view of the cofferdam employed for the repair of Blackfriars Bridge. Alberti is, we believe, the earliest writer on cofferdams.

COFFIN, the box or chest in which dead bodies are put into the ground; also in modern English a mould of paste for a pie: from the Latin *cophinus*, and that from the Greek κόφινος, which properly meant a wicker basket. Wyntown, in his 'Chronicle,' uses *cofyne* for a shrine or box. The kistvaen, or coffin composed of rough stones, set edgewise at the sides and ends, and covered with one or more flat stones, was common among the Britons, and a few such are still seen in Wales. Stone coffins are frequently discovered in barrows which also contain Roman urns, proving their use in England at that period. Sir Christopher Wren found such of the Saxon times, at the rebuilding of St. Paul's: and Gough adds that, from the ninth century to the reign of Henry III., stone coffins were in general use, that is, for persons of the higher classes. The bodies of the common people, not only in the Norman but also in the English æra, as we see in the illuminations of antient missals, were only wrapped in cloth, and so put into the ground. In this manner, Matthew Paris informs us, the monks of St. Alban's were buried, till the time of Abbot Warin, who died in 1195. He ordered that they should be buried in stone coffins, as more decent. Matthew Paris, on this occasion (*Vit. Abb. S. Alb.*, p. 95), charges him with innovations on established customs, to please the multitude. Strutt says, in the reigns of Henry V. and VI., stone coffins were made with necks, distinguishing the head and shoulders. Coffins both of lead and wood are of early use. The former occur in numerous instances through different centuries: and that the Saxons buried in coffins of wood, occasionally, we have the testimony of Bede. Ceadda was so buried (*Hist. Eccl.*, l. iv., c. 3), as was Etheldreda, wife of Egfrid, king of the East Angles. (*Ibid.*, l. iv., c. 29.) Sebba, king of the East Saxons, was buried at St. Paul's in a coffin of grey marble. (*Ibid.*, l. iv., c. 11.) The forms and ornaments of various antient coffins, mostly of stone, may be seen in the plates of illuminations in Strutt's *Manners and Customs*, vol. i., pl. xxxix., xlv., lxvi., and in Gough's *Sepulchral Monuments*. We have a remarkable instance of the use of the word coffin for an ordinary chest, in the Wardrobe Accounts of King Edward IV., 8vo. Lond., 1830, p. 125:—'For closyng and fastenyng of divers *cofyns* of fyrre, wherein the kyng's books were conveyed and caried from the king's great wardrobe in London to Eltham, v^{d}.'

COG [WHEEL.]

COGNAC. [BRANDY. CHARENTE.]

COHESION (*co-hærere*, to hold together) means the common phenomenon of the adherence or coherence of particles of matter, by which they form collective masses, requiring the application of more or less force to separate the parts.

According to the common notion entertained of matter, it is solid, or at least composed of particles which come into absolute contact. If we could substantiate the first supposition, it would still be apparent that the term *force of solidification* must take the place of *force of cohesion*, and give rise to inquiries into its quantity and mode of action: and even if we could imagine absolute contact of particles, we should find it necessary to append a notion of some force by which particles in contact remain in contact when some of them are put in motion, so as to draw the rest after them. But the balance of probabilities is very strong indeed against the supposition that matter is composed of particles in contact; so much so, that we are almost entitled to conclude it to be composed of particles separated by interstices of much greater dimensions than the particles themselves. If any one should assert the particles of the densest matter to be as far apart in proportion to their bulk as the bodies of the solar system, it would be impossible to bring any direct evidence in contradiction.

Such being the case, we may ask—1. What is the force of cohesion? for such a force there certainly is. 2. What is that law of action by which the particles of bodies are not drawn into absolute contact, but compelled to remain separate, and yet prevented from separating indefinitely?

With regard to the first question, it is most probable that as two bodies approach each other, a strong repulsive force is the cause of the first phenomenon which is perceived. When one billiard ball strikes another, we have no evidence, except that of our senses, of absolute contact taking place: that is to say, we only know that the first visible action takes place when the distance of particles is too small for the eye to perceive. All the evidence which is at all conclusive, is against the supposition of such contact being produced: and we are obliged to admit that our explanation must end in the statement that, arise from whence it may, there is a power in matter by which other matter is repelled, and which begins to act before contact has taken place. But if two pieces of solid matter be pressed together with great force, it would seem as if the particles would thereby be brought within a degree of nearness at which an attractive force begins to act. Two bits of lead pressed together remain in coherence even in a vacuum; and metal plates can be hammered together until the cohesion is as strong as if they had been naturally united.

The cohesive force is an absolute phenomenon, but if we suppose the particles of matter not in contact, it then becomes necessary to admit a new repulsive force, of which the sphere of action is interior to that of the cohesive force. Complete interstices can only exist upon the supposition that, at a certain distance, the cohesive force is destroyed, or at least overcome, by a counterbalancing repulsion. From the known effects of heat, it is supposed that caloric, a name which indicates the cause of heat, plays a prominent part in the production of the repulsion. Nothing positive, however, has yet been established on this subject: we can only make use of phenomena as they exist, to overturn the common impressions, by means of which *force*, the great agent of the universe, meaning the cause of visible display of motion excited or motion prevented, is postponed to notions of *matter*, or *impenetrability*, or similar words, which, if made accurate by close attention, and freed from such latent assumptions as arise from the unassisted senses, will be found to amount to the same idea.

In the article ATTRACTION we had to deal for the most part with assumed forces, of which the effects are seen to coincide with the case of nature only by long and difficult mathematical deduction. In treating of attraction or cohesion we have the indications of real physical attraction [ATTRACTION] in a less difficult form. The arguments against absolute contact are almost insuperable: if we yield to them, we are immediately obliged to admit that particles really act on each other at a distance. Nor will any suppositions as to caloric afford us the means of avoiding such a conclusion. If caloric be matter, we must first explain *its* cohesion or repulsion before we can apply it to explain that of other matter: if caloric be not matter, we gain nothing in the way of avoiding difficulty; for an agent which is not matter, but something else, with new properties superadded to the common and visible properties of matter, is as difficult as ordinary matter with the express addition of power over other matter at a distance. And it must be observed, that if we are rationally compelled to allow such power to a particle upon a particle, there is no new difficulty in the attraction of *gravitation*. If A can act upon B at the millionth part of an inch, there is no *à priori* difficulty in the notion that two A's together can act on B at twice the distance with as much visible effect as a million of A's collected can act at a million of times the distance, and so on. It must not however be supposed that we mean to infer that gravitation and cohesion are both referable to the Newtonian law of attraction: all that is assumed in the latter refers to particles or masses supposed to be at sensible distances from each other, without either affirming or denying anything as to the modifications which the law may undergo at distances so small as never to be subjects of consideration in comparing one planet with another, or one leaden ball with another, as in Cavendish's experiment. [ATTRACTION.]

We may make it apparent to the mathematician that laws of attraction may very easily be expressed which shall combine the leading circumstances connected both with gravitation and cohesion in one formula. Let us suppose, for instance, that at the distance *r*, the accelerating force of two equal particles on each other is expressed by

$$\frac{a}{r^2}\left(1-\frac{b}{r}\right)\left(\frac{c}{r}-1\right)+\epsilon^{-\frac{m}{r}}\cdot\frac{n}{r^2}$$

positive values denoting attraction, and negative values repulsion. If *a* and *m* be made sufficiently small, the first term may be made insensible at all finite distances, and the second as near as we please to the Newtonian law. But when *r* is very small, the second term becomes insensible, and such a value may be given to *n* that the first term shall be of sensible value, as follows: Let *c* be greater than *b*, both being quantities of that order of smallness at which the Newtonian term becomes insensible. Then when *r* is little greater than *c*, the first term is negative; when *r* lies between *c* and *b*, it is positive; and when *r* is less than *c*, it is negative again.

The solid, fluid, and gaseous states of matter show the rise and progress of a repulsive force generally produced by the action of heat. In the first, the particles absolutely attract, in the third they absolutely repel, each other; but in the second the repulsive force almost counterbalances the attractive force, leaving only enough to create that weak degree of cohesion which exists in fluids, or at most that semi-cohesion which is observed in birdlime, in gum-water, and the like. The transition from complete solidity to the gaseous state appears to be made through various degrees of fluidity, and the gradual hardening of melted sealing-wax is a familiar instance of a part of the gradation.

It is impossible to do more than point out the manner in which leading phenomena are explicable on the notion of attraction and repulsion. Mathematical analysis is not yet sufficiently powerful to enable us to say whether such a formula as we have enunciated above could be made to give the numerical phenomena of cohesion.

The practical considerations connected with cohesive forces will be treated under the usual heading [STRENGTH OF MATERIALS].

COHORT was a division of the Roman legion. The term (cohors, or chors, the Greek χόρτος) originally signified an enclosure for sheep or poultry, and was afterwards used to designate the number of men which could stand within such an enclosure. The Roman legion, as well as the citizens at the census [CENSUS], was subdivided into centuries. A century did not always consist of a hundred: the number varied. A legion consisted of ten cohorts; each cohort contained three maniples, and each maniple two centuries; hence there were thirty maniples and sixty centuries; and in the whole legion there must have been sixty centurions. The different centurions received names indicative of their rank. Of the two centurions in a maniple, one ranked before the other, and had the title prior; the second was called posterior. The first centurion of the first maniple had the charge of the eagle, the great standard of the legion: he was ranked with the equites. He was called centurio primi pili (*Livius*, xxv., 19), or simply primus centurio, or primus pilus (*Cæsar*, *De Bell. Gall.* ii. 25). The office was lucrative, but it was not always the reward of merit: favour or money in some cases procured it (*Cicero*, Pis. 36); under the emperors it was bestowed generally from caprice (*Vegetius*, xi. 3, in Pitiscus, *Lexic. Antiq. Rom.*) The badge of a centurion was a vine rod, which the soldiers sometimes felt (Tacitus, *Ann.* i. 23).

The cohortes alares, or alariæ (*Liv.* x. 40, 43), were the troops of the auxiliaries and the allies which were stationed in the wings (alæ).

The cohors prætoria was a select band which usually attended the prætor (Sallustius, *Catil.* c. 60); (Pitiscus, *Lexicon Antiquit. Rom., in Cohors, Centurio.*)

COIMBATORE, a province situated in the region of the Eastern Ghaut mountains, in the South of India, about the 11th degree of north latitude, and bounded on the north by Mysore, on the west by Malabar, on the south by Dindigul, and on the east by Salem and Trichinopoly. The length of the province from north to south is 50 miles, and its breadth from east to west about 45 miles. The surface of the country varies exceedingly. Towards the south the level is not more than 400 or 500 feet above the sea, but it gradually rises towards the north, and even in what is considered the low country the level rises to 900 feet above the sea. About 11° 35′ N. lat., the mountains called the Eastern Ghauts occur; the Kumbetarine hill, in 11° 35′ N. lat., and 77° 20′ E. long., is reckoned to be 5548 feet above the level of the sea. Some summits of the Neelgherry mountains, which are in the north-west part of the province, and unite the Eastern and Western Ghauts, are still higher: one of the peaks called Moorchoorti Bet is 8800 feet above the sea. The soil is generally dry, but in the south there is some marshy ground. The low country is effectually sheltered from the violence of the south-west monsoon. The climate is considered healthy, and in particular the Neelgherry mountains are resorted to by Europeans resident in India for the recovery of their health. In these hills the mean temperature in April and May is 65° Fahrenheit. During the cold season the thermometer sometimes sinks to the freezing point, when the air is peculiarly clear and elastic, and produces a cheering effect upon the spirits. Coimbatore is watered by the rivers Bhavani, Amaravati, and Cavery, the first and second of which fall into the Cavery; the Bhavani, at Bhavani-Kudal, 58 miles north-east from the town of Coimbatore, in 11° 26′ N. lat., and 77° 44′ E. long., and the Amaravati about 10 miles below the town of Caroor. These rivers are filled by both monsoons; by the south-west in June, July, and August, and by the north-east in October, November, and December. The extent of land under cultivation in 1814-15 was 960,000 acres, and in 1825-26 was increased to 1,451,439 acres. Up to the former period the land revenue of the province was collected under the village system, but a permanent assessment being then made, not only upon every farm, but upon each field, and the ryots being confirmed in the possession of their lands, the improvement here noticed began. The government has fully participated in this advantage; in 1814-15 the land revenue was 18,64,391 rupees, and in 1825-26 had advanced to 23,79,633 rupees, being an annual increase of 51,524*l.* In 1814-15 the government assessment was considered to be equal to one-third of the gross produce of the soil, and in 1825-26 it did not exceed one-fifth; the price of land during that time was doubled. The population of the province in 1828 was 870,866; in 1823 it was stated to be 638,199; but in this latter number children under five years of age were not included. The means for education provided by the government are miserably deficient. According to the latest returns, the whole number of scholars was only 8930, of whom 8618 were Hindus, including 82 females, and 312 were Mohammedans.

The principal places in the province, in addition to the capital, Coimbatore, are, Animalaya, Aravacourchy, Bhavani-Kudal, Caroor, Daraporam, Erroad, Palachy, Satimangalum, and Sivana Samudra. Animalaya is on the west side of the small river Alima, in 10° 31′ N. lat., and 77° 1′ E. long. This town, which contains about 400 houses, is the common thoroughfare between Malabar and the southern part of the Carnatic. A fort stands at a short distance west of the town, and had fallen into decay, when, to provide materials for repairing it, Tippoo pulled down five large temples. The forests in the neighbourhood contain abundance of fine timber, which is of little value from the want of means for transporting it. Aravacourchy, the seat of Arava, so called from the name of the founder, is situated in 10° 41′ N. lat., and 77° 54′ E. long. The town was destroyed towards the end of Hyder's reign, by an English force under Colonel Laing, but it has since been rebuilt, and at the beginning of the present century it already contained 250 houses, and was fast increasing: the inhabitants mostly speak the Tamul language. Bhavani-Kudal, at the confluence of the Bhavani and Cavery rivers, contains two celebrated temples, one dedicated to Vishnu and the other to Siva, and is considered a place of great sanctity by the Hindus. Caroor, on the north side of the Amaravati river, in 10° 53′ N. lat., and 78° 4′ E. long., is a considerable town, and contains 1000 houses; it was formerly a place of great commercial activity, but its trade has long since been greatly diminished. Daraporam, or more properly Dharma-puram, is a populous town situated in an open country near the Amaravati, in 10° 37′ N. lat., and 77° 35′ E. long. The streets are wide and regularly laid out, and many of the houses are spacious. Erroad was a very considerable place during Hyder's reign, and contained 3000 houses; under the government of his successor it was much reduced; and during the invasion of the country by the English under General Meadows, the town was in a great measure destroyed. It has since been partially restored, and has been made a military station. Palachy is a small but thriving town, situated in a well-cultivated country, in 10° 39′ N. lat., and 77° 6′ E. long. Some coins of Augustus and Tiberius have been dug up in the vicinity. Satimangalum, a town and fortress, in 11° 31′ N. lat., and 77° 16′ E. long., contained, in Hyder's reign, about 800 houses, but the number has since been much reduced. The fort is large, and the town is built in a straggling manner about the plain; it contains a large temple dedicated to Vishnu. This place is considered unhealthy, and the air is mostly intensely hot. The island of Sivana Samudra, formed by the Cavery, is the site of the antient Hindu city of Gunga Raja; two cataracts are here formed by the Cavery, one on its northern and the other on its southern arm. [Cavery.] The city of Gunga Raja, supposed by Dr. Buchanan to have been founded not more than 300 years ago, is now completely destroyed; the southern gate of the wall by which the city was surrounded may still be seen, and one principal street, about a mile in length from north to south, may be traced: there are besides visible the ruins of several Hindu temples, in one of which is a colossal statue of Vishnu; but the whole place is choked by jungle, and occupied by banyan and other forest trees.

A considerable quantity of dry grain is raised in the province; cotton and sugar are likewise cultivated, and weaving is carried on extensively.

This province was acquired by the British from the rajah of Mysore in 1799.

(Rennell's *Memoir of a Map of Hindustan*; Buchanan's *Journey through Mysore, Canara, and Malabar*; *Report of Committee of House of Commons on the Affairs of India*, 1832.)

COIMBATORE, the capital of the province, in 10° 52′ N. lat., and 77° 5′ E. long., is a well-built town, containing about 2000 houses, being little more than half the number which it contained under the government of Hyder Ali. His son Tippoo sometimes resided at Coimbatore, where he built a mosque. About two miles from the town, at a place called Peruru, is a celebrated temple dedicated to Iswara, and called *Mail* (high) *Chitumbra*, to distinguish it from another Chitumbra near Pondicherry. The idol is said to have placed itself here at a very remote period, and about 3000 years ago the temple was built over it by a rajah of Madura. This building exhibits a profusion of Hindu ornaments, but is destitute of elegance, and the figures are not only rude, but many of them indecent also. This temple was plundered of its gold and jewels by Tippoo, who excepted it, however, from the general order which he issued for the destruction of all idolatrous buildings; and although its splendour was then destroyed, the Brahminical worship has always been continued.

The town was taken by the English in 1783, but was restored at the peace in the following year. It was again taken by the English in 1790, and retaken by Tippoo's general, but was transferred with the province to the British government in 1799, and has since remained in their possession. The travelling distance from Seringapatam is 122 miles, and from Madras 306 miles.

(Rennell's *Memoir*; Mill's *History of British India*, Buchanan's *Journey through Mysore*, *&c.*)

COIMBRA, a town and bishop's see in Portugal, in the province of Beira, and the chief town of a comarca, or administrative division. It lies on the slope of a hill on the right or north bank of the Mondego, about 120 miles N.N.E. of Lisbon, and 25 N.E. of the seaport of Figueiras at the mouth of the Mondego, in 40° 12′ N. lat. and 8° 17′ W. long.

A fine bridge connects the town of Coimbra with the splendid and extensive monastery of Santa Clara, situated with its gardens upon a hill on the south bank of the Mondego. To the north-east of Coimbra rises the high ridge of Busaco, and on the west and south-west a fertile but marshy and unwholesome plain extends towards the sea. The town is old-fashioned, and most of the streets are narrow steep, ill-paved, and dirty. There are, however, several fine buildings, such as the palace of the university, once the residence of the kings, and the various colleges connected with it, the cathedral, besides other churches and convents, and several squares adorned with fountains, which are supplied through a fine aqueduct adjoining the town. The university was transferred to Coimbra from Lisbon by King Denis in 1308. It was afterwards removed again to Lisbon, but John III. transferred it again to Coimbra in 1537. In 1653 King John IV. issued regulations for the university, 'Estatutos da Universidade de Coimbra,' printed in 1654. Pombal, in 1733, effected several useful reforms in the system of instruction, and added the faculties of mathematics and natural philosophy to those of theology, canon and civil law, and medicine, already existing. He also gave to the university several buildings belonging to the suppressed order of the Jesuits. No student is permitted to attend a course of lectures in any of the faculties without having first undergone one year of preparatory study in the Royal College of Arts. The course of theology lasts five years. The same time is allotted to the canon and civil law, after which the student can obtain his Bachelor's degree, which qualifies him for the bar, or for inferior appointments in the magistracy. In order to obtain the degree of Doctor a sixth year is required, after which the candidate undergoes a private examination. In the faculty of medicine eight years' attendance are required, and an additional year for the Doctorship. The course of philosophy lasts four years. The lectures begin in the autumn and last till May, after which the public examination takes place till July, followed by three months' vacation. The public examinations are in Portuguese, and are said to be very severe. The university is very rich, and the emoluments of the professors are respectable, besides which they have the prospect of preferment in the civil and ecclesiastical departments. A Doctor's degree in the university is a necessary qualification for the higher stations in the church and magistracy.

The government of the university is vested in a council, consisting of the rector, who is appointed by the king for a limited time, the deans of the various faculties, two sindicoes or fiscals, and a secretary. The financial administration is intrusted to a separate council, 'Junta de Fazenda,' consisting of three professors, a treasurer, and a clerk. The library of the university occupies three large halls filled with books chiefly of antient date. It is opened every evening, for the use of the students, at the conclusion of the public lectures. The library of the Benedictine convent is better both in number and choice, and contains works of more modern date. The lectures on canon and civil law are the most attended to, on account of the great demand for law graduates for civil offices in the various towns of the kingdom. The average number of academical students is said to be about 1200. The medical students use French and English works. The lectures are generally gratuitous. The annual necessary expenses of a student during his nine months' attendance are equivalent to about 30*l.* sterling. There is a botanical garden, a museum of natural history, with a collection of minerals, a chemical laboratory, and an observatory well furnished with instruments. (Kinsey, *Portugal Illustrated*, 1828.) The large monastery of Santa Cruz, in the lower part of the town, contains the monument of Affonso Henrique, the founder of the monarchy, and other early kings. In the great hall of the university, where the public examinations and disputations are held, is a complete collection of the portraits of the Portuguese kings; and the apartment where the candidates for the Doctorship undergo their last examination in private contains the portraits of the successive rectors of the university. (*Ibid.*)

Coimbra has 19,850 inhabitants distributed into eight parishes, an hospital, a house for the poor, and a Magdalen. It has several manufactories of pottery. The civil magistrates are the Corregidor and seventeen Juezes de Fora. (Miñano, *Diccionario Geografico, & Suplemento.*)

The immediate neighbourhood of Coimbra is delightful, and filled with gardens and quintas, or country-houses. The tract of country between it and Condeixa, south of the Mondego, is styled the fruit-basket of Portugal. In the same direction, not far from the convent of Santa Clara, is the Quinta das Lagrimas, in a romantic sequestered spot, where Donna Inez de Castro is reported to have been murdered. (Camoëns, *Lusiadas.*)

Conimbrica, the antient Coimbra, is said to have been built by the Romans, though at some distance from the present spot; but Miñano asserts that its name is of Arabic origin. Others say that the present town was first built by Ataris, one of the Gothic kings. The view of the town from the south bank of the river is very fine, the summits of the heights above being covered with convents and public buildings. Coimbra lies on the high road from Lisbon to Oporto, and its fine bridge affords the principal means of land communication between the north and the south provinces of the kingdom.

COIN: metal stamped for currency; derived by some from the Greek κόινος, *common*; by others from the Latin, cuneus, *a wedge*; the first currency of metal, in all probability, being in the form of wedges, or ingots. Commerce, in the earliest periods, was carried on by the mere exchange of articles, and it is remarkable that throughout the early part of Scripture, as well as through the poems of Homer, not a single passage occurs from which we can infer either the use or the existence of stamped money. Metals, however, being close and compact in form, universal as to use, and admitting of division into larger or lesser parts, soon became the representatives of value, though at what exact period remains in doubt. Herodotus, i. 94, speaking of the Lydians, expressly says they were the first people on record who coined gold and silver into money. The Parian Chronicle, however, ascribes the origin of coined money to the Æginetans, under Pheidon, king of Argos, 895 years before Christ. Ælian, in his 'Various History,' corroborates this statement as far as the Æginetans are mentioned: and our best numismatic antiquaries agree in considering the coins of Ægina, from their archaic form and appearance, as the most antient known. They are of silver, and bear on the upper side the figure of a turtle, and on the under an indented mark, as if the metal, at the time of striking, had been fixed upon a puncheon, and from the weight of the blow had received a deep cleft. In later coins of Ægina, the turtle has been changed to a tortoise, and the fissure on the other side converted into a device. The coins of Lydia probably come next in point of antiquity, and then the early Darics of the Persian kings, which occur both in gold and silver, and bear a strong resemblance to the coins of Ægina in the mode of striking: these, if they are to be referred to Darius the First, must have been coined betwe[illegible] B.C. 522 and 486. The richer the metal, the smaller and more portable was the quantity required for the coin. There are coins in gold of the early kings of Persia, similar in type to the silver Darics, and of very minute size.

The study of coins is not to be considered as the province of the antiquary alone. Coins are among the most certain evidences of history. In the later part of the Greek series they illustrate the chronology of reigns. In the Roman series they fix the dates and succession of events. Gibbon observes that if all our historians were lost, medals, inscriptions, and other monuments, would be sufficient to record the travels of Hadrian. The reign of Probus might be written from his coins. In illustrating the history and chronology of sculpture and antient marbles, coins enable the scholar and the artist not only to discern those peculiarities which characterise style, as it relates to different ages and schools, but to ascribe busts and statues to the persons whom they represent. The personation of the different provinces, too, forms another point of interest upon the Roman coins. Coins are frequently essential to the illustration of obscure passages in antient writers; and preserve delineations of some of the most beautiful edifices of antiquity not existing now even in their ruins. Addison, in his 'Dialogue on the Usefulness of Antient Medals,' has long convinced the world of the connexion of this science with poetry. As a branch of the fine arts, it may be sufficient to say that some of the medals of Sicily belong to a period when sculpture had attained its highest perfection We would particularly refer to the coins of Syracuse. In every quality of art, too, the Roman coins, to a certain period yield to the Greek alone. From Augustus to Hadrian the Roman mint was the seat of genius: and coins of admirable execution are found even down to the time of Posthumus.

The generality of numismatic writers divide coins into Antient and Modern;—the Antient, into the great divisions of Greek, Roman, and Barbarian.

The *Greek* they divide into cities and kings. Of the first they can make no chronological arrangement: it is alphabetical, under the different countries. The kings commence with the age of Alexander the Great, and belong to the four kingdoms into which his empire was divided, besides the kingdom of Epirus. This series, in a chronological point of view, closes with the extinction of the dynasty of the Lagidæ in the Augustan age. The coins of the Greek cities were impressed either with appropriate symbols or the heads of deities. The coins of the monarchs bore the heads of the respective princes. Pinkerton observes that the first copper coins of Greece known are those of Gelon king of Syracuse, about 490 years before our æra. These were called Chalci, pieces of brass; others, of a more diminutive size, were called Lepta, or Kerma, as being change for the poor. He considers there is no proof of the coinage of gold in Greece before Philip of Macedon. Athens had no gold money at the beginning of the Peloponnesian war.

The *Roman* coins are divided into consular, imperial, and medallions. The subdivisions of the consular are into Roman asses and coins of the families. Of the imperial there are two subdivisions, Roman and Grecian; the latter being again subdivided into those of provinces, colonies, and municipia. The medallions are likewise divided into Roman and Grecian. The earliest coinage of Rome was of copper, and took place in the reign of Servius Tullius, probably about five centuries before Christ. The Romans are supposed to have borrowed the art from their neighbours, the Etruscans. Of the as, its divisions and its compounds, we have already spoken in a former article. On some of the later Roman, as well as on what were called the Italian asses and their parts, the practice became prevalent of placing the names of many of the principal families of Rome upon the fields of the coins. These form the division which are called family coins. The silver coinage of Rome was introduced in the year 266 before Christ, when the denarius was so termed from its being equivalent to ten asses. Pliny informs us (*Nat. Hist.* xxxiii. 13, edit. Hard. ii. 612) that the coinage of gold was introduced sixty-two years after that of silver. The largest piece of gold was called aureus. [AUREUS.] The imperial coins of Rome form the most complete and most interesting series of any extant. Those of copper being found of different sizes, are distinguished into first, second, and third brass: in historical importance, as well as for the devices, the largest series is to be preferred. The largest imperial brass coin was the sestertius, and from the Augustan age went by the name of nummus, or æreus. It was worth twopence English. All the large brass coins are of yellow metal; the middle brass, yellow and red; the small, mostly red. No sensible diminution of the sestertius took place till the reign of Alexander Severus, when it lost upwards of a sixth of its weight, and continued to diminish till the reign of Gallienus, when it totally vanished. In this reign the chief copper coins in use were the small brass, or assaria, which, according to the writers of the Lower Empire, were at last numbered at sixty to the silver denarius. Under Valerian and Gallienus, copper washed with silver appeared. In the reign of Diocletian, a coin denominated the follis supplied the place of the sestertius; but the denarii ærei continued quite common down to Constantine I. He introduced a new coinage, and then the follis had its changes and its subdivisions; but its appellation adhered to what had now become the largest brass coin of the Roman empire, to the very latest notices which we have of the Byzantine money. From the time of Augustus to that of Gallienus, the imperial or silver denarius contained sixteen assaria. Under Caracalla a larger denarius was struck, which had a third more or twenty-four assaria, and was called argenteus: the common denarius of silver being then termed minutus. Under Gallienus however the minutus ceased, and argenteus and denarius then became only different names for the Roman silver coin, which at that time contained no less than sixty assaria. Constantine I. introduced the milliarensis, worth somewhere about a shilling of our money: but the argentei, or denarii, were struck as late as the reign of Heraclius. Aurei and semi-aurei were the sole pieces in gold for near three centuries. Till Sulla's time the aureus continued at thirty silver denarii. In the reign of Claudius, and afterwards, it went for twenty-five silver denarii. Under Philip, aurei of two or three sizes first appear, of a rude fabric; one class of which were called trientes. The weight originally given to the aureus was 120 grains; it afterwards fluctuated to between 80 and 90 grains, and was sometimes even of less weight. Constantine I. accommodated the aureus to his new coinage, and gave it the name of solidus, of six in the ounce of gold. The solidus passed for fourteen milliarenses. It went for rather more than twelve shillings of our money, and continued of the same standard to the very close of the Byzantine empire. The medallions were struck both at Rome and in the provinces, whence the division of this class into Roman and Grecian. The term is applied to all those productions of the Roman mint which exceeded the coins ordinarily current in size, whether in gold, silver, or brass. Though generally conceived to have been struck upon similar occasions to those on which we ourselves coin medals, there are still various circumstances which lead to the belief that they were intended for circulation as money. Medallions, says Pinkerton, from the time of Julius to that of Hadrian are very uncommon and of vast price: from Hadrian to the close of the Western Empire, they are less rare. The types of the Roman medallions are often repeated upon common coin. Those struck in the Grecian territories are the most numerous, and are distinguished from the Roman by their thinness and inferiority of workmanship. Many Roman medallions have S. C. upon them, as being struck by the senate; others have not, as being struck by order of the emperor. The Roman medals called Contorniati, it is the opinion of our first medallists, were no more than tickets of admission for different places at the public games.

The third class of antient coins, denominated *Barbarian*, consists of those of Lydia, Persia, Judæa, Phœnicia, Numidia and Mauritania, Carthage, Spain, Gaul, and Britain. The coins of Lydia and Persia have been already slightly noticed. The Darics, from their present extreme scarcity, are supposed to have been melted down for his own coinage by Alexander the Great, upon his conquest of Persia. Pinkerton asserts that all the real Darics were of gold, and that the silver coins with the archer (the same type) are later. Nevertheless many of the silver Darics are equally if not more archaic in appearance. Of Persian coins there is a second series, that of the Sassanidæ, beginning about A.D. 210, when Artaxerxes overturned the Parthian monarchy; they extend to the year 636, when Persia was conquered by the Arabian caliphs. The Hebrew coins were struck under the dominion of the family of the Maccabees, and chiefly in the time of Simon the high-priest, about the year 150 B.C. They are nearly all of copper, and extremely rude in workmanship; the legends are in Samaritan characters, and the symbols are those appropriate to the nation, such as a sprig, considered as Aaron's rod, sacramental cups, censers, &c. The Hebrew shekel, as it is called, is of silver, about the value of the Greek tetradrachm. Hebrew coins pretending to an earlier date than the Maccabees are spurious. The Phœnician coins are in no instance considered older than the time of Alexander the Great, and are chiefly referred to the cities of Tyre and Sidon. The Numidian coins are those of Juba I. and II. The Punic or Carthaginian coins are believed to have been struck by Greek artists. Those of Spain agree in character with the coins of the different nations by whom the several colonies of that country were planted, Phœnicians, Greeks, and Carthaginians; and many of them are inscribed with Phœnician, Greek, and Roman legends: a few others are met with, distinguished by what are called Celtiberian characters, not unlike the letters of the Runic and Etruscan alphabets. Of the coins of Gaul, the most antient have no legends at all; they have very rude devices, and many of them are in base gold after the Gauls had intercourse with the Romans, some of their coins bear inscriptions which look like Latin, mostly in single words, and not of easy interpretation: they are not unlike many of those which are called early British. Cæsar describes the Britons as a people just emerging from barbarism, and no further acquainted with commerce than to have discovered that it could not be conducted by simple barter alone. His account implies, that however they might have known its use, the Britons had not proceeded so far as actually to coin money: although they had a substitute for it in pieces of brass, or iron rings, or plates regulated by weight. He says, 'Utuntur aut ære, aut annulis ferreis, ad certum pondus examinatis, pro nummo.' (*Bell. Gall.* v. 12.) The passage however is corrupt: for *annulis* some manuscripts read *taleis*, and others *laminis*. Coins however are found in this country which are usually attributed to the very early British kings, in gold, silver, and the inferior metals; ruder in fabric than they would have been had the Britons learned the art of coining them from the Romans. They are without legends, and many of them, like the early Gaulish coins already mentioned, have unintelligible devices: they seem to justify our antiquaries in thinking that Cæsar had not sufficient information to make his testimony quite conclusive. The use of a better sort of money was unquestionably taught the Britons by the Romans very soon after Cæsar's second invasion, when the types improved, and when no one who examines them carefully will doubt that Roman artists were employed upon the dies. The earliest coin which can, with the least appearance of probability, be attributed to any particular British monarch, bears upon it the letters SEGO, possibly for Segonax, one of the four Kentish monarchs who attacked Cæsar's camp at the time of the invasion we have just mentioned; it has also the word TASCIO upon it, which is seen upon numerous other coins which are undeniably British. Cunobelin was a later monarch of Britain, whose name is considered to be abbreviated upon the coins which have CVN, CVNO, and CVNOBELI upon them, together with the words CAMV and CAMVL, the leading letters of Camulodunum, his capital city, supposed to be either Colchester or Maldon in Essex. VER, as well as VERLAMIO at length, for Verulam, occur upon other coins of the same period. One has BODVO, which may or may not be a coin of Bonduca or Boadicea, queen of the Iceni. It is probable that the British coinage closed with the money of Cunobelin; for in a very few years after his decease the second subjection of Britain took place under Claudius, and was so complete and severe, that the country became rather a Roman than a British island. Gildas (*De Excidio Britanniæ*, c. v.) expressly speaks of a Roman edict which ordained that from that time that all money current among the Britons should bear the imperial stamp. That this prohibition was followed up by the establishment of Roman mints in Britain is highly probable: and certain initial letters, as P. LON. for *pecunia Londini*, &c., are brought forward as evidence of the fact; but most of these initials are equally applicable to other places in the Roman empire where mints were established, and therefore do not afford a proof quite so conclusive as is wanted. The coins of Carausius and Allectus, the seat of whose empire was in Britain, have a strong claim to be considered as the production of British mints. Those who wish to see under one view the 'Coins of the Romans relating to Britain,' will find the fullest information in a little volume recently published under that title by Mr. John Yonge Akerman, 12mo., London, 1836.

MODERN COINS are those which have been struck since the fall of the Western Empire; but it is impossible, in the space to which the present article is necessarily confined to enter into minute details respecting the series of coins in each country. We shall be brief in our notices of the greater part, that we may devote a larger space to the coins of England

The series of the coins of Italy under the Ostrogoths began soon after the year 480 of the Christian æra. The French series commences with Clovis, A.D. 490. That of Spain with Liuva, Prince of the Visigoths, soon after the middle of the sixth century, or about A.D. 567. The states of Germany appear to have struck money very shortly after the age of Charlemagne; as well as the independent Lombard cities, and the Neapolitans. The Papal series of money begins with Pope Hadrian I., A.D. 772. Denmark has coins of an early date, but few of them are intelligible before the time of Canute; contemporary with whose date are the coins of the petty kings of Ireland. In Sweden coinage is said to have begun under Biorno, A.D. 818; and in Norway with Olave or Olaf, A.D. 1066. The Russian coinage is of a later date than the other coinages of Europe. Of Scotland pennies exist ascribed to Alexander I., A.D. 1107: those of William the Lion, A.D. 1165, are numerous. Pennies were the earliest coins in most of the European kingdoms, and a prevailing device upon them was a cross.

The *Coins of England* form the most complete modern series extant. At what time the circulation of the Roman money ceased, we are ignorant: but Sceattæ (from the Anglo-Saxon ꞅceaꞇ, shot, money) are known of the early kings of Kent, some of which must have been struck within the sixth century; and there are others so similar to them in type as to justify their appropriation to the same people, but which from their symbols were evidently coined before their conversion to Christianity. They are too rude generally to admit of description, are of silver, and found of different weights, from seven grains and a half troy to twenty and upwards: their most common weight is from fifteen to nineteen grains. Several plates of these coins are engraved in Ruding; they appear to have been current chiefly from the year 500 to 700. A sceatta of Ethilberht I. of Kent is the earliest Saxon coin which can be appropriated: he reigned from A.D. 561 to 616. Sceattæ also are the only coins which have hitherto been discovered of Ecghbert, king of Kent, who reigned from 665 to 674. In point of antiquity the penny succeeds; the name of which first appears in the laws of Ina, king of the West Saxons, who began his reign in 688. The word has had numerous etymologies; but that from *pendo*, to weigh, seems the most reasonable: it was then, as it still is, the 240th part of the nummary pound. The half of the penny, called helꝼlinᵹe or halꝼpeniᵹe, and the fourth part or ꝼeoꞃðunᵹ, farthing, are mentioned in the Saxon gospels; and a Saxon halfpenny of Edward the Elder is said to exist in the Bodleian collection at Oxford: but we know little more of the earliest divisions of the penny. The coin ascribed as a penny to Ethilberht II. king of Kent, between 749 and 760, with Romulus and Remus on the reverse, is beyond doubt a forgery. As to the rest of the kingdoms of the Heptarchy, no coins have yet been discovered of the South Saxon monarchs. Of the West Saxon kings, we have coins of Athelheard, A.D. 726; and of Beorhtric, who came to the throne in 784. Mercia seems to have been the most wealthy kingdom, and has a large series. It begins with Eadvald, who ascended the throne in 716, followed by Offa (whose queen Cenethreth or Quindred also enjoyed the privilege of coining), Egcberht, Coenvulf, Ciolvulf I., Beornwulf, Ludican, Wiglaf, Berhtulf, Burgred, and Ciolvulf II., with whose short reign the kingdom expired. The coins of the East Angles begin with Beonna, about the year 690; but in consequence of the temporary annexation of the kingdom to that of Mercia, we have but few coins of succeeding monarchs: those only of Aethelweard, 760, Edmund the Martyr, 855, and Ethelstan, 860, are known. The kingdom of Northumberland has this remarkable peculiarity belonging to its coinage, that from its mints issued, as far as is yet discovered, the only brass coins which were struck by the Anglo-Saxons. The earliest specimen hitherto known is of the reign of Ecgfrith, who ascended the throne in 670: it differs from the stycas of succeeding monarchs in the omission of the moneyer's name on the reverse. Of sixteen succeeding monarchs (whose reigns occupy more than a hundred and thirty years), no coins have as yet occurred. The first that appears was struck by Eanred, who began to reign in the year 808. One silver penny of Eanred is known. His stycas are of various rude types, without any representation of the monarch, but with a legend similar to that on his silver coin, excepting that the moneyer's name stands on the reverse, without any addition. Other stycas occur of Ethelred his son 840, of Redulf, and of Osbercht, whose reign began in 849. After his reign stycas seem to have fallen into disuse, at least none of a later period have yet been found. Stycas were also struck in the Saxon times by the archbishops of York: Ruding has engraved those of the archbishops Eanbald II., Vigmund, and Wulphere. One coin of Regnald, who was expelled the kingdom of Northumberland in 944, is known; and one of Anlaf, which has upon its reverse the Danish ravens, these are pennies. Pennies also are known of Eric. At the beginning of the ninth century Ecgbeorht or Egbert ascended the throne of the West Saxon kingdom; and in the course of his long reign brought under his dominion nearly the whole of the Heptarchic states· he is therefore commonly considered as the first sole monarch of England, notwithstanding those states were not completely united in one sovereignty until the reign of Edgar. On his coins he is usually styled ECGBEORHT REX, and sometimes the word SAXONVM is added in a monogram within the inner circle of the obverse: some of his coins have a rude representation of his head, and some are without it. From Egbert's time, with very few exceptions, the series of English pennies is complete; indeed for many hundred years the penny was the chief coin in circulation. Of the Saxon pennies those of Alfred bear a considerable price; on some he is called AELBRED REX, on others ÆLFRED. Edward the Elder has Saxon buildings on the reverses of several of his coins; and on one of Athelstan's is a building intended for York Cathedral. The coins of Canute and of Edward the Confessor are among the most common of the Saxon series; those of Harthacnut are rare. English coins of Canute have frequently, and of Harthacnut in a few instances, been found in Denmark. Numerous coins of Canute and Ethelred II. have also been found in Ireland.

The archbishops of Canterbury, during a part of the Anglo-Saxon period, also coined money. Pennies exist of Jaenberht, archbishop of Canterbury, from 763 to 790; of Æthilheard, who died in 803; of Vulfred, who succeeded in that year; of Ceolnoth, who died in 870; of Ethered, 871; and of Plegmund, who sat from 891 to 923. In Athelstan's laws two moneyers are allowed to the archbishop of Canterbury, but no archiepiscopal coins of that reign are known, nor indeed any until the time of archbishop Bourchier, a space of several hundred years. Of Harold II.'s pennies there are three distinct types; two with the head looking to the left, the third, which is of very uncommon occurrence, with the head to the right; all have the word PAX in the centre of the reverse. Of the coins of William I. and II. the best account, with engravings of all the types, will be found in the 'Archaeologia,' vol. xxvi. p. 1—25. Of the types there exhibited, those which bear the strongest resemblance to the coins of the Confessor and Harold are ascribed with great probability to the first William; those which most resemble Henry I.'s coins to William II. The coins which present a sceptre on each side of the king's head, are universally ascribed to the Conqueror· those with two stars to William Rufus, the same ornament occurring upon his Great Seal. Most of them read PILLEM, PILEMV, OF PILLEMVS REX A, AN, ANGLO, OF ANGLOR; the P in Pillem being in reality the Saxon V (W). Of Henry I.'s pennies the types are as various as upon those of any monarch of the English series: the reverses bear the name of the mint and moneyer. This had been the Saxon practice, and it continued till the reign of Edward I. Our historians say that Henry I. coined halfpence and farthings; but none such are known in our cabinets. Through the Norman times, and certainly in the reign of Edward the Confessor, halves and quarters of the penny, regularly and nicely cut, to go as halfpence and farthings, occur almost whenever parcels of the coins of those periods are discovered. The troubles of Stephen's reign will account for the wretched state in which the pennies of that king occur: these, with what are certainly the earliest pennies of Henry II., are among the worst of the English coins in point of mintage. The barons of this reign are reputed by our historians to have struck coins; but only two or three such are known, and those of persons related to the king. Pennies are extant ascribed to Robert earl of Gloucester, bastard son of Henry I.; to Henry bishop of Winchester, base brother of Stephen; and to Eustace, Stephen's son. They are all of great rarity, as is the coin which bears the full-length effigies of Stephen and Henry II. The coin of Robert however is by some ascribed to Robert duke of Normandy, the eldest son of the Conqueror. Henry II., according to Ruding, had but one type; but there seems every reason to believe that the pennies which usually go by the name of the first coinage of King Henry III. are in reality the last coinage of Henry II. at the time he reformed his money, A.D. 1180. Of Richard I. and John we have no English money; but pence, halfpence, and farthings are extant of John, all struck in Ireland. Those coins with a full face, bounded by the inner circle, have the inscription IOHANNES DOM. and were struck at the time his father made him lord of Ireland; those which give the face inclosed in a triangle, and IOHANNES REX, were coined after he ascended the throne. The farthing of this last coinage is extremely rare. Of John's coins, Dublin appears to have been the only place of mintage. Henry III.'s pennies (if those which we once considered as the latest pennies of Henry II. really do not belong to Henry III.) have usually the numerals added to his name, HENRICVS REX III. Some of his pennies have HENRICVS REX TERCI, and a few HENRICVS REX ANG. His coinage, if we may judge from the quantity of his pennies which still remain, must have been a very extensive one. Halfpence and farthings are spoken of in a record of this reign, but none have appeared. The pennies of Edward I., II., and III. are usually thus distinguished by our antiquaries: those which give the king's name EDW. are ascribed to Edward I.; those with EDWA., EDWAR., and EDWARD, to Edward II.; those with EDWARDVS to King Edward III. A few with EDW. are known certainly to belong to Edward I., particularly those which have a monever's name on the reverse, ROBERT DE HADELEIE, who is known from records to have been a moneyer in 1280. Both Henry III. and Edward I. struck pennies in Ireland, in the manner of John's later coins, representing the king's head within a triangle. Edward I. struck halfpence and farthings in his new coinage of 1279, which are not unfrequently met with in the cabinets of collectors, as well as halfpence and farthings with the Irish type, struck at Dublin and Waterford. It may be sufficient, as regards these small coins, to say that they continued in currency for several centuries. The last silver farthing is known to have been coined in the reign of Edward VI., but no specimen of it has been seen: the last silver halfpenny was struck under the Commonwealth. The penny has continued through every reign to the present. Our limits will not allow of further minute description. Among the rarest in the later part of the series may be reckoned the pennies of Edward VI., Mary, and Philip and Mary. From the reign of Edward I. to Henry VIII., we have pennies which bear the privy marks of the bishops of Durham; from Henry IV. to Henry VIII. we have coins struck in the archiepiscopal mint at York; and others of the see of Canterbury, from archbishop Bourchier to archbishop Cranmer. The first English pennies weigh 22½ grains troy. Towards the close of Edward III. the penny weighs 18 grains, and in the reign of Edward IV. it fell to 12, after previously sinking to 15. In Edward VI.'s time, 1551, the penny was reduced to 8 grains, and after the 43rd of Eliz. to 7$\frac{23}{31}$ grains, at which weight it still continues. The penny affords the best rule for estimating the other silver coins.

According to Grafton, Henry III., in 1249, ordered groats to be stamped, but none such are mentioned in any record. There is a large piece however found occasionally in the cabinets of the curious, sometimes ascribed to Edward I, but whether his, or Edward II.'s, or Edward III.'s, is uncertain. It occurs of different weights, from 80 to 138 grains, and represents the king's head on its obverse, within a double tressure of four arches, with mullets and roses; inscribed EDWARDVS DI. GR. REX. ANGL. The reverse, besides a continuation of the king's titles in the outer circle, has CIVI. LONDONIA within an inner one. There can be little doubt but that it was a trial-piece. Groat and half-groats were not introduced for currency till the 25th Edward III., and continue at present, though not for circulation. A silver fourpenny piece for circulation, of a different type from the ordinary groat, has been issued for circulation by King William IV., A.D. 1836. The groat received its name from the French *gros*, a large piece. In the time of Henry VII. and Henry VIII. groats and half-groats were struck in the archiepiscopal mints of Canterbury and York. It was one of the charges against Wolsey, that he had put the cardinal's hat upon the king's money, as is seen upon his York groats and half-groats.

The testoon, or shilling, was first coined by Henry VII., in 1503. The appellation of testoon was from the *teste* or *tête*, the head of the king, upon it: that of shilling is of old but uncertain origin. Pinkerton says, that coins of that name had been struck at Hamburg in 1407. The scilling was a denomination of money in the Saxon times.

Henry VIII. struck some patterns for a silver crown; but the first crown for currency was struck by Edward VI., with the half-crown, sixpence, and threepence. Queen Elizabeth, in 1558, coined three-halfpenny, and in 1561 three-farthing pieces. Pinkerton says they were dropped in 1582, but there is a three-halfpenny piece in the cabinets of the British Museum, bearing the date of 1599. Charles I. struck twenty-shilling and ten-shilling pieces in silver, but they were of very limited currency.

From the 43rd Elizabeth, 1601, the denominations, weight, and fineness of English silver have remained the same. It is worthy of remark, that, during all his distresses, King Charles I. never debased his coin.

The gold coinage of England is next to the silver in point of antiquity. The gold current with us, till the 41st Henry III., was foreign. In that year, 1257, a manuscript chronicle, in the archives of the city of London, states that the king made a penny of the finest gold, which weighed two sterlings, and willed that it should be current for twentypence. Three specimens of it only are yet known to have reached us; and two out of the three are preserved in the British Museum. They are from different dies. This coin is engraved in Snelling's 'View of the Gold Coin,' in the last edition of Folkes's 'Tables,' and in Pinkerton's 'Essay on Medals.' It is from Edward III. that the series of English gold coin really commences, for no more occurs till 1344, when that prince struck florins. The half and quarter-florin were struck at the same time. The florin was then to go for six shillings, though now it would be intrinsically worth nineteen. This coin being inconvenient, as forming no aliquot part of larger ideal denominations, seems to have been withdrawn. None have yet been found, but a few quarter-florins are preserved in cabinets, and one half-florin is known. In consequence, in the same year, the noble was published, of 6*s*. 8*d*. value, forming half a mark, then the most general ideal form of money. The obverse represents the king standing in a vessel, asserting the dominion of the sea. The noble was also attended by its half and quarter. This coin, sometimes called the rose noble, together with its divisions, continued the only gold coin, till the angels of Edward IV., 1465, stamped with the angel Michael and the dragon, and the angelets or half-angels were substituted in their place. Henry V. is said to have diminished the noble, still making it go for its former value. Henry VI. restored it to its size, and caused it to pass for 10*s*., under the new name of ryal. The ryal of 10*s*. and the angel of 6*s*. 8*d*., with their divisions of half and quarter, then continued the sole gold coins till, in 1485, Henry VII. issued the double ryal, or sovereign, of 20*s*., accompanied by the double sovereign of 40*s*. Henry VIII., in 1527, added to the gold denominations the crown and half-crown, at their present value, and in the same year gave sovereigns of 22*s*. 6*d*, ryals of 11*s*. 3*d*., angels of 7*s*. 6*d*., and nobles at their old value of 6*s*. 8*d*. In 1546 he struck sovereigns of the former value of 20*s*., and half-sovereigns in proportion. Henry VIIIth's gold, like his silver coin, was in the latter part of his reign much debased. Edward VI. coined a treble sovereign; and under James I. the sovereign was called a unite. The former coins however continued, with a few variations, till Charles II. coined the guinea, so called from the Guinea gold, out of which it was first struck in 1663, when it was proclaimed to go for 20*s*., but by tacit and universal consent never went for less than 21*s*. Charles II. likewise issued half-guineas double guineas, and five-guinea pieces, which his successors, till King George IV., continued. George I. and George III. issued quarter-guineas; and George III. pieces of seven shillings in 1797. In 1815 sovereigns and half-sovereigns, of 20*s*. and 10*s*. each, were again coined, and the guinea and half-guinea were gradually withdrawn from circulation.

With the exception of the styca, the copper coinage of England arose a thousand years later than its silver. Queen Elizabeth had a great aversion to copper money, although the necessities of her people for small change were obvious. She suffered a pattern to be struck as the PLEDGE. OF. A. HALF PENNY, and James I. and Charles I. actually issued farthing tokens also as pledges; but no authorized coinage of copper was struck till 1672, when halfpence and farthings of that metal were first made public money. In 1684 tin farthings were coined, with a stud of copper in the centre. Others, as well as halfpence of the same metal, were struck by James II., and William and Mary. In 1693 the tin was called in, and copper renewed. Pieces of a penny and twopence in copper were coined in the reign of George III. The latter did not answer their purpose, and were soon discontinued. The penny pieces remain in circulation.

Our space will allow us to say less than we could wish upon the money struck in France by English princes. Of Anglo-Gallic silver coins we have deniers of Eleanor, wife of Henry II., as duchess of Aquitaine, with deniers and half-deniers of Henry II., and pennies and half-pennies of Aquitaine, and pence of Poitou and Rouen of Richard I Of John and Henry III. we know of no Anglo-French money; but there is a lion of billon of Edward I., coined during the lifetime of his father after he had received Gascony, and a plentiful series of silver and billon coins of Edward III., of Edward the Black Prince, of Richard II., Henry IV., V. and VI. The denominations of the silver were the hardi, double hardi, groat, half-groat, penny and half-penny. In this class also fall the Calais groats and half-groats of the sovereigns of England, from Edward III. to Henry VI., and the Tournay groats of Henry VIII. Edward III. was the first of the English princes who struck gold money in France; the denominations were guiennois, leopard, chaise, and mouton; to these Edward the Black Prince added the hardi of gold and the pavilion; and Henry V. salutes and half-salutes. Henry VI. coined salutes, angelots, and francs in gold. The equivocal specimen of silver coin, supposed to have been struck by Margaret of Burgundy for Perkin Warbeck, is usually classed with the Anglo-Gallic series.

In respect to numismatic writers, we can only enumerate a few of the most important upon the various series of coins. On the Greek and Roman series, the best works are Eckhel's 'Doctrina Numorum Veterum,' Rasche's 'Lexicon Universæ Rei Numariæ,' and Mionnet's 'Description de Medailles Antiques Grecques et Romaines,' the last work in 5 vols., 8vo., with 7 vols. of Supplement, Paris, 1806-35. For the Roman alone, the reader may consult A. Morel's 'Thesaurus Familiarum Romanarum,' 2 tom fol., Amsterdam, 1734; and his 'Thesaurus Numismatum Imperatorum,' 3 tom., Amsterdam, 1752. Another which brings the Roman series to the close of the empire, will be found in Banduri's 'Numismata Imperatorum Romanorum a Trajano Decio ad Palæologos Augustos,' 2 tom., Lut. Par., 1718, with Tanini's 'Supplement,' in 1 vol., fol., Rome, 1791. See also Mionnet's work, in 2 vols., 'De la Rareté et du Prix des Medailles Romaines,' 8vo., Paris, 1827 The prices of the different coins, fixed according to their rarity, in this work are now the guide to the coin-dealers and collectors throughout Europe. To the English reader, Captain W. H. Smyth's 'Descriptive Catalogue of a Cabinet of Roman Imperial Large Brass Medals,' 4to., Bedford, 1834; and Akerman's 'Descriptive Catalogue of Rare and Unedited Roman Coins,' 2 vols., 8vo., London, 1834, will be especially useful. Pinkerton's 'Essay on Medals,' 2 vols., 8vo., 1789, with all its errors, is valuable as a general elementary treatise.

Bayer's work, 'De Numis Hebræo-Samaritanis,' 4to., 1781; and his 'Numorum Hebræo-Samaritanorum Vindiciæ,' 4to., 1790, are valuable works upon the Jewish coins.

On English coins, the best works are Leake's 'Historical Account of English Money,' 8vo., London, 1745; Snelling's various works; Folkes's 'Tables of English Coins,' as published by the Society of Antiquaries; and Ruding's 'Annals of the Coinage of Britain.' Simon has written an 'Essay towards an Historical Account of Irish Coins;' and Cardonnel his 'Numismata Scotiæ, or a Series of the Scottish Coinage.' On Anglo-Gallic coins, we have a quarto volume by Ducarel; a volume of similar size, 'A Description of the Anglo-Gallic Coins in the British Museum;' and 'Illustrations of the Anglo-French Coinage,' by Major-Gen. Ainslie, 4to., London, 1830; the last, and a very valuable publication.

On the French coinage, we have the works of Bouteroue and Le Clerc; on the Papal coins, Floravante. Argelati and Zanetti have written on the coins of Italy; and Florez on those of Spain. For the coins of Germany, the reader may consult Madai's 'Thaler-Cabinet,' 4 tom., Königsberg, 1765-8; and Weise's 'Gulden-Cabinet,' 2 tom., Nurnberg, 1780-2. For Danish coins, the 'Danske Mynter og Medailler,' 3 tom., fol., Copenh.. 1791-4. On Bulgarian coins Fraehn's work, 4to., Casan, 1816. For Oriental coins, Marsden's 'Numismata Orientalia Illustrata,' 2 vols., 4to., London, 1823-5

COINING. [MINT.]

COINING. The numerous and complicated laws upon this subject, passed from time to time during several centuries, as occasion called for penal enactments to protect the coin of the realm, were repealed by the recent stat. 2 Will. IV. c. 34. The making or coining of money being one of the exclusive prerogatives of the crown, the counterfeiting of the king's coin was in early periods of the history of English law considered to be a usurpation upon the royal authority, and upon that principle constituted the offence of high treason both by the common law and by various statutes. By the late stat., 2 Will. IV., c. 34, s. 3 it is enacted, with respect to gold and silver coin, That any person falsely making or counterfeiting any coin resembling, or apparently intended to resemble or pass for, the king's current gold or silver coin, shall be liable to transportation for life, or any term not less than seven years or to imprisonment for any term not exceeding four years. The 4th section of the act imposes the same punishment upon the offences of colouring, washing, or casing over any metal or counterfeit coin so as to pass for the genuine gold and silver coin of the realm; and of filing, washing, or otherwise altering silver coin so as to pass for gold, or copper coin so as to pass for silver or gold. By the 5th section persons impairing, diminishing, or lightening the king's current gold or silver coin, with intent to make it pass for the king's current gold and silver coin, are made liable to transportation for fourteen years, or imprisonment for three years.

By the 6th section of the statute it is enacted, That if any person shall buy, sell, receive, pay or put off, any false or counterfeit coin resembling, or apparently intended to resemble or pass for, any of the king's current gold or silver coin, or offer so to do, at or for a lower rate or value than the same by its denomination imports; or if any person shall import into the United Kingdom, from beyond the seas, any false or counterfeit coin resembling, or apparently intended to resemble or pass for, any of the king's current gold or silver coin, knowing the same to be false or counterfeit, he shall be liable to be transported for life, or for any term not less than seven years, or to be imprisoned for any term not exceeding four years.

By the 7th section it is enacted, That if any person shall tender, utter, or put off any false or counterfeit coin, resembling, or apparently intended to resemble or pass for, any of the king's current gold or silver coin, knowing the same to be false or counterfeit, he shall be liable to imprisonment for any term not exceeding one year; and if any person shall tender, utter, or put off any false or counterfeit coin resembling, or apparently intended to resemble or pass for, any of the king's current gold or silver coin, knowing the same to be false or counterfeit, and such person shall, at the time of such tendering, uttering, or putting off, have in his possession, besides the false or counterfeit coin so tendered, uttered, or put off, one or more piece or pieces of false or counterfeit coin resembling, or apparently intended to resemble or pass for, any of the king's current gold or silver coin, or shall, either on the day of such tendering, uttering, or putting off, or within the space of ten days then next ensuing, tender, utter, or put off any more or other false or counterfeit coin resembling, or apparently intended to resemble or pass for, any of the king's current gold or silver coin, knowing the same to be false or counterfeit, he shall be liable to imprisonment for any term not exceeding two years. And it is further declared by the same section, that if any person who shall have been convicted of any of the offences thereinbefore mentioned, shall afterwards commit any of such offences, he shall be liable to be transported for life, or for any term not less than seven years, or to be imprisoned for any term not exceeding four years.

The 8th section of the statute enacts, That if any person shall have in his custody or possession three or more pieces of false or counterfeit coin resembling, or apparently intended to resemble or pass for, any of the king's current gold or silver coin, knowing the same to be false or counterfeit, and with intent to utter or put off the same, he shall be liable to be imprisoned for any term not exceeding three years; and if any person so convicted shall afterwards commit the like misdemeanor, or crime and offence, he shall be liable to be transported for life, or for any term not less than seven years, or to be imprisoned for any term not exceeding four years.

The provisions above abstracted relate to the protection of the gold and silver coin: by the 12th section of the same statute the following provisions have been made with respect to copper coin. It is by that section declared, that if any person shall falsely make or counterfeit any coin resembling, or apparently intended to resemble or pass for, any of the king's current copper coin; or if any person shall knowingly, and without lawful authority (the proof of which authority shall lie on the party accused), have in his custody or possession any instrument, tool, or engine adapted and intended for the counterfeiting any of the king's current copper coin; or if any person shall buy, sell, receive, pay, or put off, or offer to buy, sell, receive, pay, or put off, any false or counterfeit coin resembling, or apparently intended to resemble or pass for, any of the king's current copper coin, at or for a lower rate or value than the same by its denomination imports; every such offender shall be liable to be transported for any term not exceeding seven years, or to be imprisoned for any term not exceeding two years; and if any person shall tender, utter, or put off any false or counterfeit coin resembling, or apparently intended to resemble or pass for, any of the king's current copper coin, knowing the same to be false or counterfeit, or shall have in his custody or possession three or more pieces of false or counterfeit coin resembling, or apparently intended to resemble or pass for, any of the king's current copper coin, knowing the same to be false or counterfeit, and with intent to utter or put off the same, every such offender shall be liable to be imprisoned for any term not exceeding two years.

The 10th section of the act contains the following provision against making, mending, or having in possession any coining tools. It enacts, that if any person shall knowingly, and without lawful authority (the proof of which authority shall lie on the party accused), make or mend, or begin to proceed to make or mend, or buy or sell, or shall knowingly and without lawful excuse (the proof of which excuse shall lie on the party accused) have in his custody or possession any puncheon, counter-puncheon, matrix, stamp, die, pattern, or mould, in or upon which there shall be made or impressed, or which will make or impress, or which shall be intended to make or impress, the figure, stamp, or apparent resemblance of both or either of the sides of any of the king's current gold or silver coin, or any part or parts of both or either of such sides; or if any person shall, without lawful authority (the proof whereof shall lie on the party accused), make or mend, or begin or proceed to make or mend, or buy or sell, or shall, without lawful excuse (the proof whereof shall lie on the party accused), have in his custody or possession any edger, edging tool, collar, instrument, or engine, adapted and intended for the marking of coin round the edges with letters, grainings, or other marks or figures apparently resembling those on the edges of any of the king's current gold or silver coin, such person knowing the same to be so adapted and intended as aforesaid; or if any person shall, without lawful authority, to be proved as aforesaid, make or mend, or begin or proceed to make or mend, or buy or sell or shall without lawful excuse, to be proved as aforesaid, have in his custody or possession any press for coining, or any cutting engine for cutting by force of a screw, or of any other contrivance, round blanks out of gold, silver, or other metal, such person knowing such press to be a press for coinage, or knowing such engine to have been used, or to be intended to be used, for the counterfeiting of any of the king's current gold or silver coin, every such offender shall be liable to be transported beyond the seas for life, or for any term not less than seven years, or to be imprisoned for any term not exceeding four years.

COIRE. [GRISONS.]

COKE, EDWARD,[*] was born at Mileham, in the county of Norfolk, on the 1st of February, 1551-2. He was the only son of Robert Coke of Mileham, and Winifred, daughter and one of the heirs of William Knightley, of Morgrave-Knightley, in the same county. His father, who was a bencher of Lincoln's Inn, died in the year 1561, when Edward Coke was ten years old. Before that event he had been sent to the Free Grammar School at Norwich, whence, in September, 1567, he removed to Cambridge, and was admitted as a fellow commoner at Trinity College. After having spent three years at the University he went to London to commence his legal education. According to the practice of that time, he took the first step of his legal course by becoming a member of Clifford's Inn, a house of Chancery, or inferior inn, dependent upon the Inner Temple, and was admitted into the latter society April 24, 1572. On the 20th of April, 1578, he was called to the bar. During the continuance of his studies in the Inner Temple, he is said to have greatly distinguished himself in the exercises called Mootings and Readings, which constituted a necessary part of the education of an advocate in former times, and which excited a great degree of interest and emulation among the members of the societies called Inns of Court and Chancery.

In the course of the year after his call to the bar, the society of the Inner Temple appointed him reader at Lyon's Inn; and the intelligence and learning displayed by him, in the conduct of the exercises at which he presided in this capacity, raised for him a high reputation as a lawyer, and opened the way to that extensive practice at the bar, which he acquired with a degree of rapidity almost without a parallel in the history of the profession. Lloyd, in his 'State Worthies,' says that 'his learned lecture so spread forth his fame that crowds of clients sued to him for his counsel.' In the next term after he was called to the bar he argued a case of much nicety and importance, known to lawyers by the name of Lord Cromwell's Case, which he says, in his own report of it (4 Rep. 146), 'was the first cause that he moved in the King's Bench.' About three years afterwards he was associated with Popham, the solicitor-general, in arguing before the chancellor and the twelve judges in the case of Edward Shelley, where the important rule in the law of real property, which has since become celebrated as the 'Rule in Shelley's Case,' was laid down so distinctly that it has taken its name from this case, though the rule itself is of much higher antiquity. From that period until he became solicitor-general, his practice was enormous: it appears from the reports of that time that there was scarcely a single motion or argument before the court of King's Bench in which he was not engaged. Professional honours were the consequence of this large business in the courts; in 1586 he was chosen recorder of Norwich, and for years afterwards was called to the bench of the Inner Temple. In January, 1591-2, the corporation of London having with much difficulty and at the expense of an annuity of 100*l.* procured the resignation of Serjeant Fleetwood, unanimously elected Coke their recorder; but he resigned that office in June, 1592, on being appointed solicitor-general. In the same summer he became reader of the Inner Temple, and had delivered several readings on the Statute of Uses to a large audience, consisting of not less than 160 members of the society, when the appearance of the plague compelled him to leave London abruptly for his house at Huntingfield in Suffolk. Such was the honour and respect in which he was held by the profession, that on this occasion, as he records in his Notes, he was accompanied on his journey as far as Romford by a procession composed of nine benchers and forty other members of the Inner Temple. In March, 1594, he was appointed attorney-general, and as the office of solicitor continued vacant until the close of the following year, the duties and labours of both offices during that interval devolved upon him.

At this period originated the animosity between Coke and Bacon, which prevailed with little intermission during the life of the latter. As soon as the office of attorney-general became vacant, upon the removal of Sir Thomas Egerton to the seals, the earl of Essex used his most strenuous efforts to induce the queen to bestow that place upon Bacon, instead of promoting Sir Edward Coke from the inferior office of solicitor-general. The letters of Bacon to Essex and others, with relation to this intrigue, abound with sarcastic and contemptuous expressions respecting Coke, whose high reputation and great experience pointed him out as at all events a fitter man for the office than his rival, whose practice at the bar was never extensive, and who was then scarcely known in the courts.[*]

The state services imposed upon the attorney-general at the end of Elizabeth's reign were extremely laborious. The severity of the laws recently introduced against Roman Catholics had occasioned a succession of plots by foreign adventurers against the person of the queen, the investigation of which was necessarily committed to the attorney-general. The treasons of Lopez, of Patrick Cullen, of Williams and Yorke, and numerous others of inferior moment, occurred about this period: and the business of constant examination at the Tower, added to his Star Chamber duties and his undiminished practice in the common-law courts, must have imposed a weight of labour and responsibility upon Coke which no mind of common activity and energy could have undergone. Whole volumes of examinations in these cases, taken by himself and written with his own hand, which are still preserved at the State Paper Office, sufficiently attest his zeal and assiduity in the service. In February, 1593, Coke, being at that time solicitor-general, was elected a member of parliament for his native county of Norfolk. In his own memorandum of this circumstance he says, that the election was 'unanimous, free, and spontaneous, without any canvassing or solicitation on his part.' At the meeting of this parliament he was chosen speaker of the House of Commons.

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[*] Many of the dates and incidents in this sketch of Sir E. Coke's life are taken from some characteristic memoranda in his own hand-writing prefixed to a volume of Notes among the Harleian MSS. in the British Museum, No. 6 87. This was probably the book which Lloyd mentions in his 'State Worthies' as 'a manual which Coke called *vade mecum*, from whence at one view he took a prospect of his past life, having noted therein most remarkables.' Roger Coke, in his 'Detection of the Reign of King Charles,' says, that when Sir E. Coke was on his deathbed, a king's messenger seized all his books and papers, and among them his 'Comment on Littleton, and the History of his Life before it, written with his own hand.' These notices seem to describe the identical book which has now found its way into the British Museum. It is remarkable that these notes have not been referred to by any of Coke's numerous biographers.

[*] Bacon, in a letter to Lord Burleigh, alludes to the objection made by the queen to his appointment, on the ground that he was 'rather a man of study than of practice and experience.' (*Cabala*, p. 17.)

In the year 1582 Coke married the daughter and heiress of John Paston, Esq., of Huntingfield, in Suffolk, through whom he became connected with several families of great opulence and importance, and with whom he received a fortune of 30,000*l.* By this lady he had ten children. She died in June, 1598. In the month of November in the same year Coke contracted a second marriage with the widow of Sir William Hatton, daughter of Thomas Lord Burleigh, and grand-daughter of the lord high treasurer, which, though an advantageous alliance in point of connection and property, was by no means a source of domestic happiness. The marriage itself involved all the parties concerned in it in considerable embarrassment: for having taken place without licence or banns, Coke and his lady, together with the clergyman, Lord Burleigh, and all who were present at the ceremony, were cited to appear in the Archbishop's Court; and it was only in consequence of their making a full submission, and pleading their ignorance of the law (a singular excuse in Coke's mouth), that they escaped the sentence and penalties of excommunication.

Sir Edward Coke held the office of attorney-general until the death of Queen Elizabeth; and having always been favourable to the title of James I., cooperated cordially with Cecil and the other members of the late queen's council in making the necessary arrangements for the peaceable accession of the king of Scotland to the crown. James, upon his arrival in London, received him into his full confidence and favour, and continued him in his office of attorney-general.

Coke's sound judgment and extensive legal knowledge, united with his fervent attachment to Protestantism, rendered him a valuable officer of the crown in the various proceedings against the Roman Catholics at the close of Elizabeth's reign, and the beginning of that of James I. In the examinations respecting the several assassination-treasons, which have been already mentioned, as well as that of Squire in 1598, of the Raleigh conspiracy in 1603, of the Gunpowder Plot in 1605, and of numerous other treasonable and seditious movements imputed to the Catholics during the period that he filled the office of attorney-general, he engaged with a zeal and ardour far beyond mere professional excitement; and the temper displayed in his speeches and general conduct on the several trials is much more that of a religious partisan than of a legal advocate. It is common with Catholic writers to attribute to him the utmost barbarity in the use of the rack and the general treatment of prisoners under examination. That he, who in his writings forcibly condemns the use of torture, was nevertheless in his official character the constant instrument of the crown for applying this odious process, is beyond all question: but it must be remembered that what he wrote on this subject was written long after the period of which we are now speaking, in the dawn of a better order of things; and that the use of the rack for discovering state secrets was common throughout Europe in his time, and had been in daily practice in England for centuries before he was born. There is no satisfactory proof that he was coarse and cruel in his conduct towards prisoners under examination, and on the contrary, Father Cornelius, the Jesuit, who was repeatedly examined by Coke, said he found him 'omnium hominum humanissimus;' and Garnet, in his intercepted correspondence, and also on his trial, admits that he was constantly treated by him with courtesy and kindness.

There is no doubt however that as the advocate of the crown on trials for state offences, he displayed a degree of intemperance and asperity not only shocking to the feelings of readers familiar only with the more civilized character of criminal proceedings at the present day, but strongly offensive even to contemporaries.

With the trials of the conspirators in the Gunpowder Plot in 1606, the career of Sir Edward Coke as an advocate closed. In the month of June in that year he received his appointment as chief justice of the Common Pleas. He retained the situation upwards of seven years; and in the discharge of the common judicial duties at this period, his profound learning and unwearied industry procured him the highest reputation. At this time too, though he has sometimes been reproached for a haughty and unconciliating deportment on the bench, the bitterness of temper which he had displayed at the bar appears to have been suppressed or softened; and in several constitutional questions of the highest importance which occurred while he was chief justice of the Common Pleas, and in which he resolutely opposed the views of the king, especially in the conflicts between the ecclesiastical jurisdictions and the courts of common law, and in his resistance to the encroachment of prerogative on the subject of royal proclamations, he displayed great integrity and independence. With a view to corrupt his uncompromising disposition, his crafty rival, Bacon, who was then solicitor-general, suggested his promotion to the chief-justiceship of the King's Bench; and accordingly he received his patent for that office in October, 1613, and a few days afterwards, in consequence of a special order from the king, took his seat at the board as a privy councillor. In the following year he was elected high steward of the University of Cambridge.

The project of making the chief justice 'turn obsequious' by his advancement, which was no doubt entertained by the court, and was expressly avowed by Bacon, altogether failed. In the case of Peacham, who was prosecuted for treason in the year 1615, for having in his possession a sermon supposed to contain sedition, written by him, but never preached or published, Coke, after long hesitation to deliver what he quaintly called an 'auricular opinion,' seems at last to have declared that the offence was not treason. His exertions in the prosecution of the murderers of Sir Thomas Overbury in the same year, though praised by Bacon in conducting the case as attorney-general, gave displeasure to the king; and his independent conduct in the case of Commendams, which occurred in 1616, finally determined the court to remove him from his office. The transaction was this. A serjeant-at-law, in the discharge of his duty as an advocate in the Court of Common Pleas, was supposed to have used matter in his argument which tended to question the royal prerogative, upon this the king required the judges to proceed no further in the case without his warrant. The twelve judges conferred upon this message, and resolved that in a common dispute between party and party it was their duty to proceed notwithstanding the king's mandate. Upon this they were summoned to the council table, and personally reprimanded by the king; and all of them, excepting the lord chief justice, acknowledged their error, and craved pardon for their offence upon their knees. Sir Edward Coke, on the contrary, after craving pardon for any formal errors which he might have committed, boldly justified his opinion upon the substantial point, contending that the king's command for staying the proceedings was a delay of justice, and consequently against the law, and contrary to the judges' oath. After much discussion, the lords of the council proposed the following question to the judges:—'Whether in a case where the king believed his prerogative or interest concerned, and required the judges to attend him for advice, they ought not to stay proceedings till his Majesty had consulted them?' All the judges at once answered in the affirmative, except Lord Coke, who only said 'that, when the case happened, he would do that which should become an honest and just judge.'

The court now despaired of bending the stubborn integrity of the chief justice, and determined at all events to displace him. Accordingly, on the 26th June, 1616, as a preliminary to his removal, he was summoned before the council, and charged with several frivolous accusations, some of them founded upon alleged malversations while he was attorney-general, to all of which he returned distinct answers. Four days afterwards, he was again summoned to appear before the council; upon which occasion he was reprimanded, sequestered from the council-table during the king's pleasure, enjoined not to ride the summer circuit as judge of assize, and ordered to employ his leisure in revising many 'extravagant and exorbitant opinions' set down in his Book of Reports. In the course of the vacation he was again summoned before the council to answer a list of twenty-eight objections to doctrines contained in his Reports, which a contemporary writer observes, 'were either so weak in themselves, or so well answered, that they were readily reduced to five.' (Chamberlain's *Letter to Sir D. Carleton*, 26th Oct., 1616.) In November, 1616, he received his writ of discharge from the office of chief justice: and was succeeded by Sir Henry Montague, who was expressly warned by the lord-chancellor Egerton 'to avoid the faults of his predecessor, who had been removed for his excessive popularity.'

From causes not very distinctly explained in the letters and histories of the day, which probably were connected with an intrigue for the marriage of his daughter to Sir John Villiers, afterwards Viscount Purbeck, Sir Edward Coke, though he never afterwards filled a judicial situation, was, at no long interval, restored to a certain degree of royal favour. In September, 1617, he was reinstated as a member of the privy council, and in July, 1618, he was appointed a 'commissioner for the exercising the office of lord high treasurer of England,' jointly with archbishop Abbott, lord-chancellor Bacon, and several others. (See Devon's *Pell Records*, temp. Jac. I.) In the course of the next three years he was employed in several other commissions of a public nature, and until the year 1620 he was constant in his attendance at the board. In the parliament which assembled in that year he was returned as a member for the borough of Liskeard in Cornwall. In this parliament he distinguished himself as one of the most able and zealous advocates of the liberal measures which were proposed; he became a strenuous opponent of the pernicious monopolies by which at that period the freedom of trade was fettered, and took an animated part in that struggle between the prerogative pretensions of James and the freedom of debate, which ended in the celebrated resolution of the Commons, 'that the liberties, franchises, privileges, and jurisdictions of parliament are the antient and undoubted birth-right and inheritance of the subjects of England.' During the year 1621, he attended only three times at the privy council; and on one of those occasions, namely on the 5th Oct., 1621, he seems to have appeared only to inform the board that he had induced one Johnstone to give up a grant which he had obtained from the king, as 'both a grievance to the subject, and a disservice to the state;' which information he desired might be recorded in the council register. (*Council Books.*) His adherence to the popular or *country* party gave great offence to the court, and he was accused of various offences and malpractices. The king, at this period, was so incensed against him, that before he would grant his warrant for a general pardon, at the end of 1621, he expressly commanded the privy council to consult upon the means of excepting Sir Edward Coke from the benefit of it; and on the 27th of December of that year, Coke was arrested and committed to the Tower, where he remained a close prisoner until the 6th of August, 1622. While he was in the Tower, proceedings were instituted against him both in the star-chamber and the court of wards, the precise nature and issue of which cannot now be ascertained. Upon his enlargement from the Tower, he was ordered to confine himself to his house at Stoke Pogis, and not to repair to the court without express licence from the king. After his disgrace on this occasion, he was never again restored to the council-board. At the end of 1623 he was appointed a commissioner, together with Sir William Jones, one of the judges of the Common Pleas, and two other persons, to inquire into the church establishment in Ireland. That he was on the point of going on this mission appears from the fact that a passport dated 16th January, 1623-4, was actually granted by the council. Some accident however prevented his departure.

In the first parliament of Charles I., called in April, 1625, Sir E. Coke was again returned as one of the knights of the shire for the county of Norfolk, as he says in his Note, 'sine aliquâ motione aut petitione inde a me præbitis.' At the commencement of this parliament he adopted a moderate tone. He dissuaded the house from insisting upon grievances, and urged conciliatory measures; saying, that 'as it was the very beginning of the new king's reign, there could be no grievances as yet.' But this disposition to peace was overcome by the determined tendency of the crown to arbitrary measures; and the king being unable to obtain any answer to his demand of a subsidy, but repeated remonstrances against grievances, abruptly dissolved the parliament. He was compelled, however, by his pecuniary wants, to assemble a new parliament in the course of the same year, having previously appointed Sir Edward Coke and three other popular leaders sheriffs of counties, in order to prevent their serving as members. Coke, having been in this manner named Sheriff of Buckinghamshire, was again returned as knight of the shire for Norfolk; and though in consequence of his shrievalty, he did not take his seat in that parliament, no new writ was issued to supply his place, and it was considered that he was *de facto* a member of the house. He mentions this circumstance in his 'Fourth Institute,' p. 48, though he does not state it to have been his own case; and says, that 'having a subpœna out of chancery served upon him, he had his privilege of parliament allowed unto him by the judgment of the whole House of Commons.' On occasion of the third parliament summoned by Charles I. in March, 1628, Sir Edward Coke was returned for two counties, Buckingham and Suffolk; but he tells us that 'he chose the former, because he resided there, and because his election for that county took place first.' In this parliament, though now in his 79th year, this extraordinary man asserted and defended the constitutional rights of the people of England with all the energy of youth, and all the sagacity of age. By his advice, and with his active cooperation and assistance, which his extensive and varied experience rendered particularly valuable, the celebrated Bill of Rights was framed; and by his perseverance and reasoning the lords were, after many conferences, induced to concur in the measure, which was, at last, and after many ineffectual attempts at evasion, reluctantly assented to by the king. One of the last acts of his public life was his spirited denunciation of the Duke of Buckingham as the cause of all the misfortunes of the country. As a proof of the earnest feelings by which he was impressed, Rushworth records that, on this occasion, 'Sir Edward Coke, overcome with passion, seeing the desolation likely to ensue, was forced to sit down when he began to speak, through the abundance of tears.' At the close of the session of parliament in March 1629, the growing infirmities of advanced age induced him to withdraw from public life, and to spend the remainder of his days in retirement on his estate at Stoke Pogis, in Buckinghamshire. Still it appears that his vigorous and active mind was not without employment; and the last years of his life are said to have been occupied by the revision of the numerous works which he left behind him.

The last entry in his note-book, written with almost as firm a hand as he wrote at the age of 40, records the following incident, which may possibly have been the cause of his death:—

'Memorandum. Die Jovis, the iiird of May, 1632, riding in the morning in Stoke, between eight and nine of the clocke to take the ayre, my horse under me had a strange stumble backward, and fell upon me (being above 80 years old), where my head lighted nere to sharpe stubbes, and the heavy horse upon me. And yet, by the providence of Almighty God, though I was in the greatest danger, yet I had not the least hurt,—nay, no hurt at all. For Almighty God saith by his prophet David, "The angel of the Lord tarrieth round about them that feare him, and delivereth them." Et nomen Domini benedictum, for it was his work!'

He died on the 3rd of September, in the following year, repeating with his last breath the words, 'Thy kingdom come, thy will be done;' and was buried in the family burying-place of the Coke family in the church of Titeshall, in Norfolk.

The most celebrated of Sir Edward Coke's works is the treatise commonly known by the name of 'Coke upon Littleton, or the First Institute.' It consists of a minute and laborious commentary upon the text of Littleton's 'Tenures.' in the course of which almost the whole learning of the common law, as it existed in his time, is digested and explained. This book has, ever since the time of Lord Coke to the present day, been considered as a work of the highest authority in the municipal and constitutional law of England. The 'Second Institute' contains notes on several antient statutes; the 'Third Institute' is a treatise on criminal law; and the 'Fourth Institute' treats of the origin and jurisdiction of different courts. Besides these works, Sir Edward Coke was the author of a treatise on copyholds, entitled 'The Complete Copyholder,' and a 'Reading on Fines.' He also published a collection of Reports, which are still of great value to the profession; and at the time of their appearance formed an epoch in the history of the law. Sir Francis Bacon speaks of this produce of the industry and learning of his great rival in terms of high and deserved commendation; and justly ascribes to the Reports the praise of having preserved the vessel of the common law in a steady and consistent course; 'For the law,' says he, 'by this time had been like a ship without ballast, for that the cases of modern experience are fled from those that are adjudged and ruled in former time.'

COL, COLLE, from the Latin *collis*, 'a hill or ascent,' is a name given in Italian, and in the dialects of the Italian and Romanse languages, to several mountains in the Alps and Apennines over which there is a road or pass. The name is applied both to the pass itself, and to the mountain. The principal Cols are the Col de la Seigne and Col de Bonhomme, in the Pennine Alps south of Mont Blanc; the Col de Balme and Col Ferret in the same chain north of Mont Blanc, the latter adjoining the St. Bernard; the Col d'Argentiere in the Maritime Alps south of Mount Viso, and over which is a pass for mules, leading from the valley of Barcelonette in France into the valley of the Stura in Piedmont. A branch of the antient Via Æmilia led over this pass, which is one of the most direct from France into Piedmont, and has been repeatedly used by the French in their invasions of Italy. The Col di Tende lies between Piedmont and the county of Nice, on the road from Turin to the latter town, which is the only carriage-road over the Maritime Alps. [Alps.] The term Col implies a depression in the mountain, however high, which affords a natural pass; for instance, in the great ridge adjoining Mont Blanc, which divides the valley of Chamouny from that of Aosta, there is a lofty needle or summit, called Le Géant, 'the Giant,' which is above 13,000 feet high. By the side of this great pyramid, and between it and Mont Blanc, there is a considerable depression, called Le Col du Géant which affords in summer a practicable, though dangerous communication between Chamouny and Cormayeur in the Val d'Aosta. The highest part of the Col du Géant is about 10,000 feet. This pass was first tried in the last century by a guide of Chamouny, called Michel Cachat, who ever after was called Le Géant; it was afterwards passed by Saussure, Bourrit, and others.

There are several passes in the Apennines called by the name of Col: one of the most known is Col Fiorito, on the road from Rome to Loreto and Ancona. There are also several towns in Italy, especially in Tuscany, called Colle, from being built on some hill.

In Catalonia also, where a dialect of the Romanse language is spoken, the appellation of Col is applied to mountain-passes, such as Col de Creu, near Vich, and Col de Balaguer, near the town of that name.

COLAPORE, a small independent Mahratta state, situated within the province of Bejapore, in the region of the Western Ghaut mountains, being partly below and partly within the Ghauts. The territory of the Colapore rajah is so intermixed with that of the British and of other Mahratta chiefs, that it would be difficult to describe its boundaries. [Bejapore.] The state of Colapore was founded by Sumbajee, the grandson of Sevajee. In 1728 Sumbajee was confederated with the Nizam, and accompanied his army to Poona; and in 1731 a treaty was concluded between the Peishwa and Sumbajee, by which it was agreed that the lands of the province lying north of the Kistna should belong to the Peishwa, that all between the Kistna and Warna and the Toombuddra should belong to Sumbajee, and that all conquests south of the Toombuddra should be divided equally between them. The territory thus assigned to the rajah of Colapore was then partly in the actual possession of the Moguls, and partly of other chiefs, called Dessyes, who had set up for themselves. It was not until the subsequent reign of Madhoo Rao, about the year 1762, that the whole was effectually brought under the rajah's power. The Colapore territory became after this the constant scene of war and turbulence, and a place of refuge for all the plunderers and pirates of neighbouring countries. In 1804 the rajah was at war with the Peishwa, and after a long struggle, in which the latter succeeded in capturing the chief places in the state, and in reducing the rajah's government nearly to the point of extinction, the British government interfered for the establishment of peace, and procured the restitution of his towns. This occurred in 1812, after which the state of Colapore enjoyed a long continuance of tranquillity from without. In 1821 the rajah was privately assassinated in his palace, and was succeeded by a son of immature age, during whose long minority the country fell into a state of great disorder; the strong holds in the Ghauts were held by petty chiefs, who rebelled against the superior authority of the rajah, and the state of disorganization became such as to call for a report to the English government from the political agent in the Deccan, in which it was stated that 'robberies and other outrages are frequent in all parts of the Colapore country: and when one occurs, no person ever seems to be near the spot whose business it is to prevent the offence, or to secure the offender. After many delays a case of robbery sometimes finds its way to the rajah's ears, and if he happens to be struck with its enormity, he orders out the Tuppasnuves with a body of horse and foot to hunt the perpetrators. The party after scouring the country, and probably becoming as great a nuisance as the thieves themselves, return to Colapore, and report that it arrived too late to trace them. Under such misrule the potails, who should be here what the justices of the peace are in England, become the abettors of rogues instead of their terror, and the officers of police become thieves instead of thief-takers.' The young rajah on taking the government into his own hands proved to be of an arbitrary disposition, and early lost the good esteem of his subjects by his exactions and his degrading vices. In 1825, 1826, and 1827, the rajah having committed aggressions in the territories of some Mahratta Jagheerdars under the protection of the English, his territory was occupied by our troops, and the powers of government were temporarily placed in the hands of a minister appointed by the governor of Bombay. In each of the years just mentioned a treaty was concluded with the rajah, by which he bound himself to desist from acts of aggression; but these treaties having been forced upon him, their provisions were broken upon every occasion that presented itself, and in 1829 a definitive treaty restricted him from keeping up a greater force than 400 horse and 800 foot soldiers: some districts in which he had committed oppressions against the Zaminders were at this time taken from him; British garrisons were placed in the capital and in the fortress of Punnalaghur at the rajah's expense, and a chief minister for the future management of his government was to be permanently appointed by, and removeable solely at the pleasure of the English government.

(*Selection of unpublished papers, from the records of the East India House; Report of Committee of House of Commons on the Affairs of India*, 1832—*political section*).

COLAPORE, the capital of the state just described, is situated in 16° 19′ N. lat. and 74° 25′ E. long., in a valley between a curved range of hills, by which it is protected on three sides, the fourth side being protected by two hill-forts about ten miles north-west from the town. These forts stand upon rocks which are about 300 feet above the level of the valley, and which present natural perpendicular ramparts of basalt, from thirty to sixty feet high. The two forts are connected together; one of them, called Penowlghur, covers a space three and a half miles in circumference, in which area are several dwellings, lofty trees, gardens, and fine tanks. The works immediately connected with the town of Colapore are not strong. The town is 120 miles south of Poona.

COLAPTES. [Picidæ.]

CO'LARIS. [Eurystomidæ.]

COLBERG, a town and strong fortress in the administrative circle of Cöslin, in the Prussian province of Pomerania, about 170 miles north-east of Berlin, and in 54° 9′ N. lat., 15° 34′ E. long. It is on the right bank of the Persante, which empties itself into the Baltic about a mile below the town, and at its mouth forms a harbour, called the Münde; which properly consists of two dams, carried out from the banks of the river into the sea, and protected by redoubts. Colberg contains 720 houses and 5900 inhabitants, five Lutheran churches, five hospitals, a workhouse, a house of correction, an exchange, a foundation in a nunnery for seven daughters of noble families, and nine of citizens; an orphan asylum, a gymnasium &c. Colberg has a salmon, haddock, and lamprey fishery; manufactures of woollens, anchors, and brandy; also salt-works, which however do not yield above 1620 tons annually. The absence of fresh-water springs is supplied by admirable but very expensive water-works: the water, which is raised by a wheel to the height of forty feet, is conveyed in pipes to every part of the town.

Colberg was formerly one of the Hanse towns, and till 1812 the seat of a collegiate chapter. The modern fortifications and outworks were commenced in 1773. It was taken after a siege of several weeks by Gustavus Adolphus, in 1630; was besieged by the Russians in 1758, 1760, and 1761, and surrendered to them by capitulation on the 16th December, in the last-mentioned year. The French invested it without success in 1817. It has a considerable trade, both inland and foreign, and a brisk woollen market. Its military strength is greatly increased by the swampy nature of the country around it.

COLBE'RT, JEAN BAPTISTE, born in 1619, at Rheims, was brought up to business. He was first employed at Lyon, in a commercial house, and afterwards went to Paris, where he was introduced, about 1648, to Mazarin. (Grosley's *Mémoires*.) Mazarin employed him first as an amanuensis, but afterwards made him intendant or steward of his vast fortune. He appointed him his executor on his death-bed in 1661, and recommended him to the king as a man deserving all his confidence. Louis XIV., on appointing Colbert contrôleur-général des finances, had many conferences with him, which led to the dismissal and imprisonment of Fouquet, the superintendent of the finances, who had assisted in dilapidating the resources of the state to serve the cupidity of Mazarin. On the trial there was a manifest anxiety on the part of the court and of Colbert to have Fouquet condemned to death, but D'Ormesson, one of the reporting judges, stood firm; he found much abuse and mal-administration, but no proof of peculation. Fouquet was condemned to banishment, and his property was confiscated. Louis XIV. aggravated this sentence into imprisonment for life in the citadel of Pignerol.

Colbert advised the king to form a chamber of justice for the liquidation of the debts of the state. The finances were in a ruinous condition; out of eighty-four millions which the people paid, the treasury received only thirty-two. The farmers of the revenue had in their hands all the resources of the kingdom; it was calculated that during the last five years they had appropriated to themselves eighty millions. They were now called to a severe account, and all the forms of inquisitorial process, torture not excluded, were employed to convict them. The result was that Colbert recovered for the king the sources of the public revenue, and reduced the debts of the state by an arbitrary composition, which was, in fact, a real bankruptcy. Having got rid of the burdens, he next applied himself to simplify and improve the collection of the revenue. He reduced by two-fifths the tailles, or land and income tax, which was unequally distributed, owing to the exemptions of the privileged classes. Finding this tax unmanageable, Colbert preferred reducing it, to make it weigh less heavily on the poorer classes. He founded his chief dependence on indirect taxation, or taxes upon consumption, which he raised not less than tenfold. Besides the octroi, or barrier duty on provisions, of which he appropriated one half to the treasury, and the aides or excise duties on wine and spirits, he imposed a stamp duty upon paper used in commercial and judicial proceedings, a stamp on plate, a duty on paper, a licence duty, and he established the monopoly of tobacco, &c. He also made a new and minute tariff for the custom duties. At his death, 1683, the regular revenue of France was 116 millions of livres, of which 23 were absorbed by the charges of collection and administration, and the rentes or annuities due by the state, leaving ninety-two millions of net receipt, instead of thirty-two, which he had found when he entered on office twenty-two years before. (Lemontey, *Pieces Justificatives*.) But one half only of this increase was obtained through additional taxation; the other half was the result of better order and economy. Colbert however had to deal with a sovereign, absolute, young, fond of pleasure, of pomp, and of war, seconded by an ambitious and unprincipled minister, Louvois. In the latter years of his administration Colbert was therefore obliged to have recourse to ruinous loans, an increase of the oppressive tailles, the sale of offices and honours, and other extraordinary or war expedients. This took place during the second war of Louis XIV., which began in 1672, and ended by the peace of Nimeguen, 1678-9. Colbert's aversion to loans was very great. He said to Lamoignon, who had supported in the council the proposal of a loan, 'You don't know the man we have to deal with (meaning the king). You have opened a sore which your grand-children will not be able to heal'

Colbert's most strenuous and effective efforts were directed to the encouragement of commerce and manufactures. To accomplish his object, he adopted the only means known at that time, perhaps the only means practicable in his situation, and under such a government as that of Louis XIV., privileges, patents, monopolies, bounties, and honours. He is generally looked upon as the inventor, or at least the great propagator, of the system of the balance of trade. He made numerous regulations to protect, as it was then called, the various branches of national industry. He also forbade the exportation of corn with the view of insuring plenty, but the result was that cultivation declined, and France suffered several severe dearths under his administration. He is accused of having sacrificed agriculture to manufactures, but in fact his principles were erroneous with regard to both. One merchant, more enlightened than the rest, being consulted by him on the best means of favouring commerce, answered him, 'Laissez faire et laissez passer,' 'let us alone, leave us free and uncontrolled in our transactions, and let goods pass freely,'—advice which Colbert did not understand. In the subsequent century there rose in France another school, opposite to his, which saw in agriculture alone the real wealth of a state: these men were called 'economistes.' Mengotti, in his sensible treatise 'Il Colbertismo,' has explained the principles and exposed the errors of both. But whatever may be thought of Colbert's measures, he certainly succeeded in giving a great impulse to French industry; he roused and directed the national mind towards a new and useful exercise of its faculties: the history of French manufactures may be said to begin with Colbert. Woollens, silk, glass, pottery, leather, and iron manufactures, were either created by him, or greatly enlarged and improved. He founded Quebec and Cayenne, made new settlements in India and on the coast of Africa, and favoured the colonies of Martinique and St. Domingo. He chartered privileged companies for the East and West Indies. He turned his attention to internal communications, restored the old roads, constructed new ones, planned and effected the great canal of Languedoc, and projected another in Burgundy. He also established a free port at Marseille, sent consuls to the Levant, and thus secured to France a considerable part of that valuable trade. He bought Dunkerque, and Mardyk, on the coast of Flanders, from Charles II. of England, for the sum of five millions of livres (1662). He also founded the dockyards of Brest, Toulon, and Rochefort. When he was made minister of marine, in 1669, in addition to the other departments he held, France had only a few old ships of war rotting in the harbours. Colbert purchased new ones abroad, constructed others at home, and in 1672 France had sixty ships of the line and forty frigates. But this creation of a navy was extended by the ambition of the king much beyond Colbert's original views, which were chiefly directed to the protection of the merchant trade.

Colbert brought the light of science into the various departments of the administration: his arrangement of the various offices, and the distribution of labour in each, have been highly extolled. He caused the first statistical tables of the population to be made out, and he collected the old charters and historical records of the kingdom. He removed the king's library from the miserable premises in the Rue de la Harpe, placed it in two houses near his own hotel, and increased it from 16,000 to 40,000 volumes. At the same time he formed his own extensive and valuable library, the MSS. of which alone amounted to 14,300 volumes, which his grandson afterwards sold to the king. He instituted a commission of legislation which framed the various ordonnances of civil and criminal process, of commerce, of the woods and forests, and of marine, published in 1670 and the following years, and which with all their imperfections constituted the first code of laws for France, and from which the various legislative commissions appointed by Napoleon drew most of their materials. [CODES, LES CINQ.] It was the first separation of the various branches of legislation, which had till then been confounded together in the ordonnances issued upon the spur of occasions. He also had a series of laws compiled concerning the negroes and their masters in the colonies, which was called '*le Code noir*.' A minister strict, orderly to minuteness, and averse to prodigality, could not well sympathize with Louis XIV. Colbert was ambitious, and strongly attached to his plans, which he conceived to be for the prosperity and glory of France. In order to captivate the king by means of one of his favourite tastes, that of building, which in some measure coincided with his own views, he purchased the office of superintendent of the public buildings in 1664. The gardens of the Tuileries, the Hôtel des Invalides, the façade of the Louvre, the triumphal arches of St. Denis and St. Martin, the Boulevards, and some of the quays along the Seine, were erected under him. He also began the structure of Versailles; but the king's passion for building, thus stimulated, went far beyond Colbert's intentions, and vast treasures were sunk in a gorgeous and useless work. Colbert instituted the Academy of Sciences, and those of Inscriptions and of Architecture. He reformed the Academy of Painting, and established the school at Rome for French artists. He transferred the Académie Française to the Louvre, and became one of its members. His temper was absolute, like that of his sovereign; he deprived Mézerai of his pension because he had written on the legality of taxation, and he laboured to lower the influence of the parliament of Paris. His manners were cold and repulsive; a poet of the time called him 'a man of marble.' Slow in conceiving his plans, and cautious in deciding upon their execution, he courted and listened to advice; but, when once resolved upon, his will knew no obstacles either of delicacy, feeling, or commiseration. A clear judgment, an iron will, and an indefatigable labour, supported him through his twenty-two years of administration. At last, seeing his rival Louvois enjoying the ascendency over the king's mind, Louis preparing himself for new wars, and maintaining the war-taxes which ought to have been repealed at the peace; grieved also at the incipient persecution of the Protestants, whose commercial and manufacturing industry Colbert fully appreciated, among whom he had chosen some of his best subalterns in the administration, and of whose services he was deprived by an edict which excluded the Protestants from financial appointments, Colbert felt all the pangs of disappointment for his ill-appreciated services. Exhausted with labour he fell ill, and shortly after died, 6th September, 1683, at sixty-four years of age. When near his death a letter from the king was brought to him, but he refused to open it. 'I will hear no more of him; he must leave me in peace now,' he said. 'Had I done for my God what I have done for that man, I should have been saved twenty times, while now I do not know where I am going to.' Father Bourdaloue attended his last moments. The people, enraged at the taxes, threatened to tear his body to pieces. He was buried in the night, attended by a military escort.

Colbert's first son was made Marquis of Seignelay, and another became Archbishop of Rheims. His brother held also high offices, and was made Marquis de Croissy. Colbert built himself a splendid mansion at Sceaux, and he left a fortune of ten millions of livres, the fruits of his rigid economy and of the liberality of Louis. (*Notice sur Jean Baptiste Colbert* in the *Œuvres de Lemontey*, vol. v., *Pièces Justificatives*, Paris, 1829; see also *Mémoires de Charles Perrault*, Colbert's secretary; and *Particularités sur les Ministres des Finances*, par Montyon. The several *Vies* and *Eloges* of Colbert are not worthy of much credit.)

COLCHESTER, a borough and market town, having separate jurisdiction, in the N.E. part of the county of Essex; locally situated in the hundred of Lexden, 22 miles N.E. by E. from Chelmsford, and 51 N.E. by E. from London. The liberties of Colchester, which are co-extensive with the borough, include the town of Colchester, and the parishes of Bere-church, Greenstead, Lexden, and St. Michael, Mile End, and comprise an area of 11,770 statute acres.

Colchester is generally supposed to be the Camalodunum of the Romans. There are few places in England where more Roman antiquities have been found: Morant mentions 'bushels' of coins of Claudius, Vespasian, Titus, Domitian, and their several successors. In addition to which, the town-walls, the castle, many of the churches, and other antient buildings, are chiefly built of the Roman brick. Numerous vases, urns, lamps, both bronze and in pottery, rings, bracelets, &c., as well as tessellated pavements, pateræ, and other Roman antiquities have at various times been dug up within the walls and in the neighbourhood.

By the Britons it was called Caer Colon, and finally by the Saxons Colne-Ceaster, from the Latin 'Castra,' and its situation on the river Colne. Colchester was strongly fortified by Edward the Elder, and although it had gradually diminished in importance as London increased, still at the time of the Norman survey it was a place of considerable note. In 1218 it was taken by Prince Louis, son of Philip II. of France, who had been invited into England by the rebellious barons to assist them against king John. In the reign of Edward III. the town contributed five ships and 170 marines towards the naval armament raised to blockade Calais.

Early in the civil wars the inhabitants of Colchester declared against the Royalists; and in 1648 the town sustained a memorable siege. Having been obliged to surrender to the royal forces, the city was garrisoned by Sir Charles Lucas and Lord Goring. Fairfax soon arrived, and summoned Lord Goring to surrender, and on his refusal, proceeded to storm the city; but after seven or eight hours' attack he ordered his troops to retire, and began the most rigorous blockade. The Royalists bravely held out for eleven weeks, but at last all the provisions of the place having been consumed, and the soldiers and inhabitants being compelled to live on horses, dogs, and other animals, the garrison was obliged to surrender at discretion. Sir Charles Lucas, Sir George Lisle, and Sir Bernard Gascoigne, were condemned to death. Gascoigne being a foreigner, his sentence was remitted, but the other two were shot a few paces from the castle walls. The town was fined 14,000*l.*, of which half was levied on the Dutch inhabitants, who were principally merchants that had been driven out of Flanders by the persecutions of the Duke of Alva, and had settled at Colchester. Two thousand pounds were afterwards returned to the inhabitants, but the poor Dutch were not allowed to have any part of it.

The ruins of the old castle, St. John's Abbey, St. Botolph's Priory, the Moot-hall, and its eight churches, form the principal antient and public buildings of Colchester. Of the walls by which the city was surrounded, in consideration of the repairing of which Richard II. is recorded to have exempted the burgesses from sending representatives to three of his Parliaments, only some detached portions now exist. They formed a circumference of one mile and three quarters. The remains of the castle stand upon an eminence to the north of the High Street, and form a parallelogram; the principal entrance is at the south-west corner, beneath a strong semicircular arch with capitals ornamented in the Norman style. The keep is still in a good state of preservation, and its walls are twelve feet thick. The building, which is a compound of flintstone and Roman brick, is so hard that it has frustrated repeated attempts to demolish it for the sake of the materials. The castle was formerly crown property, and the town was feudatory to it.

St. John's Abbey was founded by Eudo, dapifer or steward to Henry I., for monks of the Benedictine order. A handsome gateway, of the later style of English architecture, is all that now remains of this abbey. The last abbot was hanged for treason in 1539, and the site of the monastery passed into the family of the Lucases.

In St. Giles's church, adjoining the abbey, is a monument erected to the memory of Sir C. Lucas and Sir George Lisle. St. Botolph's Priory, not far from St. John's, was founded by Enulph in the beginning of the twelfth century. The remains of the western front of its stately church are highly interesting. A fine semicircular retiring arch, with various mouldings of small Roman bricks and stone alternately, forms the doorway.

Colchester has returned two members to Parliament since the 23rd of Edward I. At the first election after the passing of the Reform Act there were 1099 voters registered. The first charter granted to the corporation was by Richard I. in 1089. It was subsequently extended by Henry V., and renewed by George III. in 1818.

The Corporation hold quarterly Courts of Session for the borough and the liberties: and two Courts of Pleas for the recovery of debts to any amount; one called the law hundred, on Monday, for actions against burgesses, and one on Thursday, called the Foreign Court, for actions against strangers, or non-freemen. The Moot-hall is an antient building erected by Eudo, and contains the Hall and Exchequer Chamber, and the Council Chamber, where the business of the corporation is transacted. Underneath is the town gaol.

The town is built on the summit of an eminence gently rising from the river Colne, over which there are three bridges. The streets are wide and generally well paved, and the High Street contains some handsome houses and good shops. It is lighted with gas, and well supplied with water. The theatre is a neat building, erected in 1812. A literary and philosophical society was established in 1820; attached to it is a museum of shells, fossils, and natural objects. There are also a medical society, a botanical society, and a musical society of amateurs The weaving of baizes, probably introduced by the Flemings in the time of Elizabeth, was carried on here to some extent, but it now has been succeeded by a large silk manufactory. The oyster fishery on the river Colne, granted to the burgesses by Richard I., employs a great number of men, and some hundreds of smacks are engaged in conveying the oysters to London, especially from Pyfleet. The river is navigable for vessels of 200 tons burden to the Hythe, where there is a custom-house and an extensive quay. The market-days are Saturday and Wednesday, for corn and cattle; but a market for meat, fish, and vegetables, is held daily. The fairs are on the 5th and 6th of July, and on the 23rd and 24th of July for cattle; and on the 20th of October for cattle, and three following days for merchandize. The population of the borough and liberties is 16,167, of whom 8696 are females; the population of the town itself is 13,766. There are 2079 families employed in manufactures, trade, &c., and 490 families employed in agriculture.

Colchester was made the seat of a suffragan bishop by Henry VIII., and two bishops were subsequently consecrated there. The church of St. James is a handsome building, erected prior to the reign of Edward II. It has a fine altar-piece representing the 'Adoration of the Shepherds.' St. Peter's was erected before the Conquest, and is mentioned in 'Domesday Book' as the only church in Colchester. It was greatly repaired and modernized in 1758, and large sums of money have been laid out on it since that time. The church of St. Leonard's is large and convenient. There are two places of worship for Baptists, two for Independents, and one for each of the societies of Friends, Wesleyan Methodists, and Unitarians.

The free grammar-school was founded by the corporation, to whom queen Elizabeth, in the 26th year of her reign, granted certain ecclesiastical revenues for that purpose. The number of scholars on the foundation is generally from thirty to forty; the present income is 117*l.* per annum.

Two charity schools for the education and clothing of fifty-five boys and thirty girls were established in 1708; several donations have been since made to these schools. The National School is formed by an extension of the original charity school, and about 400 boys are educated in it, of whom 148 are clothed. There are several schools supported by different dissenting congregations. A school for children of members of the Society of Friends was established in 1816, and endowed with a library and a large sum of money by John Kendall. There is also a Lancasterian school for children of both sexes, supported by voluntary contributions.

There are several alms-houses at Colchester. The Essex and Colchester General Hospital is a neat and commodious building, erected in 1820.

COLCHICA'CEÆ. [MELANTHACEÆ.]

COL'CHICUM AUTUMNA'LE, or MEADOW SAFFRON, is a plant with a solid bulb-like rootstock, found wild in various parts of Europe, as well as in Great Britain, and forming a gay carpet in the autumn in the fields, where its lively purple crocus-like flowers spring up. Its underground stems, or bulbs, as they are called, and its seeds, abound in an acrid, stimulating, deleterious principle, which has been carefully examined by modern chemists, and forms an important plant in the Materia Medica, large quantities of both rootstocks and seeds being annually consumed in the manufacture of Eau Médicinale, and other medicinal preparations. Its bulb-like rootstock is irregularly egg-shaped, and covered with a dry, brittle, brown skin; at its base it bears a bud, which feeds upon the parent stock, exhausting and finally replacing it every year. Its flowers are large pale purple, and spring up in the autumn without leaves, forcing themselves readily through the soil, and expanding just their orifice, together with the anthers and stigmas, above the surface of the soil, while the tubular part, with the ovary and filaments remain enveloped in membranous sheathing spathes below the soil. Each stock produces six or eight of these flowers. The stamens are six, the ovaries three, each with a long thread-shaped style, and not adhering in any degree to the tube of the flower. These are succeeded by three little follicles, which slightly adhere to one another by their inner edge, and in the spring are elevated above the soil by their lengthened footstalk. At this time, too, the foliage makes its appearance in the form of an erect tuft of broad, oblong, shining, sheathing leaves. Each follicle contains several oblong seeds.

Colchicum is so very like an autumn crocus, that an inexperienced observer might readily mistake the one for the other. They are, however, to be distinguished by the crocus having only three stamens, one style, and an inferior ovary, while the colchicum has six stamens, three styles, and a superior ovary—distinctions of no little importance when the poisonous qualities of colchicum, in which the crocus does not at all participate, are considered.

For medical purposes, the rootstocks of colchicum should be collected at Midsummer, and they should be used immediately; for at that time the peculiar principles which they contain are in the greatest state of concentration. If they are employed at a time when the plant is in a state of growth, especially when it is coming into flower, those principles are partly lost and decomposed by the growth of the plant, and there is no certainty as to the quantity of veratria that a given weight of the rootstocks will yield.

Other species of colchicum are cultivated for the sake of their flowers, but they are of no medicinal importance, and are very badly distinguished from each other by botanists.

Three different parts of *Colchicum Autumnale* yield an active principle used in medicine, but they respectively contain it in the greatest intensity at different seasons of the year; the cormus (incorrectly called root or solid bulb) having it in perfection about June or July, the flowers in September, and the seeds the following spring. The cormus and seeds are most frequently employed in Britain; but should the proper period (Midsummer) for collecting the cormi be neglected, the flowers may be substituted, though they can only be put to immediate use, as they do not keep well. The cormi are found at various depths under ground; when very deep, they are not so good, being the produce of old exhausted plants. Each cormus is about the size of a hazel-nut or walnut, ovate or heart-shaped, consisting of a white fleshy succulent substance, which, when cut across, exhibits roundish plates. It is somewhat flatter on one side, on which also may be discovered a groove, in which is lodged the germ of the flower-stem of the following year. The recent cormus has a nauseous radish-like odour; when dried, no odour; the taste is sweetish-bitter, leaving an acrid sensation in the throat.

The seeds, which should be collected in May, are small, globose, about the size of a grain of millet, of an obscure fawn colour, opaque, rough, and wrinkled, with a white hilum at the base, very hard, tough, and difficult to reduce to powder. The relative proportions of the constituent ingredients of the cormus differ greatly, according to the season of the year when it is taken up for examination, as Stolze's analyses demonstrate. The active principle of colchicum was long considered to be the same as that of veratrum, and thence called veratria; but Geiger and Hesse have shown that it is different, and have termed it *colchicia*. The seeds contain this principle, and likewise some thick oil. Colchicum imparts its activity partially to water, but more so to acetic acid, proof spirit, and wine. A sirup is sometimes formed of it, but it does not keep well.

In a small dose, colchicum causes an increased flow of urine, and more frequent evacuations from the intestinal canal, and occasionally augmented secretion from the skin; in larger doses, frequent evacuations from the intestines, accompanied with pain and tenesmus, and desire repeatedly to empty the bladder. Still larger doses cause increase of all these actions, with vomiting and sense of burning in the throat, insensibility and stiffness of the tongue, escape of blood into the intestinal canal, vomiting of blood, and a flow of bloody urine. Great disturbance of the nervous system is likewise observed, as in other cases of poisoning with acrid substances. The same appearances are found in the intestinal canal, if the poison be injected into the veins.

Even the milk of cattle which have eaten the meadow-saffron becomes capable of causing death. (Vogt.)

In a moderate dose, colchicum seems to increase the quantity and improve the quality of all the secretions of the intestinal canal and the collatitious viscera, especially the liver; but it likewise exerts a sedative action on the heart. Chelius says that in twelve days it doubles the quantity of uric acid found in the urine, a circumstance which explains its utility in gout and rheumatism.

The diseases in which colchicum is most useful are, dropsy, when a small dose is prescribed; gout, in which larger are used; and rheumatism, in which its beneficial influence is first felt on the liver (which is almost always disordered in these diseases), and afterwards on the kidneys, from which a larger portion of uric acid is excreted, and the formation of gout-stones (urate of soda) in some degree prevented. As acid in the stomach renders the action of colchicum more violent, magnesia is usually given along with it. The acetate and acetous extract are the best forms of administration.

COLCHIS, a country of Asia, extending along the eastern shore of the Euxine Sea, from the town of Trapezus. (Strabo, p. 548, *d.*) It was bounded on the north by the Caucasus, on the south by Armenia, on the east by Iberia, and on the west by the Euxine. The modern Mingrelia includes only part of this country. The name Colchis appears in the early legends of the Greeks as connected with the expedition of the Argonauts [ARGONAUTS], and the story of Jason and Medea.

The chief river of Colchis was the Phasis, which, receiving the small streams of the Glaucus and Hippus from the neighbouring mountains, flows into the Euxine sea. (Strabo, p. 498, *b.*) Among the most important cities were Pityus, the great mart of the district, Phasis, on the river of the same name, where the Argonauts are said to have landed. Aea on the Phasis, and Ceta. Colchis was a very fertile district and abounded in timber, which was well adapted for ship building, in various kinds of fruits, and in flax. The inhabitants were famed for their linen manufactures, which formed a considerable article of export. The honey, which Strabo (p. 498, *b*) represents as being very bitter, produced violent and even fatal effects on the Greeks who eat of it during the retreat of the Ten Thousand; it deprived them of their senses, disabled them from standing upright, and occasioned vomiting, &c., but finally all recovered. (Xenophon, *Anab.* iv. s. 20). The richness of the country in silver and gold mines, some of which are said to be worked with profit at this day, was probably the cause of the Argonautic expedition. The pheasant (*Phasiana avis*) derives its name from its native place, the banks of the Phasis.

The Colchi were originally from Egypt, according to Herodotus (ii. 104), and part of the army with which Sesostris invaded Scythia. The facts on which he founds his opinion are similarity of physical features, of language, and of peculiar customs, such as circumcision. The curled hair and swarthy complexion, on which Herodotus relies in support of his position, seem however no longer to exist in Mingrelia.

Colchis was governed by kings when we first read of it. Helius is mentioned by Diodorus as king before the Argonautic expedition. Æetes is mentioned by Strabo (p. 45, *d*) as king at the time of the expedition. Colchis was afterwards divided into several small kingdoms or states (Strabo, 45, *d*), and we hear nothing more of it till the time of Xenophon, who (*Anabasis*, v., 6, 37) speaks of a son or grandson of Æetes as reigning over the Phasiani. The Colchi were not then subjects of the Persian empire, but were independent. (Xen. *Anab.* vii. 8, 25.) They opposed the Greeks in the retreat of the Ten Thousand. Mithridates afterwards subdued Colchis, and the government was administered by præfects, one of whom, Moaphernes, was Strabo's uncle. (Strabo, p. 449, *a.*) Under the early emperors, the family of Polemon, a Greek rhetorician, reigned over the Colchians. (Strabo, p. 499, *a.*)

COLD, in Natural Philosophy. [HEAT.]

COLD. [CATARRH.]

COLDEN, CADWALLADER, lieutenant-governor of New York before the revolution, was the author of numerous works on subjects in medicine, natural philosophy, and botany. His father was minister of Dunse in Scotland, where he was born in 1688. He received his medical education at the university of Edinburgh, and in 1708 he emigrated to Pennsylvania, where for several years he practised as a physician After visiting England, and having established a reputation by 'Remarks on Animal Secretions, he returned to Pennsylvania, and settled finally, in 1718, in New York, where he was appointed surveyor of the lands of the colony and master in chancery, with a seat in the king's council. His principal works are—'A History of the Five Indian Nations,' 'An Account of the Diseases then prevalent in America,' 'An Essay on the Cause and Remedy of the Yellow Fever, so fatal at New York in 1743, 'A Treatise on Gravitation,' subsequently enlarged and republished as 'Principles of Action in Matter,' with a treatise annexed, on the 'Elements of Fluxions, or Differential Calculus;' 'An Introduction to Medicine,' 'Remarks on the Inaccuracy of the History of New York.' His favourite study was botany. The *Acta Upsaliensia* (for 17 3-4, *Plantæ Novæboracenses*) contain his descriptions of several hundred American plants, of which 200 were new species. He left a long series of meteorological observations, and a daily register of the thermometer and barometer; and several valuable MSS. on the vital movement, properties of light, intelligence of animals, and on the phenomena attending the mixture of metals. Among his correspondents were most of the leading scientific and learned characters of the age, as Franklin, the earl of Macclesfield, Gronovius, and especially Linnæus, who honoured him by naming a new species of plants *Coldenia*. He died at his seat on Long Island at the age of eighty-nine. (*Biographie Universelle; Encyclop. Americana.*)

COLE, COLZA, a cultivated state of the *Brassica Napus*, which does not form a close head, like cabbage, but has sessile heart-shaped leaves. It is cultivated for its seeds, from which an oil is expressed, which is much used for burning in lamps, and in the manufacture of leather and soap.

There are two varieties of cole, one with white flowers and another with yellow; the latter is the hardiest, and consequently most generally cultivated.

It requires a good loamy soil, well manured, to produce a good crop of cole seed. In rich land lately broken up from pasture, or fenny land newly drained, it grows luxuriantly and gives a great return. It is thought to be a great exhauster of the soil. In a rotation, cole is considered as a good crop to precede wheat. Like rape, which is another variety, it is sometimes sown to be fed off by cattle and sheep on land which is not so well adapted to the growth of turnips.

COLEO'PTERA (κολεόπτερα), in Entomology, a name first applied by Aristotle (*Hist. Anim.* i. &c.), and now universally adopted to designate one of the orders into which insects are divided, the species of which order are commonly known by the name of *Beetles*.

Nearly all true insects, or those annulose animals which have six legs, exhibit, in a more or less developed state, four wings, or members, which, although they may not enable the animal to fly, occupy the same situation, and are analogous to those which in many insects are true organs of flight.

These members are modified in various ways to suit the habits of the species or of the groups in general; but in those insects whose habits are of a nature not to require the power of flight they are very seldom entirely wanting, being found either in a rudimentary state, or modified in their structure so as to perform some other office. In those instances where the wings are only rudimentary, we cannot often assign any positive use for them; we can only perceive that the affinities of the individuals exercise an influence in these respects—that is to say, those species which belong to groups where the individuals generally possess perfect wings will often possess these members in a rudimentary state, when from their habits they do not require the power of flying*. It appeared necessary to make these few general remarks before proceeding to give the distinguishing characters of a coleopterous insect, in order that the nature of these characters and the departures from them might be understood; for it is difficult to give a strict definition of any group of animals.

The insects, then, which constitute the order Coleoptera may be characterized as having four wings, of which the two superior are not suited to flight, but form a covering and protection to the two inferior, and are of a hard and horny or parchment-like nature, and when closed, their inner margins, which are straight, touch and form a longitudinal suture (fig. 16, *c*); the inferior wings, when not in use, are folded transversely under the superior, and are membranous. From this character of having the *wings in a sheath*, the term Coleoptera was applied, it being composed of the two Greek words κολεός, a *sheath*, and πτερά, *wings*. The superior wings, which form the sheath, are generally called elytra.

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* The females of many moths have only rudimentary wings.

The principal exceptions to this general rule are as follows:—those beetles which have no under wings, or have them in a rudimentary state, as in Carabus cancellatus; and those in which the elytra are soldered together at the suture, in which case we believe no under wings are ever found. Another species of Carabus (*C. violaceus*) and many among the Heteromera afford examples of this exception. There are several beetles in which the elytra do not close at the suture, and in which the under wings are not protected by them. Such is the case in the genera *Sitaris*, *Ripiphorus*, and others in which the wing-cases, or elytra, are somewhat pointed; and in the genus *Molorchus*, among the Cerambycidæ, the wing-cases are very short, and the wings are not folded beneath them when at rest. In the Staphylinidæ the wing-cases are also very short, but the under wings, by a series of folds, are, when not in use, entirely concealed beneath them; and as in this tribe the elytra form a straight suture when closed, the only exception consists in the greater number of folds in the under-wings.

Numerous other exceptions might be noticed, but we will merely mention the genus *Meloe*, where one elytron partly folds over the other; the families Lampyridæ and Telephoridæ, in which the elytra are comparatively soft and flexible; and the glow-worm, the female of which beetle has neither elytra nor wings.

The larvæ of Coleopterous insects are generally composed of thirteen distinct segments, the head included. They are almost always of an elongate cylindrical or slightly depressed form; the body is often soft and fleshy, and of a white colour: in these the head is always of a firmer texture, being of a horny nature. The principal parts of the mouth are the same, as to number, as in the perfect insect, although the parts are (as far as our observations go) always differently formed. The head is furnished with two antennæ, which are generally minute, and composed of four joints; and ocelli, or simple eyes, on each side, situated near the base of the antenna. The body is furnished with six legs, which are attached, a pair to each of the three first segments, or those next the head: the legs are small, and usually terminated by a simple claw. Sometimes in addition to the ordinary legs, the larva is furnished with false legs (often termed pro-legs); these are fleshy tubercles which the animal can protrude at pleasure, and are used to propel the body. Some larvæ have only two of these pro-legs, which are attached to the apex of the terminal segment of the abdomen, or placed beneath that segment; and in the larvæ of the species of Cerambycidæ we find each segment of the body is thickened in the middle both above and below: these parts the animal has the power of protruding considerably, by which means it is enabled to thrust itself forwards or backwards in the holes in the trunks or boughs of trees which are formed by its feeding upon the wood.

The larvæ of groups (generally believed to be natural) very closely resemble each other, though those of different groups are sufficiently distinct: hence a knowledge of the larvæ is of great use in determining the natural affinities of species when their families or sections are not well ascertained.

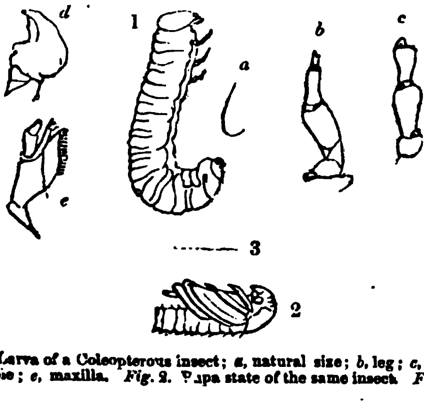

Fig. 1. Larva of a Coleopterous insect; *a*, natural size; *b*, leg; *c*, antenna; *d*, mandible; *e*, maxilla. *Fig.* 2. Pupa state of the same insect. *Fig.* 3. Natural size.

We select as an illustration of the principal characters of a Coleopterous larva, that of one of the Lamellicornes, a group which comprises the common cockchafer, and where the larvæ generally, if not always, have their body bent under at the apex.

We will now proceed to the pupa state of Coleopterous insects. Those larvæ that live in the ground generally prepare for the pupa state by removing the soil which surrounds them so as to form an open oval space: others form a species of cocoon around them, constructed of particles of earth, and other substances within reach, joined together by a kind of web or glutinous substance. Wood-feeding larvæ, or those that live in the trunks or bark of trees, for the most part assume the pupa state without such preparation.

Some larvæ which feed upon plants enclose themselves in a spherical cocoon; others again suspend themselves by the tail and hang from a leaf or stalk of the plant. In one instance we have known the animal to assume the pupa state within the skin of the larva *. The pupæ of Coleopterous insects are what is termed incomplete, *i.e.* all the parts of the perfect insect are distinctly visible, the legs, antennæ, wings, &c. being each enclosed in a separate sheath, and not, as in the pupa or chrysalis state of moths and butterflies, where all the parts are soldered together, or as in the pupæ of the Hemiptera (bug tribe), or Orthoptera (locust tribe), in which stage the insect is active, and in some instances cannot be distinguished from the perfect insect. This character, of *pupa incomplete*, is therefore one of great importance, and is generally added to the definition of a Coleopterous insect, for there are no other insects which, in the pupa state, are incomplete, and which, in the imago state could be confounded with the Coleoptera.

Having traced the beetle through the larva and pupa states, we arrive at the last or imago state, the perfect insect.

Beetles belong to the Mandibulata, which forms the first of the two great sections into which insects are divided: a section, the individuals of which are distinguished by their possessing distinct mandibles; and as the insects of the order Coleoptera possess the mandibles and all other parts of the mouth so well developed, they have by many been placed at the head of the insect tribe. We imagine, however, that the reasons stated for so doing are not sufficient †.

It would require considerable space to enter into the anatomy of an insect: we will therefore at present confine ourselves to the external parts of a beetle, and to those only which it is essential to know, in order to understand the description of these insects.

When we look at a beetle, we perceive that it is composed of three distinct parts, the foremost of which is the head; the next is called the thorax; and the last the abdomen.

The head is furnished with two eyes, two antennæ, and the various parts of the mouth, called the trophi. The eyes are situated on each side of the head, and are generally prominent, and always convex masses composed of an immense number of lenses arranged closely together, so that their interstices form hexagons. These are technically termed compound eyes, and are of a circular or oval form, frequently kidney-shaped, and in some instances (as in the genus Tetrops among the Cerambycidæ) they are completely divided.

The antennæ in Coleopterous insects have their origin generally near the eyes, and are situated for the most part either between them or before them. They are generally composed of eleven joints; in many, however, this number cannot be traced, whilst in some few there appear to be twelve ‡. The form of the antennæ is extremely variable, and will be best understood by an inspection of the following illustrations, among which will be found most of the more common forms, and some of the more extraordinary.

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* Megatoma serra, a little beetle, allied to the Dermestes, the larva of which is described in the 'Entomological Magazine,' vol. ii. p. 373.

† It appears that among the various characters which distinguish insects from other invertebrate animals, the great perfection of instinct displayed by them is one of the most striking features; we imagine therefore that that tribe which exhibits this quality in the highest perfection, and at the same time, the species of which possess in a well-developed state all the principal parts found in insects, ought to be looked upon as the head, or typical, group.

The insects constituting the order Hymenoptera, since they have all the parts of the mouth at least as well developed as in the Coleoptera, possess four wings formed for flight (which beetles do not), and exhibit the highest degree of instinct, ought, in our opinion, to be considered as the head of the insect tribe.

‡ In some of the species of the family Cerambycidæ.

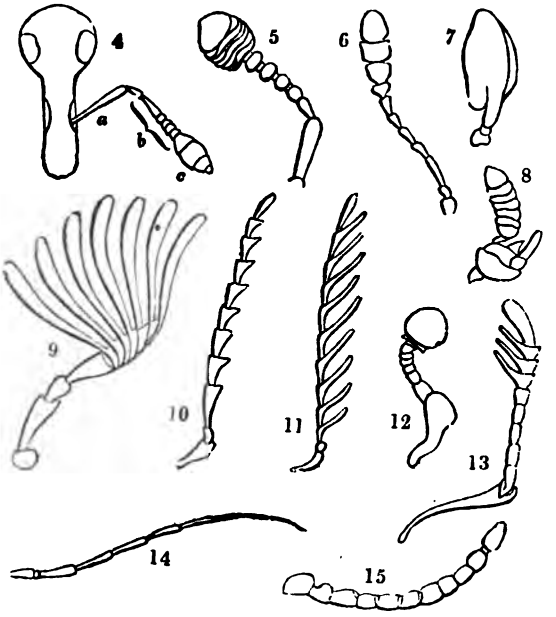
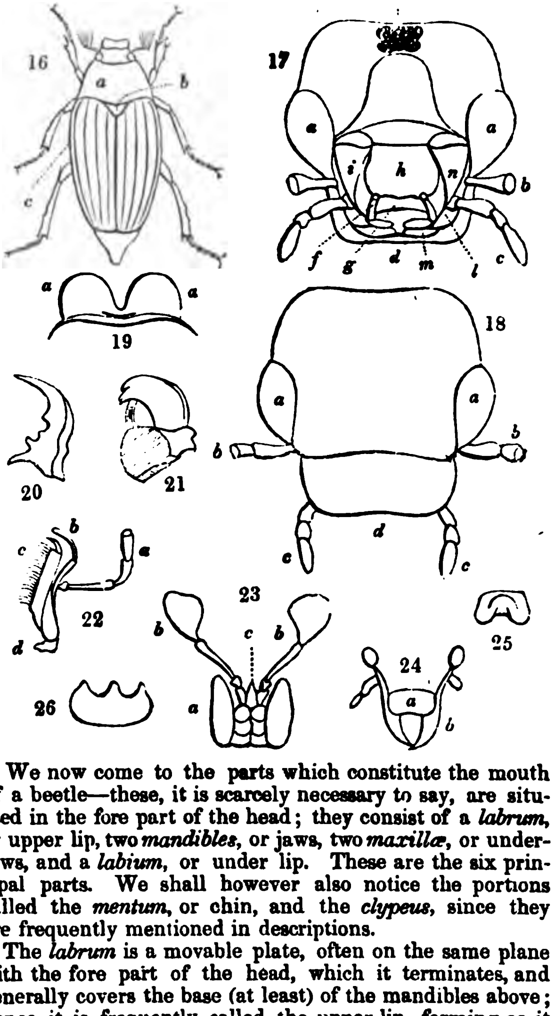


Fig. 4 represents the head (with one antenna attached) of one of the Curculionidæ, a large tribe of beetles, in which the antennæ are what is termed *geniculate**; that is, they have the terminal joints kneed, or bent at an angle with the basal joint. In describing beetles of this tribe, the antenna is generally divided into three parts. The long basal joint (*a*) is called the *scapus*, the several following joints (*b*) are termed the *funiculus*, and the terminal joints which form the knob (*c*) *clava*. *Figs.* 5 and 12 represent antennæ which are termed *capitate*, or which have the terminal joint or joints suddenly enlarged and forming a knob. When the knob exhibits distinct articulations (*fig.* 5), the antenna is termed *capitate with perfoliate knob*; and when the knob does not exhibit articulations, or is composed of a single joint, it is said to be *capitate with solid knob*. Examples of the former will be found in the genus Necrophorus, and of the latter in the genus Monotoma. *Fig.* 6 represents an antenna which becomes gradually thicker towards the apex, and which is termed *clavate*. *Fig.* 7 is the antenna of one of a most extraordinary group of beetles, the Pausidæ, many of which insects have the knob of that member swollen or inflated. *Fig.* 8 is an auriculate antenna, and is so called from its having an ear-like appendage at its base. This description of antenna is found in the genera *Parnus* and *Gyrinus*. *Fig.* 9 represents the antenna of the common cockchafer (Melolontha vulgaris). This form of antenna, which is termed lamellate† is found throughout the immense tribe of beetles called by Linnæus *Scarabæus*, and which has received the name of Lamellicornes from this peculiar character.

It must be observed however that slight modifications are found. *Fig.* 10 is a figure of a serrate antenna. Antennæ are so called when they have the apex of the joints widened, so as to resemble the teeth of a saw. Examples may be found in the Elateridæ and Buprestidæ. Pectinate antennæ (*fig.* 11) are those in which the apex of the joints is produced on one side, and which somewhat resemble the teeth of a comb. There are many examples of this structure in the antennæ of the Lampyridæ, &c., and there are some in which the joints are elongated on each side: these are termed *bipectinate*. *Fig.* 13 is what is called a fissate antenna (the joints on one side divided as by incisures). This form of antenna is found in the genus Lucanus. *Fig.* 14 represents a very common form of antenna (where it is slender and tapering gradually to the apex); it is termed *setaceous*, and most of the Carabidæ and Cerambycidæ will afford examples. The antennæ termed *filiform* somewhat resemble the last, but the joints are all of equal thickness throughout. The last description of antennæ which we shall notice are those termed *moniliform* (*fig.* 15). Here all the joints are oval or round, and resemble a necklace of beads. Examples are found in many of the species of the section Heteromera.

There are many other variations in the antennæ of Coleopterous insects which might be noticed, and for descriptions of which we refer our readers to Kirby and Spence's *Introduction to Entomology*, vol. iv., p. 324. Most of those here noticed are the more common forms, and occur frequently in our descriptions of insects of this tribe.



We now come to the parts which constitute the mouth of a beetle—these, it is scarcely necessary to say, are situated in the fore part of the head; they consist of a *labrum*, or upper lip, two *mandibles*, or jaws, two *maxillæ*, or under-jaws, and a *labium*, or under lip. These are the six principal parts. We shall however also notice the portions called the *mentum*, or chin, and the *clypeus*, since they are frequently mentioned in descriptions.

The *labrum* is a movable plate, often on the same plane with the fore part of the head, which it terminates, and generally covers the base (at least) of the mandibles above; hence it is frequently called the upper lip, forming as it does the upper boundary of the mouth.

This portion, although of various forms, is less liable to variation than most of the other parts of the mouth. The most common form perhaps is somewhat quadrate, or broader than long, as in *fig.* 24, *a*.

Upon referring to the article CARABUS, it will be seen that that genus and some other closely allied genera are separated chiefly on account of the difference in the form of this member. In one it is described as bilobate; by this is meant, that the labrum is notched in the middle, so that the two side pieces form lobes (see *fig.* 25). When the labrum is not thus notched, but presents an even anterior margin, it is described as *entire*. In one of the other genera (*Procrustes*), where the labrum is described as *trilobate*, the only difference consists in its having two notches on the anterior parts, and thus separated as it were into three lobes.

The *clypeus* is the part to which the labrum is attached, and which is usually on the same plane with it. The term *Clypeus* will seldom be found in descriptions, excepting in giving the characters of those beetles which belong to the Lamellicornes, a tribe in which this part is greatly developed (*figs.* 17 and 18, *d*), and where the labrum is hidden beneath it.

Under the labrum, the mandibles (*mandibulæ*) are situated. These, as their name implies, are the organs of manducation; they move horizontally, and are most commonly of a shape more or less approaching to a triangle. Their form however varies according to the food of the insect.

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* In Kirby and Spence's 'Introduction to Entomology,' the antennæ of the Curculionidæ are termed *Antennæ fractæ*; *Antennæ geniculatæ* being applied to such as the antennæ of the Meloe. The above, however, is the more common application of the term.

† From Lamellæ, layers.

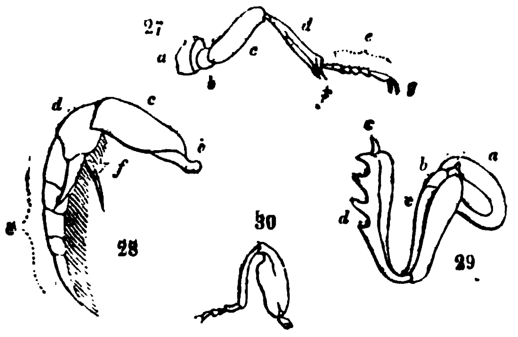
Generally speaking, in beetles which feed upon vegetable substances the jaws are broad, obtusely pointed at the apex, and have moreover a broad flat surface at their base (often with little sharp ridges), which somewhat resembles a molar tooth of herbivorous quadrupeds. (See *fig.* 21.) In those species whose habits are carnivorous, the jaws are longer and less stout, have the apex acutely pointed, and several sharp tooth-like processes on their inner side. (See *fig.* 20.)

Next in succession follow the *maxillæ*, or under jaws (*fig.* 17, *n*, and *fig.* 22): these organs are situated beneath the mandibles, and, like them, move horizontally. A typical maxilla consists of several parts, the principal of which are, the hinge (*cardo*), a piece situated at the base of the maxilla (*fig.* 22, *d*), the maxillary palpus (*fig.* 22, *a*), an articulated organ generally composed of four joints, the outer lobe (*lobus superior*), which in beetles of carnivorous habits is a two-jointed process (*fig.* 22, *b*) situated between the maxillary palpus and the inferior lobe (*lobus inferior*), which last portion constitutes the inner part of the maxilla, and is often formed like the blade of a knife, and furnished generally with a series of bristles or hairs on the inner edge. (See *fig.* 22, *c.*) The maxillæ seem to be used with the labium in directing the food during manducation, and the bristles on the inner edge appear to serve as a kind of strainer through which the juices are pressed, for we observe that solid substances are seldom swallowed by insects in their imago state.

The *labium*, or under lip (*fig.* 17, *h* and *g*, and *figs.* 23 and 26), is a movable organ which serves to close the mouth beneath, and is generally divided by a transverse suture, in which case the lower portion constitutes the *mentum*, or chin. The tongue (*fig.* 23, *e*), which may be considered as a portion of the labium, in Coleopterous insects, is usually situated at the apex of that member, or emerging from it. The *labial palpi* (*fig.* 23, *b*, *b*, and *fig.* 17, *f*) are two articulated organs, usually springing from the summit of the labium on each side.

Having now briefly noticed the head and its parts, we come to the thorax. On this portion it will be unnecessary to dwell: we need only mention that the thorax in insects is composed of the three first segments of the body, which in the larva state are usually distinct; these are termed the *prothorax*, *mesothorax*, and *metathorax;* and it generally happens that in the perfect insect one of these segments is greatly developed at the expense of the other two, particularly on the upper surface of the body; such is the case in the Beetle tribe, where the first portion or prothorax *fig.* 16, *a*) and the small plate (*fig.* 16, *b*), which is a part of the mesothorax, are all that is visible from above when the elytra are closed. Some few entomologists, therefore, in describing beetles, call the part (*fig.* 16, *a*) the prothorax, but it is most commonly called the thorax. The small plate (*fig.* 16, *b*) above referred to is called the scutellum, and is usually of a triangular form.

To the thorax are attached the legs and wings: the anterior pair of legs are attached to the prothorax; to the mesothorax the intermediate pair of legs and the anterior pair of wings, or elytra, as they are termed in the Coleoptera; and to the metathorax, the posterior pair of legs and the hinder pair of wings. Of the wings enough has been said for the present



The legs in beetles vary according to their habits: thus in some they are formed for running (*fig.* 27), in others for swimming (*fig.* 28); here they are very broad and flat; in others again their structure is suited to burrowing habits (*fig.* 29); and *fig.* 30 represents the hind leg of a beetle, which has the power of leaping to a great distance, where the thigh is very large.

A leg may be divided into five principal parts: the *coxa* or hip (*a*, *figs.* 27 and 29), which is the first joint, or that joined to the body, where it plays in a socket; the next part or second joint of the leg is the *trochanter* (*b*, *figs.* 27, 28, and 29); the third is the *femur* or thigh (*c*, *figs.* 27, 28, and 29); the fourth joint is called the *tibia* or shank (*d*, *figs.* 27, 28, and 29); the fifth and last part is the *tarsus* (*e*, *figs.* 27, 28, and 29); this part, in a great portion of the Coleopterous insects, is composed of five joints; in many a lesser number is found, but in none do they exceed five: the last joint of the tarsus is usually terminated by two hooked claws called *unguiculi* (*g*, *fig.* 27), and the apex of the tibia is furnished generally with two straight spines called the *calcaria*. (See *f*, *figs.* 27 and 28.)

The object in noticing the above parts of a Coleopterous insect is principally to make our descriptions of the species of this order intelligible to the general reader; and as the abdomen offers nothing of consequence, or rather nothing but what may be understood by its description under the various heads, we refrain from making any further remarks on the anatomy of the Coleoptera in this article, and now proceed to the classification.

As regards the classification of the Coleoptera, as well as of insects in general, in almost every work which treats of the subject, a new method is proposed. We shall content ourselves, however, with noticing two—that which is most commonly adopted on the continent, and that which is followed by most entomologists of our own country; the former is the method proposed by Latreille, and the latter that by Mr. Stephens.

In the classification of the Coleoptera, published by Mr. Stephens in his 'Systematic Catalogue of British Insects,' the various sections and subsections are as follows.

Order, COLEOPTERA.

Sect. 1. Adephaga
  Subsect. 1. Geodephaga
    2. Hydradephaga
    3. Philhydrida
    4. Necrophaga
Sect. 2. Chilognathomorpha
  Subsect. 1. Clavicornes
    2. Lamellicornes
    3. Sternoxi
    4. Malacodermi
Sect. 3. Helminthomorpha
  Subsect. 1. Rhinchophora
    2. Longicornes
Sect. 4. Anoplurimorpha
  Subsect. 1. Eupoda
    2. Cyclica
    3. Trimeri
Sect. 5. Heteromera
Sect. 6. Brachelytra

The arrangement of Latreille is founded upon the number of joints of the tarsi; he accordingly divides beetles into the four following great sections:—

Section 1. Pentamera, including all those beetles which have five joints to their tarsi.

Section 2. Heteromera, beetles with five joints to the tarsi of the two anterior pairs of legs, and four to those of the posterior pair.

Section 3. Tetramera, beetles with only four distinct joints to all the tarsi.

Section 4. Trimeri, beetles with only three distinct joints to the tarsi[*].

On comparing these two arrangements, it appears that there is considerable difference of opinion between the authors of them as to the value of certain groups. The Trimeri, according to Latreille, is made one of the four great sections, whilst Mr. Stephens makes the same group a subsection of a tribe of not equal importance with Latreille's first division, the *Pentamera*.

These discrepancies probably arise from the want of some standard by which the importance of characters may be estimated. We find a great number of insects possessing certain characters in common, but it often happens that we cannot ascertain what influence these characters have on the habits and economy of the individuals. In such instances, the most correct way perhaps would be to judge of the value of a character by its constancy; or, in other words, to consider that character of most importance, as regards classification, which is found in the greatest number of species, these species agreeing more or less in some other points.

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[*] In the two latter sections there is a minute rudimentary joint at the base of the terminal one.

In all groups of animals there are, however, certain typical characters to which all the species approach more or less, and which perhaps the greater portion actually possess. The typical characters of a group, and the departures from them, ought not therefore to be selected for constructing natural and equivalent groups. In the Coleoptera, for instance, the typical structure is to possess five joints to the tarsi; Latreille's first section (the *Pentamera*) consequently comprises at least half the species and several distinct groups, each of which is equivalent to one of his other sections.

It appears to us, being guided by the points above mentioned, that the order Coleoptera contains the thirteen following distinct sections, and that Latreille's groups are not natural.

All the Tarsi with five joints.

Section 1. Geodephaga, *Mac Leay.*
2. Hydradephaga, *Mac L.*
3. Brachelytra, *Latreille.*
4. Necrophaga, *Mac L.*
5. Palpicornes, *Lat.*
6. Lamellicornes, *Lat.*
7. Sternoxi, *Lat.*
8. Malacodermi, *Lat.*

Five joints to the tarsi of the two anterior pairs of legs, and four to the posterior pair.

9. Heteromera, *Lat.*

All the Tarsi with four joints.

10. Rhyncophora, *Lat.*
11. Longicornes, *Lat.*
12. Cyclica, *Lat.*

All the Tarsi with three joints.

13. Trimeri, *Lat.*

The number of species of beetles in existence may probably amount to between thirty and forty thousand.

The principal works on the Coleoptera are as follows:—Fabricius (J. C.), 'Systema Eleutheratorum;' Olivier (A. T.), 'Entomologie, ou Histoire Naturelle des Insectes,' 5 vols. folio. with coloured plates; Paykul (Gustavus), 'Fauna Suecica,' 3 vols.; Gyllenhal (L.), 'Insecta Suecica;' Schœnherr (C. J.), 'Genera et Species Curculionidum;' Dejean, 'Species général des Coléoptères;' five volumes of this work are published, and contain descriptions of the genera and species of the Carabidæ and Cicindelidæ. Besides these, the works of Germar, Illiger, Sturm, Knoch, and Duftschmid may be consulted; and the Coleoptera of our own country will be found described in Stephens's 'Illustrations of British Entomology.'

COLERIDGE, SAMUEL TAYLOR, was born at Ottery St. Mary in Devonshire, of which parish his father was the vicar, on the 21st October, 1772. He was the youngest of a numerous family, and became an orphan at the age of nine. Owing to the straitened circumstances of his family, he was sent to be educated at Christ's Hospital, where the late Charles Lamb was among his contemporaries. Here he made very great progress in classical knowledge; as may be inferred from the fact that he had, before his fifteenth year, translated the hymns of Synesius into English Anacreontics. His choice of these hymns for translation is explained by his having, even at that early age, plunged deeply into metaphysics. Speaking of himself in the 'Biographia Literaria' (vol. i. p. 15), he says, 'At a very premature age, even before my fifteenth year, I had bewildered myself in metaphysics and in theological controversy. Nothing else pleased me. History and particular facts lost all interest in my mind. Poetry itself, yea, novels and romances, became insipid to me.' From such pursuits he was however weaned for a time, while yet at Christ's Hospital, by the perusal of Mr. Bowles's Sonnets, which had then just been published. The powerful influence which these sonnets exercised upon his mind is described at length in the first chapter of the 'Biographia Literaria.'

In 1791 Coleridge entered Jesus College, Cambridge. While at the university, he did not turn his attention at all to mathematics; but obtained a prize for a Greek ode, and distinguished himself in a contest for the Craven scholarship, in which Dr. Butler the present bishop of Lichfield, was the successful candidate. He did not take a degree. During the second year of his residence he suddenly left the university in a fit of despondency, occasioned, it is said, by unrequited love; and after wandering for a while about the streets of London in extreme pecuniary distress, terminated this adventure by enlisting in the 15th dragoons, under the assumed name of Comberback. One of the officers, accidentally discovering his classical acquirements, was led to conclude that Comberback was something more than he professed. Questioning him in a friendly manner, and eliciting his real history, he communicated Coleridge's situation to his friends, who forthwith effected his discharge.

Coleridge now betook himself to Bristol, where Mr. Southey was then residing. He shortly after set on foot a periodical entitled the 'Watchman,' which was to advocate liberal opinions; and made a tour through the northern manufacturing towns for the purpose of canvassing for subscribers. An account of this tour, amusing on the whole, is contained in the 10th chapter of the 'Biographia Literaria.' The periodical, owing partly to a want of punctuality in its appearance, and partly to the fact that its opinions were not those which its supporters had expected, did not live beyond the ninth number.

In the autumn of 1795 Coleridge married Miss Sarah Fricker of Bristol, Southey on the same day wedding himself to her sister. He now took a cottage at Nether Stowey, a village at the foot of the Quantock Hills, in Somersetshire, where he was in the immediate neighbourhood of his friend and benefactor, Mr. Poole, and of Mr. Wordsworth, who was then living at All-Foxden. He was at this time in the habit of contributing verses to one of the London papers, as a means of subsistence. In 1796 he published a volume of poems, the greater number of which had been written at earlier periods, interspersed with some by Charles Lamb; and in 1797 a second edition appeared, with the addition of some poems by Charles Lloyd[*].

During the three years, moreover, in which Coleridge resided at Nether Stowey, the greater part of his principal poems was composed, though most of them were not published until later. In the conversations on poetry which constantly took place between Mr. Wordsworth and himself was first formed the plan of the afterwards famous Lyrical Ballads; and in pursuance of this the 'Ancient Mariner' and the first part of 'Christabel' were written in 1797. His tragedy, 'The Remorse,' was also written at this period.

Coleridge was at this period of his life a unitarian. He says of himself, 'I was at that time and long after, though a trinitarian (*i. e. ad normam Platonis*) in philosophy, yet a zealous unitarian in religion; more accurately, I was a *psilanthropist*, one of those who believe our Lord to have been the real son of Joseph, and who lay the main stress on the resurrection rather than the crucifixion.' (*Biogr. Lit.*, vol. i., p. 168.) While at Nether Stowey, he used to preach in a unitarian chapel at Taunton.

In 1798 Coleridge was enabled, through the munificence of the late Mr. Thomas Wedgwood, to visit Germany, for the purpose, as he expresses it, of finishing his education. At Göttingen he attended Blumenbach's lectures on physiology and natural history, and studied, in the notes of a young German student, Eichhorn's lectures on the New Testament. He took lessons from Professor Tychsen in the Gothic of Ulphilas, being anxious to attain a critical knowledge of the German language; and went through a complete historical course of German literature. His acquaintance with the writings of the later German metaphysicians was not formed until some time after his return to England.

After his return from Germany, Coleridge resided at the Lakes, where Mr. Southey and Mr. Wordsworth had then settled, the one at Keswick, and the other at Grasmere. The appellation of Lake-poets, given to these three individuals after the publication of the 'Lyrical Ballads,' is well known.

Coleridge now became connected with the Morning Post, and wrote both on politics and literature. From about 1808 to about 1814 he contributed to the Courier. In 1804 he had visited his friend Dr. Stoddart at Malta; and from May of that year to October of the next, he acted as secretary to Sir Alexander Ball, then governor of the island. After his return to England in 1808, he delivered a course of lectures on poetry and the fine arts at the Royal Institution. The 'Friend' appeared in the course of the next year, being then published as a periodical at the Lakes. As a pecuniary speculation it was not much more successful than the 'Watchman,' nor with reference to pecuniary advantage was it more judiciously conducted; but it continued for a longer time. Mr. Wordsworth gave some literary assistance, contributing the 'Essay on Epitaphs,' which is now appended to the 'Excursion,' and the 'Introductory Essay' of the third volume.

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[*] It is stated in the 'Biographia Literaria' (vol. i., p. 2), that this volume of poems appeared in 1794. The title-page of the earliest edition that we have been able to find (and the absence of the words 'second edition' from the same title-page renders it improbable that there should have been an earlier edition than this) says 1796.

Coleridge left the Lakes in 1810, and did not afterwards return to them. On his first arrival in London he resided with Mr. Basil Montagu; and not long afterwards became the guest of Mr. Gillman at Highgate, in whose house he died. The many friendships which Coleridge attracted to himself through life, the sincerity and constancy of which were abundantly shown, place in a striking light the amiability of his character.

It was not before the commencement of his residence in London that he formed any very extensive acquaintance with the writings of the later German metaphysicians; by the adoption of whose method and terminology, rather than by any development of a system, in his subsequent publications, he has come to be accounted the representative of German metaphysics among us. He published successively, between the years 1817 and 1825, the two 'Lay-Sermons,' the 'Biographia Literaria,' the *rifaccimento* of the 'Friend,' the 'Constitution of the Church and State according to the Idea of each,' and the 'Aids to Reflection.'

Coleridge having no profession, slothful and imprudent, was during the greater part of his life in pecuniary distress. After his connexion with the newspaper-press had ceased, and his remaining hopes of self-support were derived from his later poetical and prose publications, his publisher became a bankrupt in 1819. This was a severe blow to Coleridge. The dependent situation in which it placed him preyed much upon his mind. We see him, in the collection of his letters which has been lately published, projecting various schemes to relieve himself. One of these was a scheme of systematic contribution to Blackwood's Magazine, the publisher of which was his friend. Accordingly, No. 1 of a 'Selection from Mr. Coleridge's Literary Correspondence' appeared in the number of that Magazine for October, 1821, and was to have been followed by a sketch of the history and philosophy of Superstition, with other interesting disquisitions. But the No. 2 never appeared. Continued ill health, combined with, and to a certain extent caused by, a habit of using opium which Coleridge had contracted, having originally resorted to it, under a mistaken notion, for medicinal purposes, had taken away from him by this time even what little amount of perseverance he might once have possessed[*].

On the incorporation of the Royal Society of Literature by George IV. in 1825, Coleridge was selected as one of the ten Royal Associates, and as such received from that time 100 guineas a year out of the king's private purse. The annuity was withdrawn at the commencement of the present reign.

In his later years Coleridge was in the habit of holding weekly *conversazioni* at Mr. Gillman's house in Highgate. Those who knew little else of Coleridge are familiar by report with his extraordinary conversational powers. Of these the two volumes of 'Table Talk,' which have been published give no adequate notion. His conversation was not in fragments, but was wont to continue without aid from others, in the way either of suggestion or of contradiction, for hours at a time. All things human and divine, joined with one another by subtlest links, entered into his discourse; which, though employed upon abstrusest subjects, was a spell whose fascination even the most dull or ignorant could not resist.

In June, 1833, Coleridge was present at the meeting of the British Association of Science held that year in Cambridge. He died on the 25th July, 1834, in his 62nd year.

Though not a man of strong character, Coleridge possessed many amiable qualities. He had all the social affections strongly developed. Though he was not, in our opinion, eminently successful in attaining it, he had an earnest desire of truth. Thus he was by nature tolerant. But in his later years disease seems to have engendered an asperity in judging of the motives of others which was by no means consonant with the tenor of his earlier publications. To the same cause must be assigned a querulousness of disposition, which is exhibited in almost all his prose writings.

He was in person, as Mr. Wordsworth has described him, 'a noticeable man with large grey eyes.'

As a writer, Coleridge is to be viewed principally under two aspects: as a poet, and as the author of certain prose writings which, though miscellaneous in character, are chiefly employed upon metaphysical subjects.

As a poet, he was for a long time coupled, owing to the joint publication of the Lyrical Ballads and other accidental circumstances, with Mr. Wordsworth. Now that the derision against the Lake-school, eminently unjust as falling chiefly upon Mr. Wordsworth, has died away, the force of reaction has supplied a tendency, also erroneous in our opinion, as far as Coleridge is concerned, to run into the opposite extreme of admiration. In his translation of Schiller's 'Wallenstein' he has displayed taste and judgment of a high order. His own tragedies, the 'Remorse' and 'Zapolya,' contain many passages excellent for the apt expression of just thoughts and tender feelings. The 'Ancient Mariner' is a successful effort of fancy, in a region which had not before been tried; and the 'Christabel' contains a highly-wrought passage on divided friendship, which those who have once read cannot forget. In some of his smaller poems again a happy conceit is happily developed. But he is a poet of art rather than of nature. He has himself frequently admitted that his earlier poems are faulty, by reason of turgidness of style. It may be added that they show few signs of an original genius. There is none of that freshness and individuality about them which have always marked the earliest efforts of great poets, which (to confine ourselves to modern instances) are seen in all the poems of Wordsworth and Shelley, and in a most remarkable degree in the lately-published poems of Mr. Tennyson. And even in that department of poetic art which pertains to melody, in which we admit Coleridge's excellence, we deem the Choric Song in Tennyson's 'Lotos-Eaters' far superior to Coleridge's 'Kubla Khan.'

As regards the attainment of their chief professed end, or the advancement of mental, moral, and political science, we consider Coleridge's prose writings of little or no value. To overthrow the ascendency of Locke and Paley was, we learn from himself, the object of his ambition. In the first place, we approve not of such an object; in the second place, we assert that next to nothing was done towards its accomplishment.

In mental science, or psychology, he espoused a particular hypothesis (that propounded by Schelling) of the *absolute*. Now Schelling and Fichte and Cousin, and other philosophers of this school, appear to us to have perverted psychology as completely as, and more perniciously than, the Materialists. Each set of philosophers have transcended the limits of consciousness, and have left observation for conjecture. But, apart from the system itself, Coleridge has done little either to advance or diffuse it. As he got it from Germany, so has he left it[*]; and his writings, from their method and style, are not fitted for the use of learners.

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[*] One among the many inaccuracies into which the English Opium-eater (Mr. De Quincey) has fallen in his articles on Coleridge in Tait's Magazine, is a statement that Coleridge first resorted to opium for the pleasurable excitement which it affords. This statement has been contradicted by the editor of Coleridge's Table-Talk, who also informs us that Coleridge had entirely conquered the habit some time before his death.

[*] The passage in Coleridge's writings which approaches nearest to a systematic exposition of his views, viz., the 12th chapter of the 'Biographia Literaria,' is little more than a translation from the introduction to Schelling's 'System of Transcendental Idealism.' Mr. De Quincey (Tait's Magazine, Sept., 1834) has, in respect of this passage, charged Coleridge with *plagiarism* from Schelling. Professing to bring five instances, of which this is one, of unavowed obligation to other writers, he has founded upon these a charge of habitual plagiarism.

As regards the particular charge, which relates to this passage in the 'Biographia Literaria,' the observations which are made concerning Schelling in the preceding chapter, and which have been misrepresented by Mr. De Quincey, acquit Coleridge of plagiarism.

As regards the general charge, the instances brought forward are also inadequate to its establishment. One of them, that concerning the interpretation of the Pythagorean caution against beans, is altogether frivolous. The next, though they are not adequate to establish a habit of plagiarism, are adequate to prove that Coleridge was accustomed to trust to others for suggestions upon which he improved, and for ideas which he elaborated. Of this habit another instance is supplied by Alvar's dungeon soliloquy in the 'Remorse' (act v., scene 1), the ideas, and to a certain extent, the words of which are derived from Caleb's prison soliloquy in Godwin's 'Caleb Williams.' The anecdote concerning the origin of the 'Ancient Mariner,' and Coleridge's denial of it (which anecdote neither Mr. Hare nor Mr. Nelson Coleridge have given any reason for disbelieving), are eminently characteristic of a person having this habit. The habit may be partly accounted for by indolence. It is chiefly to be explained, we believe, by the fact that Coleridge's was not properly an original mind.

In moral science, which, properly speaking, is no other than what Hobbes long ago stated it to be, the science of what is just and what is unjust, and which, thus viewed, has been significantly named Deontology by Mr. Bentham, Coleridge also followed the later German metaphysicians. These make moral science a part of, and in fact confound it with, psychology. In following them he thought it necessary to declare eternal warfare against the school of writers who have been absurdly named 'Utilitarians.' He contends for a something within us which, 'being absolutely *unique*, no man can *describe*' (*Friend*, vol. i., p. 256), which 'bearing the same relation to God that an accurate timepiece bears to the sun,' faithfully tells God's will, and which has the various names of 'universal reason,' 'practical reason,' 'moral sense,' 'moral instinct,' 'conscience.' 'Good and evil,' 'just and unjust,' are determined by the decisions, from which there is no appeal, of this inward monitor. This system professes to be diametrically opposed to that which makes the whole tendency of an action to affect men's happiness, or the sum of possible consequences in respect of general happiness, the principle of morality. Yet its professors cannot stir beyond the bare enunciation of their own principle without drawing for aid upon the principle which they impugn. But, inasmuch as they disavow this aid, their system comes before us as one continued *petitio principii*.

Coleridge's political doctrines are explained in the first section of the 'Friend.' This section is but one series of confusions and mis-statements. In the very outset the phrases 'political justice' and 'origin of government' are used as convertible expressions. Hobbes is made to deny *right* and *duty*. Rousseau's theory of a social contract, as explanatory of the origin of government, is accounted proof that he could not and did not admit expediency as the principle by which the government when formed should be guided. Other similar instances might be easily cited.

Yet there is not one of Coleridge's prose writings which has not incidental merits sufficiently many and great to rescue it from oblivion—merits discernible either in scattered criticisms on our older writers both of poetry and prose, or in illustrations drawn from stores of knowledge which a very wide reading had amassed, or in passages of great acuteness and sound practical wisdom, whenever the author lowers his flight to subjects to which such qualities can be applied with any hope of profit. And though, from the combined effects of indolence and of an intense devotion to conversational display, his ordinary style of writing is rambling and obscure, these works contain occasional passages of great beauty and power. In treating lighter subjects, his style may even be pronounced happy. Witness his account of Sir Alexander Ball in the third, and the tale of Maria Schöning in the second, 'Landing-place' of the 'Friend.'

Coleridge's fame will principally rest upon his powers as a critic in poetry and the fine arts. To establish his fame in this respect, there are his Lectures delivered at the Royal Institution (just published in the 2nd volume of Coleridge's 'Literary Remains'), his review of Mr. Wordsworth's poetry, in the 2nd volume of the 'Biographia Literaria,' which is perhaps the most philosophical piece of criticism extant in the language, and also his review of Mr. Maturin's 'Bertram,' which, though, when first published, it exposed him to much obloquy and many imputations of jealousy, is distinguished from common criticisms, if by nothing else, by a constant reference to first principles and a freedom from personality.

We do not place Coleridge in the first class of thinkers and writers; nor do we consider his to have been, in any high degree, an original mind. In support of this opinion, our limits will now only allow us to adduce the two following considerations. First, he was ever changing his opinions: and each new opinion, bringing with it a new idol, was preached with the utmost extravagance until it was in its turn displaced by another. Secondly, one fault which pervades his prose writings is an excess of quotation. They are the works (and, so far as this implies praise, we most willingly concede it) of a man of very extensive reading; but they are also the works of one who requires something from another whereon to hang whatever he may himself have to say.

COLET, JOHN, the founder of St. Paul's School, was born in the parish of St. Antholin, London, in 1466, and was the eldest son of Sir Henry Colet, Knight, twice Lord Mayor, who had, besides him, twenty-one children. In 1483 he was sent to Magdalen College, Oxford, where he passed seven years, and took the usual degrees in arts. Here he studied Latin, with some of the Greek authors through a Latin medium, and mathematics. Having thus laid a good foundation of learning at home, he travelled abroad for further improvement: first to France, and then to Italy, in which two countries he continued from 1493 to 1497. Before his departure however, and indeed when only of two years standing in the university, he was instituted to the rectory of Denington in Suffolk, being then in acolythe's orders, to which he was presented by a relation of his mother, and which he held till his death. His father also presented him in 1485 to the rectory of Thyrning, in Huntingdonshire, which he resigned in 1493. At Paris he became acquainted with Budæus, and was afterwards introduced to Erasmus. In Italy he contracted a friendship with numerous eminent persons, and especially with some of his own countrymen, among whom were Grocyn, Linacre, Lilly, and Latimer, all of whom were studying the Greek language, then but little known in England. Whilst abroad he devoted himself chiefly to divinity and the study of the civil and canon law. During his absence from England he was made a prebendary of York in 1497, and was also made a canon and prebendary of St. Martin's-le-Grand in London. He returned in this year, and was ordained deacon; taking priest's orders in the following year. Soon after this he retired to Oxford, where Erasmus came, and renewed his friendship with him. In Oxford he read public lectures upon St. Paul's Epistles gratuitously. In 1502, having proceeded in divinity, he became prebendary of Durnsford in the church of Salisbury, and in 1504 resigned his prebend at St. Martin's-le-Grand. In the same year he commenced D.D. In May, 1505, he was instituted to the prebendary of Mora in St. Paul's, London, and in the same year and month was appointed Dean. In this office he reformed the decayed discipline of his cathedral, and introduced a new practice of preaching himself upon Sundays and great festivals. By his own, and by other lectures which he caused to be read there, he mainly assisted in raising that spirit of inquiry after the holy Scriptures which eventually produced the Reformation; but the contempt which he avowed for the abuses in religious houses, his aversion to the celibacy of the clergy, and the general freedom of his opinions, made him obnoxious to some of the clergy, and especially to Fitzjames, then bishop of London, who accused him to Archbishop Warham as a dangerous man, and even preferred articles against him. Warham however dismissed the case. From Bishop Latimer's sermons it should seem that Fitzjames afterwards tried to stir up the king and court against him. Tired with trouble and persecution, Colet began to think of retiring from the world. He had now an ample estate, without any near relations, for numerous as his brethren had been, he had outlived them all. He resolved therefore, in the midst of life and health, to consecrate his fortune to some lasting benefaction, which he performed in the foundation of St. Paul's School, of which he appointed William Lilly first master in 1512. He ordained that there should be in this school a high master, a sur-master, and a chaplain, who should teach gratis a hundred and fifty-three children, divided into eight classes; and he endowed it with lands and houses then producing an income of 122*l.* 4*s.* 7½*d.* per annum, of which endowment he made the Company of Mercers trustees. The gross average income of St. Paul's School is now about 5300*l.* per annum. (Carlisle's *Grammar Schools*, vol. ii. p. 94.) To further his scheme of retiring, Colet built for himself a handsome house near the royal palace of Richmond in Surrey, in which he intended to reside, but having been seized by the sweating-sickness twice, and relapsing into it a third time, a consumption ensued, which proved fatal, Sept. 16, 1519, in his fifty-third year. He was buried in St. Paul's choir, with an humble monument which he had himself prepared some years before, bearing simply his name. Another monument was afterwards set up for him by the Mercer's Company, of a handsomer description; but it was destroyed in the fire of 1666. It had previously been engraved for Dugdale's 'History of St. Paul's.' Dean Colet's works were, 1. 'Oratio ad Clerum in Convocatione,' anno 1511; reprinted by Dr. Samuel Knight, in the appendix to his Life of Colet, with an old English translation of it, supposed to have been done by the author himself. 2. 'The construction of the Eight Parts of Speech, entitled Absolutissimus de octo Orationis partium constructione Libellus,' 8vo. Antw. 1530. 3. 'Rudimenta Grammatices,' for the use of his school, commonly called 'Paul's Accidence,' 8vo. 1539. 4. 'Daily Devotions;' said not to be all of his composition. 5. 'Monition to a godly Life,' 8vo. 1534, &c. Many of his letters are printed in Erasmus's Epistles, and five, with one from Erasmus, in the appendix to Knight's Life. The original Statutes of St. Paul's School, signed by Dean Colet, were, some years ago, accidentally picked up at a bookseller's, by the late Mr. Hamper of Birmingham, and by him presented to the British Museum. (Knight's *Life of Dr. John Colet*, 8vo. Lond. 1724; Wood's *Athenæ Oxon.*; Chalmers's *Biogr. Dict.*, vol. x., pp. 31-36.)

COLIBRI. [HUMMING BIRDS.]

COLIC, (from κῶλον, *colon*,) *dolor colicus*, called by Sydenham and the old English writers the dry belly-ache; a disease attended with severe pain of the bowels, remitting and recurring at intervals, with constipation, and without fever. The seat of this malady is conceived to be chiefly, if not entirely, in that portion of the large intestines called the colon, and hence its name. It arises from a great variety of causes, and assumes a corresponding variety of forms, many of which have received distinct names; but pain and constipation of the bowels, with the absence of fever, are common to them all; and this concurrence of symptoms is essential to the medical notion of colic.

The pain in colic often most distinctly follows the course of the colon, while the morbid distension and contraction of the bowel (for these two morbid states alternate with each other, and attack successively different portions of the intestine) often become visible to the eye. The colon receives all that portion of the food which is not converted into chyle, together with all those portions of the pancreatic, biliary, and intestinal secretions, which do not form component parts of the chyle. Consequently it has a considerable mass of matter to carry downwards and convey out of the system. It is provided with muscular fibres, very much larger than those which belong to the small intestines. These fibres form three large bands, which are placed in a longitudinal direction along the intestine, and which produce the effect of dividing the inner surface of the colon into folds, so disposed as to form little distinct apartments called cells. In these cells the feculent matter, which should be slowly but progressively carried downwards, is sometimes collected and closely impacted, so that when at length rejected it has the form of those cells constituting hard rounded balls, termed *scybalæ*. The natural stimulus to the muscular fibres of the colon is the resinous portion of the bile [BILE], together with the non-nutrient portion of the aliment. It is easy then to conceive how a loss or diminution of the contractile power of these fibres may occasion the constipation incident to colic, attended with the retention of the feculent matter in the cells of the colon; how a suppression or an altered condition of the bile may contribute to the same effect; and how an acrid quality of the bile and of the non-nutrient portion of the aliment may produce the irritation and pain incident to colic. The colon then, both from its structure and function, it is obvious must be peculiarly predisposed to such an affection as that to which, from the frequency with which it is the subject of the malady, it has given a name. It is perhaps desirable that the term colic should be restricted to the designation of a disease of a definite character, seated in the colon; and some medical writers do so limit the use of the term, though others give it a more extended signification, and with less propriety include under it diseases which do not arise primarily in the colon, but in some neighbouring organ, the colon being only secondarily and sympathetically affected.

Colic, properly so called, is attended with severe griping pains in the bowels, which often follow very accurately the course of the colon; sometimes having their seat in one portion of it and sometimes in another. These pains remit for a time, affording intervals of ease; but they soon return with increased violence. They are often relieved by pressure, a character by which they are distinguished from pain occasioned by inflammation, the latter being always increased by pressure. The pain is usually attended with a greater or less degree of flatulence. The flatus sometimes collects to such an extent as to occasion a prodigious dilatation of the bowels, greatly increasing the pain. When the digestive process is perfectly natural, it is always attended with the evolution of some portion of gas; in disordered states of digestion, the quantity of gas is often very much increased. But in colic the quantity generated is sometimes greater than can possibly be derived from this source; there would appear to be an actual generation of a gaseous fluid, probably from the blood. While one portion of the intestine is thus preternaturally distended, another portion is in a state of preternatural contraction, from the irregular spasmodic action of the muscular fibres of the colon, excited by the irritating cause—whatever it may be—which produces the disease. These irregular spasmodic contractions of the colon are always present when this disease is severe, and are intensely painful. The constipation, which is so constant as to be a diagnostic character of the malady, is often long continued and obstinate, and the consequent accumulation of feculent matter is very great. To the preceding train of symptoms is very frequently superadded vomiting, which is often urgent and most distressing; and in cases of the greatest severity, the action of the whole intestinal tube above the seat of the disease is inverted, and the fæces are mixed with the matter vomited. Occasionally there is hiccough, and very often the griping pains are attended with loud rumbling noises in the interior of the intestines.

It is unnecessary in this place to enter into the details of the varieties of this malady to which physicians have assigned distinct names, since these varieties are merely modifications of the same disease produced by different causes. The preceding account will be sufficient to give to the general reader a distinct conception of the nature of the malady, and of the causes which produce it; and it is only necessary to observe respecting the treatment, that the two great principles on which the cure depends are the complete evacuation of the intestine, and the strict regulation of the diet. It is indispensable that the evacuation of the intestine of its accumulated and irritating contents should be complete, and this is best affected by an alternation of mild and unirritating aperients, with opiates. After the intestine has been fully relieved of its load, it is necessary to persist in a course of mild aperients for a considerable time; because the bowel long remains in an irritable state, and very slight causes are apt to occasion a relapse. For the same reason only the most bland and unirritating substances should be taken as food; all acid and acrid matters in the solid and all stimulating matters in the fluid aliment should be most carefully avoided.

COLIGNY, GASPARD DE, born in February, 1516, was the son of Gaspard de Coligny, lord of Châtillon-sur-Loing and marshal of France, and of Louise de Montmorency, sister to the famous duke and constable of that name. Coligny served in Italy under Francis I., and was present at the battle of Cerisoles. Henry II. made him Colonel-General of infantry, and afterwards, in 1552, Admiral of France. In the latter capacity he sent a colony to Brazil, which however was soon after driven away by the Portuguese. Coligny himself continued to serve in the army by land. He defended St. Quentin against Philip II., and was made prisoner at the surrender of the place. Having embraced the reformed religion, he became, with Louis prince of Condé, one of the great leaders of the Protestant party against Catherine de' Medici and the Guises, during the reign of Charles IX. Coligny was much respected by his party: he was prudent in his plans and cool in danger; defeat did not dishearten him, and he rose again after it as formidable as ever. After the loss of the battle of Dreux, in which Condé was taken prisoner, Coligny saved the remains of his army. The following year peace was made, but in 1567 the civil and religious war broke out again, and the battle of St. Denis was fought, in which the old Constable Montmorency, who commanded the royal or Catholic army, was killed. A short truce followed, but hostilities broke out again in 1569, when the battle of Jarnac was fought, in which the prince of Condé was killed. Coligny again took the command and saved his army, which was soon after joined by the prince of Béarn (afterwards Henry IV.), then sixteen years of age, and Henry the son of Condé, who was but seventeen. The prince of Béarn was declared the head of the Protestants, but Coligny exercised all the functions of leader and commander. On the 3rd of October, 1569, Coligny lost the battle of Moncontour, against the duke of Anjou (afterwards Henry III.). Still Coligny continued the war south of the Loire, gained several advantages, and at last a peace was concluded at St. Germain in August, 1570, which was called 'la paix boiteuse et mal assise,' because it was concluded by the Sieur de Biron, who was lame, and by De Mesmes, lord of Malassise. The peace however fully deserved its nickname, by the spirit in which it was concluded by the Court. The leaders of the Protestants, and Coligny among the rest, entertained strong suspicions on the subject, but they were lulled into security by the apparent frankness of Charles IX., and the approaching marriage of the prince of Béarn with the Princess Margaret, the king's sister. Coligny came to Court, and was well received, but on the 22nd of August, 1572, he was shot at in the street by an attendant of the duke of Guise. The wounds however did not prove dangerous. The attempt was made at the instigation of the duchess of Nemours, whose first husband, Francis duke of Guise, had been assassinated by a Huguenot fanatic at the siege of Orléans in 1563, when Coligny was unjustly suspected of having directed the blow. On the 24th of August, 1572, two days after the attempt upon Coligny's life, the massacre of 'la Sainte Barthélemi' took place. [Bartholomew, Massacre of.] The duke of Guise himself led the murderers to the house of the admiral, but remained in the court below, while Besme, one of his servants, went up followed by others. They found Coligny seated in an armchair; 'Young man,' said he to Besme, 'you ought to respect my grey hairs; but do what you will, you can but shorten my life by a few days.' They stabbed him in several places, and threw him, still breathing, out of window into the court, where he fell at the feet of the duke of Guise. His body was left exposed to the fury of the populace, and at last was hung by the feet to a gibbet. His head was cut off and sent to Catherine de' Medici. Montmorency, cousin to the admiral, had his body secretly buried in the vaults of the château of Chantilly, where it remained in a leaden coffin till 1786, when Montesquieu asked for the remains of Coligny from the duke of Luxembourg, lord of Châtillon, and transferred them to his own estate of Maupertuis, where he raised a sepulchral chapel and a monument to the memory of the admiral. After the revolution the monument was transferred to the Musée des Monumens Français, and a Latin inscription was placed upon it by M. Marron, the head of the Protestant consistory at Paris. (Coligny's biography in the *Hommes Illustres de France*, and *Dictionnaire Universel Historique*, art. 'Coligny.')

COLISE'UM, properly Colosseum. [Amphitheatre.]

CO'LIUS. [Fringillidæ.]

COLLATERALS. [Consanguinity.]

COLLATION. [Benefice.]

COLLE'GIUM, or **CONLE'GIUM**, from the word 'colligo,' 'to collect or bring together,' literally signifies any association or body of men. The word Corpus was also used in the same sense, and those who were members of a collegium or corpus were hence called corporati. The word Universitas was sometimes used as equivalent to Collegium or Corpus, but it had also the more general signification of 'community,' or 'collective body of citizens.' In the Roman polity collegium signified any association of persons such as the law allowed, and which was confirmed by special enactment or by a senatus consultum, or an imperial constitution, in which case it was called Collegium Legitimum. A collegium necessarily consisted of three persons at least. (*Dig.* 50, tit. 16, l. 85.)

In general, any association or collegium, unless it had the sanction of a senatus consultum, or of the emperor, was illegal (illicitum); but when dissolved, the members were allowed to divide the property of the association according to their respective shares. The members of a collegium were called sodales: the terms and object of their union or association might be any that were not illegal.

A great variety of collegia (many of them like our companies) existed at Rome and in the empire, as we see by antient writings and inscriptions, such as the Collegia Fabrorum, Pistorum, Pontificum, Fratrum Arvalium, Virorum Epulonum, Augurum, &c. Some of these, such as the colleges of Pontifices and Augurs, were of a religious character. These collegia possessed property as a corporate body; and in the time of the emperor. M. Antoninus, if they were collegia legitima, they could take a legacy or bequest (*Dig.* 40, tit. 5, l. 20) in their corporate capacity. Collegia were allowed, as a matter of course, to have a common chest, and an actor, syndicus or attorney, to look after their rights and interests, and appear on their behalf. (*Dig.* 3, tit. 4, l. 1.) The maxims, that what was due to a university was not due to the individual members, and that the debts of universities were not the debts of the individual members, and that even though all the members were changed, the university still existed, comprehend the essential notion of a corporation as now understood. In most cases the members probably filled up vacancies in their own body; as to the mode of election in the college of Augurs, see Augurs.

In England a College is an eleemosynary lay corporation, of the same kind as an hospital, existing as a corporate body either by prescription or by the grant of the king. It is not necessarily a place of learning. An hospital also is not necessarily a mere charitable endowment, but is sometimes a place of learning, as Christ's Hospital, London. Its particular form and constitution depend on the terms of the foundation. A college consists of a head, called by the various names of provost (præpositus), master, rector, principal or warden, and of a body of fellows (socii), and generally of scholars also, besides various officers or servants, according to the peculiar nature of the foundation. A college is wholly subject to the laws, statutes, and ordinances which the founder makes, and to the visitor whom he appoints, and to no others. All elections, and the general management of a college, must be in conformity with such statutes or rules. If a college does not exceed its jurisdiction, the king's courts have no cognizance, and expulsion of a member is entirely within its jurisdiction. If there is no special visitor appointed by the founder, the right of visitation, in default of the heirs of the founder, devolves upon the king, who exercises it by the great seal. When the king is founder, his successors are the visitors.

The general power of a visitor is to judge according to the statutes of a college, to expel and deprive for just reason, and to hear appeals. His precise powers are determined by the founder's statutes, and if there are any exceptions to his power, the jurisdiction in such excepted cases devolves on the king. Certain times are generally named in the statutes for visitation, but the visitor may visit whenever he is called in, it being incident to his office to hear complaints. So long as a visitor keeps within his jurisdiction his acts cannot be controlled, and there is no appeal from him, as was decided in the well-known case of Philips *v.* Bury, or the case of Exeter College, Oxford. (Show. P. C. 35). The visitors are not bound to any particular forms of proceeding, and, in general, want of jurisdiction is the only ground on which they are liable to prohibition. If a visitor's power is not limited or defined, he must use his best discretion. If a power to interpret the statutes is given to any person, as to the bishop of the diocese, this will constitute him and his successors visitors. The heirs of a founder cannot alter the statutes, unless such a power is expressly reserved; and it appears, that where the king is founder, his successors cannot alter statutes without the consent of the college, unless such a power is reserved. But as to the power to alter statutes, it must be observed, that in the case of the crown at least, it has not unfrequently been done, though such a power might now possibly be disputed, unless expressly reserved to the founder and his heirs by his original statutes.

Whenever a visitor is appointed, the Court of Chancery never interferes with the internal management of a college; but this court exercises jurisdiction on all matters pertaining to the management of the funds, considering that as to the funds of a college, those who possess the legal estate are in the situation of trustees. If governors, or persons called visitors, have the legal estate, and are in trusted with the rents and profits, the Court of Chancery will make them account. In colleges, when a new foundation is engrafted on the old one, it becomes part of the old one, and subject to the same visitorial authority, unless new statutes are given with the new foundation.

The validity of all elections in colleges must be determined by the words of the founder's statutes or rules. In the disputes that have arisen on elections, the point has generally been, whether the master's concurrence is necessary, or whether a bare majority of the electors, of which electors the master is one, is sufficient. In Catharine Hall, Cambridge, fellows must be elected 'communi omnium consensu aut saltem ex consensu magistri, et majoris partis communitatis;' and it was held by Lord Eldon, upon these words and another clause which follows, that no election was valid in which the master did not concur.

The statutes of Clare Hall, Cambridge, require 'that the election of a fellow shall be by the master and the major part of the fellows present'; and here it was held (A.D. 1788) that a valid election might be made without the concurrence of the master. But this interpretation is obviously wrong, and is referred to with disapprobation in the recent case of Queen's College, Cambridge, 5 Russell.

Colleges (13 Eliz., c. 10), cannot grant leases of their land beyond 21 years, or three lives; and in such leases the accustomed yearly rent, or more, must be reserved, payable yearly during the term. By 18 Eliz., c. 6, in all leases made by colleges in the universities, and by the colleges of Winchester and Eton, one-third of the whole rent must be reserved in corn. The Mortmain Act of 9 Geo. II., c. 36, which has put considerable obstacles in the way of gifts of land or money to be laid out in land in England, for charitable purposes, does not extend to the two universities of Oxford and Cambridge, or to colleges in the two universities, nor to gifts in favour of the scholars of Eton, Winchester, and Westminster. This statute contained a restriction as to the number of advowsons which a college in either of the universities was allowed to hold; but this restriction was removed by 45 Geo. III., c. 101, having been found, as the preamble to this statute sets forth, injurious to learning. These colleges can therefore now purchase and hold as many advowsons as they please.

A collegiate church is a church that has a college or chapter of canons, but no bishop, and yet is under the authority of a bishop. The canonists require three canons at least to constitute a collegiate church, because three, according to the Roman law, were required to make a college. These collegiate churches are sometimes simply called colleges. In the case of Manchester College, a mandamus was directed to the bishop of Chester, as warden of Manchester College, to admit a chaplain. The bishop happened also to be visitor of the college. It was held by the King's Bench, that in the case of a spiritual corporation the jurisdiction was in that court, unless there was an express visitor appointed, and the court interposed in the present case because there was no separate visitorial power then existing, owing to the union of the wardenship and visitorship in the same person. This case was afterwards provided for by an express Act, 2 Geo. II., c. 29.

As to the relation between the English universities and the colleges within their limits, see UNIVERSITY and CAMBRIDGE and OXFORD. The nature of a college in the English universities, considered simply in itself, will be best understood by referring to the particular accounts of colleges in this work, as Brasenoze, All Souls, Balliol, &c.

The statutes of all the old colleges in England are in Latin; and, indeed, with the exception of some comparatively modern endowments, probably all college statutes are in Latin. Those of Eton College, of Trinity College, Cambridge, and of St. John's College, Cambridge, which may serve as specimens of the statutes of such foundations, are printed in the Education Reports of the House of Commons, 1818.

Meiners (*Geschichte der Enstehung und Entwickelung der Hohen Schullen*, &c., Göttingen, 1802, vol. i.) has given an interesting chapter on the origin of colleges in universities. The colleges in the University of Paris were the first institutions of the kind in Europe, though it is a mistake to suppose them older than the university itself.

The terms college and university have been often confounded in modern times, and indeed are now sometimes used indiscriminately. Some of the incorporated places of learning in the United States, which confer degrees, are called universities, and some are called colleges, though there is in fact no distinction between the two. Some of these institutions called colleges contain the schools or departments of arts, law, medicine, and theology; and some that are called universities contain only those of arts, law, and medicine. Some of these colleges are more limited as to the objects of instruction, but still confer degrees. If we look to the origin of colleges and their connexion with universities, it will be evident that the indiscriminate use of these terms is incorrect, and tends to lead to confusion. When an incorporated college, such as the College of Surgeons in London, is empowered to confer a degree or title after examination of candidates in a single department, some other name would be more appropriate. The word Academia, which is the most modern of all the terms applied to places of higher instruction, has been most usually applied to endowed corporate bodies which have for their object the improvement of some particular science or some particular branch of knowledge, in some cases with the power to confer degrees in such particular science, &c., and sometimes without this power. Yet the terms academia and university have also often been used, and now are used indiscriminately. (Meiners, vol. iv., *On the Different Names of High Schools*.)

The history of the Scotch universities shows that the terms college and university were, both at the time of the foundation of these institutions and subsequently also, used with little discrimination; and this carelessness in the application of the terms has led to anomalies in their constitution, and no little difficulty in comprehending the history and actual constitution of these bodies. (See the *Report of the Royal Commission of Inquiry into the State of the Scotch Universities*, printed 1831; and Malden's *Origin of Universities*, London, 1835.)

In France, the term college signifies a school, though the constitution of a French college is very different from that of our grammar-schools. It comes nearest, perhaps, to a German gymnasium. Of these colleges there are about 320, every large town having one of them. They are maintained by the towns, their heads and professors being paid out of the revenues of the communes. They are all under the superintendence of the University of France. There are also about forty royal colleges, in which the directors (*administrateurs*) and professors are paid by the state. The College Royal of France, founded by Francis I., has above twenty professors, who lecture on the various sciences and the oriental languages. (See *Journal of Education*, No. III. 'On the State of Education in France.')

COLLIER, JEREMY, was born on the 23rd of September, 1650, at Stow Qui in Cambridgeshire. He was educated under his father, who was master of the free-school of Ipswich. In 1669 he was admitted of Caius College, Cambridge, and in 1676 took the degree of M.A. He resided some time as chaplain with the countess dowager of Dorset, and then received the small rectory of Ampton, in Suffolk. In 1685 he resigned this living and came to London, when he was soon appointed lecturer of Gray's Inn. At the revolution of 1688 he put himself in opposition to the government and the church as established under William III., and engaged in a hot controversy with Burnet, afterwards bishop of Salisbury. One of his publications, 'The Desertion Discussed, in a Letter to a Country Gentleman,' (4to. 1688) gave great offence to the new government, and Collier was sent a close prisoner to Newgate, where he remained some months, and whence he was, at last, discharged without ever being brought to trial. This persecution did not cool his zeal: during the four following years he published a number of works, which were all of a political and controversial nature. Towards the end of 1692 Collier, with Newton, who was also a non-juring clergyman, was arrested at a solitary place on the Kentish coast, whither he was supposed to have gone for the purpose of communicating with the partisans of the house of Stuart on the other side of the water. After a short examination before the earl of Nottingham, secretary of state, he was committed to the Gate-house. There was no evidence against him; but in consequence of his questioning the legality of the courts, and refusing bail, he suffered a short imprisonment in the King's Bench.

In the course of 1692 and 1693 he published six more works, all hostile to government. In 1696 he was prosecuted for giving church absolution to Sir John Friend and Sir William Perkins, who were convicted of being accessories in the plot to assassinate King William. Collier absconded and was outlawed. The outlawry was never revoked, but the energetic divine, after the first rigour was abated, seems to have cared little for it. He lived in London or its suburbs till his death, supporting himself by his literary labours. In the course of the very year in which he was outlawed he put forth five political works. The next year he published the 1st volume of his 'Essays upon several Moral Subjects,' adding a 2nd vol. in 1705, and a 3rd in 1709. These essays were much admired at the time. It was, however, in 1698 that he produced the work by which he is now best known: 'A Short View of the Immorality and Profaneness of the English Stage, together with the Sense of Antiquity upon this Argument,' 1 vol. 8vo. The 'Short View' was almost as severe upon theatres and theatrical writers as Prynne's famous 'Histrio-Mastix,' published about 65 years before. It led to a controversy with Congreve and Vanbrugh, in which many sheets were printed on both sides, many hard names exchanged, and in which Collier, to whom contest was a delight, is thought to have had the better of his adversaries. After three other defences of his 'View,' he published, in 1703, 'Mr. Collier's Dissuasive from the Play-house, in a Letter to a Person of Quality, occasioned by the late calamity of the Tempest.' This literary combat lasted ten whole years; but Collier lived to see the English stage become much more decent than it had been—an improvement to which he had doubtlessly contributed.

Between the years 1701 and 1721 he translated and published Moreri's great 'Historical Dictionary,' and wrote and published 'The Ecclesiastical History of Great Britain,' in two huge folio volumes. The history was attacked by Bishop Burnet and others, to whom Collier replied with his usual vigour. He was the author of a few other religious and controversial papers. He died on the 26th of April, 1726, in the 76th year of his age, and was buried in the church-yard of St. Pancras, London.

COLLIMATION, LINE OF, the line of sight in any astronomical or geodesical instrument. [Circle.] Where a telescope is used, this name is given to the line joining the centre of the object-glass and the intersection of the fine wires or spiderwebs in its focus, this being the direction of any object which is there seen bisected by the observer.

COLLIMATION, ERROR OF. In most instruments the line of sight is supposed to have a certain relation to other parts. Thus in a transit telescope it ought to be perpendicular to the horizontal axis, in a circle or quadrant it should be in a horizontal or vertical direction when the reading of the limb is 0° or 90°. When this is not the case, the difference between the existing and required positions is called the *error of collimation*, which must be carefully ascertained, and be corrected or allowed for, or eliminated in the mode of conducting the observations. This will be particularly explained as each instrument comes under our notice. Many readers will have a general notion of the error of collimation from the mode in which a workman tries the truth of his square, or of the mason's level, which in principle is nearly allied to the methods of astronomers. When the telescope was originally applied to astronomical instruments, the mystery of ascertaining the true direction of a line which could not be mechanically examined, presented considerable difficulties to some observers. Hevelius of Danzig never could be induced to apply telescopic sights to his sextants or quadrants, and in consequence of this prejudice much of the labour of his long and active life was completely wasted.

COLLIMATOR, the name given by Captain Kater to his contrivance for determining the error of collimation in any principal instrument, without the reversal of the instrument itself. This reversal troublesome in all large instruments, and in mural circles and quadrants is forbidden by their construction. We shall give a sketch of Captain Kater's collimators and those antecedent to his invention, and a drawing and description of a *level* collimator, which on the whole we think best suited for common use. Where the adjustments, &c., mentioned are not described, the reader will find them in the article Circle.

On referring to the description of each instrument, it will be seen that the determination of the error of collimation requires—1. a well-defined object, of which the direction remains unchanged; 2. a reversal of the instrument, similar to that of the mason's level; 3. for angular instruments, a power of determining the relation of the direction of that object to a vertical line. Now a near object cannot be seen on the wires of a telescope when they are in the focus of the object-glass, and a distant object is very seldom sufficiently steady or sharply defined. This want may be supplied by a second telescope, having its axis parallel to the axis of the telescope under examination and nearly in the same right line, which has cross wires in its focus; the object-glasses being towards each other. As parallel rays falling on an object-glass converge to the focus, so rays diverging from the focus become parallel after refraction at the object-glass, and emerge as if they came from a real object at an infinite distance; hence the cross wires in the supplementary or collimating telescope will be seen distinctly in the *direction* of the line joining the cross and the centre of the object-glass, in whatever part of the cylinder of issuing rays the eye may be placed. Great care is requisite in adjusting the wires of the collimating telescope exactly to focus, especially if a short telescope be used; but the axes of the two telescopes need only be approximately in a right line.

In many of the private observatories in England, a metal plate with sharp lines or dots engraved upon it, is firmly secured to an outside stone and viewed through a lens fixed in the wall of the observatory, the distance between the lens and the mark being equal to the focal distance of the lens. It is evident that such a mark may be used for determining the error of collimation in altitude of a reversible circle, and in all cases where merely a distinct and distant object is required. If the position of the mark be permanent, and the focal length of the lens be considerable, this may be advantageously used as a *meridian mark* [Transit]; but then the lens should have a separate support within the observatory, and the position of the mark should be jealously watched and verified. Dr. Rittenhouse first made use of this substitute for a distant mark (*American Philosophical Transactions*, vol. ii. p. 181); and we believe Dr. Maskelyne at one time used an adaptation of the same principle, viz., a cap with a lens of long focus, slipping over the object end of his transit telescope, to view the south meridian mark at Greenwich, which was too near the observatory to be seen distinctly.

The collimating telescope and its cross wires are thus made to supply the want of a distinct, distant, and immovable object. In the *Astronomische Nachrichten*, No. 43, Professor Gauss, after enunciating the optical property above mentioned, used it for measuring the intervals between the wires of a transit telescope by a theodolet, which viewed them through the object-glass of the transit. In No. 61 of the same work, Professor Bessel applied the same principle to a still more important purpose, that of determining the horizontal flexure of the telescope of his meridian circle. After taking out the object-glass and eye-piece of this instrument (or the instrument might have been raised out of the way), he placed two collimating telescopes, one to the north and the other to the south of the circle, looking into each other, and nearly in the horizontal line which passed through the centre of his instrument. These he adjusted to have their cross wires apparently upon each other, when the two object-glasses and the two crosses are evidently all in the same right line. The object-glass and eye-piece were then replaced in the circle telescope, and the angle between the two crosses of the collimator measured, which would have been exactly 180°, without flexure; hence the difference from 180° was the double horizontal flexure of the circle telescope. Bessel further remarks, that a vertical telescope turning freely round in its collars, and having a cross level attached, might be used for determining the true zenith point of any instrument, without reversing the latter. The date of this publication is July, 1824.

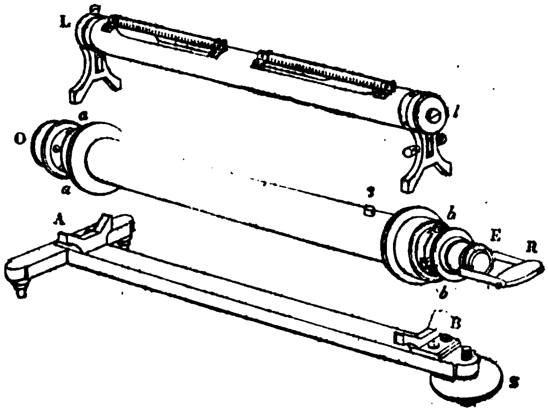
Captain Kater, who had not heard of either of these memoirs, gave, in the *Philosophical Transactions*, 1825, p. 147, a description and figure of a *horizontal floating* collimator. This is a telescope laid horizontally upon a block of cast iron, which floats in a vessel filled with mercury. This collimator was designed for determining the *zenith point* of mural and other irreversible circles. The cross of the collimating telescope is observed by the circle telescope in one direction, suppose to the north, and the divisions read off. The trough of mercury with the collimator floating in it, is then transported to the south of the circle, the cross again bisected, and the divisions read off as before. If the angle which the line of sight of the collimating telescope makes with the horizon be supposed to be unchanged by this change of place, it is clear that half way between the means of the two sets of readings is the reading corresponding to the vertical position of the circle telescope. Again, as the difference of the north and south mean readings would equal 180°, if the collimating telescope were truly horizontal, half the excess of this difference above 180°, or half the defect from 180°, will be the angle which the collimating telescope makes with the horizon. We believe however that, in addition to the trouble of moving such an apparatus, the permanence of the position of the collimating telescope could not be relied upon if at all disturbed.

In the *Philosophical Transactions*, 1828, p. 257, Captain Kater proposed a very much improved form of this instrument, which he called the *vertical* floating collimator. The iron float is here a ring swimming in an annular trough, and the telescope, which is placed vertically, has a clear view through the centre of the float and trough. This collimator may be placed below the instrument to be examined, when the collimating telescope will have its object-glass uppermost, or, as is most usual, above the instrument, when the collimating telescope looks downwards. A smooth rotatory motion upon rollers can be given to the annular trough, when it is evident the line of sight of the collimating telescope will either be and continue to be vertical (supposing the position of the float to be permanent), or will describe a conical surface of which the axis is vertical. Hence if the cross be bisected in two opposite positions of the collimator by the telescope of a circular instrument, the mean of the two readings will be the reading of the zenith of the instrument.

It will, generally speaking, be convenient to adjust the axis of the collimating telescope truly vertical. To do this, first observe the position of the cross by a circle or transit telescope, turn the collimator half round, and note the position again; then, by placing a small weight upon the float, bring the cross half way between the two observed positions. Turn the collimator a quarter round and perform the same adjustment for this and its reversed situation. The axis of the collimating telescope is now truly vertical. From some trials, which however we must admit were not made under favourable circumstances, we do not think the vertical floating collimator capable of giving results as accurate as may be obtained by other means; but it ought also to be stated that there is a good deal of difference of opinion among practical astronomers upon this point.

In the accompanying figure we have represented a more portable, and perhaps a more accurate instrument for determining the error of collimation, and also the position of the horizon, than either of the floating collimators.

The three parts of which this collimator consists have been separated from each other for easier comprehension. The telescope O E rests with its ground cylindrical collars, *a a*, *b b*, in the rectangular Y's, A, B of the stand. These collars should be truly cylindrical, and, if possible, exactly equal. There are cross wires which must first of all be placed correctly in the focus of the object-glass, when the screw *c* is to be tightened. To adjust the cross-wires, bring the intersection of the cross to bisect any distinct and immovable object (the wires of another telescope, for instance), turn the telescope half round in its Y's, and then, by releasing one of the four adjusting screws, (the heads of which are seen near *b b*,) and screwing up its antagonist, bring the cross *half way* back to coincidence, and complete the coincidence by screwing S. When this has been done satisfactorily, adjust the cross in the transverse direction by the other two screws, and it will then be found that the telescope can be turned round without any apparent change of place in the cross wires, that is, the line of sight is in the axis of the collars or parallel to the axis. The reflector R, which is merely to throw the light of the sky or a lamp upon the wires, may now be put on.



[Level Collimator, Troughton and Simms.]

The collimator being thus adjusted, is to be set to the north or south of the circle under examination, and at the same height as the centre of the telescope, when the axis of the collars is to be made horizontal by the reversible level *L l*, and the foot screw S. When the cross of the collimator is bisected by the wires of the circle telescope, the telescope is horizontal, and the mean reading of the circle microscope is the reading of the *horizontal point*, which, if the circle reads altitudes, should be 0°, and if zenith distances, should be 90°. The difference from these values is the error of collimation. By setting the collimator to the other side of the instrument any error of flexure may be detected.

We have said that the cylindrical collars should be perfectly equal, but it is not easy to make them so. The difference is easily ascertained by reversing the telescope in its Y's, end for end, and again applying the level. Suppose the level to have shown perfect horizontality before reversing, and that afterwards the reading towards O exceeds that towards E, by m''. It will easily be seen that $\frac{m''}{4}$ must always be *subtracted* from the indications of the level towards O. It is equally evident, that if, after the above correction is made, the object end O appears too high by n'', that the true angle with the vertical is $90 + n''$, or that the reading of the circle should show n'' of depression. The different cases which may occur present no difficulty. If the collars are truly cylindrical and the level a delicate one, such a collimator should show the true horizontal point within 1″. The telescope should not be very small, not less than 12 inches.

It would scarcely be just not to notice under this head an instrument by Roemer, which has as much merit, as an invention, as any of these which we have described. It consists of two equal lenses fixed in a tube at a distance somewhat exceeding their focal length, with a system of wires in the focus of each, between the glasses. By applying the proper eye-piece at each end, the near wires, and consequently objects through the most distant object glass, are made visible. The two object-glasses and the crosses of the wires being all adjusted in the same straight line, it is evident that, on looking in at each end of the tube, objects 180° apart will be seen on the crosses. Roemer called this tube an *amphioptron*, or *reciprocal telescope*, and used it for the transit adjustment in collimation of his *rota meridiana*. (Horrebow, *Basis Astronomiæ*, p. 97.)

For further details, see Pearson's *Practical Astronomy*, vol. ii., p. 446, plate xxi.

COLLIN, KOLIN, or NEU-KOLIN, a town in the Bohemian circle of Kaurzim, situated on the Elbe. It lies in 49° 59′ N. lat., 15° 10′ E. long., and contains 420 houses and about 5800 inhabitants, among whom are numbers of Jews. Large quantities of garnets, topazes, and cornelians are found in the vicinity, and polished here. In the neighbourhood, between the castle of Chotzemitz and the village of Planian, general Daun, the commander of the Austrian army, gained the famous victory over Frederick the Great on the 18th of June, 1757.

Collin contains a haupt-schule, or grammar school, and a manufactory of potash and one of cottons; a monastery of Capuchins, a church and a town-hall, both in the Gothic style, and a castle with grounds and a botanical garden attached to it. The town is well built, surrounded by walls, and finely placed upon an elevated rock, beneath which the Elbe has a considerable fall.

COLLINGWOOD, CUTHBERT, ADMIRAL LORD, was born on the 26th of September, 1750, at Newcastle-upon-Tyne. At the age of eleven he was sent to sea, as a midshipman, under the care of Captain, afterwards Admiral Brathwaite, who was the son of his mother's sister, and who seems to have taken extraordinary pains in giving him nautical knowledge. After serving some years with this relation, he sailed with Admiral Roddam. In 1774, during the American war, he went to Boston with Admiral Graves, and, in 1775, was made a lieutenant by him, on the day of the battle of Bunker's Hill, when Collingwood, with a party of seamen, supplied the British army with what it required. In 1776 he took the command of the Hornet sloop, and soon after met, at Jamaica, with his favourite companion Horatio Nelson, who was then lieutenant of the Lowestoffe. Collingwood says, in one of his interesting letters: 'We had been long before in habits of great friendship, and it happened here, that as Admiral Sir P. Parker, the Commander-in-Chief, was the friend of both, whenever Nelson got a step in rank, I succeeded him: first in the Lowestoffe, then in the Badger, into which ship I was made commander in 1779, and afterwards in the Hinchinbroke, a 28-gun frigate, which made us both post-captains.'

Although Nelson, who was a younger man, always kept a remove a-head of him, and came in for a much larger share of fame or popularity, Collingwood never had a feeling of jealousy towards his friend, whose merits he was always the first to extol, and whom he loved to the last hour of his life. Nelson, on his part, seems to have had a greater affection for Collingwood than for any other officer in the service.

In 1780 Nelson was sent, in the Hinchinbroke, to the Spanish Main, with orders to pass into the South Sea, by a navigation of boats along the river San Juan, and the lakes Nicaragua and Leon—a physical impossibility which no skill or perseverance could surmount. Nelson caught the disease of the climate, and his life was with difficulty saved by sending him home to England. Collingwood, who succeeded him at the San Juan river, had many attacks: his hardy constitution resisted them all, and he survived the mass of his ship's company, having buried in four months 180 of the 200 men who composed it. Other ships suffered in the same proportion. In August, 1781, Collingwood was wrecked in the middle of a dreadful night in the Pelican, a small frigate which he then commanded, on the rocks of the Morant-keys in the West Indies, and saved his own and his crew's lives with great difficulty. His next appointment was to the Sampson 64. In 1783 he went to the West Indies in the Mediator, and remained with his friend Nelson on that station till the end of 1786. He then returned, after 25 years' uninterrupted service, to Northumberland, 'making,' as he says, 'my acquaintance with my own family, to whom I had hitherto been, as it were, a stranger.' In 1790 he again went to the West Indies, but a quarrel with Spain being amicably arranged he soon returned, and seeing, as he says, no further hope of employment at sea, he 'went into the north and was married.' In 1793 the war with the French Republic called him away from his wife and two infant daughters, whom he most tenderly loved, though he was never after permitted to have much of their society. As captain of the Barfleur he bore a conspicuous part in Lord Howe's victory of the 1st of June, 1794. In 1797 he commanded, with his usual bravery and almost unrivalled nautical skill, the Excellent 74, in Jarvis's victory of the 14th of February, off Cape St. Vincent. In 1799 he was raised to the rank of rear-admiral. The peace of Amiens, for which he had long prayed, restored him to his wife and children for a few months in 1802, but the renewed war called him to sea in the Spring of 1803, and he never more returned to his happy home. This constant service made him frequently lament that he was hardly known to his own children; and the anxieties and wear and tear of it shortened his valuable life. Passing over many less brilliant but still very important services, Collingwood was second in command in the battle of Trafalgar, fought on the 21st of October, 1805. His ship, the Royal Sovereign, was the first to attack and break the enemies' line, and, upon Nelson's death, Collingwood finished the victory and continued in command of the fleet. He was now raised to the peerage. After a long and most wearying blockade of Cadiz, the Straits of Gibraltar and adjacent coasts, during which, for nearly three years, he hardly ever set foot on shore, and showed a degree of patience and conduct never surpassed, he sailed up the Mediterranean, where his position involved him in difficult political transactions, which he generally managed with ability. The letters to foreign princes and ministers, the despatches of this sailor who had been at sea from his childhood, are admirable even in point of style. Completely worn out in body, but with a spirit intent on his duties to the last, Collingwood died at sea on board the Ville de Paris, near Port Mahon, on the evening of the 7th of March, 1810. In command he was firm but mild—most considerate of the comfort and health of his men, averse to flogging and all violent and brutal exercises of authority; the sailors called him their father. As a scientific seaman and naval tactician he had few, if any equals, and in action his judgment was as cool as his courage was warm. His mind was enlightened to an astonishing degree, considering the circumstances of his life; he was liberal and kind-hearted, and all his private virtues were of the most amiable sort. His letters to his wife on the education of his daughters are full of good sense and feeling. (*A Selection from the Public and Private Correspondence of Vice-Admiral Lord Collingwood: interspersed with Memoirs of his Life.* By G. L. Newnham Collingwood, Esq., F.R.S., 2 vols. 8vo., second edit. Lond., 1828.)

COLLINS, JOHN, the son of a nonconformist clergyman, was born at Wood Eaton, in Oxfordshire, March 5, 1624. He was at first apprenticed to a bookseller at Oxford, but went abroad during the civil war, and served the Venetians at sea against the Turks. After the restoration he was made accountant to the excise office, which office was abolished before 1670. From that time he supported himself mostly by his skill in accounts. He died in London, November 10, 1683.

Collins was an early member of the Royal Society, and contributed some fair papers to its transactions. (Numbers 30, 46, 69, 159.) He also wrote several elementary works, which it is not now necessary to mention. His claims to remembrance are the intimate communication in which his attainments placed him with all men of science at home and abroad, from Newton downwards. The influence of his request and recommendation produced (as is asserted) Barrow's Lectures, his Archimedes and Apollonius, Branker's Translation of Rhonius, Kersey's Algebra, and Wallis's History of Algebra. The esteem in which Collins, a poor accountant, was held by men so much above him in external position, as Newton, Barrow, Wallis, &c., is honourable to all parties. The principal result however of their epistolary intercourse is the work on the invention of fluxions, published in 1712, under the title of 'Commercium Epistolicum,' &c., which will be noticed in a separate article. [COMMERCIUM EPISTOLICUM.] (See the *Biogr. Dict.*, which cites Birch; *Hist. Roy. Soc.*; and Wood, *Fasti Oxon.*)

COLLINS, ANTHONY, was born in 1676 at Heston, near Hounslow, in Middlesex. His father, Henry Collins, Esq., was an independent gentleman, with an income of 1800*l.* a year. After the usual preparatory studies at Eton, he went to King's College, Cambridge, and had for his tutor Francis Hare, afterwards bishop of Chichester. He then became a student of the Temple, and married a daughter of Sir Francis Child, lord mayor of London. During 1703 and 1704 he carried on a correspondence with Locke, who appears to have cherished a most enthusiastic friendship for him. Twenty-five letters of Locke to Collins are preserved in the 'Collection of Pieces by Locke, not contained in his works,' published by Des Maizeaux, 8vo., 1720. In one of these, dated October 29, 1703, Locke says to his friend, 'Your complaining of a great many defects is the highest recommendation I could desire to make me love and esteem you, and desire your friendship; and if I were setting out in the world, I should think it my greatest happiness to have such a companion as you, who have a true relish of truth—would in earnest seek it with me—from whom I might receive it undisguised, and to whom I might freely communicate what I thought true. Believe it, my good friend, to love truth for truth's sake is the principal part of human perfection in this world, and the source of all other virtues: and if I mistake not, you have as much of it as ever I met with in any body. What then is there wanting to make you a friend for any one to be proud of?' In one dated Oates, September 11, 1704, he says, 'Your soul is enriched with the most valuable qualities of human nature, truth and friendship: what a treasure have I then in such a friend with whom I can converse, and be enlightened about the highest speculations.' In one dated the 1st of the following October he says, 'My infirmities prevail so fast upon me, that unless you make haste hither I may lose the satisfaction of ever seeing again a man that I value in the first rank of those I leave behind me.' In a remarkable letter, dated August 23, 1704, and addressed 'For Anthony Collins, Esq., to be delivered after my decease,' Locke, after speaking of having left property to Collins, and the guardianship of a young friend, concludes with 'May you live long and happy—I know you loved me living, and will preserve my memory now I am dead. Adieu, I leave my best wishes with you.' In 1707 Collins published an essay concerning human reason as supporting human testimony. It was replied to by Bishop Gastrell. The same year he entered into a controversy with Dr. Samuel Clarke, in support of Dr. Dodwell's book against the natural immortality of the human soul. Five successive rejoinders were elicited. (*General Dict.*, fol., 1736; and *Biog. Brit.*) In 1709 he published 'Priest-craft in perfection, or detection of the fraud of inserting and continuing this clause (the church hath power to decree rites and ceremonies, and authority in controversies of faith) in the 20th article.' It passed through three editions in the same year, and occasioned a very general and anxious inquiry. Numerous pamphlets, sermons, and books discussed the question. Two works especially were written against it with great labour, and were supplied with hints and materials from all quarters of the church: one, entitled 'A Vindication of the Church of England from Fraud and Forgery, by a Priest,' 8vo., 1710; the other, a long-delayed and elaborate essay on the Thirty-nine Articles, by Dr. Bennet, 8vo. To these Collins replied in his historical and critical essay on the Thirty-nine Articles, in 1724, proving (p. 277-278) that the clause has neither the authority of the convocation nor of the parliament. Collins's next work was entitled 'A Vindication of the Divine Attributes,' being remarks on a sermon of the archbishop of Dublin, which asserted the consistency of divine foreknowledge and predestination with human free-will. He went in 1711 to Holland, where he formed a friendly intercourse with Le Clerc, and other leading characters among the learned of that country. On returning to England he published, in 1713, his 'Discourse on Freethinking,' which excited much animadversion among the clergy. The most important of the replies which appeared was that by Dr. Bentley, entitled 'Remarks on the Discourse of Freethinking by Phileleutherus Lipsiensis,' which is remarkable as a display of learned sagacity, coarse wit, and the most intemperate abuse. The object of Collins is to show that, in all ages, the most intellectual and virtuous men have been freethinkers; that is, followers of philosophical reasoning, in disregard of established opinions. There are several French editions of this work. It was reprinted at the Hague, with some additions and corrections derived from Bentley's Remarks. On the continent it was answered by Crousaz, and several others. The 'Clergyman's Thanks to Phileleutherus,' 1713, is by Bishop Hare. Collins, on returning from a second residence in Holland, was made justice of the peace and deputy-lieutenant of the county of Essex, offices which he had previously held in Middlesex. In 1715 he published his 'Philosophical Inquiry concerning Liberty and Necessity,' which was reprinted in 1717 in 8vo., with corrections. It was translated into French, and is printed in the 'Recueil de Pièces sur la Philosophie,' &c., by Des Maizeaux, 2 vols. 12mo., 1720. Dr. Samuel Clarke replied to the necessarian doctrine of Collins, chiefly by insisting on its inexpediency, considered as destructive of moral responsibility.

In 1718 Collins was appointed treasurer of the county of Essex, an office which he performed with great fidelity. He married, in 1724, his second wife, the daughter of Sir Walter Wrottesley, Bart. In the same year he published his 'Grounds and Reasons of the Christian Religion,' in which his object is to show that Christianity is founded and dependent on Judaism; that the New Testament is based upon the Old, as the canon of Christians; that the apostles and writers of the former establish and prove their propositions from the latter; and that none of the passages they adduce are literally, but merely typically, and allegorically applicable, by the assumption of a double construction. This work created a great sensation in the church, and drew forth a great number of replies from some of the most eminent divines. In the final answer of Collins, Scheme of Literal Prophecy,' 1726, he enumerates five-and-thirty replies which appeared during the two first years after its publication. The artful way in which Collins availed himself of the theory of Whiston respecting the corruption of the present Hebrew text, so provoked that divine, that he petitioned Lord Chancellor King, though without success, to remove Mr. Collins from the commission of the peace. In 1727 Collins, in a long letter, replied to eight sermons of Dr. Rogers on the necessity of revelation and the truth of Christianity. He died in December, 1729, at his house in Harley Square, London, in consequence of being long afflicted with the stone. In his last moments he said, 'I have always endeavoured, to the best of my ability, to serve my God, my king, and my country, and I am certain I am going to that place which God has designed for those who love him, for the Catholic religion is to love God and to love man.' He was interred in Oxford Chapel, London. The long and elegant Latin epitaph on his monument there, is inserted in the 'General Dict.' and in the 'Biog. Brit.' All parties agree that the moral and social character of Collins was remarkably amiable. Temperance and benevolence were its prominent points. His integrity, energy, and impartiality in the exercise of his magisterial functions commanded the highest respect, and by all his conduct and writings he ardently endeavoured to promote the cause of civil and religious liberty. Collins, as a writer, is remarkable for the great shrewdness of his reasoning; and for still greater subtility in masking the real drift of his arguments with orthodox professions. His library, which was of great extent and extremely curious, was open to all men of letters, to whom he readily communicated whatever he knew, and even furnished his antagonists with books and arguments to refute his own writings. A catalogue of his books was published by the Rev. Dr. Sykes in 1730. (*General Dictionary*, *Biog. Brit.*; Hollis's *Memoirs*.)

COLLINS, WILLIAM, the son of a hatter at Chichester, was born December 25, 1720. He was educated at Winchester, from which he went to Queen's College, Oxford; but in about half a year he removed to Magdalen, on being elected a *demy*, or scholar, of that body. Soon after taking his bachelor's degree he quitted the university abruptly, about 1744, and repaired to London as a literary adventurer. He won the cordial regard of Johnson, then a needy labourer in the same vocation, who, in his 'Lives of the Poets,' has spoken of him with tenderness. He tells us that 'his appearance was decent and manly, his knowledge considerable, his views extensive, his conversation elegant, and his disposition cheerful. He designed many works, but his great fault was irresolution; or the frequent calls of immediate necessity broke his scheme, and suffered him to pursue no settled purpose.'

His Odes were published, on his own account, in 1746. They were not popular; and it is said that, disappointed at the slowness of the sale, he burnt the remaining copies with his own hands. He was relieved from his embarrassments by a legacy from an uncle of 2000*l.*; but worse evils than poverty overclouded the rest of his life: he sank gradually into a species of melancholy and intellectual languor, to relieve which, he resorted to intoxication. 'Those clouds which he perceived gathering on his intellect he endeavoured to disperse by travel, and passed into France; but found himself constrained to yield to his malady, and returned. He was for some time confined in a house of lunatics, and afterwards retired to the care of his sister at Chichester, where death, in 1756, came to his relief.' (*Lives of Poets*.)

Collins is inferior to no English lyric poet of the eighteenth century, except Gray. His Odes to 'Fear,' and the 'Passions,' afford the best specimens of his genius; and the well-known 'Dirge in Cymbeline' is admirable in a softer style. His poetical merits Dr. Johnson did not rightly appreciate. Mrs. Barbauld, in her edition of his works, has given a more favourable and juster character of them. 'He will be acknowledged to possess imagination, sweetness, bold and figurative language. His numbers dwell upon the ear, and easily fix themselves in the memory. His vein of sentiment is by turns tender and lofty, always tinged with a degree of melancholy, but not possessing any claim to originality. His originality consists in his manner, in the highly figurative garb in which he clothes abstract ideas, in the felicity of his expressions, and his skill in embodying ideal creations. As it was, he did not enjoy much of the public favour; but posterity has done him justice, and assigned him an honourable rank among those of our poets who are more distinguished by excellence than by bulk.

COLLISION (con, lædo.) The striking against each other of two bodies in motion. The mathematical laws of collision are usually treated under the word IMPACT in English treatises, and under the head *choc des corps* in French.

COLLURICINCLA. [LANIADÆ.]

COLLURIO. [LANIADÆ.]

COLMAN, GEORGE, commonly called 'the Elder,' was the son of Francis Colman, Esq., British resident at the court of the Grand Duke of Tuscany, by a sister of Anna-Maria Pulteney, Countess of Bath. He was born at Florence about 1733, and was educated at Westminster. He afterwards became a student of Christ Church, Oxford, and forming an acquaintance with Mr. Bonnel Thornton, published in conjunction with that gentleman, the periodical paper called 'The Connoisseur.' Fixing on the law for a profession, he was entered at Lincoln's Inn, and duly called to the bar. In 1760 he produced his first dramatic piece, entitled 'Polly Honeycomb,' at Drury Lane with great success. This was followed in 1761 by the comedy of 'The Jealous Wife,' and in 1766 by that of 'The Clandestine Marriage,' written in conjunction with Mr. Garrick. In 1767 he united with Messrs. Harris, Rutherford, and Powell, in the purchase of Covent Garden Theatre, and became the acting manager, in which situation he continued seven years, when he sold his share to Mr. Leake. In 1777 he purchased the little theatre in the Haymarket of Mr. Foote. In 1785 Mr. Colman was seized with the palsy, and four years afterwards discovered symptoms of an alienation of mind, which gradually increasing terminated in a state of idiotism. He died at Paddington on the 14th of August, 1794, aged sixty-two. Mr. Colman, besides writing and adapting upwards of thirty dramatic pieces, was the author of a very spirited translation in blank verse of Terence, a translation of and commentary on Horace's Art of Poetry, and several fugitive pieces.

COLMAN, GEORGE, 'the Younger,' son of the preceding, was born October 21, 1762. His education was commenced at Mr. Fountain's academy in Marylebone, from whence he was removed to Westminster, and afterwards entered at Christ Church, Oxford. From thence he was sent by his father to King's College, Old Aberdeen, and on his return to London was entered of the Temple; but following the peculiar bent of his genius and the example of his father, he soon commenced writing for the stage. During the illness of Mr. Colman, Sen., he directed the Haymarket Theatre, and on the death of his father King George III. kindly transferred the patent to him. He married first Miss Morris, the sister of the present proprietor of the Haymarket, to whom he sold his interest in the theatre; and secondly, the popular actress Mrs. Gibbs. Mr. Colman, Jun., was appointed by George IV. Exon of the Yeoman Guard (an office which he afterwards by permission disposed of), and by his Grace the Duke of Montrose, then Lord Chamberlain, Examiner of Plays, which situation he held to the day of his death, Wednesday, October 26, 1836, having just completed his seventy-fourth year. Mr. Colman was the author of several excellent plays and farces: amongst the most popular are 'John Bull' (for which comedy he received the largest sum of money perhaps ever paid for any drama), 'The Poor Gentleman,' 'Heir at Law,' 'Inkle and Yarico,' 'Iron Chest,' 'Mountaineers,' 'Surrender of Calais,' 'Ways and Means,' 'Review,' 'Blue Beard,' 'X. Y. Z.,' and 'Love Laughs at Locksmiths.' He also wrote the well-known comic tales entitled 'Broad Grins,' 'Poetical Vagaries,' &c., and a variety of smaller poems. His last literary work was the publication of his own memoirs up to the time of his entering on the management of the Haymarket, in 2 vols., 8vo.

COLMAR, a town in France, capital of the department of Haut Rhin; on the left or west bank of the river Lauch, just above its junction with the Ill, and also on a branch or canal of the Fecht, another tributary of the Ill; 234 miles from Paris, in a direct line E. by S. or E.S.E., or 290 miles by the road through Châlons, Bar-le-duc, Nancy, &c. In 48° 5′ N. lat. and 7° 20′ E. long.

It has been thought by some antiquaries that Colmar was built of the ruins of the antient Argentuaria, or Argentovaria (Ἀργεντουάρια, Ptolemy), near to which the Emperor Gratian defeated the Allemanni A.D. 378; but the position of Argentovaria was probably nearer the Rhine, between Markolsheim and Artzenheim. (D'Anville.) This town was much favoured by the Emperor Frederick II., who enlarged it. It was one of the imperial cities, and disputed with Ensisheim the precedency among the towns of the Upper Alsace. Having been ceded to France by the treaty of Munster in 1648, the king of France ordered the fortifications to be razed (A.D. 1673): Colmar is consequently an open town. Under the old government of France the inhabitants, though deprived of their antient municipal constitution, enjoyed several privileges; and the Reformed, who constitute half the population, had, as well as the Catholics, the free exercise of their religion. Colmar was formerly included in the diocese of Porentrui.

The town is beautifully situated in a plain near the foot of the Vosges. It is a handsome place; the streets are watered by small streams from the Lauch and the canal of the Fecht. The church of the Dominicans is the handsomest of its antient buildings. The prisons and the theatre are also worthy of notice. The inhabitants amounted, in 1832 to 15,131 for the town, or 15,442 for the whole commune They manufacture printed calicoes, tapes and ribands; there is a powder-mill near the city. Considerable trade is carried on in the agricultural produce of the district, wheat and other grain, and wine of good quality. The town is the seat of a *Cour Royale*, or supreme court of justice There is a college or high school, a société d'émulation, and a public library, one of the richest in France, containing above 60,000 volumes. The revenue of the town is considerable. Among the natives of Colmar may be mentioned Martin Schoen, the earliest engraver in metal, and Rewbel, one of the members of the Executive Directory of France.

The arrondissement of Colmar contained, in 1832, 189,589 inhabitants: it occupies the northern part of the department. It is the seat of an extensive cotton manufacture. The mountain streams which traverse it supply a moving power for machinery.

COLNBROOK. [BUCKINGHAMSHIRE.]

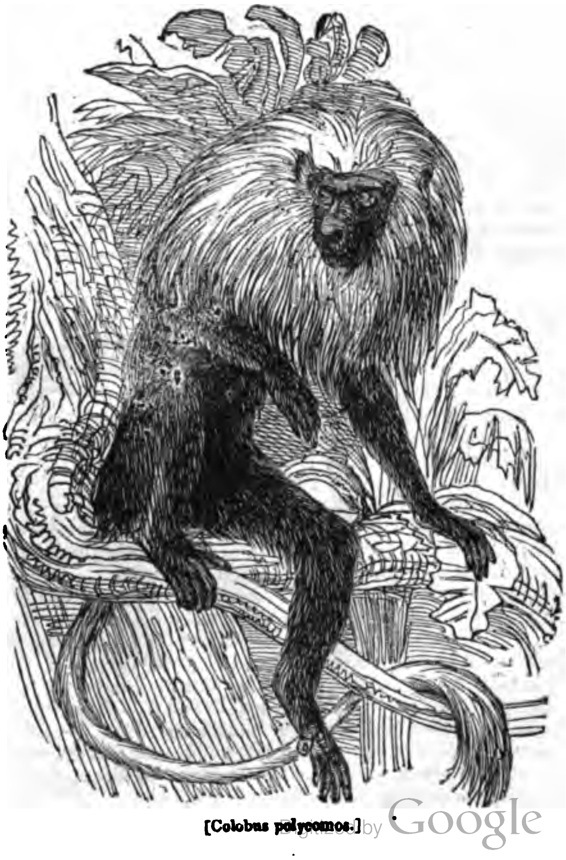
COLNE. [THAMES.]

CO'LOBUS (Zoology), a genus of Quadrumanous mammifers (Cheiropeds of Mr. Ogilby); established by Illiger and adopted by M. Geoffroy. The latter places the genus in the group of *Singes catarrhins*, or monkeys of the old continent; a group distinguished by having their nostrils separated by a very thin partition, and by possessing five molar teeth only on each side of the two jaws.

Generic character.—Facial angle from 40 to 45 degrees; muzzle short; face naked; body elongated and small; extremities slender; the anterior hands deprived of a thumb; the fingers rather short; the posterior thumb very distant from the fingers, and placed very much backwards; tail longer than the body, small, and tufted at the end; cheek-pouches and callosities on the buttocks.

The Colobi, which are supposed to be inhabitants of the Coast of Guinea, seem to be in the old world the representatives of Ateles, whose locality is South America. Example:—*Colobus polycomos*, Geoffroy.

This species, which is the *Simia polycomos* of Schreber, the *Simia comosa* of Shaw, the *Guenon à camail* of Buffon, and the *Full Bottom* of Pennant, is very handsome. The head and upper part of the body are covered with hair,



[Colobus polycomos.]

falling over the shoulders and forming a kind of hood and pelerine, from whence it derives the name given to it by Buffon, while the resemblance of this *chevelure* to a wig determined Pennant to give it the English name above recorded. This ornament is composed of floating hairs, which are yellow mingled with black; the face is brown, and the rest of the body is covered with very short close hair of a jet-black, a colour which sets off the snow-white tail, which is much longer than the body and not prehensile. In this last particular, in the possession of cheek-pouches, and in other characters, it differs from Ateles, while in some points, and especially in the absence of the thumb in the anterior hands, it resembles it much.

Locality, the forests of Sierra Leone, where the natives give it the name of 'the King of the Monkeys' (*Roi des Singes*), apparently, says Desmarest, on account of the beauty of its colours, and its 'camail,' which represents a sort of diadem. They attach great value to its fur, of which they make ornaments, and apply it to various purposes.

Besides M. Geoffroy's other species, *Colobus ferruginosus*, *Simia ferruginea* of Shaw, *Autre Guenon* of Buffon, the Bay Monkey of Pennant, which is by many considered to be only a variety of *Colobus polycomos*, the French zoologists mention another species, *Colobus Temminckii*, Kuhl, which is described by them as extremely scarce, and its locality unknown. The specimen belonging to M. Temminck came from Bullock's Museum, and together with many other rarities was suffered to leave this country when that fine collection was broken up, to the great regret of all English zoologists, and to the manifest advantage of foreign establishments.

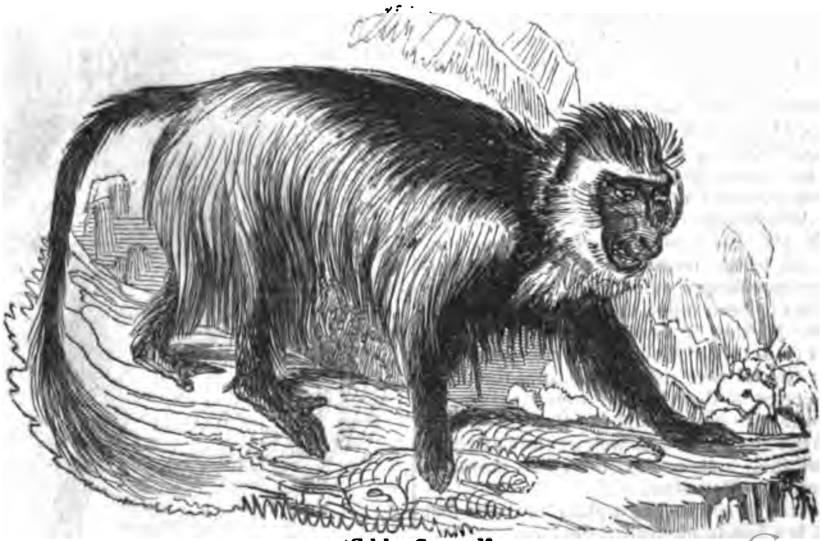
Such was the history of this curious genus; when in June, 1832, several imperfect skins of mammalia, recently obtained by Mr. Gould from Algoa Bay, were exhibited to the Zoological Society of London. One of these skins, that of a *monkey*, deficient as to the head and hands, was, Mr. Bennett remarked, evidently referrible to the *Colobus polycomos* of Illiger; the long milk-white tail strongly contrasting with the bright deep-black fur of the body, being fully sufficient to characterize it. On the upper part of the skin, above the shoulders, some nearly white hairs were intermingled with the black ones. The only discrepancy observable between the specimen and the description of the species given by Pennant was in the great length of the hairs of the body, the greater number of them being four or five inches long: this, it was stated, might be dependent on age or locality. Another skin, equally imperfect with the preceding, was declared to be that of the *Colobus ferrugineus* of Illiger, with the state of which, described by Mr. Kuhl under the name of *Colobus Temminckii*, the specimen agreed in every respect, except in the absence of any yellow tinge in the rufous fur covering the under surface of the body.

In July, 1835, Mr Ogilby exhibited to the same Society several rare and undescribed species of mammalia and birds, brought from the Gambia by Mr. Rendall. Among them were materials which, together with the specimens then lately brought from Abyssinia by Dr. Rüppell, gave Mr Ogilby an opportunity of revising the natural history of the genus Colobus, six species of which he then recorded.

1. *Colobus polycomos*, Schreber, with the head and shoulders covered with long, coarse, flowing hair, of a dirty yellowish colour, mixed with black; body, arms, and legs of a fine glossy blackness, covered with short hair; tail of a snowy whiteness, with very long hair at the end, forming a tuft. (Pennant.) Locality, Sierra Leone.

2. *Colobus Ursinus*, Ogilby, 'with very long glossy black hair over the whole body and extremities, and a long snowy-white tail, tufted at the end;' described from two imperfect skins, without heads or hands, the same as those noticed by Mr. Bennett and above referred to. These skins, Mr. Ogilby remarks, were considered by Mr. Bennett as referrible to the *Colobus polycomos*; and the general colour of the body and tail, as well as a slight appearance of grizzled or gray hair about the neck, where the head had been cut off, would, at first sight, Mr. Ogilby allows, appear to justify Mr. Bennett's views; but the words of Pennant (the only original describer of the species) imply that the 'long dirty yellowish hair,' which he compares to a full-bottomed periwig, grows from the shoulders and neck, as well as the head, and expressly declare that the hair on the rest of the body, as well as on the legs, is short. Now, in the specimens at present under consideration, the very reverse of this is observable. The black hair of the shoulders, as already observed, has a partial mixture of silvery-white on the anterior face, just where the head has been cut off; but it is not longer than the hair upon the rest of the body and limbs, which is moreover five or six inches in length, and in texture and appearance not unlike that of the *Ursus labiatus*. The whole animal, in fact, resembles a small *bear*, and is covered with the same uniform, long, black, and glossy fur upon every part except the tail, which, at the root more particularly, is furnished with much shorter hair. Whether or not this species, like the *polycomos*, has the head of a different colour from the body, is a subject for further observation: the white or silvery hairs already mentioned as still remaining about the shoulders render it extremely probable that it has, but in no case can it form the striking contrast in length, nor present the long flowing mane or wig-like appearance ascribed to the animal observed by Pennant. Mr. Gould, who procured these skins for the Society, reported them as coming from Algoa Bay: we know enough of the zoology of that part of Africa to render this account extremely doubtful, and the probability is, either that Mr. Gould was misinformed, or that he may have mistaken Dalagoa Bay for Algoa, which, from the similarity of sound, might readily happen. If this conjecture should prove correct, it would follow that the *Colobus ursinus* was the analogue of the *Colobus polycomos*, on the opposite coast, and the conjecture receives further countenance from the fact of many other known species of mammals having such analogues in the same localities.

3. *Colobus Guereza*, Rüppell, with the head, face, neck,



[Colobus Guereza.]*

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* From the specimen in the British Museum, where we have always found the greatest facilities. We are glad to observe that this collection of Mammalia has lately been increased nearly one-third.

back, limbs, and basal half of the tail, covered with short black hair; the temples, chin, throat, and a band over the eyes, white; the sides, flanks from the shoulders downwards, loins and buttocks, clothed with long flowing white, which hangs down on each side like a loose garment; the tip of the tail tufted with dirty-white. Locality, Abyssinia. There is a specimen, one of Dr. Rüppell's, in the British Museum.

4. *Colobus ferruginosus*, Geoffroy. Crown black; back of a deep bay colour; outside of the limbs black; cheeks, under part of the body, and legs, very bright bay; tail black. (Pennant's description.) Locality, Sierra Leone.

5. *Colobus fuliginosus*. Smoky-blue above, dirty yellowish-gray beneath; cheeks, throat, tail, and extremities, brick-red. (Ogilby.) Locality, the Gambia. Mr. Ogilby observes that the face is short, the head round, and the whole form and habit of the animal similar to those of the *Semnopitheci*. The teeth, he adds, are of the usual form and number, and *there are large and very distinct cheek-pouches*. 'I was the more particular,' says Mr. Ogilby, 'in making this last observation, because the organs in question had not been previously recorded as existing in the *Colobi*, and because M. Geoffroy St. Hilaire, in his valuable lectures, of which it is a matter of great regret that so small a portion has been given to the public, even doubts their existence.'

6. *Colobus Temminckii*, Kuhl, 'with the hands, face, and tail, purplish-red; rest of the members clear-red; belly reddish-yellow; head, neck, back, shoulders, and outer face of the thighs, black.' Habitation unknown: described from a specimen formerly in Bullock's Museum, and now in that of Leyden. Notwithstanding some slight discrepancies, Mr. Ogilby agrees with Mr. Bennett in referring to this species the two other skins of the Society's collection noticed by the latter and above alluded to. These skins, he observes, were procured at the same time, and most probably in the same locality, as those of *Colobus ursinus*, and are equally imperfect; and he further remarks, that if the conjecture already thrown out with regard to the derivation of these skins should turn out to be well founded, and if the animal described in his paper eventually proves to be identical in species with *Colobus Temminckii*, which he sees no just reason to doubt, it follows that the hitherto unascertained habitation of that species must be sought on the east coast of Africa. Mr. Ogilby adds, that Fischer, probably induced thereto by the authority of M. Temminck, has united the *Colobus Temminckii* with the *Colobus ferruginosus* or *Bay Monkey* of Pennant, but that there is no doubt as to the specific distinction of the two animals.

COLOCA'SIA, a kind of arum, the leaves and tubers of which, notwithstanding their acridity, are used as food by the natives of the south of Europe. It is cultivated in Portugal, Greece, and Egypt, and is supposed to have been the *Colocasium* of Virgil, the *Aron kurenäikon* of Galen, and the *Niliacum olus* of Martial.

COLOCYNTH. [CUCUMIS.]

COLOCZA (Kalocsa, Kalotscha), in the Hungarian circle of Pesth, is in a swampy plain, on a small arm of the left bank of the Danube, in 46° 32′ N. lat., and 19° 0′ E. long. It was known in the time of the Romans. It is the seat of an archbishop, and contains 1856 houses and about 6000 inhabitants. The most striking buildings are the palace of the archbishopric, which resembles a fortress, and has a library of 30,000 volumes, and the cathedral church of the Annunciation. To the archbishopric of Colocza is united the bishopric of Bacs, the metropolitan chapter of which has its seat also here. The town has an archiepiscopal lyceum, with a theological seminary; a Piarist college, which in 1825 contained 141 scholars; a gymnasium, and a Roman Catholic grammar school. The library contains the celebrated MS. called the 'Colocza Codex of Old German Poems,' supposed to have been written in the latter part of the fifteenth century. This valuable work is written and illuminated on beautiful parchment; contains 336 pages, comprises 15 poems, consisting of 54,000 verses, and is 4 inches thick, 11 high, and nearly 10 wide. The inhabitants are chiefly engaged in the breeding of horses and cattle, and in fishery.

COLOGNE, a government circle (Regierungs-Bezirk) of Rhenish Prussia, in the province of Juliers—Cleves-Berg, lies on the banks of the Rhine, which traverses it for twenty-eight miles from north to south, and divides it into the eastern and western portions. The southern, western, and eastern portions are mountainous, especially near Bonn, the northern is level, and contains but few elevations. Besides the Rhine, Cologne is watered by the Muhlenbach, Sieg, Strundesbach, Wipper, &c. The greatest length of the circle from east to west is about forty-six miles. It is bounded on the north by the circle of Düsseldorf, on the east by Arnsberg, on the south by Coblenz, and on the west by Aix-la-Chapelle, and occupies an area of about 1566 square miles. Of this surface about 517,000 acres are arable land, 31,800 gardens, 3000 vineyards, 77,000 meadows and pastures, 277,000 forest, 64,000 waste land, and 32,000 are occupied by roads and rivers. The circle is divided into 11 minor circles; viz., Bergheim, Bonn, Cologne, Enskirchen, Gummersbach, Mühlheim, Rheinbach, Sieg, Waldbroel, and Wipperfürth. It contains 17 towns, 4 market towns, 465 villages, 156 Roman Catholic churches and 119 churches of ease, 40 Protestant and 5 churches of ease, 3 free churches, 211 Roman Catholic chapels, and 34 synagogues. The population in 1816, including the military, was 332,818; in the year 1828, 383,586, of whom 326,826 were Roman Catholics; 52,096 Protestants; and 4069 Jews; and in 1831, 386,938. It contains one university, that of Bonn, and four gymnasia. The stock consisted, in 1819, of 13,854 horses, 137,758 horned cattle, 61,568 sheep, and 11,716 goats· in 1831, of 15,610, 129,622, 62,221, and 10,465 respectively. The principal employments are the working of coal, lead, and iron mines, the potteries, and the manufacture of woollens, linen, leather, Cologne water, potash, sugar, and tobacco; besides dyeing, cotton printing, and tanning.

COLOGNE (Cöln), the capital of the circle, in 50° 56′ N. lat., and 6° 53′ E. long., extends in a crescent-shape along the left bank of the Rhine. It is enclosed by a lofty wall about 6 miles in circuit, defended by eighty-three towers, and surrounded with ramparts and deep ditches. It has twenty-four gates on the land and water-sides; and in front of the seven principal gates strong redoubts have been erected. Cologne owes its origin to the Romans. It was a Roman station, and subsequently a colonia, under the name of Colonia Claudia Agrippinensis, so called from the Emperor Claudius and his wife Agrippina, who was born here while her father Germanicus commanded in these parts. Agrippina adorned it with an amphitheatre, temples, aqueducts, &c., the ruins of which may still be traced. It continued to be the capital of Lower Rhenish Gaul till 330, and after a frequent change of masters was annexed to the German empire in 870. It took part in some of the many disputes which arose in the empire, and was besieged by Henry V. for its attachment to his father Henry IV.; and afterwards unsuccessfully by Philip of Swabia, for having proclaimed his rival Otto IV. In 1349, the principal Jews of Cologne, anticipating the same fearful persecutions as in other places, shut themselves up with their wives and children, and set fire to their houses; upon this, the surviving Jews were compelled to leave the city, and though they subsequently obtained permission to return, they were again obliged to quit it in 1429

Cologne was one of the most powerful and wealthy cities of the Hanseatic league. At that time it could muster an armed force of 30,000 men, and its population amounted to 150,000 souls. When the Hanseatic league engaged in a war with England in 1452, Cologne sided with England, on which account it was formally excluded from the league; but on the conclusion of peace by the treaty of Utrecht in 1474, it was re-admitted to this privilege upon the intercession of the Emperor Frederic III. During the whole of this period the commerce of Cologne was extremely flourishing. In the eleventh century the Colognese vessels carried Rhenish wines, corn, flour, malt, beer, linen, and other German produce to all countries lying on the German Ocean and the Baltic, to England, France, Spain, Portugal, Italy, Norway, Sweden, and Russia, and brought back the productions of those countries.

The trade of Cologne with England at this early period was very considerable, and King John conceded to the merchants of Cologne privileges rarely granted to his own subjects. Whitehall was the property of the city of Cologne, and allotted exclusively to the Rhenish trade. Cologne had a large factory in Norway and the Netherlands; and all vessels navigating the Rhine were obliged to unlade their cargoes at Cologne, whence they were conveyed in its own ships. The arts and sciences were equally flourishing; its university was one of the most famous in Germany. The specimens of its architecture, paintings on glass, sculptures, and pictures, which still exist, attest the perfection which its artists had attained. Intestine divisions, the expulsion of the Jews, the public destruction of its looms, which compelled their owners to emigrate, and various other causes, hastened its decline. It ceased to be a free town in 1792.

Cologne is divided into four sections, and is built in a very irregular manner; the streets, many of which still retain their Roman names, are narrow, dark and crooked, and paved with basalt. It contains twenty-five churches, eight chapels, a synagogue, and many public buildings, the most remarkable of which is the cathedral, which, if completed, would be the most magnificent monument of Gothic architecture in Europe. It was designed by Archbishop Engleberg of Berg, and was begun in 1284 by Archbishop Conrad of Hochstedten, called the Solomon of his age; it is in the form of a cross, 400 feet in length, and 180 in breadth; the roof rests on 100 columns, of which the four centre ones are 30 feet in circumference. The only part however which is finished is the splendid choir, with its surrounding chapels and its superb painted glass windows. Of the two towers, which were intended to be 500 feet in height, one is raised only half this elevation, and the other not more than 21 feet. Considerable progress is now making in completing various parts of the cathedral, under the direction of the Prussian government. It contains the tombs of Conrad, Mary de Medicis, &c., and abounds in relics and curiosities, especially the tomb of the Magi, which is richly adorned with gold and precious stones. Among the other interesting churches are those of St. Ursula, celebrated from the legend of the martyrdom of herself and 11,000 virgins, the churches of St. Columba, the Annunciation, St. Gereon, and St. Peter, which last contains a chef-d'œuvre of Rubens, representing the martyrdom of that apostle. The other buildings of note are the antient Carthusian convent, the town-hall, the hotel of Gurzenut, where the diet and festive meetings were formerly held, the hall of justice, the archiepiscopal palace, &c. Between Cologne and Deutz is a bridge built in 1822, which rests on 39 pontoons, and is 1250 paces long.

Cologne is the centre of the provincial administration, the residence of the archbishop, and the seat of various public boards. It contains two gymnasia; one Roman Catholic, which in 1827 had 484 scholars, and the other Protestant, with about 290 scholars: the latter has a valuable library of 33,000 volumes, an observatory, and a botanical garden. There is also the library of the town-hall, of the archbishop, which contains 10,000 volumes, a public archive, with valuable documents, collections of Roman antiquities, MSS., coins, natural history, &c. Besides several elementary schools for Protestants and Roman Catholics, the town has a grammar-school, a school of trades, three of commerce, a seminary for educating schoolmasters, an orphan asylum, hospital, mad-house, &c.

The population in 1827 was 57,022, of whom 54,000 were Roman Catholics, and 2385 Protestants; at present it exceeds 60,000. The chief resources of the inhabitants, besides agriculture and the cultivation of the vineyards, are manufactures, especially of cotton yarns, cotton goods, hosiery, woollens, silks, velvets, tobacco, brandy and spirits, Cologne water, &c. Being the central mart of the Rhenish trade between the Netherlands, Germany, Alsace, and Switzerland, many of the inhabitants are engaged in shipping, and Cologne being a free port, a considerable traffic is carried on in corn, wine, rape-seed, rape-seed oil, coals, &c. In the vicinity of the city are several coal-mines, and abundance of a particularly fine sort of porcelain-earth and potter's clay.

COLOMBIA is the name which was adopted by the northern countries of South America in 1819, when New Granada and Venezuela united and established one central government for the purpose of resisting the Spanish government. In 1829 Venezuela renounced the union, and constituted itself a separate republic. After the resignation of Bolivar in 1830, it again joined New Granada; but this union lasted only a short time. In November, 1831, a new separation took place, and at the same time it was decided that the former province of Quito should constitute a separate republic under the name of Ecuador. Thus Colombia was divided into the three republics of Venezuela, New Granada, and Ecuador

COLON. The alimentary canal below the stomach is divided into the small and great intestines. The former consist of the duodenum, jejunum, and ileum; the latter of the colon and rectum. The *colon* commences a little above the right groin, in the right iliac fossa [Abdomen], in the form of a dilated pouch, which is called the *caput coli*, or more commonly the *cœcum*, from its blind rounded extremity. The ileum opens obliquely into the left side of this pouch, its inner or mucous membrane projecting so as to form the *ileo-cœcal valve*, which, permitting the contents of the small intestine to pass into the colon, suffices to prevent their return, except in peculiar cases of diseased action. Near the same part of the cœcum opens also a slender contorted intestine about two inches long, likewise blind, which is called the *appendix vermiformis*, from its resemblance in the human subject to a worm. The use of this appendage is unknown: in some animals, as the sheep, it is much larger, and is probably of more importance than in man. From the right iliac region the colon passes upwards along the side to the under surface of the liver. Hence it turns to the left, stretching over the upper part of the belly just below and in front of the stomach, to which it is connected by the common attachment of both organs to the *omentum*, a loose pendulous membrane, formed by a double fold of the peritoneum, and spread like an apron in front of the small intestines. Having reached the opposite side of the abdomen, the colon passes downwards to the left iliac fossa; thence, taking two sudden turns to the right and downwards, it descends into the pelvis over the last lumbar vertebra, and becomes continuous with the rectum. The double turn just mentioned is the *sigmoid flexure;* the transverse part is called the *arch* of the colon; and the ascending and descending or lateral parts, as they lie immediately over the loins, are called the right and left *lumbar* portions. The central space thus nearly encircled by the colon is occupied by the convoluted heap of small intestines. The length of the whole canal is six or seven times that of the body in man, the colon constituting about a fifth part. In graminivorous animals its length is proportionably greater; in those which feed exclusively on flesh it is less.

The colon is enveloped in the serous membrane called the peritoneum, which forms the external covering of all the abdominal viscera. [Abdomen.] This outer tunic passing entirely round it, meets behind, and forms a duplicature called the *mesocolon*, which attaches it, more loosely at the arch than at the sides, to the spine and loins, and serves as a medium for the passage of nerves and vessels, and the lodgment of absorbent glands. Between the peritoneal coat and the interior mucous lining, there is a layer of muscular fibres, some of which encircle the bowel in scattered bands, and serve to diminish its calibre; others, more regularly arranged in three distinct longitudinal bands, contract its length; and their combined actions, taking place successively in different parts of the intestine, but on the whole propagated from above downwards, agitate its contents backwards and forwards, and urge them ultimately into the rectum.

The colon is amply supplied with blood-vessels, nerves, lymphatics, and ducts, which pour out the mucus that lubricates the interior as well as various excrementitious matters here separated from the blood as being injurious or useless. The canal is not smooth and uniform, like the small intestines, but bulges out between the bands of muscular fibre into various prominences more or less regular in their form, in which the fæces lodge for a time and become deprived of much of their moisture as they are rolled onwards by the peristaltic action. Hence arises their lobulated or globular form, more observable in some of the lower animals, as the horse and sheep, than in man. It is in the colon that the fæces acquire their peculiar odour, which is not perceived above the ileo-cœcal valve. It is in this part of the alimentary canal that the fluid part of the food is chiefly absorbed, being no longer needed to keep the nutritive particles in suspension. The lymphatic vessels of the colon are consequently found distended with a transparent fluid, and not the milk-like chyle absorbed by those of the small intestines. [Lacteals, Lymphatics.] For further information on the functions of the colon, the reader is referred to the account of those of the alimentary canal in general, given under the head of Digestion.

The colon is alone or conjointly the seat of many disorders, such as cholera, colic, constipation, diarrhœa, dysentery, enteritis, ileus, introception, obstruction; and is liable to ulceration in the course of hectic and other fevers, as well as from local causes. It is occasionally the seat of stricture; and is not unfrequently protruded in the various forms of intestinal rupture.

COLONEL, the commander of a regiment or battalion of troops; he is the highest in rank of those called field-officers, and is immediately subordinate to a general of division.

The derivation of the word is uncertain. It is supposed to have been given originally to the leader of a body of men appointed to found a colony; or to have come from the word *coronarius*, indicating the ceremony of investing an officer with the command of a corps; or, finally, from the word *columna*, denoting the strength or support of an army.

The title of colonel-general was, for the first time, conferred by Francis I., about the year 1545, on officers commanding considerable divisions of French troops, though, according to Brantome, it had been given to the chief of an Albanian corps in the service of France at an earlier period. When the troops of that country were formed into regiments (the infantry about 1565, and the cavalry seventy years afterwards), the chiefs of those corps were designated *Mestres de Camp*; and it was not till 1661, when Louis XIV. suppressed the office of colonel-general of infantry, that the commanders of regiments had the title of colonel.

In England, the constitution of the army was formed chiefly on the model of the French military force; and the terms regiment and colonel-general were introduced into this country during the reign of Elizabeth. It must, moreover, be observed, that in the regulations made by the citizens of London for forming the militia in 1585, it is proposed to appoint *colonels* having authority over ten captains; and that both colonels and lieutenant-colonels are distinctly mentioned in the account of the army which was raised in order to oppose the threatened invasion of the country in 1588. Before the time of that queen, it appears that the commanders of bodies of troops equivalent to regiments had only the general title of captain.

The duties of colonels are described in Ward's 'Animadversions of Warre,' which was published in 1639; and from the account there given, it appears that those duties were then nearly the same as they are at present. To the colonel of a regiment, besides the general superintendence of the military duties performed by the troops composing it, is intrusted the care of providing the clothing of the men and of appointing the agent through whom their pay is transmitted. Colonels take precedence of one another according to the dates of their commissions, and not according to the seniority of their regiments.

The lieutenant-colonel is immediately under the full colonel. He assists the latter in directing the evolutions of the battalion or regiment, which he also commands during the absence of his superior officer.

The annual pay of a colonel is, in the Life Guards, 1800*l.*; in the Grenadier Guards, 1200*l.*; in the Coldstream and Scots Fusilier Guards, 1000*l.*; in the cavalry regiments generally 900*l.*; and in the regular infantry, 500*l.* The daily pay of a lieutenant-colonel is, in the Life Guards, 1*l.* 9*s.* 2*d.*; in the Foot Guards, 1*l.* 6*s.* 9*d.*; and in the infantry, 17*s.* The price of a lieutenant-colonel's commission is, in the Foot Guards, 9000*l.*; in the Life and Horse Guards, 7250*l.*; in the Dragoons, 6175*l.*; and in the infantry of the line, 4500*l.*

COLONIZATION SOCIETY, AMERICAN. [SLAVERY.]

COLONNA is the name of one of the oldest and most illustrious families of Italy. About 1050 it became possessed of the feudal estate of La Colonna on the Tusculan mount. Pietro, lord of Colonna, who lived in the twelfth century, is one of the earliest of the family recorded in history. His son Giovanni was made cardinal by Honorius III., in 1216. The family afterwards divided into several branches, one of which became princes of Palestrina; another dukes of Zagarolo; while others were made dukes of Traietto and counts of Fondi, dukes of Paliano and Tagliacozzo, and princes of Sonnino and Stigliano, in the kingdom of Naples. Moreri, art. 'Colonna,' gives their respective genealogies. At one time they were possessed of a great portion of the Campagna of Rome, besides large estates in Abruzzo. The Colonna were of the Guibelline party: their rivalry with the Orsini and other Roman barons, and their quarrels with several popes, especially with Boniface VIII., are recorded in the history of the middle ages. In the early part of the fifteenth century, one of the Colonna family was made pope under the name of Martin V. A century later, two cousins of the same family, Fabrizio and Prospero Colonna, distinguished themselves in the service of Ferdinand of Aragon, and afterwards of Charles V., against the French in Italy. Several of the same family attained high honours in the kingdom of Naples and in Spain, and others are numbered among the cardinals of the Roman church. Some branches of the family have become extinct, but the Stigliano of Naples and the Sciarra Colonna at Rome continue to exist. The Colonna have an extensive palace with gardens on the slope of the Quirinal at Rome.

COLO'NNA, VITTO'RIA, born in 1490, was the daughter of Fabrizio Colonna, Great Constable of the kingdom of Naples, and of Anna, the daughter of Frederico di Montefeltro, duke of Urbino. At the age of seventeen she married Francis Davalos, son of the marquis of Pescara, who soon after came to the title at the death of his father. Pescara served with distinction in the armies of Charles V., and contributed greatly to the gaining of the battle of Pavia, in which he was wounded. On his recovery, appearing dissatisfied with Charles V., he was sounded by Morone, the old minister of the Duke Sforza of Milan, as to his willingness to enter into a plot concerted with the other Italian princes, by which the Spanish troops were to be driven out of Milan and Lombardy, and ultimately from all Italy. Pescara was then commander-in-chief of Charles's army in Italy. He was promised the kingdom of Naples as a reward for his assistance in the execution of the plot. Pescara appeared to assent at first, but afterwards secretly informed Charles V., who is said, however, to have had already some previous information on the subject, and who ordered him to take possession of the principal towns of Lombardy, and to arrest Morone, who was soon after put to death. It is reported that Vittoria Colonna contributed by her remonstrances on this occasion, to retain her husband within the bounds of his allegiance to the emperor. Shortly after Pescara died towards the end of 1525, aged thirty-six years, and was succeeded by his cousin the marquis del Vasto in the command of the Imperial army in Italy. Vittoria Colonna, who was inconsolable for the death of her husband, determined on spending the remainder of her life in religious seclusion, although various proposals of a second marriage were made to her. She wrote several poetical effusions, lamenting the death of her husband, and also upon religious subjects. (*Rime Spirituali di Vittoria Colonna*, Venezia, 1548.) Her beauty, her talents, and her virtue, were extolled by her contemporaries, and among others by Michael Angelo, and by Ariosto, in canto 37 of the 'Furioso.' She died in 1547, at Rome, and was styled 'a model of Italian matrons.' (Corniani, Tiraboschi, &c.)

COLONNADE. [CIVIL ARCHITECTURE.]

CO'LONY, in Latin colonia, a word derived from the verb colo, colere, to till or cultivate the ground, originally signified a number of people transferred from one country or place to another, where lands were allotted to them. The people themselves were called Coloni, a word corresponding to our term colonists. The meaning of the word was extended to signify the country or place where colonists settled, and is now often applied to any settlement or land possessed by a sovereign state upon foreign soil. Thus Ceylon and the Mauritius are called British colonies, though they are not colonized by Englishmen, the former being inhabited by natives, and the second by French or descendants of French colonists. The proper notion of the word 'colony' (as determined by the general use of the term) seems to be a tract of land, either wholly or partly colonized, that is to say, possessed and cultivated by natives, or the descendants of natives, of another country, and standing in some sort of political connection with and subordination to the mother country.

The formation of colonies is among the oldest occurrences recorded in history or handed down by tradition. Maritime states, such as those of Phœnicia and of Greece, possessing only a scanty territory, would naturally have recourse to emigration as their population increased. In both these countries the sea afforded a facility for transferring a part of their superabundant citizens, with their families and movables, and their arms, to some foreign coast, either uninhabited or thinly peopled by less civilized natives, who by good will or by force, gave up to them a portion of their land. The emigration might be voluntary or forced; it was no doubt in many cases the result of civil contentions or foreign conquest, by which the losing party were either driven away, or preferred seeking a new country to remaining at home. The report of some remote fertile coast abounding in valuable productions would decide others. Lastly, the state itself having discovered, by means of its merchants and mariners, some country to which they could trade with advantage, might determine upon sending out a party of settlers and might establish a factory there for the purpose of sale or exchange. In fact commercial enterprise seems to have led both to maritime discovery and to colonization as much as any one single cause. Such seem to have been the causes of the numerous Phœnician colonies which, at a very early date, were planted along the coasts of the Mediterranean. Tyre itself was a colony of Sidon, according to the 'Old Testament,' which calls it the 'daughter of Sidon.' Leptis Magna, near the great Syrtis, was also a colony of Sidon, according to Sallust (*Jugurth.* c. 78). Hippo, Hadrumetum, Utica, and Tunes, were Phœnician colonies, and all of greater antiquity than Carthage. The Phœnician colonies extended along the north coast of Africa as far as the Pillars of Hercules (the Straits), and along the opposite coast of Spain, as well as on the Balearic Islands, and Sardinia and Sicily. Those on the Spanish coast seem to have been at first small settlements or factories for the purpose of trade between the metropolis or mother country and the natives. Several of them, however, such as Gades, by degrees took the trade into their own hands and became independent of the mother country. The foundation of Carthage was an instance of another kind. It resulted, according to tradition, from an emigration occasioned by the tyranny of a king of Tyre. There is another confused tradition of a Phœnician or Canaanite emigration to Mauritania, occasioned by the conquest of Palestine by Joshua, and mentioned by Procopius and Suidas, as well as by some Jewish commentators [BERBERS]. The Phœnicians very early settled in the fertile island of Cyprus, which lay opposite their own coast. Of their settlements in the islands of the Ægean Sea we have only traditions referring to times previous to the war of Troy, and mentioned by Herodotus, and after him by Thucydides, who says that the Phœnicians and the Carians inhabited most of the islands, and carried on piracy, until Minos, king of Crete, drove them away, and planted new colonies. Herodotus says they had once a settlement in the island of Thasus, where they worked the gold mines. They also had a settlement on the island of Cythera (Cerigo), which lay conveniently for their trade with the Peloponnesus. Thucydides (vi. 2, &c.) also mentions that the Phœnicians formed establishments on the promontories and small islands on the coast of Sicily, from which they traded with the native Siculi; but that when the Greeks came to settle in great numbers in that island, the Phœnicians abandoned several of their posts, and concentrated themselves at Motya, Soloeis and Panormus, now Palermo (which last probably had then another name), near the district occupied by the Elymi or Phrygian colonists (who had emigrated from Asia after the fall of Troy, and had built Entella and Egesta), trusting to the friendship of the latter and also to their proximity by sea to their countrymen of Carthage. These three Phœnician settlements however merged afterwards into Carthaginian dependencies. The Phœnicians appear also to have occupied Melita or Malta, and the Lipari islands, one of which retained the name of Phœnicusa. Of the Phœnician settlements in the south part of Sardinia we have the report of Diodorus (v.) and a fragment of Cicero pro Scauro, published by Mai. The Phœnicians and Libyans are said to have been the earliest settlers in Sardinia, and to have founded Caralis (Cagliari) and Sulci. A Phœnician inscription was found in a vineyard at Cape Pula, belonging to the monks of the order of Mercy, and was explained by De Rossi, *Effemeridi Letterarie di Roma*, 1774. But the undoubted field of Phœnician colonization was the north coast of Africa. There the Phœnician settlements seem to have been independent, both of the mother country and of each other. We have the instance of Utica and Tunes, which continued separate communities even after Carthage had attained its great power; Carthage only exercising the hegemony or supremacy. This seems to have been the case among the original Phœnician towns; Sidon, Tyre, Aradus, &c., each a distinct common wealth, forming a sort of federation, at the head of which was the principal city, at first Sidon, and afterwards Tyre. A feeling of mutual regard seems to have prevailed to the last between the various Phœnician towns and colonies, including Carthage, as members of one common family.

The colonies established afterwards by the Carthaginians in the interior as well as on the coast of Africa, Sicily, and Spain, were upon a different plan from those of the Phœnicians: they were made through conquest and for the purpose of keeping the country in subjection, like those of the Romans [CARTHAGE], with the remarkable exception of the emigration colonies taken by Hanno to the west coast of Africa.

The earlier Greek colonies appear to have owed their origin to the same causes, and to have been founded upon the same plan as those of the Phœnicians. Thucydides (I.) says, that 'after the Trojan war, and the subsequent conquest of Peloponnesus by the Dorians, Greece being restored to tranquillity, began to send out colonies. The Athenians, whose country was overflowing with people from other parts of Greece, who had flocked thither for security, began to send out colonies into Ionia and to many of the islands; the Peloponnesians sent theirs to Italy, Sicily, and some parts of Greece. But all these colonies were sent after the Trojan war.' The Dorians from Megaris, Argos, Corinth, and other places, colonized some of the larger islands, part of Creta, Rhodes, Corcyra, as well as Ægina, Cos, &c. They founded the Hexapolis on the south-west coast of Caria, in Asia Minor, which district took from them the name of Doris. A colony of Lacedæmonians founded Cyrene. The Megarians founded Chalcedon, Byzantium, Selymbria, Heraclea, and other places on the coasts of the Euxine. Sicily also was chiefly colonized by Dorians. Syracuse was a Corinthian colony, which afterwards founded Acræ, Camarina, &c.; Gela was a colony of Rhodians and Cretans, and Agrigentum was a colony from Gela. The Megarians founded Selinus. The Chalcidians built Naxus, which was the first Greek settlement in Sicily, and afterwards took Leontini and Catana from the Siculi. For a more detailed account of the numerous Dorian colonies see K. O. Müller's *History of the Doric Race*.

The Ionians from Attica, another great branch of the Hellenic stock, after the death of Codrus, the last king of Athens, emigrated to the west coast of Asia Minor, which took its name from them [IONIA], and established there twelve cities or communities, which quickly rose to a high degree of prosperity, and formed a kind of federal union. About eighty years before, the Æolians and Achæans, two nearly allied races, being driven away from Peloponnesus by the Dorians, had emigrated to the coast of Asia Minor, where they formed colonies from Cyzicus on the Propontis as far southwards as the Hermus. Phocæa was the most northern of the Ionian towns on the borders of Æolia. The Æolians also colonized the islands of Lesbos, Tenedos, and others in that part of the Ægean. These emigrations were posterior to the time of Homer, who mentions other people as occupying that coast. The Athenians at a later date colonized Eubœa, where they founded Chalcis and Eretria, and they also sent colonies to Naxos, to the islands of Ceos, Siphnos, Seriphos, and other islands of the Ægean. Many of these colonies having thriven and increased, became colonizers in their turn. The enterprising mariners of Phocæa formed various colonies, the most celebrated of which is Massilia on the south coast of Gaul. The Chalcidians of Eubœa founded Cumæ, on the west coast of Italy, in the country of the Opici. Pirates from Cumæ founded Zancle, but a fresh colony of Samians and other Ionians escaping from the Persian invasion, in the time of the first Darius, took Zancle, and were afterwards in their turn dispossessed by Anaxilas, tyrant of Rhegium, who called the town Messene (now Messina), from the name of his original country in the Peloponnesus. The Æolians founded Dicæarchia, afterwards Puteoli, and they with the Cumæans are believed to have founded Parthenope (Naples). Ionian colonists settled on the coast of Sardinia.

The Greek colonies on the east coast of Italy, setting aside the confused traditions of Arcadian immigrations, Pelasgian, &c., supposed to have taken place before the Trojan war, consisted chiefly of Dorians and Achæans from the Peloponnesus. Croton, Sybaris, and Pandosia were colonies of the latter. Tarentum was a colony of Lacedæmonians, and Locri Epizephyrii of the Locrians. Greek colonies were settled both on the north and east sides of the Pontus (Black Sea), and also on the north coast in the modern Crimea. [BOSPORUS.]

As to the relations subsisting between the colonists and the natives or prior inhabitants of the countries which they occupied, it was undoubtedly in most cases strictly in accordance with the right of the strongest. Either the natives withdrew into the interior and left the ground to the new occupants, as the Siculi did in several instances, or they resisted, in which case, when overpowered, the men were exterminated or reduced to slavery, and the conquerors kept the women for themselves. In some instances the older inhabitants were reduced to the condition of serfs or bondmen to the new settlers. The records of authentic history do not present us with an instance of any colony being settled in a country where there were not previous inhabitants. The consequence of the immigration of a new race, who seek to possess themselves of the land, must be the extermination or gradual decay of the prior race, unless the old inhabitants are made slaves. So far as we trace the history of Greek colonies in the scattered fragments of antiquity, such were the consequences of their colonial settlements. On the coast of Italy it would appear that the Greeks pursued a more humane or more politic course. They are said to have allied themselves to and intermarried with the natives, and by their superior civilization to have acquired great influence. It may here be remarked that the Greeks, so far from being averse to foreign intermixtures, as some have said, mingled their blood freely with that of all the nations with whom they came into contact, and thus the civilization of the Hellenic stock was gradually introduced among nations less advanced in the useful arts.

What were the relations between these Greek colonies and the mother country, and between those colonies that were of a kindred race?

This may be gathered pretty clearly from Thucydides. Epidamnus was a colony of Corcyra: but the leader of the colony (*οἰκιστὴς*), the founder of the colony, or the person under whose conduct it was settled, was a Corinthian, who was called or invited, says Thucydides, from the mother city (called by the Greeks the metropolis, *μητρόπολις*, or parent state), according to an antient usage. Thus it appears that if a colony wished to send out a new colony, this was properly done with the sanction of the metropolis. Some Corinthians and other Dorians joined in the settlement of Epidamnus, which became a thriving community, and governed itself independently of both mother countries. In the course of time, however, civil dissensions and attacks from the neighbouring barbarians induced the Epidamnians to apply to Corcyra, as their metropolis, for assistance, but their prayers were not attended to. Being hard pressed by the enemy, they turned themselves to the Corinthians, and gave up their town to them, as being the real founders of the colony, in order to save themselves from destruction. The Corinthians accepted the surrender, and sent a fresh colony to Epidamnus, giving notice that all the new settlers should be on an equal footing with the old settlers: those who did not choose to leave home were allowed to have an equal interest in the colony with those who went out, by paying down a sum of money, which appears to have been the price of allotments of land. Those who went out gave their services; those who stayed at home gave their money. 'Those who went out,' says Thucydides, 'were many, and those who paid down their money were also many.' For the moneyed people it was in fact an affair of pure speculation. The Corcyræans, themselves originally a colony from Corinth, having become very powerful by sea, slighted their metropolis, and 'did not pay to the Corinthians the customary honours and deference in the public solemnities and sacrifices, as the other colonies were wont to pay to the mother country.' They accordingly took offence at the Corinthians accepting the surrender of Epidamnus, and the result was a war between Corcyra and Corinth. (i. 24.)

Again, the Corcyræan deputies, who were sent to court the alliance of the Athenians against Corinth, stated, in answer to the objection that they were a colony of Corinth, that 'a colony ought to respect the mother country as long as the latter deals justly and kindly by it, but if the colony be injured and wrongly used by the mother country, then the tie is broken, and they become alienated from each other, because, said the Corcyræans, colonists are not sent out as subjects, but as free men having equal rights with those who remain at home.' (i. 34.) This shows the kind of relation as understood by the Greeks between the metropolis and its colonies. The colonies were in fact sovereign states, attached to the mother country by ties of sympathy and common descent, so long as those feelings were fostered by mutual good-will, but no further. The Athenians, it is true, in the height of their power, exacted money from their own colonies as well as from the colonies of other people, and punished severely those who swerved from their alliance, such as Naxos; but this was not in consequence of any original right of dominion as supposed to belong to the mother country over the colony. Many of the colonies, especially the earlier ones, which were the consequence of civil war or foreign invasion, were formed by large parties of men under some bold leader, without any formal consent being asked from the rest of the community: they took their families, their arms, and their movables with them, to conquer a new country for themselves; they left their native soil for ever, and carried with them no obligations or ties. Those that went off in more peaceful times, by a common understanding of the whole commonwealth, went also away for ever, and freely and voluntarily, though under a leader appointed by the parent state, to seek a country where they could find an easier subsistence than at home. In either case it was a complete separation of a member from the body. When the Athenians, in later times, took possession of parts of Eubœa (Thucyd. i. 114), and of Ægina (ii. 27), of Melos (v. 116), and shared the lands among their own citizens who went there, the relationship thus formed was of a different kind In the case of Ægina the whole population, which was of Hellenic stock, was turned out, and a body of Athenians occupied their place, with the express object of being as a body or community subordinate to the state of Attica, in order to prevent the annoyance to which Attica had long been subject by the proximity of an independent island so well situated both for the purpose of annoying Attica and for self-defence.

That the colonies of a kindred race should feel a common interest in opposition to those of a rival branch is natural, and is proved among other instances by the case of the deputies from Egesta in Sicily, who, while requesting the assistance of the Athenians against the Syracusans and Selinuntians, urged as an additional plea that the Leontines, who were originally Chalcidians, and therefore akin to the Athenians, had been expelled from their town by the Syracusans, and showing that it was the interest of the Athenians to assist a kindred people against the prevailing power of the Dorian colonies in Sicily. (Thucyd. vi.)

Before we pass to the Roman colonies, we must say something of the system of colonization among the other inhabitants of the Italian peninsula in the Ante-Roman times. The Etruscans extended their conquests north of the Apennines in the great plain of the Po, and founded there twelve colonies, the principal of which was Felsina (Bologna). They afterwards, having defeated the Umbrians, many years before the assumed foundation of Rome, extended themselves into East and South Italy, penetrated into Latium, and took Campania from the Oscans, where they founded likewise twelve colonies, the principal of which was Capua. The Etruscans, being skilled in architecture, surrounded their towns with solid walls built of massive stones without any cement; they were also well versed in agriculture and hydraulics, and several of the earliest drains and canals in the Delta of the Po are attributed to them. They subjected, but at the same time necessarily civilized, the people among whom they settled. Their colonies seem to have formed independent communities, though allied by a kind of federation. The Etruscans also founded colonies in the Picenum, such as Hatria [ATRI] and Cupra Montana and Cupra Maritima. They took from the Ligures the country around the gulf now called Della Spezia, and founded the city of Luna. They likewise sent colonies to the islands of Elba and Corsica, for the Etruscans were a commercial as well as agricultural people; they navigated the sea, and in the sixth century B.C. they defeated the Phocæans, and drove them out of Corsica. The Etruscans civilized Italy by means of their colonies, but, unlike Rome, they did not keep them united under a central power.

The Sabini, an agricultural and pastoral people, living in a mountainous country, sent colonies in very remote times to other parts of Italy. It was their custom, after the lapse of a certain number of years, to celebrate solemn sacrifices in the spring season, and to consecrate to the gods a number of young men, who were to quit their native land, and proceed under the auspices of Heaven to seek a new country. In this manner the Piceni and the Samnites are said to have been colonies of the Sabini. The Samnites in their turn sent out other colonies, and the Lucanians were one of these. The Samnites as well as the Sabini were entirely given to agricultural pursuits.

Rome, in the earliest ages of the republic, adopted the system of sending out colonies to the conquered countries. But the Roman colonies were different from those of most other people, inasmuch as they remained strictly subject to the mother country, whose authority they were the means of enforcing upon the conquered nations. They were, in fact, like so many garrisons or outposts of Rome. Servius (Æn. i. 12) gives the following definitions of a colony, taken from much older authorities:—'A colony is a society of men led in one body to a fixed place, furnished with dwellings given to them under certain conditions and regulations.' Again, 'Colonia is so called a colendo; it consists of a portion of citizens or confederates sent out to form a community elsewhere by a decree of their state, or with the general consent of the people from whom they are departed. Those who leave without such a consent, but in consequence of civil dissensions, are not colonies.' The notion of a Roman colony seems to be this: the colonists occupied a city already existing; and this, with perhaps one exception or two, was the general character of the Roman colonies in Italy Proper. When the Romans afterwards extended their conquests into countries where there were no regular towns, or where the population being fierce and hostile, the Roman settlers must be ever on their guard against them, they built new towns in some favourable position. Such was the case in several parts of Gaul, Germany, Dacia, &c. But the Roman colonies in Italy consisted of Roman citizens, who were sent as settlers to fortified towns taken in war, with land assigned to them at the rate of two jugera of arable land or plantation for each man, besides the right of pasture on the public or common land. The old inhabitants were not ejected, or dispossessed of all their property; the general rule was, that one-third of the territory of the town was confiscated and distributed among the colonists, and the rest was left to the former owners, probably subject to some charges in the shape of taxes, or services. The colonists constituted the *populus* of the place; they alone enjoyed political rights and managed all public offices, the old inhabitants being considered as the plebs. The ownership of the publicum or public property, including the pasture land, was probably also vested in the new settlers. It is natural to suppose, that for some generations at least, no great sympathy existed between the old and the new inhabitants, and hence we frequently hear of revolts of the colonies, which means, not of the colonists against the mother city, but of the old inhabitants, who rose upon and expelled the colonists. But these events generally ended by a second conquest of the place by Roman troops, when the old inhabitants were either put to the sword or sold as slaves, or, under more favourable circumstances, lost at least another third of their property. In later times, during the civil wars of Rome, new colonies were sent by the prevailing party to occupy the place of the former ones; and the older colonists were then dispossessed of their property either wholly or in part, just as they had dispossessed the original inhabitants. Hence the saying, 'Veteres migrate coloni.' Sometimes colonies, especially at a great distance from Rome, having dwindled away, or being in danger from the neighbouring populations, asked for a reinforcement, when a fresh colony was sent, to whom the old colonists gave up one-third of their property. Each of the older colonies, it is observed by Gellius (xvi. 13), was a Rome in miniature; it had its senators called Decuriones, its Duumviri, Ædiles, Censores, Sacerdotes, Augurs, &c.

A distinction must here be made between the Roman colonies and the Latin colonies. The former had all or nearly all the rights of the citizens of Rome, although Sigonius and some others pretend that they had not the jus suffragii; and yet, in various passages of Livy and others, colonists are styled cives and Romæ censi. The Latin colonies had not the jus Quiritium, but only the jus Latii. All those, however, who filled magistrates' offices in Latin colonies became Roman citizens. Such was the case with Tibur, Præneste, &c. The towns of Transpadane Gaul, as a reward for their fidelity to Rome, obtained the rank of Latin colonies without any colonists being sent to them.

There were also military colonies, which consisted of soldiers, to whom land was given instead of pay and provisions, as a resting-place after their campaigns. Sulla appears to have been the founder of these, and Cæsar and Augustus added greatly to their number. These colonies are distinguished by having military ensigns on their coins, while the Coloniæ Togatæ, or citizen colonies, have a plough on theirs. (Heinec. *Antiqu. Roman. Syntagma.*) The coins of some colonies have both marks, which means that the original colony consisted of citizens, after which a second was sent, composed of military. In Tacitus (*Annal.* i.) the veterans complain that, after their long service, they were rewarded only with uncultivated lands, situated in the neighbourhood of the enemies of the empire.

The system of colonies adopted by Rome had a double political object; to secure the conquered countries, and to satisfy in part the claims of its own poorer citizens, and to get rid of turbulent characters. The importance of the Roman colonies to the empire is well expressed by Cicero, who calls them 'propugnacula imperii et speculæ populi Romani.' Such they doubtless were, and at the same time they were the germ of the civilization of Northern and Western Europe. A nation of civilized conquerors, whatever evils it may inflict to gratify its own cupidity, confers on the conquered people unintentionally still greater benefits. By their colonies in Spain, Gaul, on the banks of the Rhine, and in Britain, the Romans established their language and their system of administration. The imprint of their empire is indelibly fixed on the existing nations of Europe.

The difference between Colonia and Municipium is that the latter was a town of which the inhabitants, being friendly to Rome, were left in undisturbed possession of their property and their local laws and political rights, and obtained moreover the Roman citizenship, either with or without the right of suffrage; for there were several descriptions of Municipia. [MUNICIPIUM.] The colonies, on the contrary, were all governed according to the Roman laws. The Municipia were foreign limbs engrafted on the Roman stock, while the colonies were branches of that stock transported to a foreign soil.

Under the later Roman Emperors, the difference between Colonia and Municipia became obliterated, and all were governed alike according to the Roman law, and a uniform system of administration. Augustus gave the right of Roman citizenship to all Italy. Antoninus Caracalla bestowed it upon all freemen, subjects of the empire. (For the Roman colonies see Niebuhr, vol. ii.; Manutius *de Civitate Romana*, Sigonius *de Ant. Jure Ital.*; Heineccius, *Syntagma*, *&c.*)

The northern tribes who overthrew the western empire did not found colonies; they overran or conquered whole provinces, and established new states and kingdoms. The same may be said of the Saracen conquests in Asia and Africa. But, after a lapse of several centuries, when Europe had resumed a more settled form, the system of colonization was revived by three maritime Italian republics, Pisa, Genoa, and Venice. Their first settlements on the coasts of the Levant and Egypt were mercantile factories; which the insecurity of the country soon induced them to convert into forts with garrisons, in short into real colonies. The Genoese established colonies at Famagosta in Cyprus, at Pera and Galata, opposite to Constantinople, at Caffa in the Crimea, founded in 1266; they also acquired possession of a considerable extent of coast in that peninsula, forming a district subject to Genoa under the name of Gazaria. Another tract, on the coast of Little Tartary, called Gozia, was also subject to the Genoese, who had then the colony of Cembalo. In the Palus Mæotis they had the colony of La Tana, now Azof. On the south coast of the Euxine they possessed Samastro or Amastri; they had also a factory with franchises and their own magistrates at Trebizond, as well as at Sebastopolis. These colonies were governed by consuls sent from Genoa, and the order and justice of their administration have been much extolled. In the archives of St. George, at Genoa, there is a valuable unpublished MS. containing the whole colonial legislation of the Genoese in the middle ages.

The Pisans, having taken Sardinia from the Moors, sent colonies to Cagliari and other places. Their settlements in the Levant were mere commercial factories.

The Venetians established colonies in the Ionian islands, Candia and Cyprus. Their system resembled that of Rome; they ruled, by means of their colonies and garrisons, over the people of those islands, whom they left in possession of their municipal laws and franchises. These were not like the settlements of the Genoese, merely commercial establishments—they were for conquest and dominion; in fact, Candia and Cyprus were styled kingdoms subject to the Republic. The Venetians had also at one time factories and garrisons on various points of the coasts of the Levant, but they lost them in the Morea, Eubœa, Syria, and the Euxine, either through the Genoese, or afterwards by the arms of the Ottomans. We can hardly number among their colonies the few strongholds they had until lately on the coast of Albania, such as Butrinto, Prevesa, Parga, &c., any more than those possessed by the Spaniards and Portuguese on the coast of Barbary, Oran, Melilla, Ceuta, &c. They were merely forts with small garrisons, with no land attached to them. The name used in the Mediterranean for such places is presidii; and they are often used as prisons for criminals. An essential qualification of a colony is that it should have and cultivate land, and consist at least in part of civilians. The great question agitated now in France, with regard to Algiers, turns upon this,—whether the French are merely to occupy the towns on the coast as military and in some degree commercial colonies, or establish a great agricultural colony in the interior, by taking possession of and cultivating the land. This question, as well as that of most modern colonies, touches several points both of justice and policy. When a colony is sent to a country occupied by a few hunting tribes, as was the case in part of North America at the time the English settled there, and as is now the case in New Holland, the taking possession of part of the land for the purpose of cultivation is attended with the least possible injury to the aborigines, while, at the same time, it has in its favour the extension of civilization upon a new shore. The savages generally recede before civilized man; a few of them adopt civilization, and the rest become gradually extinct. When the limits are confined, the progress towards extinction is exceedingly rapid. The aborigines of Van Diemen's Land are now, as we are informed, reduced to a very small number, and perhaps that small number may, at this moment, have been reduced to nothing. This, however melancholy in one point of view, has been, from the earliest times, the great law of the progress of the human race. But the case is much altered when the natives are partly civilized, live in domestic societies, have settled habitations, and either cultivate the land or feed their flocks upon it. The colonists in such case do what the Romans did in their colonies; they take part of the arable land, or the whole of the common or pasture land, and leave to the natives just what they please, and if the latter resist, they kill them. Whether this be justice every man may ask himself. Such however has been the system pursued by the Spaniards in various parts of America, by the Dutch at the Cape and the Molucca islands, and by all maritime nations in some part or other of Asia, Africa, or America; and this is now attempted to be done by the French against the Arabs and Kabyles of the state of Algiers. The case may be one of greater or less oppression; according as the land is either enclosed and cultivated, or merely used for pasture or the chase, and according as the natives are more or less numerous in proportion to the land, colonization may proceed on a milder or harsher system; still the question of justice remains the same, unless the natives be willing to part with their land by amicable arrangement. This system of purchase from the natives has been practised both by the English and Anglo-Americans in North America; but though it has the specious name of bargain, it has often been nothing more than a fraud, or sale under compulsion. The man of Europe has been long accustomed to regard the possession of the soil as that which binds him to a place, and gives him the most secure and least doubtful kind of property. His habits of accumulation, and of transmitting to his children a permanent possession, make him covet the acquisition of land. In whatever country he has set his foot, and once got a dominion in the soil, neither contracts, nor mercy, nor feelings of humanity, nor the religion which he carries with him, have prevented him from seizing on the lands of the owners, and punishing their resistance with death.

The modern colonies in Asia and America have been formed partly on the Roman or Venetian and partly on the Genoese or old Phœnician principle. When the Portuguese first began their voyages of discovery in the 15th century, they took possession of some islands or points on the coasts of Africa and of India, and left there a few soldiers or sailors under a military commander, who built a fort to protect the trade with the natives, and afterwards also to keep those natives under a sort of subjection. No great emigrating colonies were sent out by them, except in after times to Goa and the Brazil, which latter is really a colony of Portuguese settlers. The Spaniards, on the contrary, when they discovered America, took possession of the soil, and formed real colonies kept up by successive emigrations from the mother country. In the West India Islands the natives were made slaves, and by degrees became extinct under an intolerable servitude. On the mainland they were exterminated in some places, and in others reduced to the condition of serfs or tributaries. The Spaniards colonized a great part of the countries which they invaded. The Spanish American colonies had for their objects both agriculture and mining. The North American colonies were the consequence of emigration, either voluntary or produced by religious persecution and civil war at home. The Puritans went to New England, the Quakers to Pennsylvania, and the Cavaliers to Virginia. They formed communities under charters from the crown, and had local legislatures, but were still subject to the sovereignty of the mother country. The mother country sent its governors, and named, either directly or indirectly, the civil functionaries. The precise amount of obedience that the colonies then owed to the mother country cannot be exactly defined. The American revolution only showed that it did not extend to a certain point, without showing how far it did extend.

A new feature has appeared in modern European colonization, that of penal colonies, which was an extension of the principle of the presidii on the coast of Barbary, already mentioned. Convicts were sent by England first to North America, and afterwards to New Holland, by France to Guiana, by Portugal to the coast of Angola, and by the Dutch to Batavia. They were either employed at the public works, or hired to settlers as servants, or were established in various places to cultivate a piece of land, for which they paid rent to the government. The policy of penal colonies has been much discussed. They may afford a relief at least temporary, but at a great cost to the mother country, by clearing it of a number of troublesome and dangerous characters, especially so long as criminal legislation and the system of prison discipline continue as imperfect as they are at present in most countries of Europe; but with regard to the convicts themselves, and the prospect of their reformation, everything must depend upon the regulations enforced in the colony by the local authorities. If we look however at the horrid places of confinement to which convicts are sent by most continental governments, and which are sinks of every kind of corruption and wretchedness, we cannot help feeling disposed to think more favourably of such colonies, under proper regulations and discipline, and to prefer the penal colonies of Great Britain to such ill-regulated places of punishment, which do not even affect to be places of reformation.

With regard to the advantages resulting from colonies to the mother country, they appear to be, the extension of trade and exchange, the consequent employment of a number of additional hands, and the giving the means of acquiring property to many who have no chance at home. Many individuals also realize fortunes in the colonies, with which they afterwards return home, and thus add to the national wealth. Much has been written upon this subject by political and economical writers, and the advantages of colonies have been exaggerated by some, and perhaps too much underrated by others. In a general point of view, as connected with the progress of mankind, a busy prosperous colony on a land formerly wild and desert is undoubtedly a cheering sight. Commercial colonies or factories are likewise useful for protecting traders in remote and half-barbarous countries. But the proper question as to the policy of colonies now is this;—should a state form colonies in its collective or sovereign capacity, or should it put obstacles in the way of its citizens forming colonies by voluntary associations, or should it favour such associations by offering facilities to them, or at least putting no obstacles in the way; and should the state allow such associations of emigrants to form such a political community as they choose? This subject is properly discussed under the head of **Emigration**.

An account of the great modern colonies is given under the respective heads, such as **Barbadoes**, **Brazils**, **Canada**, **Cape of Good Hope**, **Jamaica**, &c.

The colonies of England consist of British North America, the British West India Islands, with the Bahamas and Bermudas, and British Guiana in S. America; Sierra Leone, Cape Coast, and Cape of Good Hope in Africa; the islands of St. Helena, Mauritius, Ceylon, Pulo Penang, Sincapore, and Malacca; various settlements on the coasts of Australia, and Tasmania, or Van Diemen's Land. The vast possessions of the East India Company in India cannot be called colonies, though they are dependencies of Great Britain, by which name also Gibraltar and Malta must be designated

France has the French West India Islands, and French Guiana in America; Senegal, on the Coast of Africa; the island of Bourbon; and Pondichery, in the East Indies.

Spain has lost her vast dominions in Mexico and South America, but has retained the fine islands of Cuba and Puerto Rico: she has also the Philippine Islands.

Portugal has lost the Brazils, but has still numerous settlements on the coast of South and East Africa, at Angola, Benguela, Loango, and on the Mozambique; but these settlements are the most degenerated of all European colonies. In India the Portuguese retain Goa, and they have a factory at Macao, and a settlement on the northern part of the island of Timor.

The Dutch have the islands of Curaçao and St. Eustaz, and Surinam in Guiana. In Asia they have the great colony of Batavia with its dependencies, various settlements on the coasts of Borneo, Sumatra, Celebes, and the Molucca islands.

The Danes are possessed of the islands of St. Cruz and St. Thomas in the West Indies; Christianburg, near Accra, on the Guinea coast; and Tranquebar in the East Indies.

The Swedes have the island of St. Bartholomew in the West Indies.

A society of North American philanthropists has founded since 1821, on the Guinea coast, east of Cape Mesurado, a colony of emancipated negroes, who have been transferred thither from the United States. The colony is called Liberia, and has two small towns, Monrovia and Caldwell.

On the subject of modern colonies, Raynal, *Histoire des Etablissemens des Européens dans les deux Indes*, may be useful, though it is often exaggerated and turgid; bu the best authorities are the original accounts of the various discoverers and founders of the colonies, such as have been published by Navarrete for the Spanish, Barros for the Portuguese, &c.

The *English Colonies* have, as a general rule, local legislatures, elected by the people, and a governor and council named by the king. The foreign commerce of these colonies is regulated by the sovereign authority of the mother country, and put on such a footing as generally to allow the products of the colonies admission into British ports on more favourable terms than those of other countries. To the amount of this protecting duty, the colonies then have the advantage of a monopoly in the markets of the mother country. The old strict colonial system, of excluding foreign countries from direct commercial intercourse with the colonies, had the double object in view of securing all the supposed advantages of the exchange of British for colonial products, and giving employment to the British merchant navy. The rigour of this system however has gradually relaxed, and given way to clearer views of self-interest. Still the colonial system, as maintained by Great Britain, presents in many instances examples of foreign possessions which are expensive to the country without any apparent corresponding advantages; and also of foreign possessions, the trade with which is still encumbered with regulations either unfavourable to the producers of the mother country, or favoured by discriminating duties which are an unfair tax on the domestic consumer. The expenditure in some of the colonies for the purposes of administration and protection is beyond the means of the colonial revenues to meet, and the deficiency must of course be supplied by the parent state. The immense patronage which colonial possessions put at the disposal of the government is naturally one reason why colonies are looked upon as profitable things by those who participate in the advantages of posts and places in them. On the other hand, those who only contribute to these expenses may not unreasonably ask for some proof of solid advantage to the nation in return for this annual outlay. Setting aside the interests of those concerned in the administration of the colonies, it is asked, in many cases, what advantage does the rest of the nation receive? So far as colonies may be desirable posts for protecting British commerce and shipping, the advantage of maintaining them may be fully equivalent to the expense. But in every particular instance the question as to the value of a modern colony to the mother country (omitting, as before mentioned, the value of the patronage to those who confer places in the colonies and the value of the places to those who receive them) is simply this;—what advantage is this said colony to the productive classes of the country and to those who consume the products of the colony? a question not always easy to answer; but this is the question, the solution of which must decide whether a colony ought to be maintained or not, if we look only to the interests of the mother country. If we look to the interests of the colony, it may be in many and certainly is in some cases, the interest of the colony to remain as it now is, under the protection and sovereign authority of the mother country. But again the question recurs, what is the advantage to the mother country? If some advantage cannot be shown, the maintenance of a useless colony is a pure act of national benevolence towards the colony and to those few of the mother country who have places in it. If our present relation with a colony such as Jamaica or Canada entails any expense on the mother country, we may ask whether all the commercial advantages that result from this relation would not be equally secured, if only the free commercial relation existed and that of administration were to cease. In support of this view, it is shown that the commerce of Great Britain with the United States, now free and independent, has increased most wonderfully since the separation, and probably more rapidly than it would have increased under the colonial system. This being the case, a similar increase might be anticipated in the trade with all those foreign possessions whose trade is really of any importance. This argument, to which it is difficult to reply, is met by saying that if we give up those colonies that cause expenditure on the part of the mother country, some of them at least would be a prize for other nations, who would exclude us from the commerce of those former colonies, or allow it only on unfavourable terms; or that these colonies would throw themselves into the arms of foreign nations, and the same result would follow. To this it is replied, that no other nation is in a condition to take on itself the management of expensive colonies; that nations, like individuals, will, if let alone, buy where they can buy cheapest, and sell where they can sell dearest; and that if we should be shut out from the commerce of any of our present colonies, there are equally good or better markets from which we are now in part or altogether excluded owing to those very regulations, which only exist because we have colonies to maintain.

The colonial administration of the British colonies is an important department of the general administration. At the head of it is the principal colonial secretary, who is one of the three secretaries of state, assisted by two under secretaries.

COLOQUI'NTIDA. [Cucumis.]

COLORA'DO, a river of Mexico, falls into the northern extremity of the Gulf of California, somewhat south of 32° N. lat. To judge from its appearance at its mouth, we should not suppose this river to have a course of 230 leagues or about 640 English miles, which Humboldt assigns to it; for it has often not more than six feet of water, and its breadth at low water is hardly more than 200 yards. Two low islands at its mouth are called, by Hardy, Montagu and Gore. Its banks here are low, but the western is somewhat higher than the eastern. About 30 miles from its mouth, Hardy found only two feet of water in the channel. Sixty miles from its mouth in a straight line, the Colorado is joined by the Rio Gila, a river which runs east and west for above 300 miles, and has its source in the Sierra Mogollon, the southern extremity of the Rocky mountains, about 34° 20′ N. lat., and 108° W. long. The place where both rivers unite has been visited by Dr. Coulter, who states that the country between the rivers, as well as on both sides of them, is a sandy desert, without potable water, and subject to excessive heat: the thermometer in one instance rose to 140°.

The remainder of the course of the Rio Colorado is entirely unknown, the country having only been visited by two monks, according to whose reports, as Humboldt tells us, the river is formed by two upper branches, the northern, Rio Zaguananas, rising in about 40° N. lat., and the southern, Rio Nabajoa, rising in about 39° N. lat. Both descend from the western declivity of the Rocky Mountains. [COLUMBIA RIVER.] These monks also report that they found on the banks of the Rio Yaquesila, a tributary of the Colorado, a nation of natives, the Moqui, far advanced in civilization. They passed there through a considerable town, which had two large squares, and a straight and wide street; the houses had several stories, and flat roofs, on which the people assembled in the evenings. The fact however seems to be very doubtful. Dr. Coulter does not mention it, though he had frequent opportunities of communicating with the American hunters, who traverse these countries in search of otters. (Humboldt, Hardy, Dr. Coulter, in *London Geogr. Journal*, vol. v.)

COLOSSE'UM. [AMPHITHEATRE.]

COLOSSIANS, EPISTLE TO THE, a canonical epistle of the New Testament, addressed by St. Paul to the Christians of Colossæ, a city of Phrygia. The date generally assigned to this epistle by the commentators and critics is A.D. 62. (*Tablettes Chronologiques*, par l'Abbé Lenglet Dufresnoy, tome ii. p. 211. Dr. Adam Clarke's *Succession of Sacred Literature*, vol. i. p. 89). Some say A.D. 63, or the 9th of Nero. In the Dissertations on the Harmony of the Gospels, by the Rev. Mr. Greswell (vol. ii. pp. 63—66), it is shown that the Epistles to the Ephesians, to the Philippians, and to Philemon, were written by St. Paul at the same time as the one to the Colossians, namely, in A.D. 60, nearly at the termination of the apostle's first imprisonment at Rome; and Epaphroditus in Philemon is considered by Mr. Greswell to be the same person as Epaphras in Colossians. From the expressions in ch. i. ver. 4, 7, 9, and ch. ii. 1, it is inferred by some that St. Paul himself was personally unknown to the Christians of Colossæ; but others, especially Dr. N. Lardner (*Credibility Gos.*), who argues on the statements of Theodoret (tom. iii. p. 342), assert that St. Paul preached and planted the church at this city. According to Eusebius, this city was one of three which, in the 10th year of Nero (that is, a year after the reception of this epistle), were totally destroyed by an earthquake. The chief object of St. Paul in this epistle appears to have been to exhort the Christians of Colossæ to adhere steadfastly to the doctrines which he taught, and to reject the opinions of the Jews and the Pagan philosophers. The concluding sentence of the fourth chapter states that the conveyance of this address was committed to Tychicus and Onesimus. For a list of published sermons on texts from Colossians, see Watt's *Biblioth. Brit.* (Eichhorn, Michaelis, Horne.)

COLOSSUS. [STATUE.]

COLOUR, in Optics. [LIGHT.]

COLSON, JOHN, born about the beginning of the eighteenth century, studied at Emmanuel College, Cambridge, and was master of the free-school at Rochester till 1739, when he succeeded Sanderson as Lucasian professor at Cambridge. He died in 1760 He is worthy to be remembered for his English edition of Newton's Fluxions, London, 1736; and his translation of the Analytical Institutions of Maria Agnesi, which lay in manuscript till 1801, when it was published by the Rev. John Hellins at the expense of Baron Maseres.

COLTSFOOT, the common name of TUSSILAGO FARFARA.

CO'LUBER, a sub-genus of Ophidians, or serpents. The genus *Coluber* of Linnæus comprised all the serpents whether venomous or not, whose scales beneath the tail are divided into two, or more properly speaking, arranged in pairs; but the term is generally applied by Cuvier and other authors to those serpents which have transverse plates on the belly, and the plates under the tail forming a double row, a flattened head with nine larger plates, teeth almost equal, and no poison-fangs.

Laurenti placed the *Colubridæ* between the rattlesnakes (*Caudisona*) and the vipers. Scopoli's genera were those of Linnæus. Lacépède placed the *Colubridæ* at the head of his nine genera of serpents, and next to them came the boas and rattlesnakes. Alexander Brongniart made them the last but one of his six genera of Ophidians, arranging them between the vipers and the boas. Latreille gave the genus a place between *Chersydrus* and *Dipsas* in his family of *Anguivipères*. Daudin comprehended 172 species under the genus. In the synoptical table of Duméril and Bibron, Cuvier is made to place it between *Dipsas* and *Cerberus* Oppel subdivides his section (the second) the *Squammata* (Écailleux) into seven families, of which the *Colubridæ* (Couleuvrées) are the last, coming immediately after the *Pseudo-vipères*. Merrem divided the serpents into two sub-tribes: in the first sub-division, the *innocui*, or serpents without venom, of the first tribe (*Gulones*), *Coluber* appears between *Scytale* and *Hurriah*. De Blainville separated the serpents into *Dipodes* and *Apodes*; *Coluber*, coming immediately after *Boa*, is placed in the innocuous division of these *Apodes*. Mr. Gray, in 1825, divided the Ophidians, his fourth order of reptiles, into two great groups, venomous and innocuous, and the *Colubridæ* were placed by him between the *Hydridæ* and *Böidæ*, the three families of the second group. Dr. Harlan, in the same year, made the Ophidians, his fourth order, contain six genera, and placed *Coluber* between *Ophisaurus*, his first, and *Vipera*, his third genus. Mr. Haworth, in the same year, arranged the genus between *Scytale* and *Dryinus*, among the true serpents (*Apoda epalpebrata*, or serpents without eye-lids), and under the innocuous branch of the *Gulonia*. Fitzinger (1826) placed the *Colubröides* between the *Pythonöides* and the *Bungaröides*, in his comprehensive third tribe *Monopnoa squammata*. Ritgen (1828) arranged the *Colubridæ* and the *Böidæ* under his *Macrostomata*, the third sub-partition of the first sub-division, *Holodontaspistes* (with entire teeth), of his third sub-order of scaly serpents. Wagler, whose untimely loss all zoologists deplore, published (1830) his 'Naturaliches System der Amphibean.' He makes his fourth order, the serpents, consist of one family only, comprehending ninety-seven genera, and places *Coluber* the forty-ninth between *Spilotes* (Wagler), and *Herpetodrys* (Böié). In 1831, Mr. Gray, in Griffith's 'Cuvier,' published a synopsis, in which he makes some alterations in his original classification. The *Squammata* form the second section, and the *Ophidians* its third order, which is divided into two sub-orders, the venomous and innocuous, the upper jaw of which last is toothed, but without fangs, or with very small ones: in the latter sub-order, the *Colubridæ* are again placed with the boas and the hydras.

In 1832 Professor John Müller, of Bonn, published his system: the Colubers are arranged by him immediately after *Dryinus*, as the last of the *Isodonts*, the third family of his second order, uniting the *Macrostomes* which correspond to the *Heterodermes* of Duméril.

The species of the genus as left by Cuvier, are very numerous, and their geographical distribution is very wide. The foreign species are some of them remarkable for their vivid colouring, and others for the regularity of the pattern, so to speak, with which they are marked. Others, again, are singularly slender in form, but none grow to a large size. The harmless *common snake*, or *ringed snake*, *Neidr fraith*, *Neidr y tomenydd*, of the antient British, *Natrix torquata* of Gesner and Ray, *Coluber Natrix* of Linnæus, will serve as an example of the form. [NATRIX.]

COLUMBA. [COLUMBIDÆ.]

COLUMBA NO'ACHI (constellation), the dove of Noah, a constellation formed by Halley, close to the hinder feet of Canis Major.

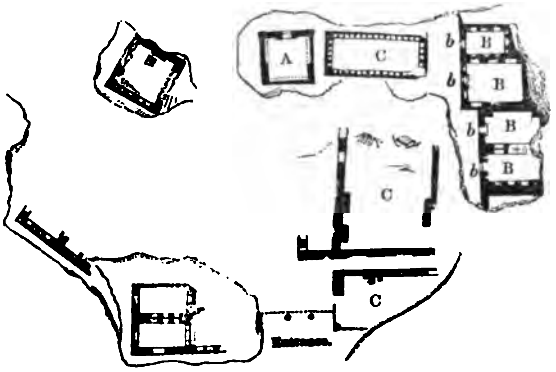
Character.	No. in Catalogue of		Magnitude.
	Piazzi.	Astron. Society.	
θ	9	767	5
	35	622	6
ο	51	630	5
	59	633	6
κ	65	787	4½
ε	140	672	4
	169	689	6
ν¹	177	692	6
ν²	183	695	6
α	196	699	2
μ	238	712	5
β	267	732	3
γ	297	746	4

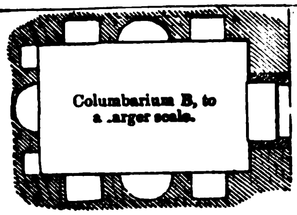
COLUMBA'RIUM, a place of sepulture used for the ashes of the Romans after the custom of burning the dead had been introduced among them. The word columbarium signifies a dovecote; and its application to the Roman places of interment has arisen from the resemblance between the small arched holes which contain the sepulchral urns and the recesses formed for the doves in a dovecote.

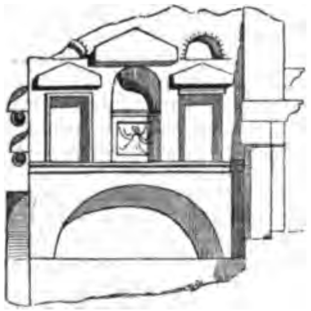
This application of the word columbarium is proved by antient inscriptions, but we are not aware that the term is used in this sense by any extant Latin writer.

In the Villa Doria Pamfili at Rome was discovered, some years since, a very extensive columbarium, or rather an assemblage of columbaria, which are shown on the accompanying plan. It was surrounded by a wall, with a triple entrance, formed by two columns. The columbaria, which are on a very diminutive scale, are placed without any regularity. One building, A, superior in workmanship to the others, appears to have been a small temple in antis, built with red bricks, set with very delicate joints, and rubbed on the surfaces. The chambers, B, B, B, &c., were superior columbaria, with large niches, which contained double ollæ or vases for the ashes of the dead, with small tablets let into the wall below each niche. The small structures at C, C, which most resemble the dovecotes, are supposed to have been the sepulchres of the slaves. They are built with reticulated work, and are filled with rows of pigeonholes, which contain ollæ: they have no inscriptions. The brickwork of these columbaria is of several dates, if we may judge from the diversity of construction. The chambers B *b*, B *b*, have stone doorways, in the Egyptian style. The interior of these little structures, and the temple, have been stuccoed and ornamented with reliefs, and painted. The small room V, in the British Museum (Townley Marbles), represents a columbarium on a large scale: the niches are represented with sculptured and plain tablets. In the immediate neighbourhood of the Columbarium, in the Villa Doria Pamfili, are numerous inscriptions, tablets, and monumental urns, which belonged to these sepulchres, but having been removed from the ollæ, they lose part of their interest. There are several columbaria in the neighbourhood of Rome, among which that of the family Pompêia is remarkable for its tablets, urns, &c., some account of which is given in the *Encyclopédie Méthodique, Architecture.* A sepulchral chamber was discovered in the year 1746 near the gate of San Sebastian at Rome. (See plates to Moses's 'Classical Ornaments, Vases, Candelabra,' &c.)

[Plan of Columbaria, discovered a few years since in the gardens of the Villa Doria Pamfili at Rome.]







[Section of Columbarium B.]

COLUMBIA, DISTRICT OF, lies on both sides of the Potomac, and is bounded by the State of Maryland on the north-east, north-west, and south-east, and by the State of Virginia on the west and south-west. It forms a square of 100 square miles. That part of it which lies on the south side of the Potomac was ceded by the State of Virginia, and that which is on the north side of the same river, by the State of Maryland, to the United States, July 16, 1790, when it had been determined to establish the seat of the Federal Government on the banks of the Potomac. Washington became the seat of the Federal Government in 1800 The Potomac traverses the district in a south-east direction, and receives within it a small stream called the Eastern Branch. By the junction of this stream with the Potomac a spacious harbour is formed, with sufficient water for the largest vessels. The tides of the Atlantic ascend as far as Georgetown in the district.

The surface of the district is diversified by slight elevations: the soil is rather light and poor. The three towns which it contains are Alexandria on the Virginia side of the river, Washington, the seat of the general government, and Georgetown. The Virginia part, which contains about thirty-six square miles, forms the county of Alexandria, and the Maryland part forms the county of Washington.

This district is immediately and exclusively subject to the Congress of the United States. By Act of Congress, February 27, 1801, the laws of Virginia and Maryland prevail in the parts which were respectively ceded by these States.

Alexandria, Washington, and Georgetown, are under the immediate government of their several corporations, which however, as already stated, are subject to the control of the Congress of the United States. The inhabitants of this district are not represented in Congress. The object in forming this district was to secure the functionaries of the Federal Government from the local jurisdiction of any single state, and all collision with its authorities.

In 1820, the population of the district was 22,615 whites, 4048 free coloured, 6376 slaves, total 33,039: in 1830, the numbers were whites, 27,635; free coloured, 6150; slaves, 6119; total, 39,904. The shipping of the district is about 17,500 tons. The capital, Washington, is in 39° 53′ 30″ N. lat., and about 76° 55′ 30″ W. long. from Greenwich.

COLUMBIA. [CAROLINA, SOUTH.]

COLUMBIA RIVER, is the largest of the American rivers which fall into the Pacific, running probably 200 miles more than the Rio Colorado, whose course is estimated by Humboldt at about 640 miles. Its numerous upper branches rise in the Rocky Mountains, between 42° and 54° N lat., and are at their source about 650 miles from the Pacific, in a straight line. The principal branch rises in a lake, near 50° N. lat., and runs first in a north-north-western direction along the base of the Rocky Mountains; but in the neighbourhood of Mount Brown (near 52° N. lat.) it suddenly turns to the south, and continues in that direction through more than three degrees of latitude, till it meets another of its great branches, the river Clarke, which also rises in the Rocky Mountains, near 45° N. lat., and traverses more than three degrees of latitude in a north-western direction. At the point of junction the Columbia turns to the west, but by degrees declines again to the south, so that at its junction with the river Lewis or Saptin it has a complete southern course. The river Lewis rises also in the Rocky Mountains, near 42° N. lat., and runs first to the west, then to the north, and towards its mouth again to the west. Though its course is long, it is much inferior in magnitude to the Columbia at their junction, the width of the latter being 960 yards, while that of the Lewis is only 575 yards. Between the mouths of the Clarke River and the Lewis occur the greatest impediments to navigation. Not far below the mouth of the Clarke River are the Kettle Falls, 21 feet high; and above that of the Lewis are other cataracts, where the descent in 1200 yards is 37 feet 8 inches, and where the rapids extend from three to four miles. The river is here contracted to 45 yards in width. After its junction with the river Lewis, the Columbia still runs upwards of 300 miles, first for a short distance south, and afterwards in general in a western direction. In this part it is from one to three miles wide, embracing a number of islands, some of which are of considerable extent. It empties itself into the Pacific, a little north of 46°, and the tide ascends nearly 180 miles above its mouth. The Indian name of the river is Oregon. It appears, from the most recent information, that the head waters of one branch of the Columbia, of the Colorado, and of the Platte and Yellow Stone, both branches of the Missouri, rise within a few miles of one another. (Lewis and Clarke; *Map of the Society for the Diffusion of Useful Knowledge.*)

COLUM'BIDÆ, pigeon tribe, a natural family of birds, comprising the pigeons, doves, and turtles.

Natural History.—Aristotle mentions five, if not six, birds of this group—Περιστερὰ, Πελειὰς, Φάττα,* Οἰνὰς, and Τρυγὼν, Peristera, Peleias, Phatta, Œnas, and Trugōn—entering at large into their organization and habits. (*Hist.*, book i. c. 1; book ii. c. 15, 17; book iii. c. 1; book v. c. 13; book vi. c. 1, 2, 4, and 8; book viii. c. 3; book ix. c. 7.) He also (book viii. c. 3) speaks of a bird named Φὰψ (Phaps), which Athenæus (Deipn., book ix. c. 11) and others consider to be one of the *Columbidæ*, while others again hold a different opinion, inasmuch as Athenæus states that Aristotle has distinguished five species of pigeons, and enumerates Φὰψ as one, omitting Πελειὰς; and so Aristotle does (book viii. c. 3), but he mentions Πελειὰς elsewhere (book viii. c. 13), and it is clear to us from the context that *Phaps* signified one of the *Columbidæ*, Περιστεροειδεῖς. There is considerable doubt as to which of the species of pigeons Aristotle intended to designate by the terms above given, and some of them have been applied by modern ornithologists to signify forms which he probably never saw. Only two, or at most three, can be identified with anything like certainty. Pliny (*Nat. Hist.*, book x. c. 34) writes de Columbis, and (c. 35) de Palumbibus. He enters, moreover, largely into their habits in other parts of his 'Natural History.'

Much doubt seems to have prevailed as to the proper place of the pigeons in the system. Belon collected the few species known to him under the title Ramiers, Tourterelles, Bisets, Pigeons Fuyards, and Pigeons, among the birds 'qu'on trouve viander indifféremment en tous lieux,' placing them between the Torcou (*Jynx Torquilla*, Wryneck) and the *Merle bleu*, blue thrush. Gesner arranged them between the gallinaceous birds and the bustards; Aldrovandi placed them between the domestic cock and the sparrow; Willughby between the bustards and thrushes, and Ray gave them the same place. Brisson, Pennant, and Latham insulated them in a particular order. Pennant also arranged them between the Gallinaceous and Passerine birds, and Latham between the *Passeres* and the *Gallinæ*. Other authors placed them among the Gallinaceous birds. Linnæus made them a genus of his order Passeres, arranging them between *Tetrao* (the grouse and partridges, &c.) and *Alauda* (the larks). Cuvier placed them among the Gallinaceous birds, next to the Tinamous (*Tinamus*, Latham, *Crypturus*, Illiger), making them the last of the order. In his arrangement, the Echassiers (*Grallatores*, wading birds) form the order which immediately follows the Gallinacés. Lacépède had previously given them the first place in the last-mentioned family, as did also Duméril. Meyer had insulated them as his seventh order, coming between the *Chelidones* (swallow tribe) and his eighth order, *Gallinæ;* and Illiger had found a situation for them under his *Rasores* (the Rasorial birds). Le Vaillant, who seems to have been the first who separated the *Columbidæ* into well-defined divisions, arranged them in three sections; the first containing the *Colombes, Ramiers*, and *Tourterelles;* the second, the *Colombars;* and the third, the *Colombi-gallines*. Vieillot made them the last family but one (*Colombins*) of his second tribe (*Anisodactyli*), arranging them between his *Ophiophages* and *Alectrides*. M. Temminck classed them as his ninth order between the *Chelidons* and the *Gallinacés*. De Blainville's order *Sponsores* or *les Colombins* contained these birds, and came between the *Saltatores* (Passeres) and the *Gradatores* (pheasants or partridges): in his amended method, as developed by M. Lherminier, they occupy nearly the same position between the Passeres and the Gallinaceous birds. C. Bonaparte (prince of Musignano) assigns the same place to them. (*Specchio comparativo.*)

When he wrote the article *Pigeon* in the 'Dictionnaire d'Histoire Naturelle,' M. Vieillot conformed to the opinion of Linnæus in placing these birds among the Passeres, because of its natural great analogy to the last-mentioned group, like nearly the whole of which the pigeons pair in the season of love, the male and female working jointly at the nest, taking their turns during incubation, and participating in the care of the young, which, among the true pigeons, are hatched blind, fed in the nest, which they do not quit till they are covered with feathers, and are supported by their parents some time after their departure from it, having no power to feed themselves. Such are the points of resemblance. Their dissimilarity consists in their mode of drinking and feeding their young, in the nature of their plumage, and the singularity of their courtship and of their voice, points of difference which also separate them from the true Gallinaceous birds, with which, says M. Vieillot, they have no analogy in their instincts, their habits, or their loves. Nearly all the Gallinaceous birds are polygamous, and lay a great number of eggs each time they incubate, which is rarely more than once a year in the temperate zones; while the true pigeons lay only two eggs each time, incubate frequently during the year, and are monogamous. Among the Gallinaceous birds, as a general rule, the male does not solace the female at the time of building the nest and of incubation; the young run as soon almost as they are out of the egg-shell, quitting their nest, and seeking their own food immediately. Finally, a striking character removes the pigeons from the Gallinaceous birds, and in M. Vieillot's opinion places them in the same natural group with the Passeres, namely, the possession of a posterior toe articulated at the bottom of the tarsus, upon the same plane as the anterior toes, touching the ground throughout its length in walking and embracing the roost in perching. On the contrary, in the Gallinaceous birds, the hind toe is articulated upon the tarsus higher than the others, and only touches the ground with its claw, or at most with its first phalanx, and remains perpendicular when the bird is on the perch. Nevertheless it must be confessed that there are found among the pigeons, species which participate in some degree with the Gallinaceous birds in regard to their manners and gait (allures) or some exterior conformity. Such are the *Colombi-gallines*, the *Pigeon-caille* of le Vaillant, to which must be added the *Colombi-gallines* of M. Temminck, the *Mountain partridge* of Sloane, the *blue-headed pigeon*, the *Cocotzin*, &c., all which have their feet more elongated than those of their congeners, with the wings of the partridges, that is to say rounded, and with the two first quills shorter than the third or fourth; but for the rest, all, with the exception of the *Colombe-galline* of le Vaillant, approach the other pigeons in their amours, their laying, and the bringing up of their young; and so it is of the birds which at Guadaloupe and Martinique bear the name of partridge; and M. Vieillot quotes Dutertre, who says that 'according to the common opinion of the inhabitants of Guadaloupe, there are three sorts of partridges, red, black, and grey, which have never passed in my mind for aught but turtles (tourterelles); for they have not the short quality of flesh belonging to our partridges, they have the straight bill, they perch and build their nests in trees, they only lay two eggs,' &c. (*Hist. des Antilles*, tom. ii.) These facts, adds M. Vieillot, have been confirmed to me by the inhabitants of Martinique and Guadaloupe. Of all the pigeons and turtles, continues this ornithologist, which I have had occasion to study in the living state, the Cocotzins are those which appear to me to have the greatest relation to the partridges: their haunt is always in the fields and savannahs; there they seek their food, and never resort to trees; they raise themselves into the air like the partridges, and after a short flight alight upon the ground. For this reason the English and the inhabitants of the United States call it the *Ground Dove*. But the habit of frequenting the ground, &c. does not belong exclusively to the pigeons whose wings are formed as above stated, for, according to Latham, the *Columba Chalcoptera* (Phaps), which M. Temminck arranges with his *Columbæ* (Vieillot's first section), has the same habits, so that the English of New Holland call it the *Ground Pigeon*. (Vieillot.)

'The family of Columbidæ (Mr. Vigors, *Linn. Trans*.

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* Belon says that the modern Greeks call it Phassa.

vol. xiv. p. 410) alternately arranged by systematic writers among the *perching* and *gallinaceous* orders, and not unfrequently grouped as a separate order between the two, at once indicates where the point of junction exists between them. These birds, although we have the high authority of Linnæus for uniting them with that division of our *perchers* which forms his *Passeres*, I do not hesitate in arranging, conformably to the opinion of M.M. Cuvier and Illiger, as a subdivision of the *gallinaceous birds*.

'In those particulars, where they respectively assume the character of each order, their affinity with the latter is considerably stronger than that which approximates them to the former. Their food and habits, their internal economy, and the formation of their bills, identify them with the *Rasores;* while, on the other hand, the characters which bring them near the *Insessores*, their divided toes and comparatively short legs, are weakened by the resemblance which those members bear to the same parts of the contiguous order in their general structure, and more particularly in the bluntness of the nails, so strongly indicative of the rasorial habits of the *Gallinaceous* tribes, and so strikingly contrasted with the sharpness of the nails in the Linnæan *Passeres*. They are much more nearly allied to these latter tribes by their habits of perching and building their nests in trees or rocks, by the absence of the spur on the legs of the male, and by the inferior number of their tail-feathers.'

In a note to that part of the text which alludes to the rasorial habits of the *Gallinaceous* birds, the author cites the habits of *Columba Nicobarica*, *Columba caruncalata*, and *Columba passerina*. Mr. Vigors accordingly places the *Columbidæ* in the aberrant group of his *Rasores*. 'I have already observed, when speaking of the affinities,' says that ornithologist in the paper above quoted, 'which connect the orders of birds together, that the Columbidæ form the passage from the *Insessores* to the *Rasores* by their habits of perching and their powers of flight. The hind-toe is articulated, as in the *Perchers*, and their *tarsi* are shorter, more particularly in the earlier groups, than those of the *Gallinaceous Birds* in general. The first group which we meet in this extensive family is the genus *Vinago* of M. Cuvier, the bills of which, stronger and more solid than they are usually found to be among the pigeons, unite them to *Penelope* and *Crax*, which form the opposite extreme of the present order, as well as to *Musophaga* and *Corythaix*, which approach, as we have seen, the whole of the groups before us, and connect them with the *Perchers*. From this genus *Vinago*, which seems confined to the southern divisions of the Old World, we may observe a series of groups leading gradually to the true *Columba*, of which genus the European species *Columba Œnas*, Linn., may be considered to form the type. Hence we are led by several intervening species to the *Columbi-Gallines* of M. Le Vaillant, which, still retaining the soft and flexible bill of *Columba*, approach the typical Gallinaceous birds in their more elevated *tarsi*, and in their habits of living in company and seeking their nourishment chiefly on the ground. Among these may be noticed some forms, *C. Nicobarica*, Linn., and *C. carunculata*, Temm., for instance, which possess the feathered appendages, together with the naked face and caruncles of the Linnæan *Gallinæ;* and another group, the *Lophyrus* of M. Vieillot, which exhibits the size and general form of the same birds, as well as the singular plumes which frequently decorate their head. This last-mentioned genus, formed of the crowned pigeon of India, possessing the strongly-formed leg and foot of *Meleagris*, Linn., but without the spurs, while at the same time it retains the bill of *Columba*, may be observed to open the passage immediately from the present to the succeeding family' (the Phasianidæ). Read 3rd December, 1823.

In 1825 Mr. Swainson wrote as follows upon this interesting family:—'The extensive genus of *Columba*, like that of *Falco*, has been pronounced *indivisible* by an eminent ornithologist of the present day; who, from having made these birds his peculiar study, is in one sense preeminently qualified to give a decided opinion. The principle he has laid down, and on which this opinion consequently is founded, is, that whenever intermediate species are discovered which serve to unite two neighbouring genera, such genera should invariably be united. After stating that this theory has been refuted in the pages of the 'Zoological Journal,' Mr. Swainson thus continues: 'It is admitted that there are certain peculiarities of form and of economy among the *Columbidæ*, which point out natural divisions. Some of these have been used for the construction of genera, by MM. le Vaillant, Vieillot, and Cuvier, and of sections by M. Temminck; but the immense number of species already known, and the great influx of new ones, renders it essential that many others should be formed. As we labour under a comparative ignorance of the natural economy of the vast number of tropical species recently described, any attempt to throw the *Columbidæ* into their natural arrangement must be very imperfect. The basis of such a work must rest on their natural habits, their food, and their geographic distribution. Yet, as we see in other natural families that a peculiarity of economy is almost invariably accompanied by some corresponding modification of structure, we shall receive considerable assistance by accurately examining such variations. We may note the forms, without being acquainted with their reference to the peculiar habits of the group; and although our inference in some cases may be erroneous, in others we shall not be far from the truth. The passenger-pigeons, for instance, have their first quill-feather as long as any of the others—a sure indication of that rapid and long-continued power of flight they are known to possess. The *Columbi-Gallines* of M. Le Vaillant are described as having naked and somewhat lengthened tarsi; a structure well adapted to those ambulating habits which bring some of them close to the *Phasianiaæ*, Vigors, and others to the *Cracidæ*, Vigors. Another group, the *Colombars* of M. le Vaillant (*Vinago*, Cuv., *Tréron*, Vieill.), have a strong hard bill; and their short clasping tarsi covered with feathers lead us to conclude they seldom perch upon the ground; in fact, MM. le Vaillant and Cuvier both assert that these birds are only found in the tropical forests of the Old World. Apparently confined to the same regions, we see another group, wherein the bill partakes of that weak structure observed in the generality of pigeons, while the tarsi are thickly clothed with feathers, similar to the group last mentioned. These seem to be the principal divisions among the *Columbidæ*. Minor distinctions may be founded on the relative strength and structure of the quill feathers, which in some are very peculiar, and, as being connected with the powers of locomotion, deserve our attention. Some writers have attached more importance to the form of the tail, and have therefore divided the *Columbidæ* into two great divisions, separating such species as have this organ rounded or lengthened from those in which the tail is short and even. This plan, however it may help to discover a *species*, is obviously artificial, and totally inadequate to give us any ideas on natural groups. The tail in fact is but an accessory help to the wings, and therefore deserves an inferior consideration, although its form may be usefully employed in sectional divisions. Among the characters which may perhaps guide us in distinguishing inferior groups or at least sections, may be noticed the naked orbits so conspicuous in several exotic species. The ground doves of the New World show a peculiar character in having the sides of their tarsi margined by a row of minute feathers, which often conceal the knees. Their first quill feather is also very broad, and almost as long as any of the others; if these characters hold good in more instances than those I have quoted, we shall be justified in using them in a generic sense, by separating these birds from the *Columbi-gallines* of M. le Vaillant. Allied to the ground doves in manners, but greatly distinguished from them in the structure of their feet, is the bronze-winged pigeon of Australasia (*Columba chalcoptera*, Lath.). In this the front scales of the tarsi (unlike any other species I have yet seen) are formed of two series, while those of the sides are reticulated and very minute; the hind toe (or hallux) is also remarkably short, and clearly evinces an approximation to the more perfect *Gallinaceæ*.' Mr. Swainson then defines his genus *Ptilinopus*[*]. In 1827 the same author characterized the genera *Peristera*, *Chæmepelia*[†], and *Ectopistes*[‡]; and in the *Fauna Boreali-Americana*[§], under *Columba Ectopistes migratoria*, he has the following note: 'As ornithologists do not appear to be aware of the great difference which exists in the groups of this family in the relative structure of their feet, we shall here draw their attention to the principal groups. In the even-tailed wood pigeons of Europe, North America, and the Old World, forming the restricted genus *Columba*, the external and internal anterior toes are equal. In the lovely genus *Ptilinopus*, Swainson, confined to the green pigeons of the Indian and Australian isles, and in that of *Vinago*, Cuv., formed by the thick-billed species of the same countries, the inner toe is much *shorter* than the outer; but in the sub-genus (?) *Ectopistes*, Swainson, and the small turtle doves, this proportion is reversed, the *inner* toe being the longest. In the beautiful genus *Peristera*, Swainson, which comprises all the bronze-winged pigeons of Australia and the ground pigeons of America, the tarsi are more elevated, the hind toe shorter, and the inner toe is likewise the longest. We have been for some time engaged in analyzing this family, with the view of ascertaining the relative value of all these groups.' Dr. Ritgen (1828) makes the genus *Columba*, Linn., form the third family (*Herpochoropteni*) of his first tribe (*Choropteni*) of his second series (*Xerornithes*, or birds of the dry land) in his trichotomous system, as applied to birds.

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[*] 'Zoological Journal,' vol. i. p. 470, *et seq.*

[†] So printed, but Chamæpelia must be meant.

[‡] Zoological Journal, vol. iii p. 360.

[§] Part II., the Birds 1831.

P. J. Selby, Esq., in the 'Naturalist's Library' (1835), characterizes the following genera, *Carpophaga*, *Phaps*, and *Geophilus*. He thus speaks of the classification: 'Of the sub-families or five typical forms of the *Columbidæ*, we can only speak with diffidence and uncertainty, as no analysis of the species sufficiently strict or extensive has hitherto been instituted, from whence conclusive deductions can be drawn. We shall only cursorily observe, that the arboreal pigeons, embracing *Vinago*, Swainson's genus *Ptilinopus*, our genus *Carpophaga*, and some other undefined groups, with feet formed expressly for perching and grasping, and through which, from their habits and form, the necessary connexion with the insessorial order is supported, are likely to constitute one; the true pigeons, of which our ring pigeon and common pigeon may be considered typical, a second; the turtles and their allies, with feet of different proportions from the preceding, and graduated tails, a third; the ground pigeons, or *Columbi-gallines* of the French naturalists, a fourth; and the fifth is not unlikely to be represented by Vieillot's genus *Lophyrus*, in which the deviation from the proper Columbine form is not to that of the typical *Rasores*, but to the *Cracidæ*, placed at the farther extremity, and, like the *Columbidæ*, another aberrant family of the Rasorial order[*].'

Organization.—One part of the internal organization of the pigeon is worthy of special notice. The crop in the state which is adapted for ordinary digestion is thin and membranous, and the internal surface is smooth; but by the time the young are about to be hatched, the whole, except that part which lies on the trachea, becomes thicker and puts on a glandular appearance, having its internal surface very irregular. In this organ it is that the food is elaborated by the parents before it is conveyed to the young; for a milky fluid of a greyish colour is secreted and poured into the crop among the grain or seeds undergoing digestion, and a quality of food suited to the nestling is thus produced. The fluid coagulates with acids and forms curd, and the apparatus forms, among the birds, the nearest approach to the mammæ of the warm-blooded animals[†]: hence no doubt the term pigeon's milk. The number of vertebræ amounts to 13 cervical, 7 dorsal, 13 sacral, and 7 caudal = 40 (Cuvier). The sternum is narrow with a deep keel, the inferior border convex, and the anterior one curved forwards, thin and trenchant; the manubrial process is strong and bifurcated, the costal processes short. The posterior margin is cleft by two fissures on either side of the mesial plane, the lateral and superior fissures being the deepest; the mesial ones are occasionally converted into a foramen. The costal surface of the lateral margin is, as in the gallinaceous birds, of very little extent. In the crown pigeon the superior fissures are so deep and wide as to convert the rest of the lateral margin into a mere flattened process, which is dilated at the extremity. (Owen.)

Geographical Distribution.—Very extensive, the form occurring almost everywhere, except within the frigid zones. Species most abundant in Southern Asia and the Great Indian Archipelago.

COLUMBIDÆ.

Bill moderate, compressed, covered at the base of the upper mandible with a soft skin, in which the nostrils are pierced, and more or less curved at the point. **Feet with three divided toes in front, and one behind.**

Genera. Vinago (Cuvier).

Bill comparatively large, strong, thick, and solid, compressed at the sides; the tip very hard, hooked, and inflated; the nostrils comparatively exposed, and with the swollen or projecting membrane but little developed. Tarsi short, partly clothed with feathers below the tarsal joint; sole wide, the membrane being extended, and the whole foot formed for perching and grasping; the outer toe longer than the inner, claws strong, sharp, and semicircular, 'closely resembling in form those of the woodpecker or other Scansorial birds' (Selby). Wings of mean length, strong and pointed, second and third quills about equal and the longest in the wing. Mr. Selby says, that in all the species submitted to examination, the third quill has the central part of the inner web deeply notched, as if a piece had been cut out; and that the prevailing colours are green and yellow of different intensities, contrasted more or less in certain parts with rich purple and reddish brown.

Geographical Distribution.—Intertropical Asia[*] and Africa.

Food.—Berries and fruits.

Habits.—The genus is shy and timid, and inhabits the woods. Mr. Selby gives the following on the authority of Mr. Neill, who, speaking of *Vinago sphenura*, says, 'I had two, but both I believe were males. Both had a *song*, very different from the mere cooing of the ringdove. When they sang in concert they gave the same little tune, but on different keys. After the death of one the survivor used to sing at command, or, at all events, when incited to it by beginning its tune.[†]'

Example.—*Vinago aromatica*, *Columba aromatica*, Latham. 'The Aromatic Vinago is of a mild and timorous disposition, and is generally seen in flocks or societies, except during the period of reproduction, when they pair, and retire to the recesses of the forest. The nest is simple, and composed of a few twigs loosely put together, and the eggs are two. . . . The base or softer part of the bill is a blackish-grey, the tip yellowish-white, strong, much hooked, and bulging on the side. The forehead is of a bright siskin green, the crown greenish-grey, the chin and throat gamboge-yellow, the remainder of the neck, the breast, belly, lower back and rump, yellowish-green. The upper back or mantle, and a part of the lesser wing coverts, are of a rich brownish red, and exhibit a purplish tinge in certain lights. The greater wing-coverts and secondary quills are greenish-black, with a deep and well-defined edging of gamboge-yellow throughout their length. The tail has the two middle feathers wholly green, and slightly exceeding the rest in length; these are of a dark blueish-grey, with a

[Vinago aromatica.]

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[*] 'Naturalist's Library,' Ornithology, vol. v. p. 85, *et seq*

[†] See Hunter, 'Animal Economy,' p. 235. Owen, article Aves, 'Encyclopædia of Anatomy and Physiology,' p. 318; and Birds, vol. iv. p. 427.

[*] 'Naturalist's Library,' Ornithology, vol. v. p. 96.

[†] Mr. Gould has figured Vinago Sphenura, N.S., from the Himalaya mountains, in his beautiful 'Century of Birds.'

dark central band. The under tail-coverts are yellowish-white, barred with green. The legs and toes are red, the claws pale grey, strong, sharp, and semicircular.' (Selby, and see Temminck.)

Locality.—The continent of India, Java, and other adjacent islands.

Habits.—Arboreal. Mr. Selby, in the interesting work above quoted, gives the following note which accompanied the skins of *Vinago militaris*, and *Vinago aromatica*. 'Green Pigeon.—This beautiful bird has brilliant red eyes. Its feet are something like the parrot's, and it climbs in the same way as that bird. It is very difficult to find; for although a flock is marked into a tree, yet its colour is so similar to the leaf of the banyan (on the small red fig of which it feeds), that if a bird does not move you may look for many minutes before you can see one, although there may be fifty in the tree.'

Ptilinopus (Swainson.)

Wings moderate, first quill contracted towards the apex, third and fourth longest. Bill slender. Tarsi feathered.

Mr. Swainson says that in proposing the characters of this genus, he wishes them to be considered more as indicating a group, by which the genus *Tréron*, Viell., (*Vinago*, Cuv.), may be united to the naked-legged pigeons, than as being so rigidly framed as to exclude all other species which do not strictly present the same structure. 'It is quite evident,' continues Mr. Swainson, 'from consulting the excellent figures of MM. le Vaillant and Temminck, that there are a number of pigeons found both in India and Australasia, which have the feathered tarsi of *Tréron*, accompanied by the slender bill of the other *Columbidæ*, and thereby clearly indicate an intervening group: yet among these birds there is a material difference in the construction of their quill feathers. In the *Columba magnifica*, for instance, the first quill is equal in breadth to any of the others, and thus assimilates, probably, to that structure which belongs to *Tréron* (I say probably, because I have not, at this moment, the means of ascertaining the fact. Mr. Vigors is in possession of several specimens of this group, which he assures me have no peculiarity in the shape of the first quill feather), while in the bird we are about to describe, this quill is suddenly narrowed, and resembles the blade of an obtuse pen-knife. This singular formation, however, I have detected in several of the naked-legged pigeons, such as the *Col. striata*, Lath., and the *Col. humeralis* of Temminck, two birds from Australasia in the Linnæan Society's collection; and likewise in two other species from Brazil now before me. This character, therefore, will not be peculiar to *Ptilinopus;* but when coupled with the feathered tarsi and slender bill, may indicate a group to which the *Col. Monacha* of Temminck, and the *Colombe porphyre*, most probably belong. The *Columba magnifica* may thus form the type of a subordinate section, more closely approaching to *Tréron;* while the narrow quill-feather of *Ptilinopus* may serve to conduct us to the naked-legged pigeons*. In the first volume of 'The Natural History and Classification of Birds†,' the same author says, 'Sometimes one half or more of some of the quills are (is) of the usual breadth, while their terminating end is suddenly contracted and obtusely pointed: this formation is seen in some few species of the exotic pigeons belonging to the genus *Peristera* and *Ptilinopus*. It cannot, however, as some have imagined, be taken as a subgeneric character, because perhaps the next species in the series has it not; and it is probably only a sexual distinction.' (p. 96.) Mr. Selby, in 'The Naturalist's Library‡,' feels inclined to still further subdivide the group, restricting the genuine title of *Ptilinopus* to that group of smaller pigeons in which the first quill feather becomes suddenly narrowed or attenuated towards the tip, and the tarsi are feathered almost to the division of the toes.

Habits and Food.—Geographical distribution of the restricted genus.—The Moluccas, the Celebes, and the islands of the Pacific (Selby.) Habits retired; in forest solitudes. Food, fruits and berries.

Description of the restricted genus.—Bill comparatively slender, the base slightly depressed, and the soft covering of the nostrils not much arched or swollen; the tip, though hard, is little inflated, with a gentle curvature; the forehead is rather low and depressed; the legs are short but strong; the tarsi clothed with feathers nearly to the division of the toes; the feet are calculated for grasping, and are similar in form to those of *Vinago*, the sides of the toes being enlarged by the extension of the lateral membrane, and the outer longer than the inner one; the wings are strong and of moderate length, the first quill feather considerably shorter than the second, and suddenly narrowed towards the tip, a peculiarity also possessed by several pigeons belonging to other distinct groups, and by which means the connexion is thus kept up between them. The third and fourth quills are nearly equal to each other, and are the longest in the wing. The tail is of proportionate length, and generally square at the end. Predominating colour like that of *Vinago*, green, varied in parts with yellow and orange, and in some, beautifully encircled with masses of purplish red and vivid blue. (Selby.)

Example.—Ptilinopus cyano-virens, *Columba cyanovirens* of Lesson, who described it in the 'Voyage de la Coquille.' The bird is termed *Manasope* in the Papuan tongue, and inhabits, says Lesson, the profound and still virgin forests (encore vierges) of New Guinea. It was in the neighbourhood of the harbour of Doréry that we procured the greatest number of individuals. Their low cooing was heard frequently from the large trees, and every thing indicated that they were common.

Description.—Total length from the end of the bill to the extremity of the tail, eight inches six lines (French); bill delicate and black; iris of a red brown; tarsi short, and nearly entirely feathered; toes with a membranous border, and of a lively orange colour; head, rump, upper part of the body, wings and tail, of an agreeable grass-green; a large patch (calotte) of a beautiful indigo blue covers the occiput; elongated blue spots occupy the centre of the subalar feathers, which are bordered with a straight yellow line; the internal and hidden part of the same feathers is brown; the quills are entirely brown, and bordered at the external edge with a line of canary yellow; the tail is square and rectilinear; the feathers which compose it are fourteen in number, brown, their extremities white below, and of a green similar to that of the back above, passing into black in the middle, and each terminating within with a white spot; the two exterior ones are brown, bordered with yellow externally, as are the two or three next; the shaft is brown; the throat to half-way down the neck is ash-grey; the breast is greyish-green; the belly and the flanks are at first green mingled with some yellow borderings, and then comes a large patch of yellowish-white extending on each side so as to form a kind of girdle; the feathers of the thighs are green; those of the vent, white and pale yellow; the lower tail coverts are yellow mingled with green. M. Lesson mentions another individual rather smaller, with some differences of plumage, which he supposes to have been either a female or a young one. Mr. Selby remarks upon the fact that no notice is taken of the form of the first quill feather in this description, and regrets it, but entertains little or no doubt of its presence in nearly a similar form to that assumed by the rest of this group, of which *Ptilinopus purpuratus* is the type. *Locality*, New Guinea.

Ptilinopus cyano-virens.

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* 'Zoological Journal,' vol. i. p. 473. † 'Cabinet Cyclopædia,' 1836.

‡ 'Ornithology,' vol. v. p. 100.

Carpophaga (Selby).

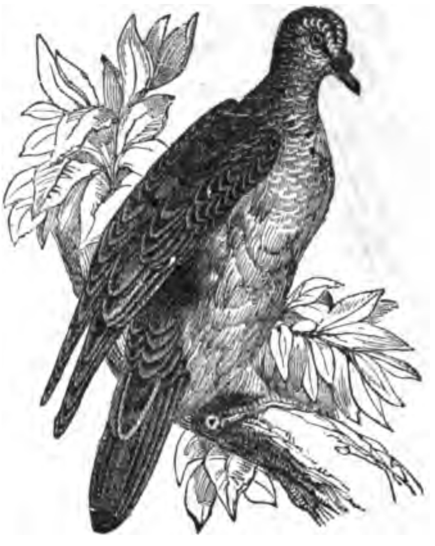
'In this group,' says Mr. Selby, 'which is composed of birds of a much larger size than the preceding, the wings, though possessing the same relative proportions, have no emargination, or sudden narrowing of the tip of the first quill. Their tarsi also are not so thickly or entirely feathered; and their nostrils are placed nearer to the base of the bill. In some species, green, yellow, and purple are the prevailing colours; in others, a rich bronzed or metallic colour composes the upper plumage, exhibiting shades of deep green and purple, according to the light in which it is viewed, while in those which lead the way to the typical pigeons, the tints become less vivid and more uniform in their distribution. Their bill is considerably depressed at the base, the membrane in which the nostrils are placed but little prominent or swollen, the tip compressed and moderately arched, the tomia slightly sinuated. The forehead is low, and the feathers advance considerably upon the soft portion of the bill. In many of them a caruncle, or gristly knob, varying in size and shape according to the species, grows upon the basal part of the upper mandible during the season of propagation. This is supposed to be common to both sexes, as the female is described with it in Duperrey's 'Voyage.' After this epoch it is rapidly absorbed, and its situation scarcely to be observed upon the surface of the bill. The feet are powerful, and formed for grasping, the soles being flat and greatly extended. As in the other members of this group, the hind toe is fully developed and long, and the exterior longer than the inner toe. They inhabit the forests of India, the Moluccas, Celebes, Australia, and the Pacific Isles. Their food consists of fruits and berries. That of the precious nutmeg, or rather its soft covering, known to us by the name of mace, at certain seasons affords a favourable repast to some species, and upon this luxurious diet they become so loaded with fat as frequently, when shot, to burst asunder when they fall to the ground. And here we may remark on the remarkable provision Nature has made for the propagation as well as the dissemination of this valuable spice, for the nutmeg itself, which is generally swallowed with the whole of its pulpy covering, passes uninjured through the digestive organs of the bird, and is thus dispersed throughout the group of the Moluccas and other islands of the east. Indeed, from repeated experiments, it appears that an artificial preparation analogous to that which it undergoes in its passage through the bird, is necessary to ensure the growth and fertility of the nut; and it was not till after many unsuccessful attempts had been made that a lixivium of lime, in which the nuts were steeped for a certain time, was found to have the wished-for effect, and to induce the germinating tendency. The fruit of the Banyan (*Ficus religiosus* (religiosa), the sacred tree of the Hindoos, is also a favourite repast of all the pigeons of this group, as well as o the stronger-billed *Vinago*.'

Example.—*Carpophaga oceanica*, *Columba oceanica*, Lesson. This species, according to Lesson, is the *Moulouesse*, or *mouleux*, of the natives of Oualan, and though it approaches the Nutmeg Pigeon, *Columba* (*Carpophaga*) *ænea* very nearly, it differs from it in size, being one third less, and in the distribution of some of its colours. 'The Nutmeg Pigeon lives more particularly in the eastern Moluccas, and especially at New Guinea and Waigiou, while the Oceanic Fruit-Pigeon is abundant in the little isle of Oualan, in the midst of the great archipelago of the Carolines, and seems to exist in the Pelew Islands, where Wilson mentions it under the name of *cyep*.' Lesson further observes, that it may be possibly spread over the Philippines, and at Magindanao.

Description.—Total length, fourteen inches (French), including the tail, which measures five; the bill, an inch long, is black, strong, and surmounted at its base by a rounded and very black caruncle; the feet are very strong and of a bright orange colour; the tarsi are feathered nearly down to the toes, which have a well-developed border; the wings are pointed, and only one inch shorter than the tail, which is almost rectilinear. The feathers of the forehead, cheeks and throat, are whitish mixed with grey; the head and the back of the neck are of a deep slaty grey; the back, rump, wing-coverts, quills, and tail feathers, are of a uniform metallic green, passing into brown on the interior of the great feathers; the breast and upper part of the belly are grey, with a tint of rust colour; the lower part of the belly, the vent, the thighs, and the lower tail-coverts, are a deep ferruginous red; the tail-feathers on the under side are a bright reddish green (vert rougeâtre clair.) (Lesson).

M. Lesson thinks that this, very probably, is the species mentioned by 'the celebrated naturalist, Forster (and not Captain Forster, as the reading is, twice, in M. Temminck's work, tom. i. p. 89, 8vo), who observed in the Isle of Tanna, one of the New Hebrides (Cook's 'Second Voyage,' vol. iii. p. 179, 4to), a Nutmeg Pigeon of the same species as that which occurred at the Friendly Islands.'

The caruncle shown in the cut is dissipated after the breeding season, leaving nothing but a slight cutaneous wrinkle. M. Lesson says that the bird feeds on a berry which is very abundant in the small Isle of Oualan, and that it is not disturbed by the natives.



[Carpophaga oceanica.]

M. Selby gives as a form apparently belonging to this division of the *Columbidæ*, the following species: *Columba Phasianella* (Temm.), the structure of the bill being, as he observes, intermediate between that of *Vinago* and *Columba*, and the feet formed upon the same plan as those of the rest of the *Ptilinopinæ*.

Description.—Length from fourteen to sixteen inches, the tail being seven, and rather more. Wings short, reaching, when closed, about an inch and a half beyond the root of the tail, rounded, and with the third quill longest; the first and fourth being equal to each other. Bill, measuring from the forehead nearly three quarters of an inch long; the tip of the upper mandible moderately arched, and with a notch; that of the lower angulated and strong. Throat, yellowish white. Head, sides, and front of the neck, and whole of the under plumage, orange-brown. Hinder part of neck changeable rich violet-purple, with brilliant gold reflections. Back, wing-coverts, and the rest of the upper plumage, deep reddish-brown, shot with bronze in some lights. Tail graduated or cuneiform, the two middle feathers brown, the lateral marked obliquely with a black bar Feet and naked part of legs reddish brown. Sole of the hind and inner toes much expanded.

Young differing from the adult in having the neck dirty reddish brown, with narrow bars of black; belly of a pale reddish-grey, minutely and darkly speckled; back inclining to hair-brown; and smaller wing-coverts deeply edged with orange-brown.

M. Temminck first described the species in the 'Linnean Transactions,' from an Australian specimen. It has since been observed in most of the Philippine and Molucca Islands, Java, &c.

Columba Phasianella is an inhabitant of the woods. Its food is said to consist of a kind of pimento and of other aromatic berries, swallowed entire. The flesh is dark, but its flavour is stated to be excellent.

Mr. Selby makes the group to contain *Columba Macroura*, Auct., *Col. nuchalis*, Wagler, and *Col. Reinwardtii*, Temm. 'Of its precise situation,' says Mr. Selby, 'in the circle of the *Columbidæ*, we speak with some degree of

[Columba Phasianella.]

doubt, not having had an opportunity of instituting so strict an analysis of the species as the subject requires; but we believe it will be found to enter among the *Ptilinopinæ* or arboreal pigeons, as the feet and tarsi of its members are similar in form to those of that division, the latter being very short and partly plumed below the joint, the former with the exterior toe longer than the inner, and the hinder toe fully developed; the sole of the foot, by the extension of the membrane, is broad and expansive, and the claws are arched and strong, all of which are characters evidently showing these members to be expressly adapted for perching and prehension, and not for gressorial movements. The bill also in one species (*Col. Reinwardtii*) approaches in point of strength near to that of *Vinago*, and in all of them the tip of both mandibles is hard and firm, the upper one with a visible emargination and moderately arched. Their habits and mode of life are also nearly allied to the other arboreal species, being the constant inhabitants of the woods, and subsisting upon the fruits and berries of various trees and shrubs. M. Temminck, in his description of this species, says that it possesses a structure and form precisely similar to that of the *Columba migratoria* of North America. To this we cannot subscribe, seeing that its essential characters, as above described, are different, and that the only point of resemblance consists in the length of the tail. Indeed, so far removed do we think it from the American group, that we cannot consider it as its analogue in the Asiatic regions where it resides.'

COLUMBA. Auct.

Most ornithologists are agreed that the sub-family *Columbina* contains the type of the form of the *Columbidæ*, and that we are to look among the species of our own country for that type. The ring pigeon, Cushat or Queest (*Columba Palumbus*), the wood pigeon (*Columba Œnas*), and the rock pigeon or biset (*Columba livia*), are considered to be the forms in which the peculiarity of structure and habits of the family are most perfectly developed, and of these *Columba Palumbus* is generally taken as the typical point of comparison. The Columbinæ are distinguished by a bill of moderate strength, with a hard tip, bulging and somewhat arched. The nostrils are partly clothed by a soft membrane, and the orbits of the eyes are more or less denuded of feathers. The feet may be called both gressorial and insessorial; for they are so organized, that the action of walking or perching may be performed at pleasure, for the back toe is moderately long, and the claws are so formed and placed as not to interfere with terrestrial progression, while they are at the same time calculated for arboreal prehension. In the types the exterior and interior toes are of equal length. The wings are fully developed and somewhat pointed; the second and third quills are the longest. The tail is generally square, and moderately long.

'In those species,' says Mr. Selby in the work above quoted, 'which are the media of connexion with other groups, the above characters become partially modified, as we see exemplified in the species nearest allied to the *Ptilinopinæ*, or arboreal pigeons, their feet losing the true character of that of the common pigeon, and assuming more of the grasping form than that fitted for progress upon the ground.'

The species are very numerous, and spread over every quarter of the globe.

'The prevailing colour of the pigeons is bluish-gray, of various intensities and shades, frequently embellished upon the neck with feathers having a metallic lustre and peculiar form, and which exhibit various tints of colour according to the light in which they are viewed. They are naturally birds of a wild and timid disposition (though one species has been partly reclaimed), and usually live congregated in extensive flocks, except during the season of reproduction, when they pair. Most of the species seek their food upon the ground. This consists of the different cerealia, as also acorns, beech-mast, and other seeds, and occasionally of the green and tender leaves of particular plants. Their flesh is sapid and nutritious, being of a warm and invigorating nature. Their flight is powerful, very rapid, and can be long sustained, and many species are in the habit of making distant periodical migrations. They are widely disseminated, species of the genus being found in every quarter of the globe, and in all climates, except the frozen regions of the two hemispheres. They build in trees or holes of rocks, making a shallow nest of small twigs loosely put together. Their eggs are never more than two in number, their colour a pure white; they are incubated alternately by both sexes, and are hatched after being sat upon from eighteen to twenty-one days. The young, upon exclusion, are thinly covered with down, which is rapidly succeeded by the proper feathers.' (Selby.) The apparatus for preparing the food for the nestlings has been before adverted to.

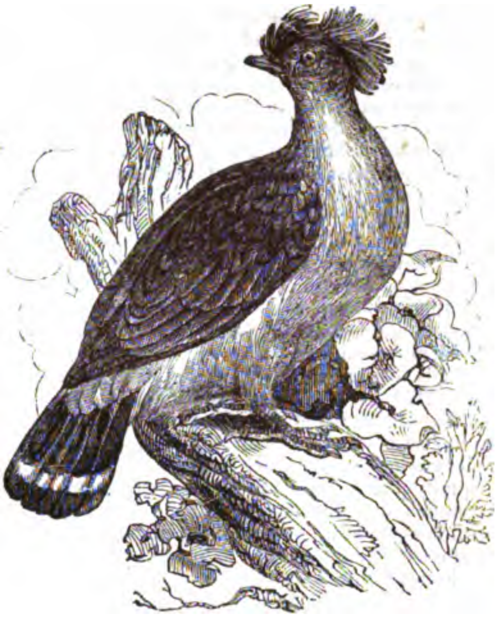
Examples.—Columba spadicea. Mr. Selby places this species as connecting the arboreal species with the typical pigeons, but arranges it under the *Columbinæ* not without doubt, 'for although it presents characters in some of its members approaching those of the pigeons, it cannot be denied that, in its general appearance, and the metallic lustre of its plumage, it also shows evident marks of a near affinity to several species of the genus Carpophaga, and it might perhaps with equal propriety be placed at the extremity of that group;' and regrets the little information extant of its peculiar habits and mode of life, which would have assisted in forming a more satisfactory conclusion as to its proper position. He adds, that from the form and size of the feet we may judge that its habits are more those of an arboreal than terrestrial bird, though its claws want the great curvature of those of the *Ptilinopinæ*, and show its capability of occasionally resorting to the ground for food. M. Lesson, who killed many individuals of this brilliant pigeon, described by Latham and figured by Temminck, says that its flesh is excellent, and that it is very abundant in the woods about the bay of Ipiripi, or the Bay of Islands. The first which he procured was killed and sent to the expedition by one of the officers of the Coquille, and Toui, chief of the hippàh of Kaouera, near which she was moored, brought them frequently on board. He adds, that the individual described by Latham as the chestnut-shouldered pigeon came from Norfolk Island, not far from New Zealand, and that M. Temminck indicates the Friendly or Tonga Islands as its native country. This locality, M. Lesson, from whom the following description is taken, seems to doubt.

Total length 16½ inches (French). English authors give it as from 19 to 20; tail 6 inches, nearly rectilineal, and slightly notched; bill rather swollen near the point of the lower mandible, of a brilliant carmine at its base as well as the feet, the tarsi of which are feathered almost to the toes. The eyes are surrounded with a bright-red membrane, and the iris is of the same colour. All the upper parts of the bird, the back, the rump, the wings, and the throat, are of a changeable hue, in which are mingled rosy-copper reflections, running into brilliant and iridescent tints, becoming more sombre upon the great quills. The plumage of the breast, belly, vent, and tarsi, are pure white. The upper part of the tail is brown, slightly tinged with greenish; and below it is brown, which is deepest within and at the extremity.

[Columba spadicea.]

Columba dilopha. 'In this curious species,' says Mr. Selby, 'besides the occipital crest, an ornament which is found in many other birds, there is an additional one in front, composed of long recurved and lax feathers, which not only occupy the forehead, but also the superior part of the soft or basal portion of the bill. This double crest gives the head of the pigeon a character unlike any of its congeners, and more resembling that of some of the crested *Phasianidæ* or *Cracidæ*, with which an analogical relation is thus sustained. In other respects its characters agree with those of *Col. spadicea*, the proportion of the wings and the form of the feet being nearly the same. Temminck, who first described it, observes 'cette nouvelle espèce a le plus de rapports dans toutes ses formes avec la *Columba spadicea*, et toutes les deux sont tres peu différentes de notre Ramier d'Europe.' In the concluding observation we cannot concur to the extent implied by that eminent naturalist; for, although an approach from the fruit-eating pigeons, or Carpophagæ, to the true pigeons, is made by *Col. spadicea* and *dilopha*, still the form of their feet, evidently better adapted for arboreal than terrene habits, and their general aspect, are such as to show that some intermediate form is wanting to bring them into that immediate connexion with the group represented by the European ring pigeon, which M. Temminck seems to intimate.'

Description.—Size nearly that of *Col. spadicea.* Wings long and powerful, reaching when closed beyond the middle of the tail, second, third, and fourth feathers longest, and nearly equal, fifth shorter than the first. Bill rich orange, tip of under mandible obliquely truncated, tip of upper mandible compressed, somewhat arched, culmen rounded. Frontal crest beginning on the upper part of the bill immediately behind the horny tip, and above the nostrils, composed of long curved feathers, soft and loose in texture, and bluish grey tinged with rufous in colour, pointing backwards. Occipital crest rich rufous, bounded on each side from the posterior angle of the eye by a streak of glossy black, decumbent, composed also of long soft feathers with open barbules, each feather widening towards the tip. Side and front of neck and breast pale-grey, black at the base of the feathers, which is hid. The feathers here are trifid at the end: on the back of the neck they are acuminated, but not distinctly divided as upon the breast. Back, scapulars, and wing-coverts deep bluish-grey, the feathers darker at the margin; quills and secondaries bluish-black; under plumage grey. Tail square, basal part and narrow band pale-grey tinged with reddish, tip and broad intermediate bar black; length seven inches. Naked parts of tarsi and toes crimson-red; hind toe strong, with a broad flat sole, and exceeding the tarsus in length; nails long and somewhat curved. *Locality*, New Holland and Java.



[Columba dilopha.]

Passing the *Columba Palumbus* (*Ramier* of the French, *Torquato*, *Ghiandaria*, &c., of the Italians, according to Belon; *Colombaccio*, *Palombo*, *Piccione da Ghianda* of the same, according to Prince Bonaparte; *Ringdufwa* of the Fauna Suecica, *Wildtaube*, and *Ringel-Taube* of the Germans, *Ring-dove*, *Queest*, and *Cushat* of the British, *Ysguthan* of the antient British, and, in Belon's opinion, the Φάττα of the Greeks), and the *Columba Œnas*, (*Palombella*, *Palombella di macchia*, *Piccione topacchio* of the Italians, *Le Pigeon Sauvage* of Brisson, *Stock Dove* and *Wood-Pigeon* of the British) we come to the *Columba livia;* but, before we enter upon the history of the last-named species, we must observe that the *Cushat* most probably sat for the pretty picture of Virgil's 'aëriæ palumbes,' and that it is considered the type of the Columbinæ. Instances have been known of its laying in aviaries, and Mr. Selby states that he has been informed 'that a pair of ring pigeons, in one of the aviaries of the Zoological Gardens, this last year built their nest in a tree or shrub contained within it, and that the female laid two eggs, which unfortunately were destroyed by some accident during incubation. This fact shows that, under favourable circumstances, and when the habits of the bird are attended to, a progeny may be obtained.' Of *Columba Œnas* Mr. Selby observes, 'Near as it approaches the common pigeon in size and form, no mixed breed that we are aware of has ever been obtained between them, although repeated attempts to effect an intercourse have been made. This in our mind appears a strong and convincing proof, that all the varieties, generally known by the name of Fancy Pigeons, have originated from one and the same stock, and not from crosses with other species, as some have supposed, the produce of which, even could it be occasionally obtained, we have no doubt would prove to be barren, or what are generally termed mules.'

Columba livia. This, the *Pigeon privé** of Bélon, *Le Pigeon domestique* and *Le Biset* and *Le Rocheraye* of Brisson, *Coulon*, *Colombe*, *Pigeon* of the French, *Palombella*, *Piccione di torre*, *Piccione di rocca* of the Italians, *Feldtaube*, *Haustaube*, *Hohltaube*, *Blau Taube*, and *Holtz Taube* of the Germans, *Wild Rock Pigeon* of the British, *Colommen* of the antient British, is the stock from which ornithologists generally now agree the domestic pigeon and its varieties are derived. 'Under this species,' writes Mr.

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* Belon is of opinion that this is the Περιστερὰ of the Greeks. He seems to have the domesticated race in view; while his Πελειὰς, Livia Columba, Palumbus minor, Livia, Palumbella, Biset, Croiseau, would seem to be the wild rock-pigeon.

Selby, ‘we include not only the common pigeon, or inhabitant of the dove-cot, but all those numerous varieties, or, as they are frequently termed, races of domesticated pigeons, so highly prized, and fostered with such care and attention by the amateur breeder or pigeon fancier; for, however diversified their forms, colour, or peculiarity of habit may be, we consider them all as having originated from a few accidental varieties of the common pigeon, and not from any cross of that bird with other species, no signs or marks whatever of such being apparent in any of the numerous varieties known to us. In fact, the greater part of them owe their existence to the interference and the art of man; for by separating from the parent stock such accidental varieties as have occasionally occurred, by subjecting these to captivity and domestication, and by assorting them and pairing them together, as fancy or caprice suggested, he has at intervals generated all the various races and peculiar varieties which, it is well known, when once produced, may be perpetuated for an indefinite period, by being kept separate from, and unmixed with, others; or what by those interested in such pursuits is usually termed ‘breeding in and in.’ Such also, we may add, is the opinion of the most eminent naturalists as to their origin, and it is strongly insisted on by M. Temminck in his valuable work, the ‘Histoire Générale Naturelle des Pigeons.’ Indeed the fact that all the varieties, however much they may differ in colour, size, or other particulars, if permitted, breed freely and indiscriminately with each other, and produce a progeny equally prolific, is another and a convincing proof of their common and self-same origin; for it is one of those universal laws of nature, extending even to plants, and one which, if once set aside or not enforced, would plunge all animated matter into indescribable confusion, that the offspring produced by the intercourse of different, that is, distinct species, is incapable of further increase. That such an intercourse may be effected is well known to all; but it is generally under peculiar or artificial circumstances, and rarely when the animals, birds, or whatever they may be, are in their natural state, and in a condition to make their own election. It is seen in the crosses obtained in a state of confinement between the canary and goldfinch, linnet, &c.; in the hybrids between different species of *Anatidæ*, when domesticated or kept in captivity; in the cross between the pheasant and common fowl, &c.***

‘The bastard produce of the common wild turtle (*Turtur communis*) with the turtle of the aviary (*Turtur risorius*) has been proved by frequent experiment to be barren, although the two species from whence it originates appear to be closely allied, and a mixed breed is easily procured; and such, we have no hesitation in saying, would be the event, if a cross could be obtained between the common pigeon and the ring pigeon, the wood pigeon, or any other species.’[*] These observations are well worthy of attention. The assertion respecting the bastard produce of the turtles, made above, is corroborated by MM. Boitard and Corbié in their History of the Pigeons de Voliere, and the principle is further confirmed by the experiments of Mauduyt, Vieillot, and Corbié.

The varieties of this bird, produced under the fostering hand of man, the tumblers, croppers, jacobines, runts, spots, turbits, owls, nuns, &c. &c., would fill a volume. Our limits will not permit us to figure or describe them. The *carrier* however demands notice. In one of his odes (*εἰς περιστερὰν*) Anacreon has immortalized it as the bearer of epistles. Taurosthenes sent to his expectant father, who resided in Ægina, the glad tidings of his success in the Olympic games on the very day of his victory. Pliny (*Nat. Hist.*, book x., 37,) speaks of the communication kept up between Hirtius and Decimus Brutus at the siege of Mutina (Modena); ‘what availed Antony the trench and the watch of the besiegers; what availed the nets (retia) stretched across the river, while the messenger was cleaving the air (per cœlum eunte nuntio).’ The crusaders employed them, and Joinville records an instance during the crusade of Saint Louis. Tasso, (Gierusalemme Liberata, cant. xviii.) sings of one that was attacked by a falcon and defended by Godfrey,

> ‘Che dal collo ad un filo auinta pende
> Rinchiusa carta, e sotto un’ ala ascosa.’

which ‘carta’ Godfrey of course reads, and is put in possession of all the secrets. In the same way Ariosto (cant. xv.) makes the ‘Castellan di Damiata’ spread the news of Orrilo’s death all over Egypt. Sir John Maundeville, knight, warrior, and pilgrim, who penetrated to the border of China in the reigns of our Second and Third Edward, thus writes: ‘In that contree and other contrees bezonde, thei han a custom, whan thei schulle usen werre, and whan men holden sege abouten cytee or castelle, and thei withinnen dur not senden out messagers with lettere, fro lord to lord, for to aske sokour, thei maken here letters and bynden them to the nekke of a *Colver*, and letten the *Colver* flee: and the *Colveren* ben so taughte, that thei fleen with the letters to the very place, that men wolde sende hem to. For the *Colveres* ben norysscht in tho places, where thei ben sent to; and thei senden hem thus for to beren here letters. And the *Colveres* retournen azen, where as thei ben norisscht and so they don comounly.’

The carrier however gradually sank, in this country at least, to the bearer of the intelligence of the felon’s death at Tyburn—Hogarth’s print will occur to every body: it became the messenger from the race-course and prize-ring, and is now said to be largely used in stock-jobbing transactions. Every day we read remonstrances on this subject, and accounts of some of the hapless messengers being shot; nay, the fostering of a breed of falcons has been threatened, to oppose their progress to our shores. Some idea of the astonishing fecundity of the domesticated pigeon may be derived from the assertion of Biberg, who observes that if you suppose two pigeons to hatch nine times a year, they may produce in four years 14,760 young.[*]

In its wild state the rock pigeon is widely distributed; the rocky islands of Africa and Asia, and in the Mediterranean, abound with them. Virgil’s beautiful simile in the Fifth Æneid evidently relates to this species:—

> ‘Cui dómus et dulces latebroso in pumice nidi.’

In the Orkneys and Hebrides it is said to swarm. ‘It is also met with upon the northern and western coasts of Sutherland, the perforated and cavernous rocks which gird the eastern side of Loch Eriboll, and those of the limestone district of Durness, furnishing suitable places of retreat; and again upon the eastern coasts of Scotland it is seen about the rocky steeps of the Isle of Bass and the bold promontory of St. Abb’s Head.’ (Selby.)[†]

Description of *Columba livia* in its wild state:—Bill blackish brown; the nostril membrane red, sprinkled, as it were, with a white powder. The irides pale reddish orange. Head and throat bluish grey. Sides of the neck and upper part of the breast dark lavender purple, glossed with shades of green and purplish red. Lower part of

[Columba livia.]

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[*] Naturalist’s Library, Ornithology, vol. v., p. 152. A work, of which the letter-press and figures improve with every volume.

[*] Biberg says 14,672; but Stillingfleet (*Tracts*, p. 90, 3d ed.) says that the numbers ought to be as above, or the expression should be altered, as Biberg includes the first pair.

[†] We are informed that at Somerset House, London, pigeons have made their nests about the building, both on the side towards the water and inland, for the last sixty years. The birds that so make their nests are said to be the blue ones. Were these originally wild birds, or have they returned to something like their wild habits from the domesticated state? Most probably they had been domesticated.

breast and abdomen bluish grey. Upper mandible and wing-coverts blue grey. Greater coverts and secondaries barred with black, so that there are two broad and distinct bars across the closed wings. Lower part of the back white; rump and tail-coverts blueish grey. Tail deep grey, with a broad black bar at the end. Legs and feet pale purplish red. Wings when closed reaching within half an inch of the end of the tail. (Selby).

Ectopistinæ (Selby).

Turtur.

Bill more slender than that of the pigeons. Tip of the upper mandible gently deflected, that of the lower scarcely exhibiting the appearance of an angle. Tarsi rather shorter than the middle toe. Feet formed for walking or perching; inner toe longer than the outer. Front of tarsi covered with broad imbricated scales. Wings, first quill a little shorter than the second, third longest of all. Tail rounded or slightly graduated. (Selby).

Example.—*Turtur risorius, Columba risoria,* Auct; *Turtur torquatus Senegalensis,* Brisson; *Tourterelle à collier,* Buffon; probably the turtle of the Scriptures, and still plentiful in Egypt and other eastern countries, where it is often kept in confinement. The relics of Greek and Roman art give a very fair representation of this species; but Belon and others seem to be of opinion that the *Turtur communis,* common turtle-dove, was the τρύγων of the Greeks.

Description of a wild specimen from Southern Africa. Length about ten inches. Chin whitish; from the corners of the mouth to the eyes a narrow streak of black. Forehead pale bluish-grey; crown darker; cheeks, neck, breast, and belly grey, tinged with vinaceous or pale purplish-red; the hind neck with a demi-collar of black; some of the side feathers of the collar tipped with white. Back, scapulars, and rump, pale clove brown, with a greenish tinge. Margins of wings, greater coverts, and under wing-coverts blue grey. Greater quills hair brown, delicately edged with greyish-white. Vent and under tail-coverts white. Legs and feet grey; inner toe a little longer than the outer. (Selby).

Habits and Food.—In its natural state it haunts the woods, where it breeds, making a nest like that of the common turtle, and lays two white eggs. It seeks its food in the open grounds, and subsists upon grain, grass seeds, and pulse, &c. Its trivial name is derived from a fanciful resemblance to the human laugh in its cooings. (Selby).

[Turtur risorius.]

Hybrids.

A race between the common turtle and this species has been obtained; but the mules are stated to have been invariably barren.

Mr. Selby provisionally places the *Columba lophotes* of Temminck under this genus.

Ectopistes (Swainson).

Bill slender, notched. Wings rather elongated, pointed; the first and third quill equal; the second longest. Tail rounded, or curvated. Feet short, naked; anterior scales of the tarsi imbricate; lateral scales very small, reticulate. Types:—*Col. speciosa,* Temm.; *Col. migratoria,* Linn. (Swainson).

Example.—*Ectopistes migratoria, Columba migratoria,* Auct. The *Passenger Pigeon,* Wilson, Audubon, and others. Our limits not allowing us to give a detailed history of any length of the habits of more than one species, we have selected Wilson's graphic account of this elegant bird as the most striking.

'The roosting-places are always in the woods, and sometimes occupy a large extent of forest. When they have frequented one of those places for some time, the appearance it exhibits is surprising. The ground is covered to the depth of several inches with their dung; all the tender grass and underwood destroyed; the surface strewed with large limbs of trees, broken down by the weight of the birds collecting one above another; and the trees themselves, for thousands of acres, killed as completely as if girdled with an axe. The marks of their desolation remain for many years on the spot; and numerous places could be pointed out where, for several years after, scarcely a single vegetable made its appearance. When these roosts are first discovered, the inhabitants, from considerable distances, visit them in the night with guns, clubs, long poles, pots of sulphur, and various other engines of destruction. In a few hours they fill many sacks, and load horses with them. By the Indians, a pigeon-roost or breeding-place is considered an important source of national profit and dependence for that season, and all their active ingenuity is exercised on the occasion. The breeding-place differs from the former in its greater extent. In the western countries, viz., the states of Ohio, Kentucky, and Indiana, these are generally in back woods, and often extend in nearly a straight line across the country for a great way. Not far from Shelbyville, in the state of Kentucky, about five years ago, there was one of these breeding-places, which stretched through the woods in nearly a north and south direction, was several miles in breadth, and was said to be upwards of forty miles in extent. In this tract almost every tree was furnished with nests wherever the branches could accommodate them. The pigeons made their first appearance there about the 10th of April, and left it altogether with their young before the 25th of May. As soon as the young were fully grown, and before they left the nests, numerous parties of the inhabitants, from all parts of the adjacent country, came with waggons, axes, beds, cooking utensils, many of them accompanied by the greater part of their families, and encamped for several days at this immense nursery. Several of them informed me that the noise was so great as to terrify their horses, and that it was difficult for one person to hear another speak without bawling in his ear. The ground was strewed with broken limbs of trees, eggs, and young squab pigeons, which had been precipitated from above, and on which herds of hogs were fattening. Hawks, buzzards, and eagles were sailing about in great numbers, and seizing the squabs from the nests at pleasure, while, from twenty feet upwards to the top of the trees, the view through the woods presented a perpetual tumult of crowding and fluttering multitudes of pigeons, their wings roaring like thunder, mingled with the frequent crash of falling timber; for now the axemen were at work, cutting down those trees that seemed to be most crowded with nests, and contrived to fell them in such a manner, that in their descent they might bring down several others; by which means, the falling of one large tree sometimes produced 200 squabs, little inferior in size to the old ones, and almost one heap of fat. On some single trees, upwards of 100 nests were found, each containing one squab only; a circumstance in the history of this bird not generally known to naturalists. It was dangerous to walk under these flying and fluttering millions, from the frequent fall of large branches, broken down by the weight of the multitudes above, and which, in their descent, often destroyed numbers of the birds themselves; while the clothes of those engaged in traversing the woods were completely covered with the excrements of the pigeons.

'These circumstances were related to me by many of the most respectable part of the community in that quarter, and were confirmed in part by what I myself witnessed. I passed for several miles through this same breeding-place, where every tree was spotted with nests, the remains of those above described. In many instances I counted upwards of ninety nests on a single tree; but the pigeons had abandoned this place for another, sixty or eighty miles off, towards Green River, where they were said at that time to be equally numerous. From the great numbers that were constantly passing over our heads to or from that quarter, I had no doubt of the truth of this statement. The mast had been chiefly consumed in Kentucky; and the pigeons, every morning a little before sunrise, set out for the Indiana territory, the nearest part of which was about sixty miles distant. Many of these returned before ten o'clock, and the great body generally appeared on their return a little after noon. I had left the public road to visit the remains of the breeding-place near Shelbyville, and was traversing the woods with my gun, on my way to Frankfort, when, about ten o'clock, the pigeons which I had observed flying the greater part of the morning northerly, began to return in such immense numbers as I never before had witnessed. Coming to an opening by the side of a creek called the Benson, where I had a more uninterrupted view, I was astonished at their appearance: they were flying with great steadiness and rapidity, at a height beyond gun-shot, in several strata deep, and so close together that, could shot have reached them, one discharge could not have failed of bringing down several individuals. From right to left, as far as the eye could reach, the breadth of this vast procession extended, seeming every where equally crowded. Curious to determine how long this appearance would continue, I took out my watch to note the time, and sat down to observe them. It was then half-past one; I sat for more than an hour, but instead of a diminution of this prodigious procession, it seemed rather to increase, both in numbers and rapidity; and, anxious to reach Frankfort before night, I rose and went on. About four o'clock in the afternoon, I crossed Kentucky river, at the town of Frankfort, at which time the living torrent above my head seemed as numerous and as extensive as ever. Long after this I observed them in large bodies that continued to pass for six or eight minutes, and these again were followed by other detached bodies, all moving in the same south-east direction, till after six o'clock in the evening. The great breadth of front which this mighty multitude preserved would seem to intimate a corresponding breadth of their breeding-place, which, by several gentlemen who had lately passed through part of it, was stated to me at several miles.'

Wilson then enters into a rough calculation of the numbers of this mass, and he comes to the conclusion that its whole length was 240 miles, and that the numbers composing it amounted to 2,230,272,000 pigeons, observing that this is probably far below the actual amount. He adds, that allowing each pigeon to consume half a pint of food daily, the whole quantity would equal 17,424,000 bushels daily. Mr. Audubon confirms Wilson in every point, excepting that he very properly corrects that part of the narrative which would lead to the conclusion that a single young one only is hatched each time. The latter observes that the bird lays *two* eggs of a pure white, and that each brood generally consists of a male and female.

Description.—Wings long and acuminate, having the second quill feather exceeding the others in length. The tail is greatly cuneiform or graduated, and consists of twelve tapering feathers. Bill black, and like that of the turtle. Legs purplish-red, short, and strong. Iris bright orange-red, the naked orbit purplish-red. Head and cheeks pale bluish-grey. Fore-neck, breast, and sides brownish-red, with a purplish tinge. Abdomen and vent white. Lower part and sides of neck purplish-crimson, reflecting tints of emerald green and gold. Upper plumage deep bluish-grey, some of the scapulars and wing-coverts spotted with black. Greater coverts grey, tipped with white. Quills blackish-grey, their exterior webs bluish-grey. Tail with the two middle feathers black, the other five on each side grey at the base, with a black bar on the interior arch, and passing into white towards the extremities.

The female is rather smaller, and has the colours of her plumage much duller than those of the male, though the distribution is the same. (Selby.) *Locality,* North American Continent, between the twentieth and sixty-second degrees of north latitude. Mr. Eyton has figured one as a visitant to our shores, on the authority of Dr. Fleming, who, in his 'History of British Animals,' says that one was shot in the parish of Monymeal, Fifeshire, on the 31st December, 1825.

Mr. Selby refers provisionally *Columba Capensis*, Auct., *Columba Macquarrii*, Lesson, and *Columba venusta*, Temm. to his group of *Ectopistinæ*, and thinks that by these and some other nearly allied forms, a passage to the next group, *Peristerinæ*, the ground doves, is effected.

[Ectopistes migratoria]

Peristerinæ (Selby).

Distinguished from the preceding groups by their terrene habits, and their evident approach in many points to the more typical Rasores or Gallinaceous birds. In these the bill is rather slender, frequently subemarginate, and the tip of the upper mandible but gently deflected; the wings are generally short and rounded, and in many instances concave, as in the partridge, grouse, &c. The legs are considerably longer than in the typical pigeons; the tarsus usually exceeding the middle toe in length, and the feet better adapted for walking than grasping; the claws are obtuse and slightly arched. The hallux is shorter, and its relative position different from that of the arboreal species. Their plumage is plainer and more uniform in tint than that of some of the preceding groups, though it is still brilliant in those species which connect them with other forms. They live almost entirely upon the ground, and many of the species run with great celerity, on which account they have been called partridge pigeons. Their flight, which is usually low, is effected with greater exertion than that of the pigeons, and is never long sustained. (Selby.)

Mr. Selby observes that this division contains a great number of species, and is of opinion that when better investigated, it will be found divisible into a variety of minor groups or genera. He places under it Phaps, Chamæpelia, and Peristera. This group is distinguished by a longer bill, very faintly emarginate, and by its tarsi, which are moderately long and naked, with the frontal scales divided into two series, and the sides and hinder part reticulated with minute scales. Another group, he adds, seems indicated by certain Asiatic species, conspicuous for the rich metallic green of the plumage of their backs, resembling therein some of the *Ptilinopinæ*. The tarsi of these are destitute of scales, except a few indistinct ones in front, just above the toes. The bill is rather long, and destitute of a notch. They live mostly on the ground, but their flight is powerful. Mr. Selby takes *Columba superciliosa* of Wagler as the type of this last-mentioned group.

Phaps (Selby).

Bill moderately long, rather slender; upper mandible gently deflected at the tip, and with the indication of a notch or emargination. Wings of mean length; second and third feathers longest, and nearly equal. Tail slightly rounded. Legs, tarsi as long as the middle toe, the front covered with a double row of scales, sides and back reticulated with small hexagonal scales. Hind toe short: inner toe exceeding the outer in length. Claws blunt, slightly arched. Type, *Columba chalcoptera*, Latham; *Columba elegans*, Temm.; and *Columba picata*, Wagler, belong to this group. (Selby.)

Example.—Phaps chalcoptera, Columba chalcoptera, Latham; *Columba Lumachelle*, Temm.; bronze-winged ground dove.

Size about that of *Columba Œnas*. Total length, about fifteen inches. Bill, from edges of the gape, hardly an inch; black anteriorly; reddish near the base. Forehead, stripe below the eyes, and throat white; crown brown, tinged with reddish, filleted with dusky red; cheeks and sides of neck bluish-grey; bottom of neck in front and breast purplish-grey. Belly and vent grey, with a pale purple tinge. Back, scapulars, rump, and upper tail-coverts brown tinged with greenish in some lights, the border of each feather paler. Wing-covers bluish-grey, but the outer webs of every feather have a large ovate spot, producing various tints of metallic brilliancy according to the direction of the light. Quills brown above, with the inner surface of the webs, the axillary feathers, and under wing-coverts bordered rather deeply with pale orange-red. Tail slightly rounded, bluish-grey, with a black band. Legs red; two rows of scales in front, the sides reticulated.

Locality and Habits.—Australia and islands in the Pacific. In the neighbourhood of Sydney, from September till February.

Haunts dry and sandy places, where it is generally seen on the ground, and occasionally perched upon the low branches of shrubs. *Nest* inartificial, in holes of low trees or decayed trunks near the ground; sometimes on it. *Eggs* two, white. These birds go in pairs generally· their cooing is loud, and has been compared, when heard at a distance, to the lowing of a cow.

[Phaps chalcoptera.]

Chamæpelia* (Swainson)

Bill slender, entire. Wings rounded, the first quill short; third, fourth, and fifth nearly equal and longest, the webs on both sides slightly emarginate. Tail rounded. Feet rather short, the sides of the tarsi feathered. Types, *Columbæ passerina*, Linn.; *squamosa*, Temm. (Swainson).

Example.—*Chamæpelia Talpicoti*, *Columba Talpicoti*, Temm., the species which Mr. Selby considers to be the type. Length six inches and a quarter, adult male; forehead, crown, and nape of neck ash-grey; cheeks and throat pinkish-white; upper plumage entirely brownish-orange, with the exception of a few transverse streaks of black upon the exterior webs of some of the wing-coverts nearest the body; under plumage deep vinaceous red; axillary feathers and part of under wing-coverts black; tail with the two middle feathers brownish orange, the remainder brownish-black, with reddish-brown tips, moderately curved; bill and orbits bluish-grey; legs and toes pale-red, the outer side of the tarsus with a row of small feathers down the line of junction between the acrotarsia and paratarsia; quills broad, the fourth with a large projecting notch towards the middle of the inner web. The female has the crown of the head of a sordid grey; the upper plumage of a wood-brown, tinged with red; the scapular and wing-coverts marked as on the male, under plumage dirty-grey, tinged with pale purplish-red. (Selby.)

Locality and Habits.—Brazil, Paraguay, and other districts of South America. Haunts open grounds near woods, where it roosts and breeds upon the underwood, but never far from the ground, where it is active, and feeds upon the smaller cerealia, berries, &c. Generally observed in pairs, sometimes in families of four or six, never in large flocks. Does not fly from the face of man, but affects the confines of houses and farm-yards. Easily kept and propagated in aviaries.

[Chamæpelia Talpicoti.]

Peristera (Swainson).

Bill slender, sub-emarginate. Wings rounded, the first quill short and abruptly attenuated, second and fifth equal, third and fourth equal and longest. Tail rounded. Feet strong, naked, somewhat lengthened; anterior scales of the tarsi imbricate, lateral scales none. Type, *Columba cinerea*, Temm. (Swainson).

Example.—*Peristera tympanistria, Columba tympanistria*, Temm. Length about nine inches; upper plumage brown, slightly tinged with grey on the neck; large spots of shining dark-green on the outer webs of three or four of the greater wing-coverts; middle tail-feathers brown; the two exterior on each side grey, with a broad black bar near the tip; inner webs of greater quills deep brown; forehead, streak over the eye, and under plumage pure white; under wing-coverts and sides pale orange-brown; under tail-coverts brown; bill and legs grey, the latter with a reddish tinge.

Locality.—South Africa, where it is said to haunt woods. The species does not seem to be common.

[Peristera tympanistria.]

Geophilus (Selby).

Mr. Selby, speaking of *Columba cyanocephala*, Wagler, *Turtur Jamaicensis*, Brisson; *Columba carunculata*, Wag ler; and *Columba Nicobarica*, Latham, *Columba Gallus*, Wägler, says, 'Whether they will form a separate division, or the three first will enter among the Peristerinæ, and the Lophyrus alone remain a representative of another group, we are unable to determine, not possessing sufficient materials to institute so strict an analysis as is necessary, or to trace out with precision the direct affinities of those species, and the situation they hold in respect to the other groups of the *Columbidæ*, as well as those of the adjoining families. The three first we have provisionally included in the genus *Geophilus*. In their form and habits they approach still nearer to the typical Gallinaceous birds than the species we have just been describing. Their tarsi are long, and covered with hexagonal scales; their tail short, and rather pendent; their wings concave, short, and rounded; and their body, as compared with the typical pigeons, thick and heavy. A striking departure from the general economy of the Columbidæ is further observed in their mode of propagation, the number of the eggs they lay each hatching not being confined to two, as is seen to prevail in the groups already described, but extending to eight or ten, which are incubated upon the ground, and the young, like those of the true Gallinaceous birds, are produced from the egg in such a state as to be able immediately to follow the parent, which broods over and attends them like the partridge or domestic fowl. They live entirely upon the ground, except during the hours of repose, when they sometimes retire to bushes, or the low branches of trees. They walk and run with great quickness, like the *Gallinæ*, and in fact appear to be the forms which immediately connect this family with the Pavonidæ and Tetraonidæ. Although for the present we have placed the first three under the same generic head, yet from their distinct geographical distribution, and the difference observed in the bill of the first, it is more than probable that a further division will be required.'

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* Printed generally Chamæpelia. The derivation we take to be χαμαὶ and πέλεια ground-dove.

Geophilus caruncululatus, *Columba carunculata*, Temm.; *Colombe Galline*, Le Vaill. Size about that of the Common Turtle, but with the body stouter and more rounded. Base of the bill and forehead covered with a naked red wattle; another wattle of the same hue depends from the chin, and branches of it extend upwards towards the ears. Plumage of head, cheeks, neck, and breast purplish-grey; back, scapulars, and wing-coverts pale grey; feathers bordered with white. Belly, upper and under tail-coverts, flanks, and under wing-coverts white. Tail short, rounded, deep ruddy-brown, except the outer feather on each side· these have the outer web white. Legs covered with hexagonal scales, purplish-red. Iris with a double circle, yellow and red. The female has no wattle, and her colours are less pure. (Le Vaillant.)

[Geophilus caruneulatus.]

Locality and Habits.—South Africa, where it was discovered in the Great Namaqua country by Le Vaillant, who gives the following account of its habits and affinities:—'To the pigeons its affinity is shown by the form of the bill and the plumage; while it differs from them in the pendent wattle, elongated tarsi, rounder body less graceful form, tail, which it carries hanging down like that of a partridge, and rounded wings, points which bring it near to the *Gallinæ*.' A passage is thus formed by it, in his opinion, between those birds and the pigeons. The nest, composed of twigs and the dried stems of grasses, is formed in some slight hollow of the ground, and there the female lays six or eight reddish-white eggs, which are incubated by both the parents. The young are hatched clothed with down of a reddish-grey, run immediately and follow their parents, which keep them together by a peculiar oft-repeated cry, and brood over them with their wings. Their first food consists of the larvæ of ants, dead insects, and worms, which the parents point out to them. When strong enough to find their own food, they live on grain of different sorts, berries, insects, &c., and keep together in coveys like the partridge and other Tetraonidæ till the pairing-time.

If the wattles of the last-named species recall to the observer the same parts so highly developed in the Gallinaceous birds, the species which we next present will remind him of the hackles which ornament the Gallinæ.

Geophilus? Nicobaricus, *Columba Nicobarica*, Latham; *Columba Gallus*, Wägler. Length hardly fifteen inches; bill slender, about 1½ inch long, tip but little bent downwards; the tail pure white, the quills deep blackish-blue, with varying tints of green; all the rest of the plumage rich metallic green, shooting, according to the light, into the variegated tints of golden green, bronze, bright copper colour, and deep purplish-red; neck-feathers long, narrow, and pointed, like those of the domestic cock; barbules towards the tip silky and distinct; tail short, pendent, nearly square; wings, when closed, reaching nearly to the termination of tail; legs strong, moderately long, black, covered with hexagonal scales; nails yellow, gently curved, blunt. Upon the base of the upper mandible of the male a round fleshy tubercle (probably apparent in the breeding season only). The female resembles the male in colour, but her neck-feathers are not so long, and she has no tubercle.

[Geophilus Nicobaricus.]

Locality and Habits.—The isles of Nicobar, Java, Sumatra, and many of the Moluccas. Authors differ about its habits, some asserting that its nest is placed on the ground, and that the female lays several eggs, the young running as soon as hatched; but Mr. Bennet, who saw them in Mr. Beale's aviary at Macao, says that they were usually seen perched upon the trees, even upon the loftiest branches and adds, that they build their rude nests and rear their young upon trees, similar to all the pigeon tribe.

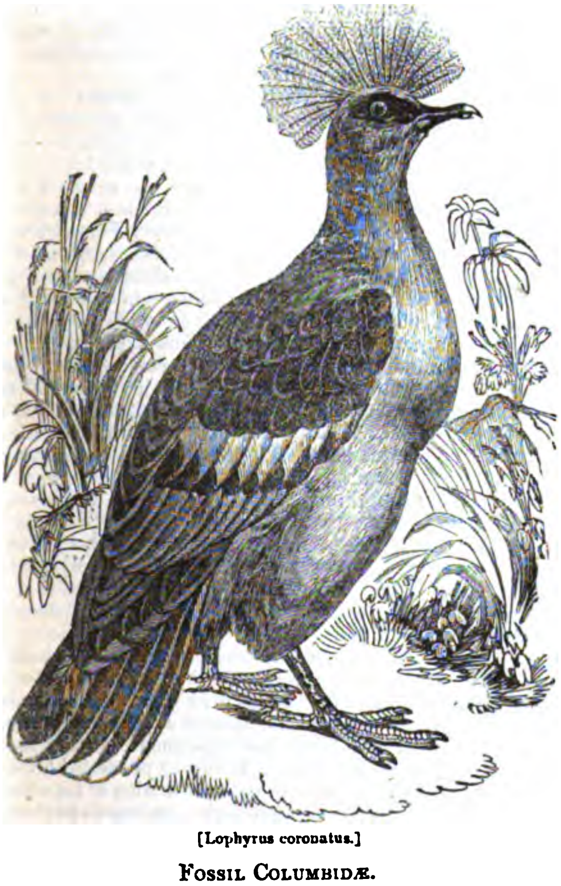
Lophyrus (Vieillot).

Bill moderate, rather slender, and slightly gibbous towards the tip; upper mandible channelled (sillonnée) on the sides, inclined towards the point; nostrils situated in a groove; wings rounded (Vieillot).

Example.—*Lophyrus coronatus*, *Columba coronata*, Latham; *Phasianus cristatus Indicus*, Brisson; *Columbi Hocco*, Le Vaill.; *Colombe Galline Goura*, Temm.; *Great Crowned Pigeon*, Edw. A species surpassing in size all the other *Columbidæ*. Total length from twenty-seven to twenty-eight inches; bill two inches long, black, tips of mandibles thickened, that of the upper one somewhat deflected; head with a large, elevated, semicircular, compressed crest of narrow straight feathers, with decomposed or rather disunited silky barbules always erect; crest and body below greyish-blue; feathers of back, scapulars, and smaller wing coverts, black at the base, rich purple-brown at the tips; greater coverts same colour, but centrally barred with white, forming a single transverse band across the wings when closed; quills and tail deep grey, the latter terminated with greyish-blue; legs grey; tarsi 3½ inches in length, covered with rounded scales not closely set, with a white border of skin round each; toes strong and somewhat short, scales placed as in the *Columbinæ*.

Locality and Habits.—Many of the islands of the great Indian group. Not rare in Java and Banda, abundant in New Guinea, and in most of the Moluccas. Nest built in trees; eggs two; cooing of the male hoarse, accompanied by a noise somewhat like that of a turkey cock when strutting; food—berries, seeds, grain, &c.; flavour of the flesh said to be excellent.

'In this magnificent and beautiful bird,' says Mr. Selby, 'we observe a combination of form different from that of the ground pigeons so lately described; for, instead of the marked affinity to the typical rasorial families, the *Pavonidæ* and *Tetraonidæ*, so decidedly exhibited by these species, both in their mode of life, and in their deviation from the usual Columbine figure, we have, in the present instance, an approximation of structure much nearer that of some of the *Cracidæ*, another tribe of birds which constitutes an aberrant family of the Rasorial Order, and it is on this account we think that this bird cannot well be placed in the same division with the ground doves, but must constitute the type of a separate group.'



[Lophyrus coronatus.]

FOSSIL COLUMBIDÆ.

Dr. Buckland enumerates the bones of the pigeon among the remains in the cave at Kirkdale, and figures a bone which he says approaches closely to the Spanish runt, which is one of the largest of the pigeon tribe, meaning, we suppose, the *Columbidæ*.

COLUMBINE. [AQUILEGIA.]

COLUMBIUM, a metal discovered, in 1801, by Mr. Hatchett in a ferruginous mineral from North America. It was afterwards detected in some Swedish minerals by Ekeberg, who supposed it to be a different and new metal, to which he gave the name of *Tantalum*. Dr. Wollaston showed that the metals were the same. The minerals found in Sweden are *tantalite* and *yttro-tantalite*. The first, sometimes called also *Columbite*, occurs amorphous and nodular, and also crystallised in the form of a right rhombic prism. The massive variety is either granular or compact; the crystals are greyish-black: fracture uneven. hardness, 6: specific gravity, 6·038: lustre, imperfect metallic: it is opake. It contains about 80 per cent. of oxide of columbium, 12 of oxide of iron, and 8 of oxide of manganese. The yttro-tantalite contains oxide of columbium, yttria, and some other substances.

Columbium is obtained with great difficulty. Berzelius procured it by heating potassium with the potasso-fluoride of columbium. It is a black powder, which by the burnisher acquires the colour and lustre of iron. The specific gravity is about 6. It is nearly insoluble in acids and in chlorine. When heated in the air it is oxidized, and converted into columbic acid.

Oxygen and *Columbium* combine in two proportions, forming columbic acid and oxide of columbium.

Columbic acid may be obtained by burning the metal in the air; it is colourless, insipid, and does not act upon vegetable blue colours. When heated with charcoal it is reduced to the state of oxide. If heated with iron it loses oxygen, and an alloy of iron and columbium is formed. Columbic acid combined with water forms a very white hydrate, which reddens vegetable blues. It combines with salifiable bases to form salts which are called *columbates*, but no one of them is of any importance, or applied to any purpose whatever.

Columbic acid is composed of

3 equivalents of oxygen . .	24
1 equivalent of columbium .	185
Equivalent . .	209

Oxide of Columbium is obtained by heating columbic acid to whiteness in a covered crucible. It is of a greyish black colour, very hard, and almost infusible.

Oxide of columbium consists of

2 equivalents of oxygen . .	16
1 equivalent of columbium .	185
Equivalent . .	201

Columbium combines also with chlorine and sulphur, &c., but these compounds are little known and of no importance.

COLUMBO, or **COLOMBO**, the capital and seat of the British government in Ceylon, is situated on the western coast of the island, 6° 57′ N. lat., and 80° E. long., 368 miles S.W. from Madras. The fort is on a promontory, two-thirds of the extent of which is washed by the sea. It derives strength from art and from nature: it embraces a circuit of about a mile and a quarter, and has eight principal bastions. Four of these bastions are towards the sea, and three face a lake and command the narrow approach from the town. The fort is surrounded, except on the side of the sea, with a deep moat, and a lake bordering on the glacis adds to the strength of the place. On the side of the sea, where the surf does not render a landing impracticable, every part is well commanded by the batteries. Inside the fort are several straight and regular streets. The residence of the governor, called the 'King's house,' is in King's Street; and behind it is the light-house, a beautiful edifice, lately erected, the light of which is ninety-seven feet above the level of the sea. The principal government offices and courts are within the fort; also an English church, a library, a medical museum, an hospital, two hotels, and numerous shops.

The lake before alluded to, being connected by canals with the Mutwal river, almost insulates the town. In the centre of the lake is a piece of land called Slave island, covered with cocoa-nut trees, and easy of access from the town or fort by a small stone bridge. It is the head-quarters of the Ceylon Rifle regiment.

Columbo has a small semicircular harbour admitting vessels not exceeding 200 tons. Ships of larger burden anchor in the roads. In the S.W. monsoon, from April to October, the best anchorage is found in from seven to eight fathoms, light-house bearing S. by E. ½ E., and the Dutch church E. by S. In the N.E. monsoon, from November to April, it is more convenient to anchor in six and a half fathoms, light-house bearing S. or S. ½ E., and the Dutch church E.S.E.

The town is regularly built, with fifteen streets, eight running E. and W. and the others at right angles to them. The houses are built of cabook, white-washed, and presents a good appearance. In 1814 there were 2654 houses within the gravets *. Between 1820 and 1829, 6512*l.* was collected by assessment for lighting and repairing the streets. The amount collected is greater than what is expended and the surplus money is put out at interest, it being intended to discontinue assessments when the interest of the surplus shall amount to 1200*l.* per annum.

Among the public buildings are the Supreme Courthouse, and the various public offices. There is also a library belonging to the burghers, a small-pox hospital, a masonic hall, and a number of religious edifices. The Dutch church, erected in 1746, is a lofty building in the form of a cross, standing in the centre of the town.

There are two steam-engines, and several native presses used in the manufacture of cocoa-nut oil.

The population is composed of Europeans, burghers, Malabars, Singhalese, and Moors, besides some Malays, Chinese, Parsees, Caffrees, and Pattangs; and according to the census of 1832, amounted to 31,519.

The commerce, external and internal, is very extensive, and daily increasing. The exports to Europe are cinnamon, pepper, coffee, cocoa-nut oil, plumbago, cordage, arrack, cardamoms, elephants' tusks, deer horns, tortoise-shells, ebony, satin-wood, &c.; and the imports consist of articles of European manufacture.

The climate of Columbo is very salubrious. The mean daily variation of the temperature is from 76° to 86½° Fahr. The tropical rains are here sometimes accompanied with dreadful thunder storms.

Columbo is mentioned in Singhalese history as early as 495 A.D. About the year 1371 it was frequented by trading vessels, and a colony of Malabars took possession of the place, and threw up fortifications, but they were soon expelled. The Portuguese visited Columbo in 1518, and soon after erected a fort; but the Singhalese, roused to resentment by the tyranny of the Portuguese, invested the fort with an army of 20,000 men, and besieged it for six months, when the Portuguese were enabled, by means of reinforcements from Goa, to disperse the Singhalese, and make their king sue for peace. The fort was at one time demolished in compliance with orders from Portugal, but a new fort was afterwards erected; and being firmly established in it, the Portuguese, by taking part in the intestine wars, gradually extended their influence over the whole island. In 1656 the Dutch wrested Columbo from them after a siege of seven months, and expelled them from the sea coast. In 1796 the Dutch surrendered it to the British.

COLUMBUS (a name latinized from the Italian Colombo, and the Spanish Colon) was born at Genoa†, about the year 1445 or 1446‡. His father, who was a wool-comber, sent him to Pavia, then the great school of learning in Lombardy; but Columbus having shown a taste for geometry, geography, and astronomy, or, as it was then termed, astrology, went to sea at fourteen years of age. In addition to the hardy encounters and dangers attending the sea-faring life of that age, he was often under the rigid discipline of an old relation, Colombo, who carried on a predatory warfare against Mohammedans and Venetians, the great rivals of the Genoese. In February, 1467, Columbus, in order to ascertain whether Iceland was inhabited, advanced 100 leagues beyond it, and was astonished at not finding the sea frozen. He also visited the Portuguese fort of St. George la Mina, on the coast of Guinea.

About the year 1470, he settled at Lisbon, then the great resort of travellers and navigators, whom Prince Henry§ highly encouraged. Here Columbus married the daughter of an Italian, called Patestrello, who had colonized and who governed the island of Porto Santo, and whose papers, charts, and journals, were highly serviceable to Columbus in his occasional expeditions to Madeira, the Canaries, the Azores, and the Portuguese settlements of Africa, and for the construction of maps and charts, which he sold to support his family, and his aged father at Genoa, as well as to defray the education of his younger brothers. Columbus resided also some time at the island of Porto Santo, which had not long been discovered, a circumstance which at a period of great excitement and expectation as to maritime discovery, kindled his mind to enthusiasm, which was heightened by the allusions in the Bible to the ultimate universal diffusion of the gospel, which Columbus hoped that he was predestined to extend to the eastern extremity of Asia. He considered his projected discoveries as only a means to this end, and also for supplying him with ample treasures to furnish an army of 50,000 foot soldiers and 5000 horse for the recovery of the holy sepulchre. Moreover the legends of the island of Cipango (Japan), of Mango (Southern China), and Cathay, the opinions of the antients, the travels of the moderns, the conjectured sphericity of the earth, its supposed smallness, and the imaginary prolongation of Asia to the east, all this presumptive evidence, added to the recent application of the astrolabe to navigation, gave him so firm a conviction of the practicability of crossing the Atlantic, and of landing on the eastern shores of Asia, that, after long delays, and repeated disappointments and struggles with poverty, he never made any abatement in those conditions which appeared to all the states* to whom he made proposals to be the extravagant demands of a mere adventurer. John II. of Portugal, after having referred the project to a maritime junto, and to his council, both of whom regarded it as visionary, nevertheless sent a caravel under the pretext of taking provisions to the Cape Verd Islands, but with secret instructions to try the route marked in the papers of Columbus. The pilots however losing all courage, put back to Lisbon, and ridiculed the scheme. Indignant at such duplicity, Columbus sought patronage elsewhere, and sent his brother Bartholomew to make proposals to Henry VII. of England.

In 1484 Columbus arrived at Palos de Moguer in Andalusia. Stopping one day at the Franciscan convent of La Rabida to beg some bread and water for his child, the guardian or superior, Juan Perez Marchena, passing by, and entering into conversation with the stranger, was so struck with the grandeur of his views, that he detained him as a guest, and sent for the physician of Palos, Garcia Fernandez, to discuss the project. Now, for the first time, it began to be listened to with admiration. Marchena, taking charge of the maintenance and education of the young son of Columbus, gave the father a letter of introduction to the confessor of Isabella, Fernando de Talavera. This expected patron treated the wandering petitioner as a dreaming speculator, and a needy applicant for bread. His humble dress, and his want of connexions and academic honours, formed, in the eyes of all the courtiers, an inexplicable contrast with his brilliant proposals and aspirations. But indigence, contumely, and indignities of all kinds, could not shake the perseverance of Columbus. At last, through Cardinal Mendoza, he obtained an audience of King Ferdinand, who referred the matter to a conference of learned monks, which was held in the convent of the Dominicans of St. Stephen at Salamanca. At the very opening of the discussion Columbus was assailed with biblical objections, against which no mathematical demonstration was admitted; but he met them on their own ground. He poured forth texts and predictions as mystical types of his proposed discovery. The inquiry however, after intentional procrastination, ended in an unfavourable report. After seven years wasted at the Spanish court in solicitation, occasional hope, and bitter disappointment, a connexion with a lady of Cordoba, Beatriz Enriquez, prevented his entirely breaking with Spain. She was the mother of his second son, Ferdinand, who became his historian, and whom he always treated on terms of perfect equality with his legitimate son Diego. Columbus was now about to apply to the French king, from whom he had received a letter of encouragement; when, returning for his eldest son, Diego, to La Rabida, the warm-hearted friar Marchena endeavoured to dissuade him from this project, sent again for the physician, Garcia Fernandez, and also called to their council Alonso Pinzon. This distinguished navigator not only approved of the projected voyage, but offered to engage in it with his money and in person, and even to defray the expenses of a new application at court.

The ardent friar lost no time in writing directly to Queen Isabella, and on her requesting a verbal explanation of the subject, he immediately went to Santa Fé, where she was then superintending with Ferdinand the close investment of Granada. Isabella, who had never heard the proposition urged with such honest zeal, enthusiasm, and eloquence, and who was besides more open to noble impulses than her husband, was at last moved in behalf of Columbus, but her favour was checked by her confessor Talavera, who, being now raised to the see of Granada, was more astonished than ever at the lofty claims of this indigent and threadbare solicitor. Those claims would be exorbitant in case of success, he observed; how unreasonable then would they appear in case of failure, which was almost sure to happen, and which would prove the gross credulity of the Spanish monarchs. More moderate, yet highly honourable and advantageous terms were offered to Columbus, but he considered them beneath the dignity of his enterprise, and determined once more to abandon Spain for ever.

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* The town of Columbo is divided into four gravets, or districts.

† As he twice declares in his own will, but this fact, as well as the history of his early days, is involved in obscurity. His son Fernando, unwilling, from mistaken pride, to reveal the indigence and humble condition from which his father emerged, has left the biography of Columbus very incomplete.

‡ This is only inferred from two of his letters to Ferdinand and Isabella, in one of which he states that he went to sea at the age of fourteen, and in another, dated 1501, that he had been in maritime service nearly forty years.

§ This prince was far before his age. He established a naval college, and erected an observatory at Sagres.

* Genoa Portugal, Genoa again, Venice, France, England, and Spain

Some friends, who considered his departure as an irreparable loss, once more remonstrated with Isabella, who at last offered her own jewels to defray the expenses of the expedition, and thus overcame the coolness of Ferdinand. Accordingly, a messenger was sent to overtake Columbus, who, after some hesitation, returned to Santa Fé. Stipulations were at last signed by Ferdinand and Isabella, at Granada, the 17th of April, 1492.

On Friday, the 3rd of August, 1492, Columbus, as admiral of the seas and lands which he expected to discover, set sail from the bar of Saltes, near Palos, with three vessels and 120 men, who were full of doubts and fears, and were partly pressed into the service. Two of these vessels were caravels, or light barques, no better than our river and coasting craft. This, however, Columbus considered an advantage, as it would afford him the means of examining shallow rivers and harbours. On the 5th, one of the vessels had her rudder broken; but fortunately, on the 6th, he perceived, as he expected, the Canaries, where he refitted. On the 6th of September he hastily quitted Gomera, to avoid three frigates which were sent against him by the King of Portugal from spite at seeing Columbus engaged in the Spanish service. As soon as the Canaries were out of sight consternation and despair spread among the crews, and the admiral was obliged to leave them in ignorance of the progress they were making*. He also forbade the variation of the needle to be mentioned to the crew, which he observed on the 13th of September, about 200 leagues W. of the island of Ferro, till it was noticed also by his pilots, when he succeeded in allaying their terrors with his ready ingenuity to meet any emergency, by ascribing the phenomenon to the movement of the pole star. The whole expedition being founded on the presumption of finding land to the west, Columbus kept steadily to this course, lest he should appear to doubt and waver, and never went in search of islands, which floating weeds, birds, and other indications, gave him reason to believe were not far off.

On the 20th of September the wind veered to the S.W.; and although unfavourable to the expedition, this circumstance cheered the dismayed crew, who were alarmed at its continuance from the E., which seemed to preclude all hope of their return. Repeated disappointments made the crews at last regard all signs of land as mere delusions. On the evening of the 10th of October they exclaimed more violently than ever against the obstinacy of an ambitious desperado, in tempting fate on a boundless sea; they even meditated throwing the admiral overboard, and directing their course homeward. Columbus, for the last time, tried to pacify them in a friendly manner; but this only increased their clamour. He then assumed a decided tone, acted in open defiance of his crews, and his situation became desperate. That he ever yielded to his men, rests on no other authority than that of Oviedo, a writer of inferior credit, who was grossly misled by a pilot of the name of Hernea Perez Matheos, an enemy to Columbus. Fortunately, on the 11th, the manifestations of land were such as to convince the most dejected. Accordingly, after the evening prayer, Columbus ordered a careful look-out, and himself remained on the high stern of his vessel from ten o'clock, when he had observed glimmerings of light, as he supposed on shore, till two in the morning, when the foremost vessel fired a gun as a signal of land having been discovered. Not an eye was closed that night, all waiting with intense feeling for the dawn of the 12th of October, 1492, which was to reveal the great mystery of the ocean, whether it was bounded by a savage wilderness, or by spicy groves and splendid cities, possibly the very Cipango, the constant object of the golden fancies of the admiral. With tears of joy, after fervid thanksgivings, Columbus kissed the earth on which he landed, and with great solemnity planted the cross in the new world at Guanahani, or San Salvador*, one of the Gucayos, Lucayan or Bahama Islands. Those who had lately been most in despair were now the most extravagant in their joy. The most mutinous and outrageous thronged closest round the admiral, and crouched at the feet of a man who in their eyes had already wealth and honours in his gift.

The naked and painted natives, when they had recovered from their fright, regarded the white men, by whose confidence they were soon won, as visitors from the skies which bounded their horizon; they received from them with transport toys and trinkets, fragments of glass and earthenware, as celestial presents possessing a supernatural virtue. They brought in exchange cotton yarn and cassava bread, which, as it keeps longer than wheaten bread, was highly acceptable to the Spaniards.

On the 24th, Columbus set out in quest of gold and Cipango. After discovering Concepcion, Exuma, and Isla Larga, Cuba broke upon him like an elysium; he no longer doubted that this beautiful land was the real Cipango. When this delusion was over, he fancied Cuba, which, to the time of his death, he took for part of the mainland of India†, to be not far from Mango and Cathay, so brilliantly depicted in his great oracle, Marco Polo. He next took Hayti, or Santo Domingo, for the ancient Ophir, the source of the riches of Solomon, but he gave it the Latin diminutive of Hispaniola, from its resembling the fairest tracts of Spain. Leaving here the germ of a future colony, he set sail homeward the 4th of January, 1493. A dreadful storm overtook him on the 12th of February. Columbus fearing the loss of his discovery more than the loss of life retired to write two copies of a short account of it. He wrapped them in wax, enclosed them in two separate casks, one of which he threw into the sea, and the other he placed on the poop of his vessel, that it might float in case she should sink. Happily the storm subsided, but another drove him off the mouth of the Tagus on the 4th of March; and although distrustful of the Portuguese, he was obliged to take shelter there. At last he landed triumphantly at Palos, the 15th of March, 1493. In his journey through Spain, he received princely honours all his way to Barcelona, where the court had gone. His entrance here, with some of the natives, and with the arms and utensils of the discovered islands, was a triumph as striking and more glorious than that of a conqueror. Ferdinand and Isabella received him seated in state, rose as he approached, raised him as he kneeled to kiss their hands, and ordered him to be seated in their presence.

On the 25th of September, 1493, Columbus left Cadiz on a second expedition, with seventeen ships and 1500 men. He discovered the Caribbee Islands, Puerto Rico, and Jamaica; and after repeated mutinies of his colonists, and great hardships, he returned against the the trade-winds to Cadiz, June 11, 1496. Having dispelled all the calumnies that had been accumulated upon him, Columbus embarked the 30th of May, 1498, at San Lucar de Barrameda, on a third expedition, with only six vessels. In this voyage he discovered La Trinidad, the mouths of the Orinoco‡, the coast of Paria, and the Margarita and Cubagua Islands. On the 14th of August he bore away for Hispaniola to recruit his health. The dissensions which arose here, the calumnies of miscreants who had been shipped off to Spain, countenanced as they were by envious courtiers at home, the unproductiveness of the new settlement, and regret at having vested such high powers in a subject and a foreigner, who could now be dispensed with, induced Ferdinand, in July, 1500, to dispatch Francisco Bovadilla to supersede Columbus, and bring him back in chains. Vallejo, the officer who had him in charge, and Martin, the master of the caravel, would have taken his chains off; but Columbus proudly said, 'I will wear them till the king orders otherwise, and will preserve them as memorials of his gratitude.' He hung them up in his cabinet, and requested they should be buried in his grave. The general burst of indignation at Cadiz, which was echoed throughout Spain, on the arrival of Columbus in fetters, compelled Ferdinand himself to disclaim all knowledge of the shameful transaction. But still the king kept Columbus in attendance for nine months, wasting his time in fruitless solicitations for redress; and at last appointed Nicholas Ovando governor of Hispaniola in his place. With restricted powers and a broken frame, but with his ever-soaring and irrepressible enthusiasm, Columbus sailed from Cadiz again on the 9th of May, 1502, with four caravels and 150 men, in search of a passage to the East Indies near the Isthmus of Darien, which should supersede that of Vasco de Gama. Being denied relief and even shelter at Santo Domingo, he was swept away by the currents to the N.W.; he however missed Yucatan and Mexico, and at last reached Truxillo, whence he coasted Honduras, the Mosquito shore, Costa Rica, Veragua, as far as the point which he called El Retrete, where the recent westward coasting of Bastides had terminated. But here, on the 5th of December, he gave up his splendid vision, and yielded to the clamours of his crews to return in search of gold to Veragua, a country which he himself mistook for the Aurea Chersonesus of the antients.

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* He adopted throughout the voyage the stratagem of keeping two reckonings, one true and private, for his own guidance, the other merely for the crews, to keep them in ignorance of the great distance they were advancing.

* Navarrete contends that it must have been Turk Island, another of the same cluster, although this supposition is at variance with all the particulars of San Salvador, which are accurately described in the journal of Columbus.

† Owing to this mistake, the appellation of Indians was extended to all the Aborigines of the Americas.

‡ He imagined this river to proceed from the tree of life in the midst of Paradise, the situation of which was then supposed to be in the remotest parts of the east.

Finally, the fierce resistance of the natives and the crazy state of his ships forced him, at the close of April, 1503, to make the best of his way for Hispaniola with only two crowded wrecks, which, being incapable of keeping the sea, came, on the 24th of June, to anchor at Jamaica. After famine and despair had occasioned a series of mutinies and disasters far greater than any that he had yet experienced, he at last arrived, on the 13th of August, at Santo Domingo. Here he exhausted his funds in relieving his crews, extending his generosity even to those who had been most outrageous. Sailing homewards on the 12th of September, he anchored his tempest-tossed and shattered bark at San Lucar, the 7th of November, 1504. From San Lucar he proceeded to Sevilla, where he soon after received the news of the death of his patroness Isabella. He was detained by illness till the spring of 1505, when he arrived, wearied and exhausted, at Segovia, to have only another courtly denial of redress, and to linger a year longer in neglect, poverty, and pain, till death gave him relief at Valladolid on the 20th of May, 1506. Thus ended a noble and glorious career, inseparably connected with the records of the injustice and ingratitude of kings. To make some amends for the sorrows and wrongs of this great man, his remains received a pompous funeral, and his grave and coat of arms the following motto:—

'A Castilla y a Leon
Nuevo mundo dio Colon.'

Although Sebastian Cabot discovered Newfoundland and Labrador in June, 1497, and Columbus did not touch the American continent till he visited the coast of Paria in August, 1498, Columbus, however, first reached Guanahani, and what may properly be denominated the Columbian Archipelago, and is really the discoverer of the New World.

The voyage of one Antonio Sanchez from the Canaries to Hayti in 1484, mentioned by the Inca Garcilaso and some other Spanish writers, is regarded as a fable. The accounts however of Spaniards and Portuguese who had sailed westward so far as to perceive indications of land, were useful to Columbus, according to his own avowal. Ferdinand and Isabella, in a written declaration of the 4th of August, 1494, ascribe the new discoveries to Columbus. Amerigo Vespucci, whose name was afterwards given to the new hemisphere, did not see it till he accompanied Ojeda, as a pilot, to the coast of Paria in 1499.

The following are the principal authorities for the Life of Columbus:—'Navigatione del Re di Castiglia delle Isole e Paesi nuovamente ritrovati,' and the Latin translation, 'Navigatio Christophori Colombi,' Vicenza, 1507; 'Itinerarium Portugallensium,' Milan, 1508; Grinæus, 'Novus Orbis Regionum,' Bâle, 1533; Life of the Admiral, by his son Fernando, Oviedo; 'Chronicle of the Indies,' Sevilla, 1535; Manuscript History of Fernando and Isabella, by the curate of Los Palacros; Manuscript History of the Indies, by Las Casas; 'Letters and Decades of the Ocean,' by Peter Martyr d'Anghierra, or Angleria; Herrera, 'History of the Indies;' 'Robertson's America;' Churchill's Voyages, vol. ii.; Navarrete, 'Relacion de los quatro Viajes de Cristobal Colon;' Irving's Life of Columbus.

COLUMBUS. [Ohio.]

COLUMELLA, LU'CIUS JU'NIUS MODERA'TUS the author of one of the most valuable works on Roman agriculture, if not himself a native of Gades (Cadiz), sprung from a family belonging to that town, which had been long most intimately connected with Rome. In several parts of his work he speaks of a paternal uncle, Marcus Columella, who had lived in Baetica (Andalusia), and had been well known as an intelligent agriculturist. In particular he speaks of his success in the improvement of the breed of sheep by the introduction of rams from Mauretania, and it has been suggested that the celebrated stock of the Merinos owes its origin to this importation. The author himself possessed an estate in the country of the Ceretani (La Cerdaña), near the Pyrenees, where he was eminently successful in the growth of the vine. When he wrote his work he appears to have been residing either at Rome, or in the neighbourhood; but he had a personal knowlege of many parts of the Roman empire. He himself mentions a residence of some length in Cilicia and Syria (ii. 10, 18), but without stating the object which carried him into that part of the world. The period at which he lived and wrote may be most safely deduced from his own writings. On the one hand he mentions his having been present at a conversation on agriculture in which L. Volusius took part (i. 7, 3), and the terms he uses imply that many years had since elapsed. Now the death of this very man happens to be specially noticed by Tacitus at the end of the year A. D. 20 (*Ann.* iii. 30). Again he speaks of Seneca as still living (iii. 3, 31); and the tragical death of Seneca, it is well known, occurred in the year 66. He speaks moreover of Varro as preceding him by two generations. He was born therefore about the beginning of the Christian æra.

The work of Columella is addressed to Publius Silvinus, and consists of twelve books: the two first on the choice of a farm and farm-house, the selection of slaves, the cultivation of arable and pasture land: the three next on the cultivation of the vine, olive, and fruits of the orchard, &c.; the sixth and seventh, on the ox, horse, mule, ass, sheep, goat and dog, that is, the shepherd's dog and the house dog, for he specially excludes the sporting dog, as interfering with, instead of promoting, the economic management of a farm. The eighth book treats of the poultry-yard, and the ninth, of bees. The next, which has for its subject the vegetable and flower garden, presents the unusual spectacle of a poem in the middle of a prose work This form was selected by Columella at the pressing solicitation of his friend Silvinus, and the poem was avowedly put forth as a supplement to the Georgics of Virgil, in answer to the challenge of the Mantuan bard:

'Verum hæc ipse equidem spatiis inclusus iniquis
Prætereo, atque aliis post me memoranda relinquo.'

In the eleventh book the author is again on the terra firma of prose, and gives us in three long chapters, not very closely connected, the duties of a bailiff, a farmer's almanack, and the vegetable garden. This book is sometimes entitled the 'Bailiff' (Villicus); as the last bears the name of the 'Bailiff's Wife' (Villica), and treats of the indoor duties, the making wine and vinegar, preserving fruits, &c.

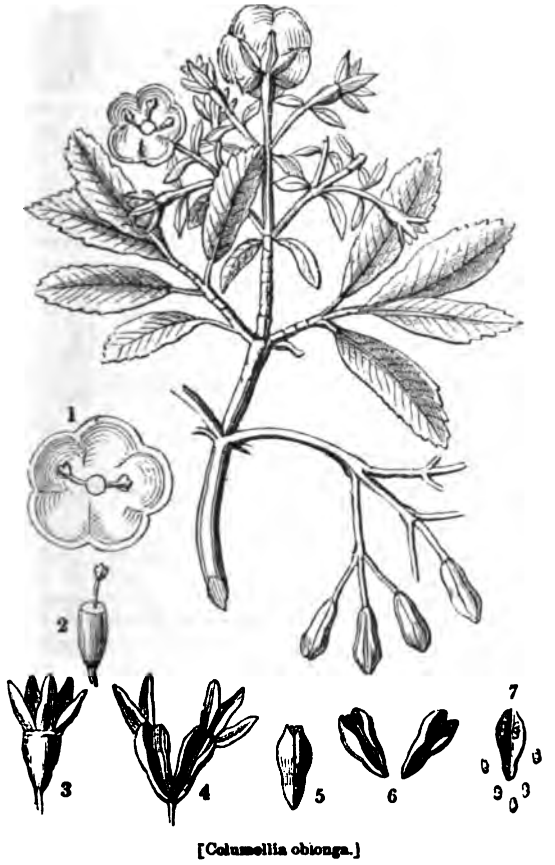
In the composition of this work, Columella has made free use of the Roman writers on agriculture who preceded him. Among these we may particularly mention Cato the Censor, Terentius Varro, his own contemporaries: Cornelius Celsus and Julius Atticus; and lastly, Julius Græcinus, the father of Agricola, who seems to have shown his predilection for the science by the name he selected for his son. But the author of whom he speaks in the highest terms, and to whom he most willingly appeals, is Mago the Carthaginian, whose work on agriculture, as he tells us, containing eight-and-twenty books, was translated from the Phœnician into Latin, under a special decree of the Roman senate. The latinity of Columella has nearly all the purity of the Augustan age; but wherever his subject gives him an opportunity, he discovers a taste for that sentimental and declamatory style which distinguishes the writers of the first and second centuries. His poem is deficient in all those qualities which give grace and beauty to the Georgics. Columella is often cited by Pliny the Elder in his 'Natural History,' but generally with an expression of dissent. He is also quoted by Vegetius and Palladius.

But the treatise on agriculture by the latter appears to have superseded Columella's work, and to have thrown it altogether into oblivion. Besides the great work of Columella, which we have described, there is a single book entitled, 'De Arboribus,' in which reference is made to a preceding book now lost. These two appear to have been a portion of an early edition of the work on agriculture, probably in four books, which being afterwards enlarged, swelled into the twelve we now possess. Accordingly the matter of the 'De Arboribus' will be found with some alterations and many additions, in the third, fourth, and fifth books of the greater work; and Cassiodorus actually speaks of sixteen books written by Columella. In ignorance of this, the writers of many of the MSS., as well as the early editors, have inserted the minor treatise after the second book of the more complete work, thus causing many contradictions and great confusion in the numbers of the following books.

The writings of Columella have generally been published together with the works of the other authors 'De Re Rustica.' The chief editions are these: 'The Princeps,' Venice, fol. 1472; Bologna, fol. 1494; by Aldus, 8vo., 1513, or rather 1514; by R. Stephens, 8vo., 1543; by Gesner, Leipzig, 2 vols. 4to., 1735; and what may now be looked upon as the best, the edition by J. G. Schneider, 4 vols. 8vo, 1794—7. We are not acquainted with any English translation of Columella.

COLUME'LLA, the central part or axis in the theca of a moss, around which the spores are arranged without having any definite connection with it. Also the axis of any kind of fruit when separate from the carpels: in the latter case it is a hardened state of the growing point.

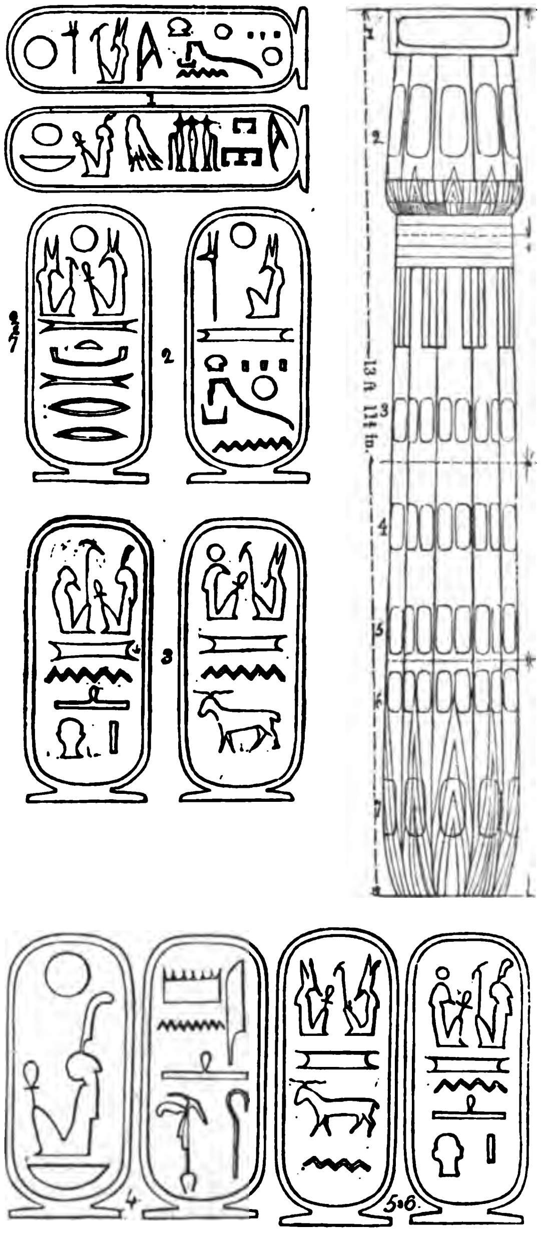
COLUMELLIA'CEÆ, a small diandrous order of monopetalous Exogens, with a superior five-parted calyx, a rotate corolla, three-lobed anthers bursting outwards, a two-celled ovary with an indefinite number of ovules and a capsular fruit. They are South American and Mexican bushes, looking like monopetalous Onagraceous plants, of doubtful affinity, and of no known use. (Lindley's *Natural System of Botany*, ed. 2, p. 240.)



[Columellia oblonga.]

1. A flower seen from above. 2. The ovary, style and stigma. 3. The half-ripe fruit. 4. The fruit opening, with the calyx adhering. 5. The pericarp separated from the calyx. 6. Valves of the pericarp. 7. One valve and seeds.

COLUMN, from the Latin columna. The column is a shaft of wood, stone, or iron, in the form of a truncated cone, a little swelled from the straight line at about one-third its height from the lower extremity. this swelling is called the entasis. The column is furnished with a base at the foot and a capital at the head of the shaft. Columns are of various proportions and kinds: circular on the plan, and rarely polygonal. The Romans had five models of columns, which were called orders; but the Greeks, from whom the Romans appear to have derived their architecture, only three. The Egyptians used columns, but they were very different in their form and proportions from both the Roman and Greek examples.



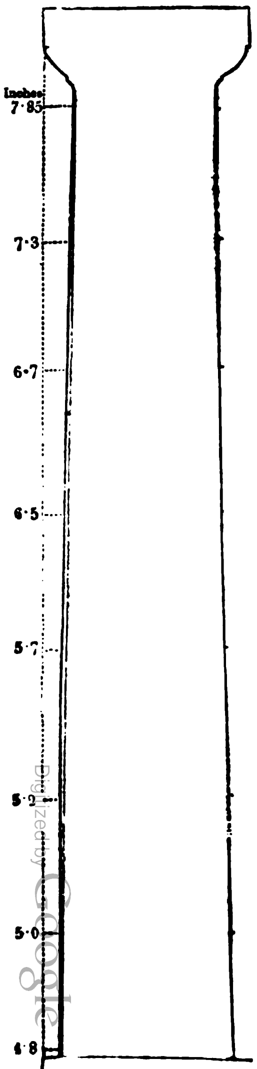
[Egyptian Column in the British Museum.]

The elliptical figures are the cartouches on the column, drawn to a larger scale. The height of the column is 13 ft. 11¼ in.

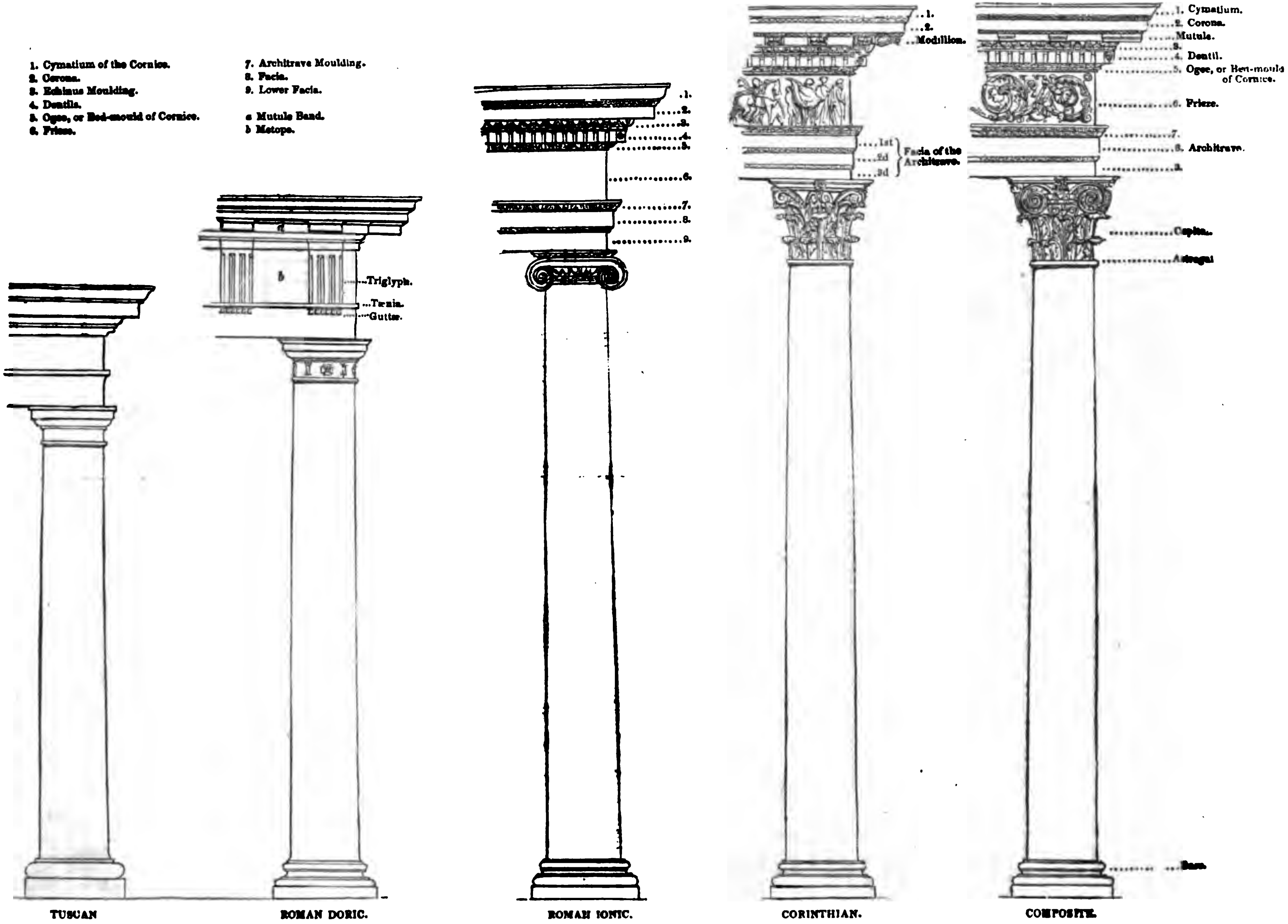
The five orders are the Corinthian, Ionic, and Composite, which is a mixture of the two former; and the Doric and the Tuscan—two orders very similar in appearance and character to each other.

The Greek Corinthian, Doric, and Ionic differ from the Roman. The proportions of the orders vary slightly in almost every example of antiquity; but the distinguishing features are the capitals. The bases also vary in proportion, and sometimes in the profiles of their mouldings; but this is not so apparent to an ordinary observer as the difference in the capitals of the orders.

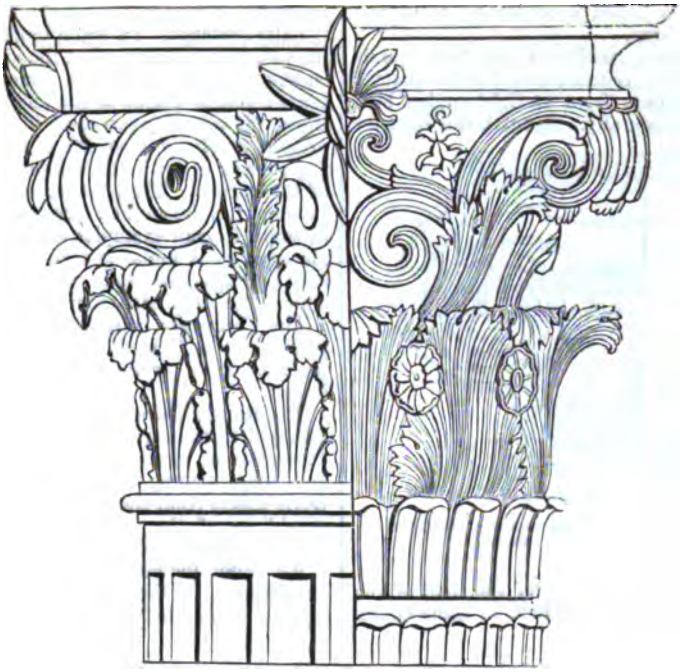
The Corinthian capital consists of the leaves of the acan-



[Entasis of a Greek Doric Column, from the 4th vol. of Stuart's Athens.]



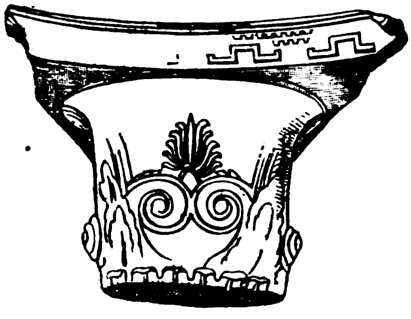
[Drawn to the same scale of two Modules, by dividing the diameter into two parts, and each part into thirty parts or minutes.]



[Half the Corinthian capital of the Temple of Vesta, at Tivoli.]

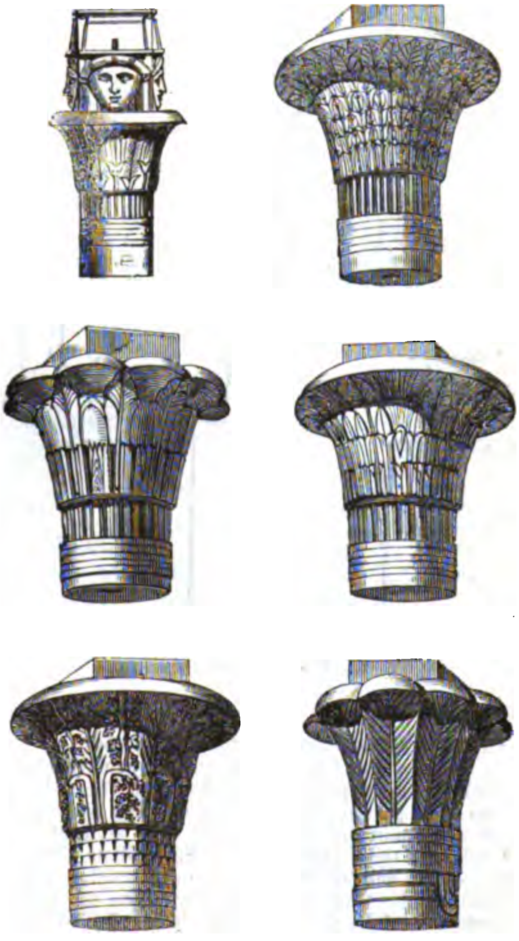
[Half the Corinthian capital from the monument of Lysicrates, at Athens.]

thus, with two spiral horns at each of the four angles of the abacus. In the centre between these horns are two smaller spirals attached to the bell of the capital; under these are two rows of acanthus leaves regularly disposed, eight being placed in each row, and eight large double leaves supporting the angular horns, called also volutes. These are the leading features of the Corinthian capital, although some are more ornamented than others, and have enriched details about the abacus and the bell, which others have not. The most striking difference between the character of the Greek and Roman foliage of the Corinthian column is this: the leaves of the Greek have angular points, and are almost straight on the sides; the Roman are rounded on the sides; the section of the hollow of the former is angular, while the latter is either a segment of a circle, or formed of two segments of a circle meeting in the centre of the hollow of the points of the acanthus leaf The Greek leaves may be said to have more of the natural character of the acanthus, or the thistle, while the Roman is more artificial, and consequently less like the model from which the Greeks drew their capital. There are examples of the Greek Corinthian capitals, although much mutilated, in the Elgin collection in the British Museum; and casts of the Roman examples from the temple of Jupiter Stator, Mars Ultor, and the Pantheon, also in the British Museum. The bell of the Corinthian capital may be clearly understood from the annexed drawing of the mutilated single Corinthian capital



[Bell of a Corinthian Capital, a fragment from the Temple of Apollo, at Bassæ.—From the 4th vol. of Stewart's 'Athens,' published by Priestly and Weale, London.]

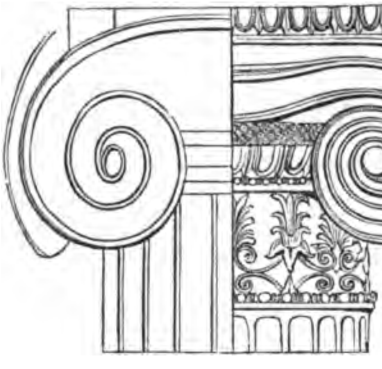
found in the Temple of Apollo at Bassæ, near Phigaleia; and the accompanying drawings of Egyptian capitals, from the French work on Egypt, will shew better than any elaborate description the strong resemblance of the Egyptian capital to the bell of the Corinthian capital, as we meet with the latter in the Temple of Jackly near Mylasa, and the Choragic monument of Lysicrates at Athens. The



[Egyptian capitals.]

order of the Temple of Vesta at Rome, which very much resembles the order of the Temple at Jackly, was most probably copied from it. Among other peculiarities, it has the same defect of the leaves projecting beyond the line of the shaft, and is the only building of the Corinthian order, in Rome, which has a Greek character. Some Greek Corinthian capitals have only one row of acanthus leaves, and are without the horns under the abacus, the bell being decorated with flat leaves called water-leaves, as in the Tower of the Winds at Athens.

The Ionic column is characterized by the two large spirals or volutes on two of its faces, connected under the abacus. The other sides connect these faces at right angles by a kind of baluster placed horizontally. Beneath this baluster and the astragal surmounting the top of the shaft of the column is the neck of the capital, which in some Greek examples is richly decorated; the baluster is also occasionally enriched. In some Ionic capitals all the faces of the volutes are conjoined at the extremities, the faces being curved inwards as in the Temple of Apollo at Bassæ. Ionic columns placed at the angles of porticos have sometimes the volute ingeniously formed at the angle, so as to present a voluted face either ranging with the volutes of the portico, or with the volutes of the columns at the side of the portico. The angle column of St. Pancras Church, London, has the angular faces curved. The angular volutes in some Roman examples are formed of two half volutes placed at right angles to each other. The bases of the Ionic vary perhaps more than any other order. In Roman examples the Attic base is employed.

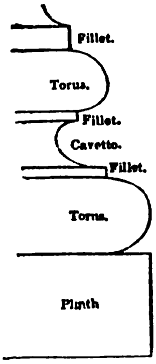


[Half the Ionic capital of the order employed in the cella of the Temple of Apollo at Bassæ.] [Half the capital of the Erectheum.]

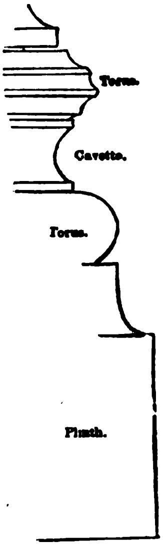
The Composite column, as its name implies, is a compound. It is formed of the Corinthian and Ionic, but partakes more of the Corinthian character and proportions.

The Roman-Doric and Tuscan columns are shafts with moulded capitals and bases, the Doric only having a slight decoration of rosettes and buds in the neck of the capital, and some trifling additional mouldings. The Grecian Doric differs from the Roman both in proportion and in the mouldings of the capital, in the flutings being without fillets, and in its being almost always without a base.

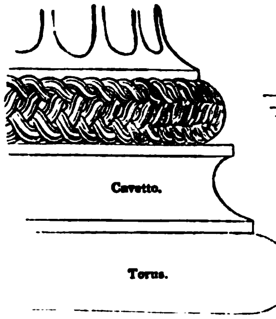
An order includes the column with the whole of the entablature, or the superstructure raised on it, which is divided into architrave, frieze, and cornice.



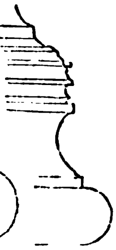
[Attic Base.]



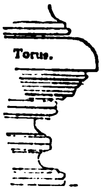
[Ionic Base at the Propylæa of Eleusis.]



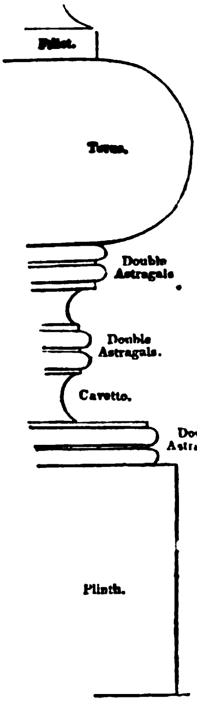
[Base of the Erectheum.]



[Base of the Minerva Polias.]



[Base of the order of the Temple of Apollo Didymæus.]



[Profile of the bases of the columns employed in the Temple of Minerva Polias, at Priene.]

All the great architects of the cinque cento, and after them those of the later Italian and French schools, have differed in the proportions and details of the orders, but for the most part in a trifling degree. The proportions of the five Roman orders which we have adopted here as our rule are those laid down in Sir William Chambers's Architecture, and which are generally employed by the English architects of the present day. The proportions of the orders used by the Greeks are from the authority of Stuart. The measure by which the proportions of the orders are determined, is the diameter of the base of the shaft of the column, which is divided into two parts called modules, and each module is divided into 30 parts called minutes. This scale is in general use in all countries which derive their architecture from the Greeks and Romans.

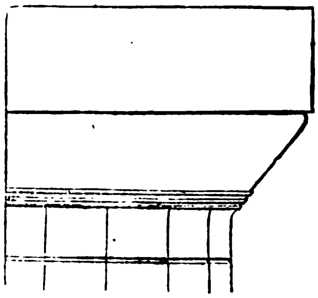
Thus the height of the shaft of the Tuscan order, from the upper line of the fillet of the base to the upper line of the astragal of the neck of the column, is 12 modules or semidiameters high; the base, including the plinth, is 30 minutes; the capital, 30 minutes; the architrave, 31½ minutes; the frieze, 31½ minutes; the cornice, including the bed-mould or ogee, 42 minutes; and the projection of the cornice, 42 minutes. The shaft of the Doric order is 13 modules, 28 minutes; the base, 30 minutes; the capital, 32 minutes; the architrave, 30 minutes; the frieze, 45 minutes; and the cornice, 45 minutes. The projection of the cornice is 57 minutes. The shaft of the Ionic order contains 16 modules, 9 minutes; the base, 30 minutes; the capital, from the upper line of the astragal, 21 minutes; the architrave, 40½ minutes; the frieze, 40½ minutes; and the cornice, 54 minutes. The projection of the cornice is 54 minutes. The Corinthian order has the shaft 16 modules, 20 minutes; the base, 30 minutes; the capital, 70 minutes; the architrave, 45 minutes; the frieze, 45 minutes; the cornice, 60 minutes·

and the projection, 58 minutes. The Composite order is similar in its general proportions to the Corinthian; and the columns of the Roman orders diminish in diameter about one-sixth, that is, are 50 minutes at the upper diameter of the shaft.* The Greek Doric varies very much in its proportions. The Doric of the Parthenon has the shaft and capital 10 modules 8 minutes high, and the entablature 3 modules 15 minutes. For a scale of the proportions of the leading features of some of the best known examples of antiquity, see the end of this article.

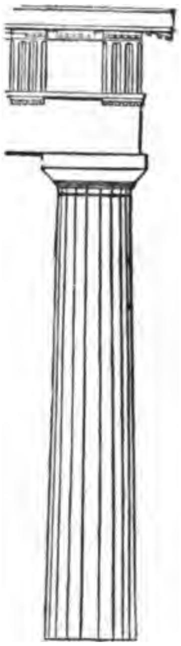
The Tuscan order, which is simple in its design, has a base formed of a plinth or squared piece of stone as a foundation, and a torus above it, surmounted with a fillet. The shaft is terminated with a fillet and an astragal, on which the capital is set, consisting of a necking (a prolongation of the shaft) and an ovolo moulding supporting the squared abacus, which is surmounted with a fillet. The architrave is a plain face with a broad fillet. The frieze also is a plain face. The cornice consists of an ogee, a fillet, an ovolo forming the bed-mould of the cornice, which consists also of the corona and fillet, surmounted with a cymatium.

The Roman Doric, resembling in some particulars the Tuscan, is however very much richer. The Doric base consists of a plinth, a torus, a hollow moulding with a fillet above and below it; on the upper fillet is another torus and fillet, from which rises the shaft, curved where it springs from the fillet.† This is the Attic base, which is most commonly used in all the orders except the Tuscan. The shaft of the Doric is terminated like the Tuscan, and from the summit springs the capital with a neck enriched with rosets and buds. Above the necking are three flat annular rings or fillets, then an ovolo moulding surmounted with the abacus, which is finished with a small ogee moulding and fillet. The architrave is a plain face, with a flat band (*tænia*) and a fillet under the triglyph, with six guttæ or drops under the fillet. The frieze is divided into compartments with a triglyph over each column and one or more between, according to the width of the intercolumniation. The triglyphs which project slightly from the face of the frieze are channelled with angular channels and two half channels at the sides of the triglyph. The metope, or space between two triglyphs, is square or nearly so; this, however, depends on the intercolumns. The triglyphs are bound together by a facia, surmounted by a small fillet under the bed-mould of the cornice, which is an ovolo moulding or an ogee. Over this is the mutule band with the mutules, square in form, projecting over the triglyphs; an ogee surmounts the mutules and the mutule band. The mutules support the cornice, consisting of the corona, an ogee and fillet, and a cavetto or hollow moulding. The soffit or under-side of the cornice is sometimes enriched with pannels, and guttæ are placed under the mutules. The Doric of the theatre of Marcellus at Rome has dentils with an ogee bed-mould in the cornice in lieu of the mutules; and the basilica by Palladio at Vicenza is without either mutules or dentils, having instead of them a bold ogee and ovolo moulding, and the architrave divided into two faciæ.

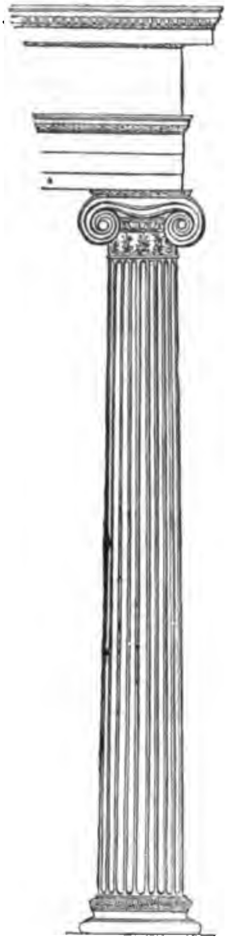
The Greek Doric differs considerably from the Roman, being almost always executed without a base. The flutings of the shaft are twenty in number without fillets; some examples are fluted only at the upper and lower extremities. The capital consists of a solid-looking abacus without any moulding above it, but supported by a very elegantly-curved echinus-moulding, which swells gradually out of the line of the shaft, being bound round by three annulets or rings near the top of the shaft, and on the under extremity of the echinus. A part of the shaft is also cut off by a sinking, or channel, cut into the shaft, forming the necking of the capital. The features of the entablature are very simple. [Civil Architecture.] The triglyphs are not very dissimilar in the Roman and Greek Doric, except in the setting them off on the frieze. In the Roman they are invariably set over the centre line of each column, the angle of a building being terminated by a portion of a metope. In the Greek the triglyph is invariably commenced at the angle of the building, and not over the centre line of the column generally.



[Half the capital of the Parthenon at Athens.]



[Greek Doric order of the Parthenon.]



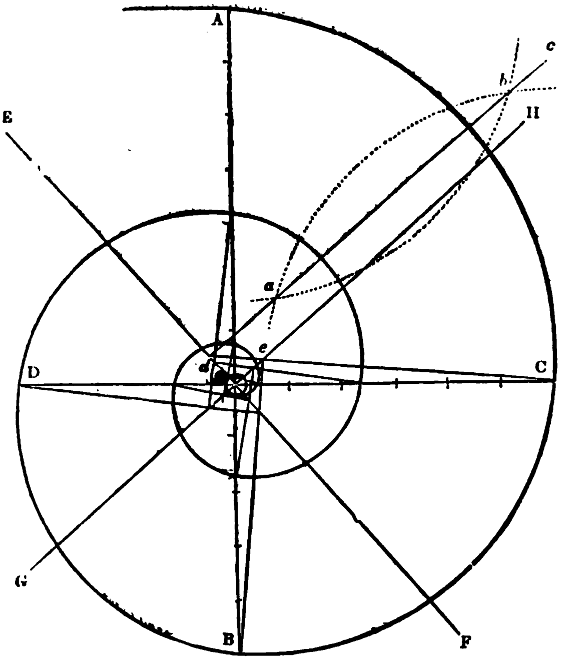
[Ionic order of the Erectheum at Athens.]

The Roman Ionic has an Attic base. The capital is formed with two volutes on two faces, and the volutes are connected by horizontal lines, though sometimes, like the Greek, the curved line is employed. The abacus is formed of a fillet and an ogee. Under the horizontal lines connecting the volutes is an echinus and astragal or bead-moulding enriched. The architrave is divided into two faciæ: the upper face is surmounted with a fillet and ogee enriched, and the lower with a small echinus, also enriched, having a narrow fillet underneath it. The frieze is usually plain, though the temple of Fortuna Virilis at Rome has a meagre decoration. The cornice is supported by an ogee moulding and dentils surmounted with a fillet, a bead moulding, and a large enriched echinus moulding. The cornice itself consists of a corona with a small ogee and fillet, on which is placed a cymatium. The volutes of the capital are connected at the sides by a pulvinus, or cushion, commonly called the baluster of the Ionic order. The Greek Ionic varies in its proportion, and is superior in beauty to the Roman example. The method of drawing the Roman volute called Goldman's volute, is described in Sir William Chamber's Architecture.

The following is a very accurate method of drawing the

* By a reference to the proportions of some of the columns of antient edifices at the end of this article, some variations from this proportion will appear.

† The lower diameter of the shaft of a column is always measured from the point where this curve ends, and is joined to the straight line of the shaft.

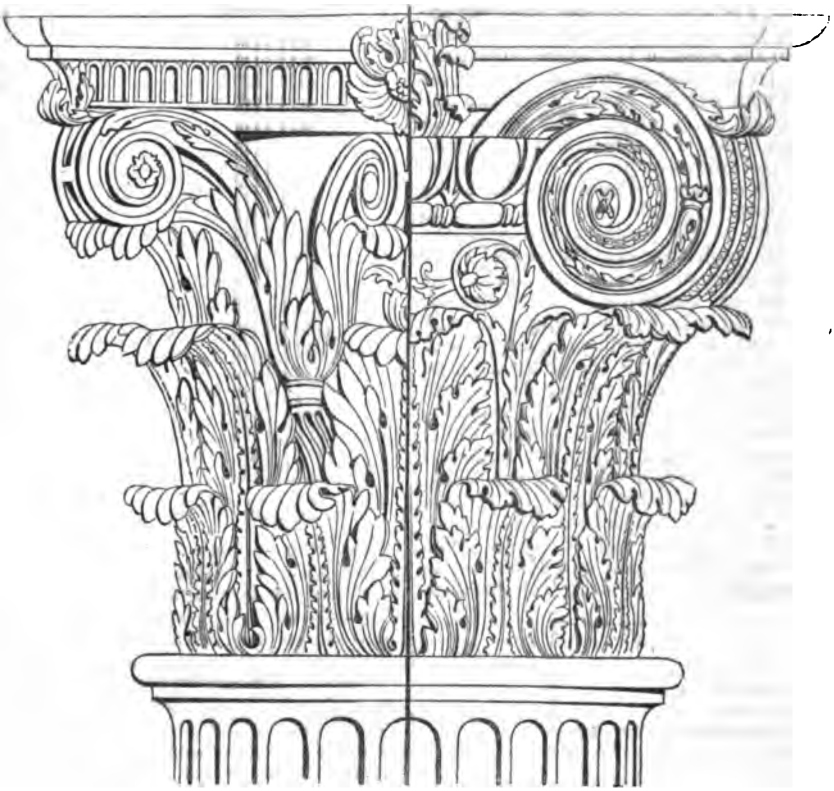


Method of drawing the spiral forming the volute of the Greek Ionic of the Erectheum and Minerva Polias Temples, at Athens.]

Greek volute similar to the form of the volute of the Erectheum or Minerva Polias at Athens. Divide any perpendicular height, A B, into 12 equal parts. Through the 7th division *g* from the top, draw the line C D at right angles to A B. Then upon the line C D, from the centre *g*, set off towards C six of the seven divisions between A and *g*. Draw the lines G H and E F, at angles of 45 degrees to the lines A B and C D respectively. Bisect the line joining A and C by *b a*, and produce it till it cuts E F in *d*. Then from *d*, as a centre, with the radius *d* A or *d* C, describe the quadrant A C of the volute. Then join C *d*, cutting the line G H in *e*; from the point *e* describe with the radius *e* C or *e* B the quadrant C B, passing through B, the extremity of the line A B; and proceed in this manner with all the quadrants till you touch the centre. The centres of the segments A C, C B, B D, &c., are always found on the diagonal lines E F and G H.

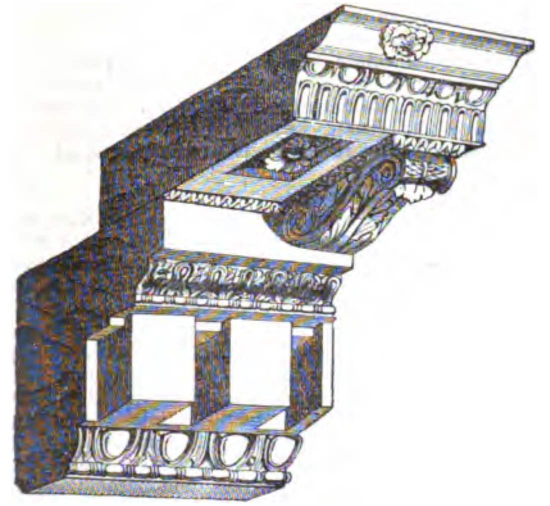
The best examples of the Roman Ionic order are fluted, with twenty-four flutings, or semicircular channels, divided by a narrow fillet, which is part of the surface of the shaft of the column. Some Greek examples, as at Bassæ, have only 20 flutings, and are without fillets.

The general proportions of the Corinthian and Composite are the same, and they differ but slightly in their mouldings and enrichments. The base of both Corinthian and Composite is the Attic. The flutings of the shaft are, as in the Ionic, twenty-four, and divided by fillets. The capital is composed of two rows of acanthus leaves, eight in each row, and the upper row is placed between and over the divisions of the lower row. Four spiral volutes in each face rise out of two bunches of the acanthus leaf, and two of them are connected at the angles, and support the abacus formed of a cavetto and fillet, and an echinus, which are, except the fillet, sometimes enriched. The face of the abacus is formed of the segment of a circle, whose extremities are supported by the spiral horns, or volutes. The connected ends of the abacus form a narrow face, round which the mouldings are continued, although in some rare instances these ends are pointed by the intersection of the two curved faces of the abacus. The leaves and volutes are carved round what is a continuation of the shaft, formed into the shape of a bell reversed The lower row of leaves generally follow the line of the shaft, which is considered the best system of setting them off round the bell, although the Temple of Vesta at Rome has the leaves projecting beyond the shaft, and Inigo Jones has adopted this system in the Banqueting-house at Whitehall. The Corinthian architrave is divided into three faces, the Composite into two. The upper face is surmounted with an astragal and ogee enriched with a fillet · the middle face has above it a small enriched ogee, and the lower face an enriched bead. The frieze is enriched with figures or ornaments. The cornice is distinguished by its modillions and dentils; the latter are supported by an ogee and astragal enriched; the former by an enriched echinus and astragal. The modillion, which is set at intervals under the corona, will be better understood by the annexed view of a modillion of the Temple of Jupiter Stator, showing also the soffit, or under-side of the corona, with the enriched pannel between the modillions. The modillions support the corona, which



[Half the Corinthian capital, from Sir Wm. Chambers.] [Half the Composite capital, from Sir Wm. Chambers.]

is terminated with a cymatium, and this moulding, in the example before us, is decorated with lions' heads.



[A Modillion or Console of the cornice of the Temple of Jupiter Stator at Rome.]

In the Composite, mutules are sometimes employed instead of the Corinthian modillion. The orders are sometimes set on pedestals, consisting of a square shaft, called the die, with a moulded base set on a deep plinth. The die is surmounted with mouldings forming a capital, but in reality resembling more the cornice of an entablature. Chambers allows, for the proportion of the die of the Tuscan pedestal, two modules, twenty-four minutes; for the Doric, three modules, six minutes; the Ionic, three modules, eighteen minutes; and the Corinthian and Composite, four modules. The bases and capitals are respectively—Tuscan, base twenty-eight minutes, capital fourteen minutes; Doric, base thirty-two, and capital sixteen minutes; Ionic, base thirty-six, and capital eighteen minutes; and Corinthian, base forty, and capital twenty minutes.

Greek mouldings vary from the Roman, and are remarkable for being almost invariably drawn by the hand, and not formed, as in the Roman examples, of parts of circles struck with the compasses.

The flutings of columns vary in the depth and form of their curves; some, as in the Doric orders, are flat segments, without fillets between them, others are deep segments and semicircles, and others are semi-elliptical, and sometimes more than semi-elliptical, on the plan, as in the Jupiter Stator. Some columns of antiquity are decorated with spiral flutes, and some with leaves, as in the Temple of Clitumnus, and in a fragment in the British Museum, Townley Marbles, room IX.

The method of drawing the entasis of the columns employed in Roman architecture is described by Chambers, p. ii. of the Preface. It is done by means of a sliding rule, called the rule of Nicomedes.

Some account of the entasis of columns, by Mr. Jenkins, is given in the 4th vol. of Stuart's 'Athens,' with comparisons of the entasis of several columns. The Greek entasis is more subtle than the Roman.

We may here observe, generally, that the principle of a base is support, which is admirably shown in the Attic base, where the two tori are proportioned and arranged, with the graceful sweep of the cavetto or hollow moulding between them, to sustain the shaft. The hollow moulding gives additional height to the base, and the profile is in no part within the perpendicular line of the shaft, which would give it a weak appearance. The annexed variety of bases, from Greek examples, present some of the beauties and some of the defects even of Greek architecture. The base of the Apollo Didymæus shows weakness, and the torus of the Minerva Polias, at Priene, appears too heavy for the delicate astragals and cavettos beneath.

Some columns, instead of being fluted the whole height of the shaft, are, for about one-third from the base, made polygonal, each side being the width of the flute. This is particularly the case at Pompeii, where the Doric columns are often very slender. In the internal order of the Pantheon, the flutings are filled with cabling about one-third of their height. Cabling is a carved band projecting out of the fluting.

PROPORTIONS OF SOME OF THE COLUMNS EMPLOYED IN ANCIENT EDIFICES, WITH THE ENTABLATURE.

DORIC.

	Height of Column.	Diameter of Base.	Upper diamet. of Shaft.	Height of Entablature.
	ft. in.	ft. in.	ft. in.	ft. in.
Temple of Jupiter Olympius at Agrigentum	61 9	13 0	10 6	25 9·25
Ditto of Hercules at Agrigentum	33 25	7 0·5	4 10	
Ditto of Apollo Epicurius at Bassæ, near Phigalia	19 6·8	3 7·75	2 10·45	6 5·1
Ditto at Cadachio, in Corfu	11 3·25	2 0	1 6	3 10·75
Ditto of Minerva at Athens, called the Parthenon	31 4·9	6 1·8	4 9·75	10 10·56
Ditto of Theseus	18 7·18	3 8·4	2 6·63	6 5.9
Ditto at Corinth	23 8½	2 5·10	4 4·10	
Doric Portico at Athens (Stuart's 'Athens.')	26 2·5	4 4·05	3 4·6	7 4·58
Trajan's column, Roman Doric	97 9·1	12 2·2	10 8·8	
Antonine column, ditto	97 8·1	13 1·9	12 1·1	
Temple of Jupiter Panhellenius, in Ægina	17 4·25	3 2·6	2 4·65	6 10·05
Ditto of Minerva at Sunium	19 9·15	3 4·3	2 6·65	6 6
Ditto of Jupiter Nemæus between Argos and Corinth	33 11·2	5 2·5	4 3	3 1·85
Propylæa at Eleusis		5 0·4	3 10·98	9 5·15
Temple of Ceres at Eleusis		6 6·27	5 4	12 8·96
Ditto of Diana Propylæa at Eleusis		2 7	2 0·75	5 0·74
Ditto of Nemesis at Rhamnus	13 5·45	2 4·8	1 10	
				including cymatium

IONIC.

	Height of Column.	Base of Shaft.	Upper diameter of Shaft.	Height of Entablature.
	ft. in.	ft. in.	ft. in.	ft. in.
Temple of Apollo Epicurius at Bassæ		2 1·9	1 9·4	3 9·31
Ditto of Erectheus, Athens	21 7·50	2 3·8	1 11·2	4 11·25
Aqueduct of Hadrian	19 1·95	2 2·35	1 11·1	4 2·90
Temple on the Ilissus	14 8·300	1 9·4	1 6·2	3 7·282
Temple of Fortuna Virilis at Rome	27 0	3 2	2 8	6 8·6 architrave.
Temple of Bacchus at Teos	. .	3 3·6	3 1·8	2 5·4
Minerva Polias at Priene	. .	4 2·8	3 6·4	
Apollo Didymæus near Miletus	. .	6 3·2	5 5·8	3 5·2
Propylæa at Eleusis	. .	3 4·6	2 9·24	

CORINTHIAN.

	Height of Column.	Diameter of Base.	Upper diameter of Shaft.	Height of Entablature.
	ft. in.	ft. in.	ft. in.	ft. in.
Incantada at Salonica	23 8·6	2 5·9		5 7·75
Temple of the Winds (without base)	13 6·85	1 7·4		
Monument of Lysicrates at Athens	11 7·65	1 2	0 11·65	2 8·218
Stoa, or Portico, at Athens	28 9·534	2 11·3	2 6·65	5 6·8
Arch of Trajan, Ancona	23 2·7	2 4·25	2 0·25	5 6·3
Ditto of Constantine	27 4·1	2 11·2	2 9	7 1·2
Portico of Pantheon at Rome	46 5·2	4 10·4	4 3·5	10 11·6
Interior of the Pantheon at Rome	34 10·4	3 8·2	3 2·3	8 2·9
Temple of Antoninus and Faustina	46 7·7	4 10·3	4 2·8	10 9·1
Ditto of Vesta at Tivoli	23 6	2 5	2 1·8	4 3 architrave.
Dito of Jupiter Tonans	46 6·2	4 8·3	3 11·4	10 0
Ditto of Jupiter Stator	48 4·9	4 10·2	4 2·5	12 10·1
Ditto of Vesta at Rome	34 7·2	3 2·5	2 8·1	
Ditto at Jackly, near Mylasa, in Asia Minor, the supposed site of Labranda	27 2·8	2 10·25	2 3·6	5 6·6
Ditto of Mars Ultor at Rome	57 11	nearly 6ft.	5 1·6	3 10·5

COMPOSITE.

	Height of Column.	Diameter of Base.	Upper diameter of Shaft.	Height of Entablature.
	ft. in.	ft. in.	ft. in.	ft. in.
Arch of Titus	20 6·5	2 0·2	1 9·4	5 4·4
Septimius Severus	27 10·5	2 10·6	2 6·5	6 7

Vitruvius makes the height of the Doric (Roman) seven times the diameter; the Ionic, 8½; and the Corinthian, two-thirds higher than the Ionic, or nine diameters and one sixth. The proportions of Palladio and Vignola differ; the latter are, we believe, preferred by the French school. See the Architecture of Palladio and Vignola. The proportions of the columns given above, are from Stuart's 'Athens;' Taylor and Cressy's 'Rome;' 'Ionian Antiquities;' and 'Unedited Antiquities of Attica.'

In studying these works the student should be guided by the figures denoting the dimensions rather than by the outlines.

COLUMN, a body of troops consisting of one battalion or more, drawn up with the several divisions behind one another, so as to present a narrow front to the enemy: it is said to be in close or open order, according to the breadths of the intervals between the companies or battalions of which it is composed.

The armies of the Greeks and Romans may be said to have been generally formed in columns both for attack and defence. The troops having nothing to fear, in their 'serried' ranks, from a distant artillery, could, by such a disposition, most effectually overwhelm the enemy, or, if on the defensive, resist the shock of his assault: and even after the use of fire-arms was introduced in war, and the successes of Gustavus Adolphus had proved the advantages of a different order of battle, military men with difficulty overcame the prejudices which attached them to the practice of keeping the troops in dense array. The Chevalier Folard, in his 'Traité de la Colonne,' has given at great length every argument that can be urged on behalf of the practice: he compares the column to a moving rampart capable of resisting every effort of the enemy to penetrate through it, and in this respect he considers it far preferable to a hollow square: he compares it also to a torrent hurrying away the enemy by its fearful impetus. He observes besides that it may be deployed and re-formed quickly, and that it can easily accommodate itself to any evolution which may be required. Lastly, he combats the opinion that its order will be destroyed by the effects of the enemy's fire; alleging that while the column is in motion, a distant cannonade is nearly harmless.

Such also are nearly the arguments lately used by Bulow and Jomini in favour of the system of attack by columns. The opinions of these tacticians are strengthened by the general practice of Napoleon, which was to concentrate a great body of troops opposite some one point of an enemy's line, and lead them to the attack. It must not however be forgotten that this method has not always succeeded; according to Rogniat, the defeat of the French at the battle of Esling was caused by the failure of an attack made in that manner against the centre of the Austrian line. In Spain, and on the field of Waterloo, their columns were invariably repelled by the firm resistance opposed to them by the British line of battle.

It is evident however that the advantage of attacking in columns will be great when the force of the enemy is too much diffused, and when his line has been previously disordered by a fire of artillery directed against it; for then a great body of men may be thrown upon a point which is too feeble to resist it, and the line will be penetrated or turned before troops can be brought up from the remoter parts to check the assault. The duke of Wellington appears to have always deployed his columns in line previously to making an attack, and his successes prove the merit of the practice; but it requires great skill in the commander to choose the proper moment for doing it. The deployment should not take place at too great a distance from the enemy's line, since the impediments of the ground may cause that of the assailants to be broken again before it arrives at the place where the charge is to be made; neither should it be postponed till the heads of the columns are very near the enemy, since then the fire of the latter might cause such confusion among the troops as to render them incapable of executing the manœuvre.

The marches of armies are necessarily made in columns, the breadths of which are of course regulated by the nature of the roads along which they are to move. When an army divided into columns has to proceed by different routes into a new position, the number of battalions of which each column is to be composed must be so determined, that all the columns, by arriving at their places on the ground at the same time, may be enabled immediately to form the line of battle.

COLUMNA'RIA. [MADREPHYLLIŒA.]

COLUMNI'FERÆ, an old name of Malvaceous plants.

COLURES (*αἱ κόλουροι, colúri*). The term was originally applied to any great circles of the sphere passing through the poles, but came at last to mean only the circles which also pass through the equinoxes and the solstices, which are distinguished as the equinoctial and solstitial colures. These terms are now of very little use, as the fact of a star being upon either circle is attended with no remarkable phenomenon. Astronomers would describe a star on the equinoctial colure as having either no right ascension, or twelve hours of right ascension, according as it is on the vernal or autumnal half of the circle; and a star on the solstitial colure as having either six hours or eighteen hours of right ascension, according as it is on the summer or winter side of the heavens. If we say that the sun is on the equinoctial colure at the quarter days of March and September, and on the solstitial colure at those of June and December, we rather elucidate the term colure than derive information from it.

The solstitial colure passes through the poles of the ecliptic also, and might be called an ecliptic colure; but the other circle, which passes through the equinoxes and the poles of the ecliptic, has no distinct name, and would be best described as the circle from which celestial longitude is reckoned.

COLU'RI. [SALAMIS.]

COLUTE'A, a Papilionaceous genus of Exogenous plants, consisting of hardy shrubs, with pinnated leaves and inflated membranous pods, which explode when suddenly compressed, and which look like vegetable bladders, whence the common English name of bladder-senna. The species have yellow or yellow and red flowers of some beauty; and are all found either in the South of Europe, in Palestine, and in the mountains of the Himalaya.

COLVILLE, JOHN, of the family of Colville, of East Wemyss, county of Fife, was some time minister of Kilbride, and chantor of Glasgow, of which latter office the church of Kilbride was the appropriate prebend; but disliking the poverty which, on the Reformation, had become incident to the condition of a Scots clergyman, he abandoned that profession about the year 1578, and was in consequence ordered by the General Assembly 'to be taken order withal for deserting of his ministry.' (Melv. *Diary*, p. 50.) He got introduced to court, and the following year we find him attending the Privy Council as Master of Requests. (*Act Parl.* iii. 150.)

He was soon afterwards engaged in the treasonable conspiracy of the Raid of Ruthven, and was on that occasion sent by the party that had seized the king's person as ambassador to queen Elizabeth, who had favoured the enterprize. On the king recovering his liberty, Colville was seized at the instance of Arran, the king's adviser, imprisoned in Edinburgh Castle, and on the 22nd of August, 1584, forfeited in parliament (*Act. Parl.* iii. 334, seq.) His forfeiture however was in all likelihood reversed, and himself restored to royal favour, not long after; for on the 2nd of June, 1587, he was appointed by the king a lord of session in the room of his uncle, Alexander Colville, commendator of Culross, who resigned, 'because through great sickness he could not await and serve the cure of the said senatory.' (*Books of Sed.*) But on the 21st of the same month he gave up the place again in favour of his uncle, and got some appointment, as it seems, in relation to the supply granted by parliament for the king's marriage expenses, part of which was employed by him in purchasing clothes for the king, and other necessaries. (*Moyse*, p. 159.) About the same time also he sat in parliament for the burgh of Stirling. (*Act. Parl.* iii. 524.)

He was probably disappointed in his expectations at court, however, for he soon afterwards joined the turbulent earl of Bothwell in his attack upon the king in December, 1591, for which he was again forfeited in parliament. (*Act. Parl.* iii. 538; Pitc. *Crim. Tr.* i. 2707.) The next year he accompanied the same nobleman to Holyrood House in a new attack upon James. But the party being discovered and defeated, Bothwell was obliged to flee; and Colville, by betraying his associates, obtained a pardon. Bothwell was afterwards excommunicated by the church courts, and not finding himself safe in Scotland, he fled to Orkney, and thence to France, whither Colville also proceeded. The latter several times requested permission of the king to return, and for that end used various arts to ingratiate himself with his majesty. In the year 1600, he published at Edinburgh a treatise entitled 'The Palinode,' which he represented as a refutation of a former treatise of his own against James's title to the English crown, which, 'in malice, in time of his exile, he had penned;' whereas, in fact, no such treatise was ever penned by him. (Spottisw. *Hist.* 457.) All his arts to obtain his recall to his native country proving unsuccessful, he at length professed himself a Roman Catholic, and became a keen writer against the Protestant faith. In 1601 he wrote a 'Parænesis ad Ministros Scotos super sua Conversione,' which was translated and printed at Paris the following year. He wrote also 'Capita Controversa,' and 'De Causa Comitis Bothwelli,' who, like himself, had turned Roman Catholic. Charteris (*Lives of Scots Writers*) mentions another work of his, 'Oratio Funebris Exequiis Elizabethæ destinata; and the author of the 'History of Sutherland' speaks of a manuscript left by him touching the affairs of Scotland.

He died while on a pilgrimage to Rome in the year 1607.

COLY'MBIDÆ. [DIVERS.]

COLY'MBUS. [DIVERS.]

COMA, a Greek word (κῶμα) signifying profound sleep; a morbid condition of the brain, attended with loss of sensation and voluntary motion, the patient lying as if in deep sleep.

It can scarcely be considered a primary or idiopathic disease; it is rather symptomatic of that condition of the brain which, when in sufficient intensity, produces apoplexy. If it be regarded as a positive disease, it must be considered as a milder form of apoplexy. It exists in different degrees of intensity; several of which degrees, as they are attended with some variety in the symptoms, and are dependent on some modification of the pathological condition of the brain, so they have acquired distinct names. When there is a state of mental and physical torpor, indicated by an almost constant tendency to sleep, and great inaptitude for muscular exertion; when the patient is sensible only as long as he is strongly excited, and as soon as the external stimulus is withdrawn, lapses into a state of forgetfulness, the affection is called Lethargy. When no distinct consciousness returns, however the patient may be roused or stimulated, though there still remain some indication of feeling on the application of mechanical irritation, as on being pricked or pinched, the affection is called Carus. But when the insensibility is so great that the patient indicates neither sensation nor feeling, whatever mechanical stimulus be applied, this state is often called, by way of eminence, Coma. This comatose state invariably accompanies apoplexy, and, as has been stated, coma, when intense, passes into apoplexy.

The abolition of sensation and voluntary motion (animal functions), which constitutes coma, is always attended with a greater or less disturbance of the organic functions. The circulating system is disordered: the pulse at one time is slow and full, and at another quick and small. The respiration is laborious, and is commonly preternaturally slow. The power of generating animal heat is almost always diminished, the skin being cold and clammy, though there are cases in which the temperature is elevated somewhat above the natural standard. The countenance is usually pale and sunk; the pupils dilated, but in the worst cases contracted; the position of the body is supine; in the worst cases there is a constant tendency to sink down in the bed; the limbs are motionless; and the evacuations, if not wholly retained, which is usually the case, are passed without consciousness.

In coma there is an exhaustion or suppression of the sensorial power; in other words, an abolition of the cerebral functions. This state of the nervous is always attended with a morbid condition of the vascular system. There is either a congestion of the capillary blood-vessels, occasioning obstructed circulation of the blood through the brain, or there is too rapid and violent a flow of blood through the cerebral vessels; or an inflammatory condition of the blood-vessels; or an extravasation of blood, or an effusion of serum into the cerebral substance. In addition to its disordered motion, there is also sometimes a depraved quality of the blood. There is reason to believe that to some morbid change in the constitution of the blood, the coma incident to bad types and advanced states of fever is mainly owing.

The morbid condition of the brain, on which coma depends, may be induced by any of the causes which have been enumerated as constituting the predisposing and exciting causes of apoplexy. [APOPLEXY.]

Coma, which may depend on directly opposite states of the nervous and sanguiferous systems, requires, in different cases, directly opposite modes of treatment. On the discrimination of the exact pathological condition with which, in any given case, coma is connected, and on the adaptation of the remedies employed to that pathological condition, life depends. If coma result from a simple depression or exhaustion of the nervous energy, and be attended with a feeble, irregular, and intermittent pulse, a cold and clammy skin, and a pallid and sunk countenance, the abstraction of the smallest quantity of blood will be certainly fatal. In this modification of the affection, not a depressing, but the very opposite, a stimulating treatment is required. The most appropriate stimulants are those denominated the diffusible, such as ammonia, camphor, &c.; but remedies of this class, whether used externally or internally, or both, must be employed with caution, and their effect watched with vigilance; for the too violent or the too long continued use of them, may actually superinduce a more dangerous form of disease, and convert simply exhaustive into congestive coma. Counter-irritants are almost always safe, and often highly useful; such as blisters to the nape of the neck, or over the scalp, or behind the ears.

When coma depends on congestion of the capillary vessels of the brain; when the pulse is oppressed, irregular, and slow; when the respiration is laborious and slow; when the countenance is tumid, and of a purple or livid colour, local depletions, as by cupping applied between the shoulders, or at the nape of the neck, or by leeches to the temples, counter-irritants, as in the preceding variety, and active purgatives, constitute the most efficient remedies.

When coma depends on the too rapid and violent flow of blood through the cerebral vessels, or on an inflammatory condition of those vessels, indicated by the full and strong pulse, and the hot skin, the same remedies must be employed, but with much greater activity. Life or death depends on the extent to which these remedies are carried, on the decision which sees how far to go, and the discernment which knows when to stop. [APOPLEXY.]

COMA BERENI'CES (Constellation), the hair of Berenice, placed among the stars by the astronomer, Conon, in memory of Berenice, the wife of Ptolemy Euergetes. (B.C. 246.) The legend is, that she had dedicated this hair to Venus, in case of her husband's safe return from Asia, and that it disappeared from the temple in which it was placed, and was never seen again till found in the starry heavens, where it now is, close to the tail of the Lion, and passing the meridian about an hour before Arcturus. [BERENICE.] Geminus attributes the constellation to Callimachus, who mentions it, as do Catullus and Pliny. Ptolemy does not place the stars now belonging to this constellation by themselves, but in the tail of the Lion; and Hyginus makes no separate mention of it. It was constantly mentioned by writers on the sphere, but not figured or catalogued separately, as far as we can find, till the time of Tycho Brahé.

The principal stars are as follows:—

Character.	No. in Catalogue of		Magnitude.	Character.	No. in Catalogue of		Magnitude.
	Flamsteed, Bradley.	Astron. Society.			Flamsteed, Bradley.	Astron. Society.	
	1	1389	7	*k*	23	1451	4
	2	1391	6	*l*	24	1452	5
	4	1402	6		25	1455	6
	5	1403	6	*m*	26	1461	5
	6	1409	5	*n*	27	1474	5
h	7	1410	4½	*o*	29*	1478	6
	8	1414	7		30	1479	6
	10	1416	6	*p*	31	1482	5½
s	11	1419	4½	*q*	35	1486	4½
e	12	1423	5	*r*	36	1493	5
f	13	1425	4½		37	1497	5½
b	14	1428	4½		38	1498	6
c	15	1429	4½	*t*	39	1504	5
a	16	1430	4½		40	1505	6
d	17	1435	6	*u*	41	1507	4½
	18	1436	6	*v*	42	1513	4½
g	21	1442	5	*w*	43	1515	5½
	22	1447	7		[1745]	1508	6

The constellation Coma Berenices will be found shut up in the triangle formed by the three bright stars, Arcturus, β Leonis, and α Canum Venaticorum.

COMA'TULA (zoology), Lamarck, ALECTO, Leach, a genus of radiated animals. Linnæus appears to have confounded the form with the other star-fishes; for it is only noticed by him as a species of his genus Asterias. Neither Gmelin nor Pennant disturbed this arrangement. M. de Fréminville (*Nouv. Bull. des Sciences,*) seems to be the first who formed a genus for it, under the name of *Antedon*. Leach characterized it generically under the name of *Alecto*. Lamarck makes it the first genus of his first family (*Les Stellérides*) of his order of *Echinodermatous Radiaria*, placing it immediately before *Euryale*. Cuvier arranges the genus under his *Échinodermes Pédicellés*; observing, that it is near to the division of the *Euryales* and *Comatulæ*, that the *Encrinites* ought to have their position. Miller is of opinion that *Comatula* presents a conformity of structure with that of the *Pentacrinite* almost perfect in every essential part, excepting that the column is either wanting or reduced to a single plate; and M. de Blainville makes it come under his first section (Free Asterencrinideans) of his third family (Asterencrinideans) of his third order (Stelleredians) of his first class (Cirrhodermarians) of his first type (Actinozoarians) of zoophytes. Mr. Thompson is of opinion that his *Pentacrinus Europæus* is the young of *Comatula*.

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* This star has been repeated twice by Flamsteed. It is 36 Virginis (Baily.)

M. de Blainville, whose observations appear to be founded on examination of a foreign species preserved in spirit, and on dissection, thus characterizes the genus.

Body orbicular, depressed, membranous; protected above by an assemblage of calcareous pieces, of which one is medio-dorsal, with one or two rows of accessory articulated simple rays, and provided on its circumference with five great rays, deeply bifid and pinnated, commencing with three basilary pieces. *Mouth* rather anterior, isolated, membranous, at the bottom of a star formed by five bifurcated channels. A large pseudo-anal orifice at the fringed extremity of a visceral sac.

The following details of structure are given by the same author. The body of Comatula is almost entirely membranous below; above, on the contrary, it is protected by a sort of *cupule*, which is thick, and composed of calcareous pieces, articulated and held together by a very delicate and hardly distinct skin. This *cupule* is formed by a centro-dorsal part, in which two pieces placed one over the other enter. It is round the first that the auxiliary rays are articulated, and to the second the great rays are joined by means of their basilary part.

The auxiliary rays, whatever may be their number—for they may form one or two rows—are always simple; that is, they are composed of simple articulations joined end to end, of which the last is attenuated and curved into a hook (*fig.* 5). They are never pinnated, and it would appear that they are not provided with any suckers.

The great rays enter by their base into the composition of the cupule or cell in which the visceral mass is contained. Each of them is formed by a simple basilary part, and another much more extended, divided, and pinnated. The basilary part is composed of three joints, a first articulated with the centro-dorsal piece, a second intermediate, and a third terminal, with which the two principal divisions of the rays are joined, and which on that account is shaped into an angle at its summit. The joints of this basilary part not only articulate with each other, but laterally they touch the corresponding parts of the two neighbouring rays. By such a disposition, becoming more and more complex, it is that the heads of *Encrinites* and the genera allied to them are formed. With regard to the pinnated or complex part of the ray, it is at first constantly double, that is, formed of two digitations, which are themselves often subdivided in a variable manner; so that sometimes the comatula bears a resemblance to a great figure of a sun: each subdivision is composed of joints in general but little elongated, which augment but little in number in a given space in proportion as they approach towards the extremity. Their most remarkable points are, that they alternately differ a little in length, and that the longest carry, right and left, on their internal surface, compressed triangular pinnules nearly cirrhous at their extremity, and also composed of a great number of short articulations. The result is, that when the animal is dead the digitation resembles the leaves of the mimosæ, because the pinnules in repose cling one to another like the folioles of sensitive plants throughout the length of the rachis when they are closed. But the principal character which distinguishes the great rays from the accessory ones is, that through the whole length of the axis and pinnules, the buccal or labial channel, fleshy and provided with sucking cirrhi, serving the animal to seize its prey, is continued. In following out these channellings (*espèces de sillons*), the number of which is in proportion to that of the digitations of the ray, we arrive by means of a channel from each, and occupying its base, at the centre of a sort of star with thick fringed borders, and finally at the mouth which is at the bottom. The star formed by the junction of the channels of the rays is not symmetrical, that is, its branches are very unequal; some which we shall call the anterior ones being shorter than the others, or posterior ones. The result is, that the mouth is not at the centre of the star, but much nearer one side than the other: it is difficult to be seen, which is not the case with another orifice which we shall presently discuss, and which M. Lamarck seems to have taken for it. The mouth is deeply buried in the star of the channellings, is round, unarmed, and leads immediately into the stomach. What is remarkable in this last is, that its parietes are thick, and especially that it is not simple. It is in fact full of lacunæ, or rather it forms a sort of cavernous tissue, enveloped on all sides by a yellow granulated matter of some volume, which must be the liver. The result of this disposition of stomach and liver is a considerable visceral mass, which occupies the excavated part of the calcareous cupule, and which is attenuated by degrees as it retires backwards, where it terminates in a soft and obtuse point. All this mass projects in the interior of a large cavity, of which it remains to speak. This cavity entirely membranous—at least below, for above and on the sides it is doubled by the solid parts—surrounds the visceral mass, and detaches it from all the rest of the animal, except towards the mouth, where it is continued. The internal orifice M. de Blainville was unable to discover. It is perfectly smooth, but it is prolonged externally into a sort of bladder (*vessie*), the base of which is behind, and whose truncated summit is forward. This free summit passes even a little beyond the mouth as it advances below it. It is pierced by a large gaping orifice, provided with a circular row of tentaculiform papillæ. 'This,' says M. de Blainville, 'is the part which M. de Lamarck took for the mouth, and which the English authors have considered to be the vent; it is really neither the one nor the other.' He then asks whether it may not be a sort of respiratory or locomotive cavity, or the termination of the ovaries? a question which he is unable to solve, inasmuch as he could not find the organs last named in the only individual which he dissected. 'However that may be,' he adds, 'it is at least easy to perceive, from what has been said of the organization of the *Comatulæ*, that these animals differ considerably from the *Ophiuræ* and other true star-fishes; and their habits are different, so far as is known.'

'Probably free wanderers in the seas which they inhabit, it is asserted that they attach, or rather anchor themselves to rocks by means of their accessory rays, using the others, which they extend on all sides, to reach their prey and bring it to the buccal orifice. It is worthy of inquiry, whether the Comatulæ do not make use of the abdominal bladder for the purposes of locomotion, in contracting it on the water, which would penetrate it somewhat after the manner of the Sepiæ.' (*Actinologie.*)

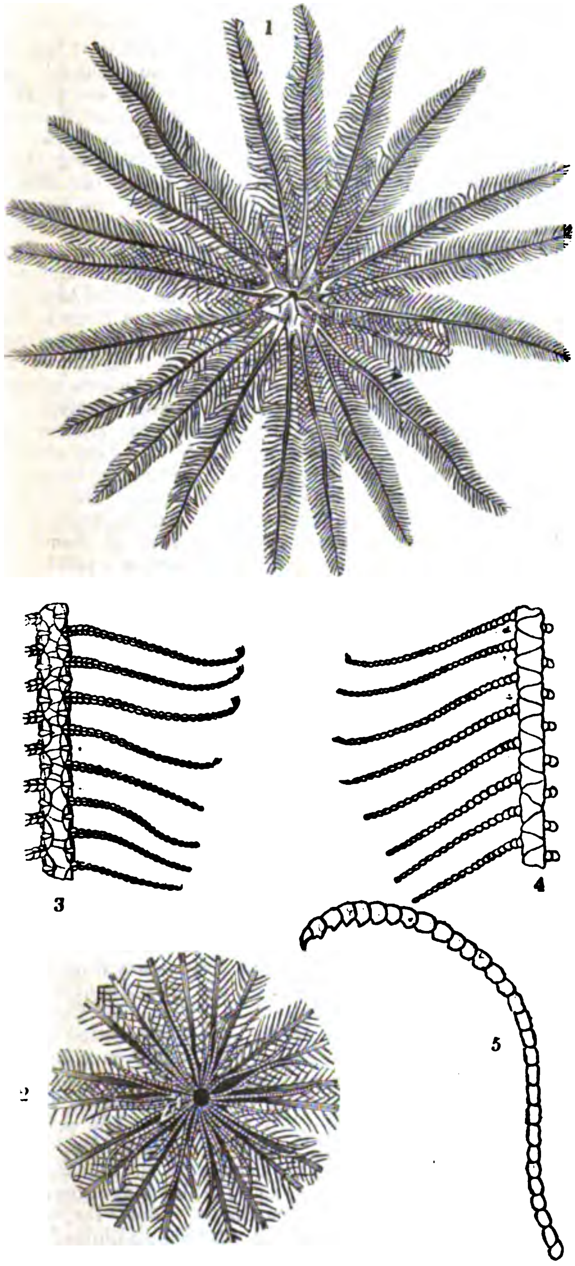
In the 'Descriptive Catalogue of the Museum of the College of Surgeons' (Physiological Series, vol. i.), there is a notice regarding *Alecto Glacialis* (No. 435, A), which imports that the alimentary canal is continued in a spiral direction from the sub-central opening at the convergence of the radiated canals to the opening at the extremity of the fleshy tube which projects forwards by the side of the mouth, forming a second distinct orifice or anus. Mr. Owen at first followed Lamarck in considering this tubular orifice as the mouth; but after dissecting a specimen carefully, and considering the analogy of *Alecto* with the other *Asteriæ*, he regarded it as the superadded orifice, and the sessile orifice at the convergence of the canals or channels as the normal orifice, and consequently the mouth. He is of opinion that this tubular orifice cannot be the opening of the oviducts, because the ovaries are situated in membranous expansions on the inside of the pinnules of the rays, as will be described in another part of the 'Physiological Catalogue.' That the tubular cavity should be a locomotive organ he considers most improbable, to use no stronger term; indeed the animal is so well provided with moveable rays, that such an adaptation would be superfluous; whether or not some respiratory actions are effected by the fleshy tube and receptacle is another question, requiring observation on the currents, &c. while the animal is living, for its solution.

Péron states that these *Radiata* suspend themselves by the small arms from fuci and polyparies, and in that position watch for their prey, which they entrap in their spreading arms.

Geographical Distribution. The form is widely distributed: it occurs in our own seas, and in the southern ocean. In the museum of the College of Surgeons are two specimens from the Society Isles, one brought up from a depth of 226 fathoms, in lat. 80° 26′ N., long. 12° 30′ E. (H.M.S. *Dorothea*, Captain Buchan, R.N.); and the same species (*Alecto glacialis*) from 250 fathoms, lat. 80° 26′ N., long. 11° 32′ E. (H.M.S. *Trent*, Lieutenant Franklin, R.N.)

The species probably are tolerably numerous. Dr. Leach records three species, two in the British Museum, Lamarck eight, and De Blainville nine.

Example. *Comatula Adeonæ*, Lamarck, who thus describes it. 'Comatula with ten pinnated, slender, penniform rays; pinnules lanceolate, complicatedly canaliculate below; twenty dorsal cirrhi.' *Locality*. The seas of New Holland, where Péron and Lesueur found it hooked on to an Adeona. It is small, delicate, with ten very slender feathery rays, and only three inches in diameter. The pinnules are 'lanceolated, and folded in two, as it were, below, longitudinally.' Many of the species are of comparatively large size; *Alecto horrida*, for example.



1. Comatula Adeonæ, 3-4ths of the natural size, lower side. 2. Upper side of the same. 3. Part of the under side of a ray magnified. 4. Upper side. 5. One of the dorsal rays magnified, showing the hook or anchor (De Blainville).

Zoologists generally use the term Comatula to express this form. According to the right of priority, Dr. Leach's name Alecto should be retained: Lamouroux has since used the term to designate a genus of fossil *polyparia*. [Cellariæa, p. 405.]

Fossil Comatulæ.

Goldfuss enumerates four species from Solenhofen (Oolitic group) (See Schlotheim, Petrefactenkunde, pl. xxviii. fig. 1—4): and there is a very doubtful announcement by Defrance, in his tableau, of one from the chalk.

COMBAT, SINGLE. [Duel.]

COMBINATIONS AND PERMUTATIONS. By the word combination is usually meant any selection which can be made out of a number of different objects without reference to the order in which they are placed: while by a permutation is meant a combination in which different orders of position are to be considered as constituting a specific difference. Thus *a b c d*, *a c b d*, *d a c b*, are all the same combination of four out of the alphabet, but different permutations of four. The investigation of questions relating to combinations, &c., is the principal mathematical part of the theory of probabilities, and was first considered in detail, with reference to that science, by James Bernoulli and Montmort (see 'Library of Useful Knowledge,' *Probability*): but the common rules had previously found their way into arithmetical treatises. The enormous number of different arrangements of which objects are susceptible, even when their number is not large, drew early attention to the subject. We shall give some of the most simple rules, as a help to calculation for high numbers.

I. The number of permutations having x in each, which can be made out of X quantities, is the product of x terms of the series.

$$X, X-1, \quad X-2, \quad X-3, \&c.$$

Thus out of 10 quantities, there are 10 × 9, or 90 permutations of two: 10 × 9 × 8, or 720 permutations of three; 10 × 9 × 8 × 7, or 5040 permutations of four; and so on. Finally, the number of different arrangements which the whole ten will admit of, say the number of changes which can be rung on ten bells, is

$$10.\ 9.\ 8.\ 7.\ 6.\ 5.\ 4.\ 3.\ 2.\ 1. \quad \text{or } 3{,}628{,}800.$$

II. When the whole number of quantities, X, contains a, which are alike of one sort, b, which are alike of another sort, &c., the total number of arrangements of the whole, is not the product of X, X — 1, &c., down to 1, but that product divided by the product of 1, 2, 3. . . . up to a, then by that of 1, 2, 3, . . . up to b, &c. This result can be most easily formed by striking out common factors from the numerators and denominators.

III. In the last case, the number of permutations of x out of X being required, no simple rule can be given, but each case must be solved by itself. For instance, how many permutations of three can be formed out of

$$a \quad a \quad a \quad b \quad b \quad c.$$

(1.) All being different, 3. 2. 1. or 6. (2.) Where a is repeated twice, we have 6. (3.) Where a is repeated three times, one only. (4.) Where b is repeated twice, we have 6. In all, 19.

IV. The number of combinations of x quantities out of X, all different, is

$$\begin{gathered}\text{prod. of } x \text{ terms of } X,\ X-1,\ X-2,\ \&c \\ \text{divided by} \\ \text{prod. of } x \text{ terms of } 1,\ 2,\ 3,\ \&c.\end{gathered}$$

Thus out of 10 quantities, the number of combinations of four is 10. 9. 8. 7. divided by 1. 2. 3. 4, or 210. The best way of arriving at this result is by destroying common factors, which shows it to be 5. 3. 2. 7. Observe also that we may shorten this process, when x is greater than the half of X, by finding out, not how many selections can be taken, but how many remainders can be left. Thus the number of combinations of 25 out of 30, is the same as the number of combinations of 5, for 25 can only be taken in as many ways as 5 can be left.

V. The number of ways in which n places may be filled up with x letters, allowing any letter to be repeated in all or any of the places, is x^n, or the product of $x, x, x, \ldots.$ (n factors in all.)

VI. The total number of combinations of all sorts out of x quantities, from one at a time up to all together, both inclusive, is 2^x, or 2. 2. 2. . . . . (x factors in all) diminished by 1. Thus out of 4 quantities, or less, there are $2^4 - 1$, or 15 different selections: they are

a b c d, *b c d*, *a c d*, *a b d*, *a b c*, *a b*, *a c*, *a d*, *b c*, *b d*, *c d*,
a, *b*, *c*, *d*.

Among the curiosities of this subject, it will suffice to mention the following: The number of all possible arrangements of letters, repeated or not, and capable of being pronounced or not, up to words of 24 letters, is of the following order of magnitude. Take a million of millions: repeat it a million of million times: the result is between 1391 and 1392 millions of such numbers. As an instance of the manner in which the dropping of consonants and confusion of vowels may permit possible alterations of spelling, M. de Mairan computed that the word *Hainaut* might be spelt in 2304 different ways, so as to be pronounced in the same way by as many different Frenchmen, or very nearly so.

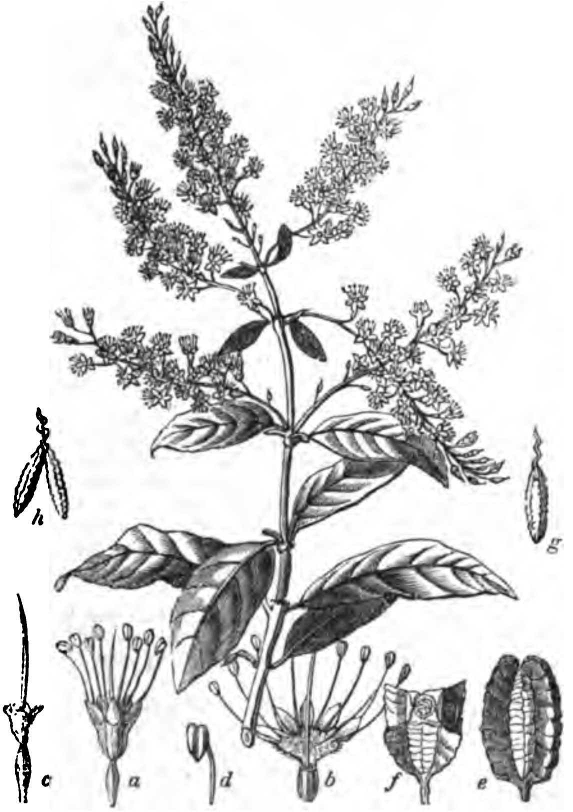
The most useful proposition in the higher part of the theory of combinations is the reduction of the formula $1.2.3\ldots.(x-1)x$ to a very close approximation, which can be easily calculated by logarithms. It affords, at the same time, a useful lesson to those who have not studied mathematics at all, or very little; we have seen ignorance comfort itself with laughter more than once at the idea of the preceding product being found by employing the proportion which the circumference of a circle bears to its diameter. But let $\pi = 3{\cdot}141593$ be this proportion; $\varepsilon = 2{\cdot}718282$, the base of Napier's logarithms· then we have

$$1.2.3\ldots\ldots(x-1)x = \sqrt{2\pi x}\left(\frac{x}{\varepsilon}\right)^{x} \text{ very nearly;}$$

which is a little too small, but the error is only about the $12x$-th part of the whole: less than 1 per cent. even when x is so low as 10. The expression can easily be calculated by logarithms. Tables of the logarithms of this product will be found at the end of the Article, 'Theory of Probabilities,' in the 'Encyclopædia Metropolitana.' For an instance of the computation, see the 'Library of Useful Knowledge:' 'Examples of Arithmetic,' &c., p. 45.

COMBRAILLES, a district in France, in the former province of Auvergne; it is the north-west part of that province, on the confines of La Marche, and is traversed by the upper waters of the Cher, a tributary of the Loire. It is divided into Combrailles, properly so called, of which the capital is Evaon or Evaux, and Franc-Alleu, of which Sermur is the chief place. Combrailles is now included in the department of Creuse.

COMBRETA'CEÆ, an order of polypetalous exogens, with one-celled inferior fruit, the seeds of which are solitary or nearly so, and pendulous, the stamens definite in number, and the cotyledons convolute. They are trop shrubs or trees, with alternate or opposite leaves destitute of stipules, and long slender stamens. The order does not contain any plants of much importance for their useful properties. Some of them are astringent and used for tanning, and the kernels of others are eatable; they are chiefly valued for their brightly coloured showy flowers especially in the genus Combretum



[Combretum coccineum.

a, flower; *b*, flower opened to show the insertion of the eight stamens; *c*, pistil; *d*, stamen; *e*, fruit; *f*, horizontal section of fruit; *g*. seed; *h*, embryo

COMBUSTION. [Heat.]

COMEDY. [Drama.]

COME'NIUS, JOHN AMOS, was born in 1592, at Comna, in Moravia, from which place he assumed the name of Comenius. His parents were of the sect of Moravian brethren. After studying at Herborn, near Nassau, he returned to Moravia, and became pastor at Fulneck; but that town being burnt during the religious war then raging, he lost his property, including books and MSS., and took refuge at Lesna, in Poland, where he became rector of a Moravian school. He there published, in 1631, his 'Janua Linguarum,' in Bohemian and Latin. This work established his reputation as a philologist, and was translated into most European and some of the Oriental languages. An edition in Latin, English, and French, was published in London, 1639: 'The gate of Tongues unlocked and opened, or else a Seminary or Seed-plot of all Tongues and Sciences.' It is a sort of encyclopædic phrasebook, in 100 chapters, every chapter being devoted to a separate department of natural history, the arts, or the various professions, sciences, and trades, &c., introducing most of the words belonging to each, and giving by means of the context an explanation of the same. His 'Orbis sensualium pictus, hoc est, omnium fundamentalium in mundo rerum et in vita actionum pictura et nomenclatura,' Latin and German, Nürnberg, 1659, is a vocabulary of technical words, likewise arranged in chapters, but not in connected sentences, each chapter being illustrated by a woodcut representing the objects therein mentioned. These two works resemble each other in principle, but differ in the arrangement. The 'Orbis' also has been often reprinted, and translated into various languages. A Latin and English edition appeared in London, 1777. Comenius was sought after by several governments for the purpose o. reforming the system of public instruction. He came to England in 1638, and afterwards went to Sweden in 1642, where he was introduced to the Chancellor Oxenstiern; but he soon after left Sweden and retired to Elbing, where he attended chiefly to the publication of his works. In 1648 he returned to Poland. On the invitation of Prince Ragotzky, he went to Transylvania, where he established a school which he afterwards transferred to Patak, near Tokay. After directing the school for four years, he returned to Lesna in 1654, but was driven away from thence by the ravages of the religious war which continued in Poland. Lesna was burnt by the Catholics, and Comenius again lost his books and MSS. He at last settled at Amsterdam, where he found a protector in Laurence de Geer who defrayed the expense of the publication of his 'Opera didactica,' fol., 1657, in which Comenius collected several of his works already published separately. The principal of these are: 1st. 'Novissima linguarum methodus,' a sort of universal grammar, with references to the German, Greek, Hebrew, Hungarian, and Turkish languages; 2nd. 'Januæ Linguarum novissima Clavis;' 3rd. 'Lexicon januale, seu Sylva Latinæ Linguæ;' 4th. 'Schola Ludus,' which consists of dramatic pieces composed for his pupils at Patak and Lesna, and in which men of various classes and conditions are introduced, each speaking about his own profession or trade, and using the technical words belonging to it Comenius's didactic works might even now furnish many useful suggestions for a system of elementary popular education. He wrote numerous other works, some historical: 'Historia Ecclesiæ Sclavonicæ,' Amsterdam, 1660; 'Historia Persecutionum Ecclesiæ Bohemiæ,' called also 'Martyrologium Bohemicum,' Berlin, 1763; 'Some Controversies against the Socinians;' 'Antiquitates Moraviæ,' which is still unedited; a Map of Moravia, with names in German and Bohemian, Amsterdam, 1627; 'Prodromus Pansophiæ, London, 1639, a sort of prospectus of a universal cyclopædia, which was the dream of his life. In his old age he listened to some fanatics and religious visionaries, who were then making a noise, and he seemed to believe in their revelations. He died at Amsterdam, November, 1671.

COMET (κομήτης, from κόμη, hair). This term, though no doubt originally derived from the tailed comet of the heavens, yet was at one time pretty generally applied to phenomena of which it may be doubted whether many were anything more than atmospheric meteors. Since the time when observation has shown comets without tails, the following must be considered as the definition of the word:—a heavenly body, of a luminous and nebulous appearance, which approaches to and recedes from the sun, after the manner of a planet in a single revolution. This includes both the comets which return, and revolve in ellipses, and those which, for any thing established to the contrary, may move in hyperbolas or parabolas.

The present is an epoch peculiarly favourable for rejecting the nebulous but *not* luminous mass of surmises, speculations, theories, and analogies, with which a succession of ages has loaded the physical constitution of comets, the question whence they come and whither they go, and every point on which curiosity could be excited. It must be fresh in memory that in the year 1832 *two* predicted comets arrived within telescopic reach, one of which crossed the place where our earth was to be a month after. The public attention was roused almost to a pitch of terror, the result of which was that much was written on the subject, and the facts which had lain unnoticed except by astronomers were drawn forth and made as common as any other fundamental points of the solar system. Still more recent is the appearance of Halley's comet, on which, for different reasons, both astronomers and the rest of the world fixed an almost exclusive attention for months together. With three comets ranking as planets both in theory and practice, we might almost as well enumerate the astrological qualities of a planet, in treating of the elements of its orbit, as reiterate the once prevailing, but now we hope almost exploded, notions about cometary bodies. Without stopping then to ask whether we are to attribute storms, fogs, rain, or the death of princes, to the appearance of a star with a tail—or whether we are to consider it as the vehicle in which departed souls, released from the functions of guardian angels, are transported to heaven;—whether, on the other hand, it is a moral agent of evil, which should be excommunicated by the church;—or whether such a phenomenon ever was the cause of a deluge,—or whether it is a method of reinforcing the light and heat of the sun,—or of creating satellites, or breaking up large planets into smaller ones, or changing the climates of countries, or introducing epidemic disorders—we shall proceed to treat the subject in the same manner as would be advisable in the case of the better known bodies of our system.

A fair average description of the phenomena of a visible comet is as follows:—

A faint luminous circle is discovered by aid of good telescopes; the appearance increases gradually, and after some little time a *nucleus* appears, that is, a part in the middle which is more condensed in its light than the rest, sometimes circular, sometimes oval, sometimes even radiated like a star. The appearance still goes on increasing, the nebula round the nucleus becomes less regular, and a tail begins to form, which looks as if one side of the nucleus were projected in a stream of light away from the body of the comet, which stream grows fainter as it recedes, and finally ceases without any definite boundary. This tail increases in length, so as sometimes to spread across the whole visible heaven: sometimes there are more tails than one, and sometimes the tail seems broken off in parts; it is generally turned directly away from the sun, but this rule is by no means universal. The comet approaches the sun sometimes in an undulating and irregular curve, sometimes nearly in a straight line: it generally crosses the part of the heaven in which the sun is found so near to the latter body as to be lost in its rays; but emerges again on the other side usually with increased brilliancy and length of tail. The phenomena of disappearance are then, in the inverse order, the same as those of its appearance. Frequently it is observed that the dimensions of the comet contract a little as it approaches the sun and dilate as it recedes again.

During such appearances, astronomical observation has always, for the last two centuries, confirmed the hypothesis that the irregularity in the motion of comets arises from their motion combined with that of the earth; and that their real path round the sun is either in a parabola (the infinitely elongated ellipse), or in an ellipse so elongated as to be insensibly different from a parabola within visible limits, or finally in a measurable ellipse, which being an oval curve, ensures the periodic return of the luminary. In fact, the laws under which the orbit is described are precisely the same as those of the planets to the eye of reason, though the elongation of the orbits creates very different visible phenomena. But the stages of discovery were at considerable distances from each other as to time. Aristotle and his contemporaries supposed comets to be igneous vapours formed in the atmosphere. In his 'Meteorologica,' lib. i., he mentions various hypotheses about comets, and describes several remarkable phenomena of the kind. Ptolemy does not mention the word in his Syntaxis; but in his astrological treatise he supposes them to be formed by the motion of the planets. The opinion of Seneca, that comets were a species of planets, was a bold and happy advance upon his age. Even Galileo and Francis Bacon were of the meteoric party; though Tycho Brahé had distinctly shown from observation that his comet [BRAHE, TYCHO] was above the moon in height. Both Tycho and Kepler supposed the orbits to be straight lines. Hevelius (1668) ascertained the concavity of a comet's orbit. Doerfel (1681) is believed to have been the first who laid down the parabolic hypothesis. The *Principia* of Newton confirmed the physical part of this conjecture (in 1687), and the practical part with regard to the comet of 1680. Newton distinctly calls the old planets *planets without tails*. The well-known conjecture of Halley, obtained in 1700 from his calculations of 24 comets, with his prediction, and its subsequent verification, will be treated under HALLEY'S COMET. We may here also observe, that we shall refer the second periodic comet, as to all specific information, to ENCKE'S COMET, annexing the third of the kind (COMET OF BIELA) to this article, from its having been omitted in the proper place. The steps which have been made in positive knowledge of the orbits of comets since Halley are closely connected with the planetary theory, and will be found in articles on that subject. [GRAVITATION, PLANETARY THEORY, &c.]

Resuming the general statistics of cometary orbits, we may observe that up to the year 1665 there are 415 comets recorded: that 46 had been added up to the year 1781; that 80 orbits had been *calculated* in 1792; and that in 1831, 137 orbits had been calculated. But it must be remembered that many of these are returns of the same comet; and that many of the old comets are very doubtful.

Having examined the particular evidence for eight reputed appearances of what afterwards became Halley's comet, we can only find in the case of two as much as would establish the most ordinary historical fact; and when we state that in one instance at least the original authority for the comet lived ten centuries after the appearance, we leave our readers to reduce the number 415 according to their own judgment.

The present average seems to be something more than one comet in each year; of which, however, it is not to be presumed that one in ten is visible to the naked eye.

Of the 137 comets whose orbits were known in 1831, M. Arago made an instructive and curious analysis, which we shall here give.

Number of comets which came to perihelion (nearest point to the sun) in different months.

January	14	July	10
February	10	August	8
March	8	September	15
April	10	October	11
May	9	November	18
June	11	December	13

The number in winter is 81; in summer 56. This probably arises from the facility which long nights and feeble sunlight give to the discovery. Of these comets 69 moved *direct* (in the order of the signs of the zodiac) and 68 *retrograde*.

The three following columns show, 1. the number of comets of which the orbits were inclined to the ecliptic between 0° and 10°, 10° and 20°, &c.; 2. the number in which the longitudes of the ascending nodes (points at which they rise above the ecliptic) were between 0° and 30°, &c. 3. the number in which the longitudes of the perihelion were between 0° and 30°, &c.

Inclination.	No.	Node.	No.	Perihelion.	No.
0° to 10°	9	0° to 30°	12	0° to 30°	11
10 ,, 20	13	30 ,, 60	12	30 ,, 60	13
20 ,, 30	10	60 ,, 90	20	60 ,, 90	12
30 ,, 40	17	90 ,, 120	8	90 ,, 120	20
40 ,, 50	14	120 ,, 150	12	120 ,, 150	10
50 ,, 60	23	150 ,, 180	13	150 ,, 180	8
60 ,, 70	17	180 ,, 210	14	180 ,, 210	6
70 ,, 80	19	210 ,, 240	11	210 ,, 240	13
80 ,, 90	16	240 ,, 270	10	240 ,, 270	18
		270 ,, 300	8	270 ,, 300	10
		300 ,, 330	11	300 ,, 330	10
		330 ,, 360	6	330 ,, 360	6

from which it seems that great inclinations are more probable than small ones, that the nodes of comets are pretty equally distributed in the two halves of the ecliptic, but that the perihelia seem inclined to cluster about the summer and winter solstices. Laplace, in applying the theory of probabilities to the subject of the inclinations of the ten planets, which are not altogether as great as any one of them might have been (or 90°), ascertained that it was ten million to one in favour of some specific cause for the inclinations of planets being what they are. But on applying the same analysis to a large number of comets, he was not able to detect as much as three to one for a similar supposition in the case of comets.

With regard to the magnitude of the perihelion distances, it was found that—

Nearer than Mercury			there were	30	comets
Between Mercury	and	Venus	,,	44	,,
,, Venus	,,	Earth	,,	34	,,
,, Earth	,,	Mars	,,	23	,,
,, Mars	,,	Jupiter	,,	6	,,
Further than Jupiter			,,	0	,,

or the number of perihelia do not by any means increase in proportion to the spheres within which the several planets are contained. If the perihelia were distributed throughout the system as thickly as between the Sun and the orbit of Mercury, there would be three millions and a half of comets within the sphere of Uranus.

With regard to the periodic time of comets there is little to be said, owing to the small number of verified instances. Encke's comet revolves in 3¼ years, Biela's in 6¾ years, Halley's in 75¼ years (roughly): these are the three verified instances. Of predictions remaining for verification we have the following (Airy, *Rep. Brit. Ass.* vol. i.):—

Year of Comet.		Supposed Period.		Authority.
1807		1543	years	Bessel.
1811	(celebrated)	3383	,,	Bessel.
——	————	2888	,,	Argelander.
1815		72–77	,,	Bessel and others.
1819	(2nd com.)	5½	,,	Encke.
1819	(4th com.)	3⅝	,,	Encke.
1812		66–76	,,	Encke.
1822	(2nd com.)	1550	,,	Encke.
1822	(3rd com.)	1817	,,	Rumker.
1825	(4th com.)	556	,,	Hansen.
1825	(?)	265	,,	Mossotti?

The short comets of 1819 have not been seen again, but this is not conclusive, as they were excessively feeble, and were very near the earth when observed. It must be remembered that these determinations are not of very high probability, since a determination of the length of the major axis is very uncertain from observations made near the perihelion, and comets are visible at no other time. The time of a revolution, when ascertained by observation, settles the major axis of a comet's orbit very completely: but it is difficult to determine the major axis with sufficient correctness by any other observations.

With regard to our general knowledge of the orbits of comets, we shall only further remark that an instance which might once have led to doubts regarding the universality of the Newtonian principle, has become a striking confirmation of it. We allude to the comet of Lexell, which appeared with brilliancy in 1770, and was most unquestionably (as was found) moving in an elliptic orbit of five and a half years in period. But it has never appeared again. It was found however from theory, that a near approach to Jupiter in 1767 changed an orbit of long period, if not a parabola or hyperbola, then in course of description, into the ellipse just alluded to, and that an orbit of long period was afterwards restored by the action of the same planet; it being easily shown that it would depend on the relative positions of the comet, the sun, and Jupiter, whether the perturbations of the latter would lengthen or shorten the period. This must have appeared a pure hypothesis to all who could not verify the process; it must have seemed that the perturbations of a planet were always ready to explain the disappearance of a predicted comet. But in the meanwhile, more than half a century has gone by; no such comet has appeared again, and it has been proved by the instances of the three verified periodic comets, that the calculated perturbations will enable astronomers to predict with great exactness the actual place in which a comet is to be seen. Consequently, to the appearance of the comets which, if the Newtonian theory be correct, should appear, we may add the disappearance of those which on the same supposition should disappear. But it is hardly necessary now to insist on such a point.

We leave the certain and numerical field of observation of orbits, and proceed to what we know of the constitution of comets. The most interesting question is that of their masses—are they solid, or mere clouds of gaseous matter? Do they derive light from the sun, or are they luminous of themselves? Do they gradually waste away, or do they continue of the same magnitude and intensity of light? These are the only questions which it is worth while to state separately, being the only ones as to which good grounds for conjecture can be given. The question relative to the masses of the comets has been pretty well settled. It may be stated as a certain fact, that though several comets have been placed in situations in which a mass as heavy as a satellite of Jupiter would have produced sensible effects of perturbation, no such effects have been produced. The comet of 1770, had it been only the five-thousandth part of the earth, would have altered the length of our year more than a second of time, which must have been observed again and again before now. The same comet must have passed in 1779 between the satellites of Jupiter: had it been the fiftieth part of one of them in mass it must have affected that system sensibly. The comet of Biela came very near the earth in 1832: not the smallest effect of perturbation has been observed. But the question has been lately brought within still narrower limits. The tail of a comet, supposing it to consist of matter like the gases on our earth (on which supposition every speculation must proceed), is a continual efflux from the body. It is impossible that a permanent atmosphere could be in equilibrium under such a form. The attraction of the body of the comet itself upon such an atmosphere must be exceedingly slight. Again, it is known from the old planets that if space be filled with any fluid, such a fluid must be excessively rare and elastic, or it would show some effect in gradually causing the planets to approach the sun, and shortening their period of rotation. No such acceleration has been observed: not that small accelerations cannot be detected, for that of the moon [LUNAR THEORY] depending on other causes, has been detected, though only amounting to a minute of space in six centuries. Nevertheless, just in the same way as the fall of a feather shows our atmosphere, though that of a bit of lead does not, it may happen that a fluid pervading all space, and so rare as not to affect the planets sensibly for many thousands of years, may soon show itself on such a mass as that of a comet. According to the observations of Encke, the comet which bears his name is gradually shortening its period, at the rate of something less than one day out of 2500, being precisely the sort of effect, and up to this time the only known sort of effect, which could result from a resisting medium. A translation of the memoir of Encke on this subject was published by Professor Airy in 1832, and both the author and translator declare themselves perfectly convinced that the resisting medium is established: M. Arago seems to be of the same opinion, as does M. Poisson. We cannot go such a length; for though we should not be willing to assert a positive conclusion against such authorities, we are obliged to suspend our opinion, either till new observations shall have confirmed the fact, or until some decisive proof shall be given, that the probable errors of terms rejected in the approximation to the perturbations are not sufficient to explain the phenomenon. But in the mean time we rest perfectly satisfied that the conclusion is one of considerable probability; and feel inclined to expect that when the comets of Biela and Halley shall be as well known as that of Encke, they will confirm the result.

It is most probable that a comet is altogether gaseous, without any solid matter whatever. Stars have been repeatedly seen through the thickest parts. Sir J. Herschel, for instance, in 1832, saw a group of stars of the sixteenth magnitude almost through the centre of Biela's comet. We shall on this subject content ourselves with citing some authorities.

M. Arago.—'I think we should conclude, 1. that there are comets without nuclei; 2. comets of which the nucleus is *perhaps* transparent; 3. comets more brilliant than the planets, of which the nucleus is *probably* solid and opaque.'

Sir J. Herschel.—'Whenever powerful telescopes have been turned on these bodies, they have not failed to dispel the illusion which attributes solidity to that more condensed part of the head, which appears to the naked eye as a nucleus; though it is true that in some a very minute stellar point *has* been seen, indicating the existence of a solid body.'

Mr. Airy.—'On the physical constitution of comets we have learnt nothing, except that they appear to be wholly gaseous.'

We cannot help being convinced that every probability leans towards the truth of the gaseous hypothesis. If this be true, we might as well attempt to ascertain how far a cloud which is driven against a mountain will tend to break off the top, as speculate upon any mechanical danger to the earth from contact with a comet. The effect of such a circumstance would be the mixture of its gaseous material with the atmosphere, a permanent rise (probably) in the mean height of the barometer (though there is no evidence to make it highly probable that all the comets put together would have mass enough to produce a sensible effect of this kind), and, if the gaseous matter should condense sufficiently to descend to the lower regions of our atmosphere, some effect upon animal and vegetable existence, as likely good as bad. For anything rendering the contrary highly probable, the earth may have been many times in the tail (or, as we might say, in the draft) of a comet.

That comets receive their light from the sun is made evident by their alterations of brilliancy. If they shone by their own light, the size would vary with the distance, but not the intrinsic brilliancy. [Light, Optics.] But nothing like phases have been observed, except in a very few instances, which are satisfactorily shown to be either doubtful as to the fact, or not such phases as should have been, the position of the sun and earth being considered. This absence of phase is in favour of the supposition of an irregular gaseous mass.

If we take all the recorded accounts, we should certainly be inclined to imagine that the whole system of comets is diminishing in brilliancy and magnitude. But these accounts were written under the bias of terror, and must be considered as most probably exaggerated. It is impossible to see how the waste which arises from the tail can go on without such diminution. The only positive fact however is this, that the comet of Halley, which in 1682 was as round and clear as Jupiter, was not visible to the naked eye in 1759, and in 1836 exhibited a medium brightness, being then in a much more favourable position. The question as to waste is therefore mixed up with others, from which it cannot at present be separated.

The nuclei of comets (so far as observed) have varied from 30 to 3000 miles; the lengths of their tails from nothing up to more than a hundred millions of miles.

The following are references to works which are easily obtained: for those of a more mathematical character, the reader may consult Lalande, *Bibl. Astron.*, and Mr. Airy's *Report Brit. Ass.*, vol. i.; Sir J. Herschel's *Astronomy*, in the Cabinet Cyclopædia; Arago, *des Comètes en général*, troisième édition, Paris, 1834; Pontécoulant, *Notice sur la Comète de Halley*, Paris, 1835; *Companion to the Almanac for* 1833 *and* 1835; *List of Comets*, by Mr. Hussey, *Philosoph. Mag.*, vol. ii.

COMET OF BIELA. In 1805 Gauss found that one of the comets of that year appeared to have a short period of about 1731 days. No prediction was attempted, nor, as it turned out, could have been made successfully. In 1826, February 27-28, M. Biela, an officer residing then at Prague, found a comet which, it seems, 'he had partly expected, (*Rep. Brit. Ass.* v. i. p. 163); but whether on account of Gauss's determination, we are not informed. It was soon found, however, that this was a repetition of the comet of 1805, and that it had a period of about six years and three quarters, or about 2460 days. Its return was predicted for 1832, and it appeared that the orbit crossed that of the earth about a month before the arrival of the latter at the point of intersection. This annunciation excited much curiosity, and in many quarters considerable excitement, if not positive alarm. We need hardly add that such a feeling was only created among those whose means of information were small: for in truth, the comet in 1836 was always more than fifty millions of miles from the earth, whereas in 1805 it had been within five millions. To this apparition of Biela's comet, we owe a very general desire to obtain information on the subject, and among the fruits of this is the excellent treatise of M. Arago, alluded to in the preceding article.

The comet appeared in September, 1832, according to prediction, and in the part of the heavens assigned to it. Sir J. Herschel describes it as a nebula of $2\frac{1}{2}'$ or $3'$ in diameter, of the order of W. Herschel's 'first class.' It had neither tail nor decided nucleus, but only a slight increase of density towards the centre. Very small stars were seen through it. [Comet.]

This body is now a recognized body of the solar system, its next appearance being in 1839. The following, being the elements of the orbit for 1832, is given in Schumacher's *Astronomische Nachrichten*, No. 103. To each element is annexed the effect which could be produced by the discovery of an error in the major semiaxis of the ellipse, amounting to $\Delta a \div 1000$. The perihelion passage is *mean time at Paris*.

Perihelion passage	1832 Nov. 26^d $123066 - {\cdot}0009567\ \Delta a$
Inclination . . .	$13^\circ\ 13'\ 30''{\cdot}33 + 1''{\cdot}546\ \Delta a$
Long. Asc. Node . .	$248\ \ 15\ \ 11\ {\cdot}14 + 6''{\cdot}749\ \Delta a$
Dist. of perih. from asc. node on the orbit .	. $221\ \ 45\ \ 3\ {\cdot}96 - 4''{\cdot}186\ \Delta a$
Perih. distance, Earth's distance being 1 .	$0{\cdot}8790808 + {\cdot}000008541\ \Delta a$
Semi-major axis . .	$3{\cdot}53683 + {\cdot}001\ \Delta a$

COMET OF ENCKE. [Encke's Comet.]

COMET OF HALLEY. [Halley's Comet.]

COMINES, PHILIPPE DE, Lord of Argenton, was born at the château of Comines, near Menin in Flanders, about 1445. His father was in the service of Philip the Good, Duke of Burgundy, who was also sovereign of Flanders, and Philip himself was early introduced into the court of Charles le Téméraire, Philip's son, whose councillor and favourite he became for a time. When Charles made Louis XI. prisoner at Péronne in 1468, Comines exerted all his influence to calm his master's violent temper; he acted the part of a conciliator between the two princes, and succeeded in bringing about a treaty of peace between them. This timely service was not forgotten by Louis. In 1472 Comines all at once left the service of the Duke of Burgundy, and passed into that of Louis XI., who received him most graciously, and made him his chamberlain and seneschal of Poitou. The reasons for this step on the part of Comines have remained a secret; probably he was tired of Charles's violent temper, and foresaw his impending ruin. Comines married Helène, of the family of the Counts of Monsoreau in Anjou, who brought him as her marriage portion the fiefs of Argenton, Coppoux, Brisson, and others. Comines was employed by Louis XI. in several diplomatic missions to Savoy and other places. After the death of Louis, Comines having joined the party of the Duke of Orleans (afterwards Louis XII.), who aspired to be regent during the minority of Charles VIII., was arrested in 1486 on a charge of treason, and shut up for several months in an iron cage at Loches, and afterwards transferred to Paris. He was at last tried and condemned to banishment, and his property was confiscated, but the sentence was not executed, and the fame of his abilities induced Charles VIII. to employ him in several important negotiations. He accompanied Charles in his Italian campaign, of which he gives a good account in his memoirs. Previous to the return of the king through North Italy, in the midst of the hostile armies of the Italian princes, Comines was sent to Venice to endeavour to detach that state from the league, but he did not succeed. The battle of Fornovo, July, 1495 secured the retreat of the French across the Alps After his return from Italy, Comines retired to his estates, where he began to write his memoirs. When Louis XII. succeeded to the crown in 1498, Comines repaired to court to pay homage to the new sovereign, for whom he had at one time suffered severe imprisonment and risked his life, but Louis does not seem to have noticed him by any marks of favour. Comines returned into the country, and he died at Argenton in Poitou, October, 1509, at the age of sixty-four. His body was transferred to Paris, and buried in the Church des Grands Augustins, where Comines had built himself a chapel. His monument has been transferred to the Musée des Monumens Français. He left one daughter, who married a Count of Penthievre.

The memoirs of Comines contain the history of his own times, from the year 1464 to the death of Charles VIII. in 1498. He gives a faithful picture of that singular character Louis XI., whom he greatly extols for his political art. He is also a great admirer of the Venetian government. He was a cool and sagacious observer, and seems to have fully understood the crooked policy of those times. The great value of Comines' Memoirs consists in his frankness and sincerity. He is a matter-of-fact historian; like his contemporary Machiavelli, he paints men and politics such as he found them to be, with all their selfishness, craft, and evil doings, which he relates with great imperturbability. Those historians are the mirror of their age, and what that age was may be conceived by reflecting that Louis XI., Ferdinand of Aragon, the Borgias, Ludovico il Moro, and others of the same stamp, were the contemporaries of Comines. The Memoirs of Comines have been often reprinted, and translated into various languages. The edition by Godefroy and Lenglet du Fresnoy, London, 1747, consists of 4 vols., 4to., of which however the first volume only is occupied by the Memoirs, the other three being filled with numerous historical documents and additions.

COMI'TIA. Comitium originally signified a place of meeting, as the name imports. Plutarch (*Rom.* xix.) says that the plain where the Romans met the Sabines, in order to agree on the terms of a treaty, was called 'comitium.' The plural 'comitia' denotes general assemblies of the Roman people, convened by the constitutional authority of some magistrate, in order to enact or repeal anything by their suffrages. The comitia were also named 'calata,' from *calare*, to call or convene.

There were three kinds of Roman comitia.

1. *Curiata*, so called because the people met and voted in curiæ. Romulus, it is said, divided the whole Roman people into three tribes, and each tribe into ten curiæ, which were subdivided into decuriæ. The word curiæ is derived from curare, to take care of or superintend civil and religious affairs. Each curia formed a separate community for the celebration of sacred rites, for which purpose a particular priest, called curio, was attached to each curia, and a decurio to each decuria. But all the curiæ were under the superintendence of a curio maximus. A separate place, which was also called curia, was assigned to each curia for performing their sacred rites. The members of a curia were called curiales.

There is some obscurity and doubt about the antient constitution of the curiæ and comitia curiata. However, it seems certain, that the curiæ had the superintendence of sacred matters, that all the public power was united and centralized in the comitia curiata, and that the patrician order must have possessed a great preponderance in them. (See Niebuhr's *Rome*, vol. i., *on the Curies.*) In these comitia laws were made or repealed, capital crimes judged, and the king as well as the other chief magistrates of the state elected. The place of meeting (comitium) was in the forum, and in its northern corner were the rostra. There was no fixed time for the meeting of the curiæ, but they met as business required.

Servius Tullius having instituted the comitia centuriata, and the plebeians becoming powerful through the comitia tributa, the comitia curiata gradually lost almost all political power. However they still passed enactments under the title of leges curiatæ, which, before the institution of the comitia centuriata, denoted every law made by the comitia curiata; but afterwards that term was limited to express a few political rights, still reserved to the latter comitia, particularly that of granting military power (*imperium*) to those magistrates who were elected in the comitia centuriata, which could only confer civil power (*potestas*). Finally, the power of the comitia curiata was reduced to a mere formality, and represented, in Cicero's time, by thirty lictors. Still these comitia retained the privilege of adrogatio, a species of adoption. Though their political power was lost, the curiæ retained their religious functions till the last times of the republic, and always elected the curio maximus and the flamens. Their number was never augmented, as was the case with the tribes.

2. *Centuriata.* Servius Tullius, according to tradition, in order to diminish the power of the patricians, and to elevate the plebeians without giving them any power, made a new division of the Roman people into six classes, which were subdivided into centuries. There has been much dispute about this division and the number of the centuries; and the controversy scarcely admits of decision, as the antient writers (Livius, i. 43, Dionys. Halicarn., *Antiq. Rom.*, i. 19-22, and Cicero, *de Republica*, ii. 22) are of different opinions. But the nature of the institution is not so doubtful. According to the more probable opinion, the 6 classes contained 193 centuries. The first class consisted of 18 centuries of knights and 80 centuries of those (*ditissimi*) whose fortune amounted to at least 100,000 asses; the second class (*ditiores*) contained 22 centuries, and consisted of those who possessed at least 75,000 asses; the third (*divites*) 20 centuries, and consisted of those who had a property of 50,000 asses at least; the fourth class (*mediocres*) 22 centuries, of those who possessed 25,000 asses at least; the fifth class (*modici*) 30 centuries, of those who possessed 12,500 asses; the sixth class contained but one century of capite censi, *i.e.* persons counted by head and not by estates: they were also called proletarii, or ærarii.

According to this division the Roman people met in the comitia centuriata, in order to vote in centuries on public matters; that is, a decree of the assembly was made by counting the votes of the centuries. As the first class alone contained more centuries than all the other classes together, it may be said that, as Romulus had created an aristocracy of birth by his division of curiæ, so Servius Tullius created an aristocracy of fortune by his new division. In order to prevent that disadvantage, when the plebeians had obtained more power, the century, which was to give its suffrages first, was appointed by lot. The century upon which the lot fell was called prærogativa. The other centuries voted according to the order of their classes, and were called jure vocatæ. The decision by lot being regarded as a divine omen, the centuriæ jure vocatæ commonly followed the vote of the centuria prærogativa; and thus the power of the first class was balanced in some measure. A contest however sometimes arose whether a matter was to be decided in the comitia centuriata or tributa.

Every Roman citizen (in the best sense of the word, *civis optimo jure*) had the right of giving his suffrage in the centuries. The magistrates who were competent to call these comitia were the consul, the prætor in the absence of the consul, and the dictator. The magistrate who presided sat on the sella curulis. On holydays (*feriæ*) comitia were not lawful; the days on which they could be held were called dies comitiales. The place of meeting was the Campus Martius. Before the business began the auspices were taken, and if they were not favourable the meeting was deferred to another day; but if no obstacle appeared, the business was opened by reading either the names of the candidates, or the proposition of a law (*rogatio*). Originally they gave their suffrages aloud (*vivâ voce*), but afterwards by tablets, or ballot; which mode of voting was established by the leges tabellariæ, in order to secure the freedom of election. It was not till after a long contest, commenced by the tribune Gabinius, B.C. 140, that the plebeians obtained the protection of the ballot.

As the comitia curiata originally possessed the sovereign power, so, after the time of Servius Tullius, it came into the hands of the comitia centuriata.

In the first place all legislation belonged to these comitia, and the enactments made by them only were called leges (laws), being obligatory upon all the Romans. A *lex* differed both from a decree of the senate (*senatus-consultum*), and from an enactment of the comitia tributa (*plebiscitum*), which only bound the respective estates of the patricians and the plebs. If a law was to be proposed to the comitia centuriata, it was to be promulgated (*promulgata*), that is, notice of it was to be given on three market-days before the day of assembly. The proposed law being accepted by the people, which they expressed by the term 'perferre,' was, after being confirmed by oath of the people, engraved on a public tablet and deposited in the ærarium.

Henceforward all magistrates, both ordinary and extraordinary, were elected at these comitia, as consuls, prætors, censors, decemvirs, and military tribunes. Those who sought for office appeared in a white toga (*toga candida*, and hence they were called *candidati*) before the people on three previous market-days. The candidate who was elected was proclaimed by the præco, or crier; and if this formality was not observed the election was null. Until the magistrate elected entered upon his office he was called 'designatus.'

The comitia centuriata were also the court of the people (*judicium populi*), for judging public crimes (*crimina publica*) of a grave kind, which were immediately directed against the state or people; as for example, attempts upon the freedom of the people, attempts of individuals to seize on the sovereign power, insult to or the murder of a tribune. Such a crime, which was called crimen perduellionis, was different from the crimen majestatis. (Heinecc., *Antiq.*, iv. 18, 46 and 47.)

3. The *Comitia tributa* were the comitia wherein the Roman people met and voted according to tribes. The plebeians having acquired considerable power in the state, these comitia were established, B.C. 491. Neither birth nor fortune gave advantage in these comitia, as was the case in the other comitia. Every Roman citizen who was classed or registered in a tribe was permitted to vote in these comitia. The place of meeting was not fixed, but the ordinary meeting-place was the Campus Martius; sometimes also the forum or capitol, or Circus Flaminınus. The same minute formalities with respect to the auspices were not necessary as at the comitia centuriata. The assemblies were called by a tribune, who also presided, if tribunes or ædiles were to be elected; but at elections of other magistrates, or if laws were to be made, consuls and prætors also might preside.

Soon after these comitia were established, all inferior magistrates, ordinary and extraordinary, were elected in them, as tribunes, ædiles, quæstors, proconsuls, and proprætors; the election of the pontifex maximus, and of various other religious functionaries, was made in these comitia. They also sat in judgment in certain inferior cases; but for capital punishments the comitia centuriata only had competent authority, and the trial of Coriolanus, as the story has come down to us, must be regarded as an anomaly and an illegal act.

It has been already mentioned that enactments made by the comitia tributa were called plebiscita, and at first bound only the plebeians. But as the power of the plebeians became enlarged by degrees, the plebiscita, after many contests between the plebeians and patricians, were made equal in effect to the leges, by the lex Hortensia, B.C. 288. (Gaius, i. 1.) From this time these comitia possessed the complete legislative power, thoroughly independent of the senate. Accordingly enactments for making war or peace, or granting a triumph, were frequently passed against the will of the senate.

In the later times of the republic, the management of the comitia became an important object both for ambitious aspirants to power, and for those who professed to maintain the rights of the people. Cæsar, after being made perpetual dictator, virtually concluded their authority by himself appointing consuls, and naming half of the other magistrates. Finally, the elections of the comitia became a mere formality.

(Sigonius *de Antiq. Jur. Civ. Rom.* i. 17.; Nic. Gruchii, lib. iii. *de Comit. Rom.*, *in Thes. Antiq. Rom.*, ed. Græevius, t. i. p. 531, seq.)

COMMA, in music (κόμμα), is the difference between two sounds whose ratio is 81 : 80; or, the difference between the major tone, C D ($\frac{8}{9}$) and the minor tone, D E ($\frac{9}{10}$). Practically considered, the comma is the ninth part of a major tone. Ptolemy thought so small an interval inappreciable: Salinas asserts the contrary. Maxwell (*Essay on Tune*) agrees with the latter, and gives the following rule for tuning the comma. Obtain G, stopped as the octave to the open fourth string (on the violin), and the difference between that note and the same taken as the greater sixth below the first open string, must be a comma. We refer those who wish to go deeper into this matter to Smith's *Harmonics*. But the clearest and fullest information on the subject is to be obtained from the *Théorie Acoustico-Musicale* of M. Suremain-Missery.

COMMAGE'NE, a small district on the west bank of the Euphrates, between the river and the range of Taurus; it is included by Strabo (Casaub. 749) in the general term Syria. The chief town was Samosata, a fortified place, which contained a royal residence; it was the birthplace of Lucian. The Zeugma, or one of the great passes of the Euphrates, was in Commagene; and on the opposite bank, in Mesopotamia, was the town of Seleuceia, in which Cleopatra, who had the name of Selene or Moon, was besieged by Tigranes, and being taken prisoner, was put to death. When Pompey the Great conquered Syria, he left the little principality of Commagene to Antiochus XIII., the son of Antiochus Eusebes, who died B.C. 58. Antiochus XIV., probably his son, was king of Commagene B.C. 36, at the time of the expedition of Ventidius, the legate of M. Antony against the Parthians under Pacorus.

COMMANDERY, a species of benefice attached to certain foreign military Orders, usually conferred on knights who had done them some especial service. According to Furetière, these Commanderies were of different kinds and degrees, as the statutes of the different orders directed. The name of Commandery in the order of St. Louis was given to the pension which the king of France formerly assigned to twenty-four commanders of that order, of whom eight received 4000, and sixteen 3000 livres each. The Order of Malta had commanderies of justice, which a knight obtained from long standing; and others of favour of which the grand master had the power of disposal.

In England, Commanderies were the same amongst the Knights Hospitalars as preceptories had been among the Knights Templars, viz., societies of those knights placed upon some of their estates in the country under the government of a commander, who were allowed proper maintenance out of the revenues under their care, and accounted for the remainder to the grand prior at London. At the dissolution of religious houses, in the time of Henry VIII., there were more than fifty of these commanderies in England, subordinate to the great priory of St. John of Jerusalem. A few of these held productive estates, and had even the appearance of being separate corporations, so much so as to have a common seal; but the greater part were little more than farms or granges. The Templars' term of preceptory was as frequently used to designate these establishments as the term commandery. (Furetière, *Dictionnaire Universel;* Tanner, *Notitia Monastica*, edit. 1787, pref. p. xvii.; Dugdale's *Monasticon Anglicanum*, last edit., vol. vi., pp. 786, 800.)

COMMANDINE, FREDERIC, born in 1509, at Urbino, of a good family, was at first in the service of Clement VII., after whose death he studied medicine at Padua. Unsatisfied with the state of this science, he applied himself to mathematics, and finally settled at Verona as the instructor of the Duke of Urbino and his son. He died there in September, 1575.

This is all that is generally stated as known of Commandine (though there is a life of him by Baldi, which we have never seen), except the evidence which his writings afford that he is to be placed at the head of all the commentators on the mathematics of the Greeks, whether as respects the care which he took to select and print valuable remains, (several of which would probably have been lost but for him) or the knowledge which he displayed in the treatment of difficult and corrupt texts. The list of works which we have collected is as follows. The dates stand at the beginning, and separate the titles.

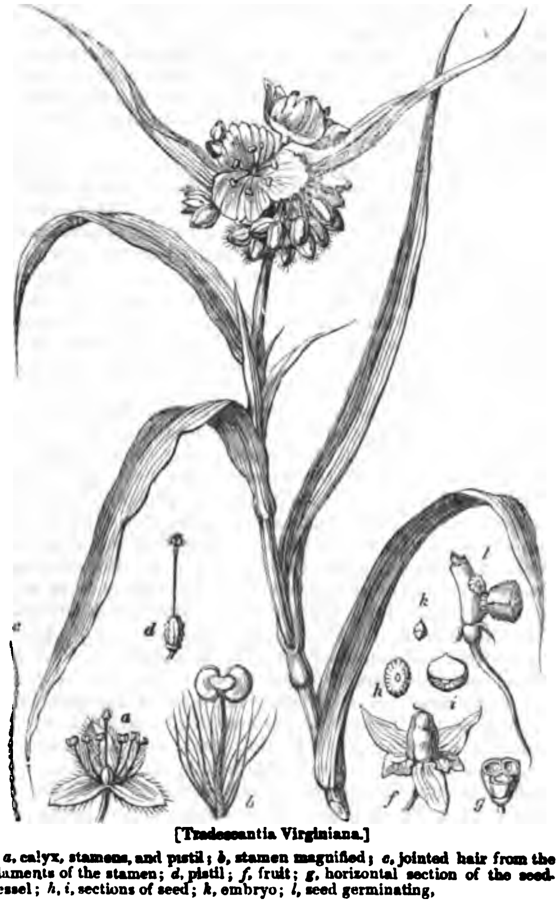
1558, Venice: the Psammites and Statical Treatise of Archimedes, in Latin, with notes (from a bad text). 1558, Venice: Ptolemy's Planisphere, with commentary, in Latin: in the same book is Jordanus, also with a commentary. 1562, Rome: the Analemma of Ptolemy, with commentary. The original is lost, but a mutilated Latin version was found by Commandine. With this came his own work on Horology, printed at Venice. 1565, Bologna; and Pesaro, 1572: Archimedes on Floating Bodies, with commentary, Latin. 1566, Bologna (and several other editions): Latin version of the four books (then known) of Apollonius, with the lemmas of Pappus, the commentary of Eutocius, and the book of Serenus on the Section of Cones and Cylinders. 1570, Pesaro: the book of Mohammed of Bagdad, on the division of surfaces, which John Dee, who found it, attributed to Euclid, and gave to Commandine. A translation into English, with Commandine's preface, is appended to the second edition of Dee's Euclid 1660. 1572, Pesaro: Euclid in Latin, fifteen books with scholia, in folio. An Italian version of the books most commonly read, under Commandine's inspection, appeared at Urbino in 1575. 1572, Pesaro: Latin edition of Aristarchus, with notes. [ARISTARCHUS.] 1575, Urbino; and Amsterdam, 1680: the Pneumatics of Hero, with Latin version and notes. 1588, Pesaro; again in 1602; and

Venice, 1589; lastly, at Bologna, 1660, edited by Manolessius: the mathematical collections of Pappus, books 3-8 inclusive, being all which remain, folio. It is sometimes stated that the edition of Pappus appeared in 1558, which is not correct, as Commandine died before the publication, which was superintended by his son-in-law, Valerio Spaccioli, as explained in the preface.

COMMELIN, JEROME, born at Douai, in France, in the sixteenth century, embraced the reformed religion and retired to Geneva, where he carried on the business of a printer. His abilities both as a printer and a scholar, which, in that age, were often united in the same person, attracted the attention of Frederic, Elector Palatine, who invited Commelin to Heidelberg, and made him his librarian.

At Heidelberg he published editions of several Greek and Latin authors, which were valued for their correctness; among others of Eunapius, the text of which he corrected by the MSS. in the Palatine library of Heliodorus, Apollodorus, &c., to which he added critical notes. He also published a handsome edition of 'Rerum Britannicarum Scriptores Vetustiores ac Præcipui,' fol., under the fictitious date of Lyon, 1587, dedicated to Frederic, Elector Palatine. This collection consists of Geoffrey of Monmouth, Pontius Virunnius, Gildas, Bede, Gulielmus Neobrigensis, Froissart, and Buchanan's 'De Jure Regni apud Scotos.' Commelin died in 1598. He has been praised for his accuracy and learning by Scaliger, Casaubon, and De Thou. Another of the same name, and probably of the same family, was a printer at Leyden in the seventeenth century, and published a valuable edition of Virgil, with Servius' Commentaries and numerous notes, 4to., Leyden, 1646.

COMMELINA'CEÆ, a very small order of tripetaloideous endogens, consisting of plants with sheathing leaves, white or most frequently blue flowers enclosed in a green spathe, and a single three-celled ovary terminated by a single style. They are moreover remarkable for their pulley-shaped (or *trochlear*) embryo lying in a particular cavity of the albumen. None of the species are European, nor of any known use. Many of them are common Indian weeds; others are handsome American herbaceous plants. The common Spiderwort is a good type of the order.



[Tradescantia Virginiana.]

a, calyx, stamens, and pistil; *b*, stamen magnified; *c*, jointed hair from the filaments of the stamen; *d*, pistil; *f*, fruit; *g*, horizontal section of the seed-vessel; *h*, *i*, sections of seed; *k*, embryo; *l*, seed germinating,

COMMELINUS, ISAAC, born at Amsterdam, 1598, wrote several historical works in the Dutch language, among others, 'Hollandsch Placaat Boek, or Collection of the Acts of the Government of Holland,' 2 vols. fol., Amsterdam, 1644; also a 'History of the Dutch East India Company,' 4to., 1646; the 'Lives of the Stadthouders William I and Maurice of Nassau,' fol., 1651; and the 'Life of Frederic Henry of Nassau,' which was translated into French; 'Histoire de la Vie et Actes Mémorables de Fréderic Henri de Nassau, Prince d'Orange,' fol., Amsterdam, 1656; which is an interesting historical work. He also collected the materials for a description of Amsterdam, which was published by his son, Caspar Commelyn, 1694, 2 vols. fol. according to Biog. Univ. 'Beschryvinge van Amsterdam, tot den jaare 1691,' fol., 1691, with plates; a second and enlarged edition of which appeared in 1726. It is considered a very good account of that important city.

Isaac died in 1676. His brother, James Commelyn, collected many curious and scarce historical documents concerning Holland, and wrote in French, 'L'Histoire des Troubles, Divisions, et deplorables Calamités des Guerres Civiles survenues dans les 17 Provinces depuis le Commencement du Règne de Philippe II., jusqu' à la Mort de Guillaume, Prince d'Orange,' which remains unedited, as well as his 'Actes et Privilèges des Villes de Delft et Leyden, et de leurs banlieues,' 3 vols. fol.

John Commelyn, son of Isaac, and a senator of Amsterdam, published, in 1697, a work in folio, with very fine plates, of the new plants then growing in the Medical Garden of that city. Caspar, the nephew of John, gave to the world a second volume in 1702, after which he became the author of two volumes in quarto upon similar subjects. At that time the Dutch held in their hands the commerce of the east, and the Commelyns were among the first who made known in Europe the curious plants of the Cape of Good Hope.

COMMENDAM, from 'commenda,' a term of the canon law, which, according to its original signification, was applied where the custody of a void ecclesiastical benefice was, during the avoidance, committed by the bishop or other superior to a person who was to discharge the spiritual duties attached to the benefice without meddling with the profits. The person to whose charge these duties were committed was said to hold the benefice *in commendam*. In process of time, this practice of honorary custody degenerated into an actual perception of the profits, and the device of holding livings *in commendam* was found by the ecclesiastics of the middle ages a useful method of evading the provisions of the canon law against pluralities. [BENEFICE.] By the law of England, no benefice can be held *in commendam* without a licence from the crown. The instance in which this prerogative has been most frequently exercised is where the parson of a parish has been made bishop of a see, the revenues of which were insufficient to support the dignity of the station. The only way to prevent the avoidance of a benefice by promotion to a bishopric, is to grant a licence to retain it *in commendam*. This dispensation is commonly called a *commendam retinere*. (Burn's *Eccles. Law*, tit. Commendam.) It must be obtained before consecration, in case of a person being raised to the episcopal dignity for the first time, or before confirmation, in case of a translation from one see to another. The effect of it, when so obtained, is to preserve the institution, induction, or other means by which the person obtained the benefice, in full force, notwithstanding his promotion. But if the dispensation is not obtained till after consecration or confirmation, it comes too late. There is, however, another kind of dispensation, called a *commendam capere*, which enables a bishop to take a benefice after consecration or confirmation. The consent of the patron of the benefice is essential to the validity of a commendam. Such consent, therefore, must be obtained in due form before a *commendam capere* will be granted, except where the bishop who seeks the commendam, or the king, is patron of the benefice. In the former case, the acceptance of the benefice, in the latter the grant of the commendam, is sufficient evidence of the patron's consent.

In the ordinary case where a *commendam retinere* is required on account of the incumbent being made a bishop, the king is himself patron of the benefice for that time by the promotion, and therefore no other consent than what is implied by the grant of the dispensation is necessary.

Not only dignities and benefices, but headships of colleges and hospitals, may be granted *in commendam*. Several instances of such grants are mentioned by Dr. Burn.

A licence to hold a benefice *in commendam* may be temporary or perpetual. When it is temporary, the precise time is limited in the dispensation. When perpetual, the dispensation expresses that the incumbent shall hold it so long as he shall live and continue bishop of the see to which he is about to be promoted. A temporary dispensation may be renewed or prolonged. If a bishop who holds a benefice *in commendam* is translated to another see, and so a new title accrues to the crown by a new promotion, the avoidance of the benefice may be prevented; but it must be by a new dispensation, giving him permission to hold the benefice *in commendam* with the new bishopric.

By the recent statute 6 and 7 Will. IV., c. 77, sect. 18, it is enacted, that 'no ecclesiastical dignity, office or benefice, shall be held *in commendam* by any bishop, unless he so held the same at the time of passing that act; and that every *commendam* in future granted, whether to retain or to receive, and whether temporary or perpetual, shall be absolutely void to all intents and purposes.'

COMMENSURABLE. Two magnitudes are commensurable which have a common measure. The peculiar part of this subject belongs to [Incommensurables, Theory of], and [Proportion], which see.

COMME'RCIUM EPISTO'LICUM (commerce of letters), a name which was at one time frequently given to published collections of letters, such as were common about the end of the seventeenth century and the beginning of the eighteenth. Thus we have the Commercium Epistolicum of Wallis in the second and third volumes of his works (1693 and 1699), that of Kepler (though his name does not appear in the title-page), published in 1718, and that of John Bernoulli and Leibnitz, published in 1745.

But the name by itself is generally understood to apply to the celebrated collection published by the Royal Society in 1712, in vindication of their decision upon the dispute between Keill and Leibnitz as to the right to the invention of the Differential Calculus, or Method of Fluxions. We have not space here to enter upon the subject-matter of the quarrel itself, but only to give some account of the Commercium Epistolicum, [referring for the rest to Newton, Leibnitz, Fluxions (Method of).]

In the year 1708, Newton and Leibnitz being then both alive, Keill, an astronomer, now better known by his concern in this matter than by his writings or discoveries, inserted in the Philosophical Transactions (No. 317) an article in which he defended Newton against the editors of the Leipsic Acts, who had spoken of Newton's Quadratura Curvarum as a secondary work in comparison of the previous writings of Leibnitz. He asserted that the method of fluxions was first invented by Newton, and that Leibnitz, changing the name and notation, had inserted it in the Leipsic Acts: his words will bear the construction that he conceived Leibnitz to be a plagiarist, but not that of his being an independent inventor. Leibnitz, on the receipt of this volume (March, 1711), complained of the accusation in a letter to Dr. Sloane (then secretary of the Royal Society); reminded him that on a similar accusation having been made a few years before by M. Fatio de Duillier, the Society and Newton himself had disapproved of it; pointed out the dishonourable stigma implied by Keill (whom he presumed innocent of all bad intention), and requested the interference of the Royal Society to induce him to disavow the intention of imputing fraud. Keill (in a letter to Dr. Sloane, May, 1711) denied that he meant to charge Leibnitz with having known the science of Newton by name and notation, but asserted that Newton had explained his Fluxions in two letters to Mr. Oldenburg (then secretary of the Royal Society), which were transmitted to Leibnitz; and that the latter either did draw, or at least could have drawn, the principles of Differentials from thence. On this subject he wrote a long detail of what he considered the proof of his assertion. Leibnitz, in another letter (December, 1711), complains that the charge was now more open than before; that he and his friends had never contested the independent invention of Newton; and that he appealed to the Royal Society and to Newton himself. The Royal Society accordingly appointed a committee, which collected and reported upon a large mass of documents, consisting mostly of letters from and to Newton, Leibnitz, Oldenburg, Wallis, Collins, &c. &c. Their report was to the effect that Leibnitz was in London at the beginning of the year 1673, from which time to September, 1676 (when he visited London before returning to Hanover), he was in correspondence with Collins and Oldenburg: that when first in London, he was in possession of a differential method, which was no other than that of Mouton: and that he never mentioned any other till he wrote a letter of June, 1677, being a year after a copy of Newton's letter to Oldenburg, of December 10, 1672, had been sent to Paris to be communicated to him, and four years after Collins began to communicate the contents of that letter. Also that by a former letter of Newton, of June, 1676, it appeared that he had been in possession of his Fluxions five years before: that Leibnitz's method is in fact the same as that of Newton, with a difference of name and notation: finally, that Newton being the first inventor, Keill, in asserting the same, had been no ways injurious to Leibnitz. This report, preceded by a large mass of letters or extracts, appeared in the year 1712, and again with a Recensio, &c. prefixed, and notes by Keill and others added, in 1725. It was translated into French, and was also published in a journal at the Hague. Leibnitz only protested in private letters against the injustice of the proceeding: he declared that he would not answer a reasoning so weak: and it appears moreover that he had on his mind an impression that the acrimony excited against him in England was political. He was in the service of the Elector of Hanover, the health of the queen was declining, and many of the men of science were Jacobites.

With regard to the Commercium Epistolicum, and the Report attached, it is obvious that the final conclusion was not to the point. The question was not whether Newton was the first inventor, but whether Leibnitz had stolen the method. The committee did not attempt to prove that Leibnitz had received the letter which was sent to Paris to be sent to Hanover; nor do they formally venture to assert their belief that Leibnitz was a plagiarist: but, with a subterfuge wholly unworthy of them, they conclude that because Leibnitz might have seen Newton's letter, &c., which they could not prove, Keill did him no injustice in asserting the priority of Newton's invention—which was not the matter of complaint. Moreover, they published much of their evidence in the form of extract, and their omissions are not always justifiable. It does not appear on the face of the report itself that Leibnitz knew of the appointment of the committee, or had any opportunity of stating any objections he might entertain to its members, or of furnishing any documents relating to the question under consideration. There runs throughout the extracts a desire of proving Leibnitz guilty of more than they meant positively to affirm. The latter acted wisely in appealing to posterity; for though party feeling long adopted the conclusions of the Report in England, it is now nearly, if not quite, the opinion of those who study the matter, that Leibnitz really was an independent inventor.

The part which Newton himself took in the matter at the time is not very well known. In the first edition of the Principia (1687), he stated (book ii., Scolium to Lemma 11) that ten years before (the scolium must probably have been written in 1686 at the very latest) he had communicated *in cipher* a single sentence to Leibnitz as a key to what he informed him was a method of drawing tangents, &c., and that Leibnitz not only wrote in reply, that he had fallen upon a similar method, but actually communicated it, and that he (Newton) found it to be the same as his own, except in notation and symbols. No doubt it was upon the strength of this scolium that Leibnitz confidently appealed to Newton himself: and we might have imagined that the question of the date of this letter would have formed a part of the inquiry. But we cannot find it alluded to: the publication of the Principia is mentioned in its proper place, without a word as to this scolium; nor can we find any allusion to it. We wish we could end here: but we are compelled to add, that this scolium was omitted by Newton in the third edition of the Principia (1725), and its place supplied by another, in which the name of Leibnitz is not mentioned, but an account of what Newton had written to Collins in 1672 begins and ends in nearly the same words. But it must be remembered that between 1687 and 1725 Newton had suffered that illness which perhaps impaired the powers of his mind, and certainly altered his disposition, perhaps even his memory: for in a letter preserved by Raphson, Feb. 26, 1715-16, he gives an account of the letter of Leibnitz differing in several particulars from the printed scolium.

The Commercium Epistolicum will be found complete in Horsley's edition of Newton, accompanied by additional letters extracted from Raphson's 'History of Fluxions,' London, 1715. The appendix contains the additional letters.

COMMERCY. [Meuse, Department of.]

COMMINATION (THE OFFICE OF), a service in the Liturgy of the Church of England. It is called 'A Commination, or denunciation of God's anger and judgments against sinners,' from the Latin word *comminatio*, a threatening or cursing. The Protestants at the Reformation introduced the reading of this comminatory service as a substitute for the antient and still continued Catholic ceremony of sprinkling the head, and making the sign of the Cross on the forehead with ashes, on the first day of Lent, hence denominated Ash Wednesday; but though it is ordered especially to be read on this day, the rubric adds, —'and at all other times as the ordinary shall appoint.' From Archbishop Grindall's Visitation Articles, published in 1576, it appears at that time to have been used on four days in the year, namely, on Ash Wednesday and on the third Sunday before Easter, Whitsuntide, and Christmas. The origin and object of the service will be best explained by the following extract from its commencement. 'In the primitive church there was a godly discipline that at the beginning of Lent such persons as stood convicted of notorious sin were put to open penance and punishment in thi world, that their souls might be saved in the day of the Lord, and that others, being admonished by their example, might be the more afraid to offend. Instead whereof (until the said discipline may be restored again, which is much to be wished) it is thought good that at this time (Ash Wednesday) should be read the general sentences of God's cursing against impenitent sinners.' The form of the Commination seems to be derived from Deuteronomy xi. 26-30 and xxvii. 1-26, which was afterwards strictly obeyed, as related in Joshua viii. 33-34, in the solemn rehearsal of a series of twelve curses from Mount Ebal by the Levites, with a response to each by the people. See a sermon on the 27th ch. of Deut., entitled 'the Commination Service vindicated,' by the Rev. Benjamin Camfield, 4to., 1680.

COMMINES. [NORD, DEPARTMENT OF.]

COMMINES. [FLANDERS, WEST.]

COMMINGES, a district of Gascogne, which is described in the *Dictionnaire Universel de la France* as being bounded on the north by Armagnac, on the south by the ridges of the Pyrenees which divide France from Spain, on the east by Bas or Lower Languedoc and by the district of Couserans, and on the west by Bigorre and part of Armagnac; but the subdivisions of Gascogne are so indistinctly or so variously laid down in most maps, as to make it difficult to ascertain or describe their true boundaries.

The country was divided formerly into Haut and Bas, or Upper and Lower Comminges, the southern part, towards the Pyrenees, being the Upper.

Comminges is now chiefly included in the department of Haute Garonne; some portions are included in those of Gers, Hautes Pyrénées, and Arriège. Among the towns comprehended in this district are St. Bertrand on the Garonne, and Lombes on the Save, a feeder of the Garonne, both formerly of episcopal rank; St. Girons, on the Salat (population 3634 for the town, 4381 for the whole commune); St. Gaudens, on the Garonne, (population 6179); Muret, on the Garonne, at the junction of the Louge, (population 2330 for the town, 3787 for the whole commune); and Aspet, (population of the commune 5575).

COMMISSION, in military affairs, is the document by which an officer is authorized to perform duty for the service of the state.

Antiently, in this country, the regular mode of assembling the national army, either to resist an invading enemy, or to accompany the king on a foreign expedition, was by sending a royal command to the chief barons and the spiritual lords, that they should meet at a given time and place with their due proportion of men, horses, &c. properly equipped, according to the tenure by which they held their estates; and these *tenants in capite* appear to have appointed by their own authority all their subordinate officers. But commissions were also granted by our kings to individuals, authorizing them to raise men for particular services; thus, in 1442, Henry VI. gave one to the governor of Mantes, by which the latter was appointed to maintain 50 horsemen, 20 men-at-arms on foot, and 210 archers, for the defence of that city. According to Père Daniel, the commission was written on parchment, and, that it might not be counterfeited, the piece was divided, by cutting it irregularly, into two portions, of which, doubtless, each party retained one.

Commissions of array, as they were called, were also issued by the crown, probably from the time of Alfred, for the purpose of mustering and training the inhabitants of the counties in military discipline; and in the reign of Edward III. the parliament enacted that no person trained under these commissions should be compelled to serve out of his own county except in the event of the kingdom being invaded. Of the same nature as these commissions of array was that which, in 1572, when the country was threatened with the Spanish invasion, Queen Elizabeth issued to the justices of the peace in the different counties, authorizing them to muster and train persons to serve during the war. Those magistrates were directed to make choice of officers to command bodies of 100 men and upwards; and such officers, with the consent of the magistrates, were to appoint their own lieutenants. This privilege of granting commissions to the officers of the national militia continued to be exercised by the lords-lieutenants of counties, the king having the power of confirming or annulling the appointments; and it was made law in the reign of Charles II. It appears, however, that before the Revolution, the lieutenants and ensigns were recommended for commissions by the captains of the companies.

In the French service, between the reigns of Francis I. and Louis XIV., we find that the sovereigns reserved to themselves the nomination of the principal commanders only of the legions or regiments, and that the latter were permitted to grant commissions under their own signature and seal to the subordinate officers, who were charged with the duty of raising the troops and instructing them in the use of arms.

In the British regular army, as well as in the navy, all the commissions of officers are signed by the king. In the navy, in the regiment of artillery, and in the corps of engineers and marines, the commissions are conferred without purchase; and to a certain extent this is the case with the commissions granted to officers of the line. Those cadets who have completed a course of military education in the Royal College at Sandhurst are so appointed. In other cases, gentlemen obtain leave to enter the army by the purchase of an ensigncy, the prices of which, in the different classes of troops, are regulated by authority; and they proceed to the higher grades on paying the difference between the price of the grade which they quit and of that which they enter.

The commissioned officers of a battalion of infantry are as follow: Field-officers—colonel, lieutenant-colonel, and major. Regimental officers—captains, lieutenants, and ensigns. Staff-officers—chaplain, adjutant, quarter-master, and surgeon.

For a statement of the prices of, and the fees on, commissions, see the monthly lists.

COMMITTEE, of either house of parliament, may be either of the whole House, or of a certain number of the members selected from the rest. When the House resolves itself into a committee of the whole House, the Speaker in the Commons, or the Lord Chancellor or whoever else is the ordinary Speaker in the Lords, leaves the chair, and the Chairman of Committees, a salaried officer, being one of the members, who is appointed by the House at the commencement of every parliament, takes his place. In the Commons the mace, which usually lies on the table, is at the same time placed under it. In a committee members are not restricted to a single speech on the question under consideration, but each may speak as often as he pleases. Another distinction in the Commons is, that the committee divides by the ayes merely going to the one side of the room, and the noes to the other, instead of one of the two parties going out into the lobby, as in divisions of the House. By the standing orders or established practice of both Houses, there are certain subjects that can only be brought forward in a committee of the whole House. For instance, all measures relating to the church must be so introduced; and in the Commons all propositions for the grant of money for the public service must be first made in such a committee, called a Committee of Supply; and all propositions for raising the money so granted, by taxes or loans, or otherwise, in another committee of the whole House, called a Committee of Ways and Means. No vote of a committee is of any force until it has been reported to the House, and the report received. The Committees of Supply, and of Ways and Means, always meet for the first time immediately after the commencement of the session, and are commonly continued very nearly to its close by leave to sit again being repeatedly granted by the House. Instructions directing, or otherwise to a certain extent controlling, their proceedings, are frequently issued to committees by the House, to which of course they are bound to attend. All public bills in both Houses are also considered in committees of the whole House, after the second, and before the third reading. Private bills cannot be introduced into either House, until the petitions of the parties interested for leave to bring them in have been referred to select committees; and every such bill is again referred to another select committee after the second reading. The members of select committees are commonly appointed by the open nomination of each, that is, in effect, by the vote of the House; but those of committees for trying contested elections in the House of Commons, are appointed by secret ballot. The investigation of any subject whatever that is brought before parliament may be referred to a Select Committee, and the proceedings of such committees are usually conducted in public; but sometimes a Committee of Secrecy, which takes evidence and deliberates with closed doors, is appointed, when the public safety or other reasons are considered to make that precaution expedient. A committee is generally empowered to summon witnesses, and to call for papers; but no committee of either House can administer an oath. A witness can only be examined on oath at the bar of the House of Lords.

There are some instances in former times of all the members of both Houses meeting together, at the request of one of the Houses, and such a meeting is described as a Committee of the Lords and Commons. What is called a Joint Committee of the two Houses, composed of a certain number of members selected from each, was formerly not unusual. Such a committee very much resembled a free conference; but it was sometimes resorted to after a free conference had failed to bring the two Houses to an agreement. As in the case of a conference, the time and place of meeting of a joint committee were always appointed by the Lords; and the practice was for that House always to appoint only half the number of members appointed by the Commons, a rule which is also observed in the case of a conference. A joint committee had no power to report anything more than the evidence taken by it; but still, as a division might take place on the motion for putting any particular question to a witness, the Lords have latterly considered that they were placed in a disadvantageous position in a meeting so constituted, and on the last two or three occasions on which a joint committee has been thought of the proposition has been given up on that account. In cases in which a joint committee would formerly have been appointed, the method that has of late been taken is for separate committees to be appointed by the two Houses, with power to communicate with each other. The forms at a joint committee made none of those distinctions between the Lords and Commons, which are made by the forms observed at a conference; all the members of the committee were on a perfect equality. (Hatsell's *Precedents* (edit. of 1818), vol. iii., pp. 38-45, 84-86, 169-201, *et alibi*.)

COMMITTEE OF PUBLIC SAFETY, Comité de Salut Publique, the name given to a committee of members of the National Convention, who exercised a dictatorial power in France for about fifteen months, which is known by the name of the Reign of Terror. The National Convention having abolished the royal authority at the end of 1792, and proclaimed the republic, found themselves invested with the whole sovereign power. They delegated the executive part of it to several committees of government, and placed a committee of public safety paramount over all. This committee consisted of ten members of the Convention, appointed for three months, but re-eligible indefinitely: they were commonly called the decemvirs. Their business was to watch over the conduct of the public authorities, and to promote the cause of the revolution. By degrees their powers attained a most extensive range; all the constituted authorities and public functionaries, civil and military, were placed under their immediate inspection. This was after the successful insurrection of the 31st of May, 1793, when the Mountain or terrorist party in the Convention gained the victory, by means of the armed multitudes of Paris, over their fellow-deputies of the Gironde party, who wished to govern the republic according to legal forms, and when the leaders of the Girondins were sent to prison and to the scaffold. From that time, Robespierre and his friends monopolized all the power of the Committee of Public Safety. By a decree of the Convention, 4th of December, 1793, the committee had the right of appointing and removing all the administrative authorities, all the agents and commissioners sent to the departments and to the various armies, and the agents sent to foreign countries. They were to watch and direct public opinion, and denounce all suspected persons. By another decree, of 28th of July, 1793, the Committee was invested with the power of issuing warrants of arrest. There was, besides, another committee, called de Sureté Générale, which has been sometimes confounded with the former, but was subordinate to it, and concerned itself with the internal police and judicial affairs. 'The Committee of Public Safety,' says a witness and a member of the Convention, 'did not manifest its ambition at the outset; it was useful at first. But that prudent conduct ceased after the revolt of the 31st of May, when the Convention, its several committees, and especially that of General Security, fell under the yoke of the Committee of Public Safety, which acted the part of the Council of Ten and of the three inquisitors of the Venetian government. Its power was monstrous, because it was in a manner concealed,—because it veiled its acts amidst the multitude of other committees,—because, by renewing itself perpetually from among men of the same stamp, it took away the responsibility from its members, although its measures were ever the same. The Committee concentrated itself at last in three of its members: Robespierre, who was the real chief, though half-concealed from view, and Couthon and St. Just. There was perfect unanimity among these three down to the moment of their fall; in proportion as the Mountain itself became divided, and its chiefs perished on the scaffold, the alliance between the three became more firmly cemented. There is reason to believe that they had resolved to perpetuate their power by establishing a supreme council of three consuls, in which Robespierre would have had the perpetual presidency, with the departments of justice, exterior, and finance; Couthon that of the interior, and St. Just the war department.' (*Histoire pittoresque de la Convention Nationale*, par un Ex-Conventional, 4 vols. 8vo., Paris, 1833.) The means by which these men contrived to maintain their usurped power are shown by Mignet in his History of the French Revolution. Acting in the name of the National Convention, the Committee were in fact masters of that assembly, which it obliged to adopt its reports and resolutions; it decreed the proscription of any member who resisted its will; it had at its command the armed multitudes of Paris and the suburbs, whose passions and fears it kept constantly excited by suspicions of royalists and traitors; it was supported by the numerous clubs and revolutionary committees distributed all over the country, the poorer members of which received by a decree of the Convention, extorted from that assembly on the 31st of May by the armed mob, an allowance of forty sols a day; and it sent commissioners to the armies, who impeached every general suspected of disaffection, and easily prevailed on the deluded soldiers to give him up. 'It had at its command the law against the suspected passed by the Convention, by which it could arrest any citizen; the revolutionary tribunals which summarily sent the accused to the scaffold; and the decrees of confiscation, forced loans and requisitions, and the maximum upon provisions, by which it disposed of the property of all.' This law of the maximum fixed the highest legal price of provisions and other necessaries, both for wholesale and retail dealers, forbidding them to demand more. (*Tableau du Maximum de la République Française décreté par la Convention Nationale le 6 Ventose, An II.*) The net was so widely spread that it took in all France; and a few obscure men exercised in the name of liberty a tyranny infinitely greater than that of the most arbitrary sovereigns of the old dynasty. In the Convention, from which nominally they derived their power, they were supported by a few bold men, who frightened the rest with the pikes of the mob and with threats of the scaffold. But when these men, Tallien, Barras, and others, discovered that they themselves stood in the way of Robespierre's ambition, and were destined to the common lot of the guillotine, they at once turned upon him and his friends of the Committee, and the majority of the Convention, which had through fear acquiesced in all their measures, immediately sided with them; the National Guards, weary of useless proscriptions, stood by their representatives, and Robespierre and his few friends found themselves alone, without any military man to support them. Even in the Committee of Public Safety, Collot d'Herbois and Billaud Varennes turned against Robespierre. On the 9th Thermidor, July 28, 1794, Robespierre, Couthon, and St. Just were executed. From that time the moderate party gradually, though slowly, acquired the ascendency in the Convention.

The most conspicuous members who sat in the Committee of Public Safety, besides the three above mentioned, were Collot d' Herbois, the destroyer of Lyon, Billaud Varennes, Cambon, who had under his inspection the department of finance, Barrere, who was secretary and reporter to the Committee, and Carnot, who occupied himself entirely with the military department, though his signature was affixed to several of the more obnoxious orders and dispatches sent by the Committee. Herault de Sechelles, who had at first a seat in the Committee, was sacrificed by Robespierre together with Danton, whose friend he was. The public accuser, or attorney-general, was Fouquier Tinville, a most strange and repulsive character; a political fanatic, gloomy, merciless, and disinterested, who seemed persuaded that massacre was the duty of a republican. After the fall of Robespierre, Fouquier Tinville was arrested, and tried on the charge of having sent to the scaffold multitudes of men and women of all ages without any legal forms. His trial lasted nineteen days; 400 witnesses were examined for and against him; he was convicted, sentenced, and executed in April, 1795. He died poor; his whole furniture was sold for 20*l.* sterling. At the same time, Barrere, Collot d' Herbois, and Billaud Varennes, although defended by Carnot on the plea of necessity, were sentenced to transportation to Cayenne. A reaction had now taken place in the popular opinion, which pursued the agents of the proscriptions at the bar of the Convention, when their former accomplices being obliged to give them up, endeavoured to throw the whole blame upon them.

Carrier, commissary at Nantes, who invented the Noyades, or wholesale drownings of the suspected in the Loire, and who was himself a member of the Convention, was ordered for trial. He said in his defence that he had only obeyed the orders of the Convention, in conformity with their general spirit, and that the Convention could not condemn him without condemning itself: he concluded by these remarkable words:—'If I am to be punished as guilty, every body and every thing in this hall is guilty, even down to the president's hand-bell.' He was sent however before the revolutionary tribunal, and condemned for having ordered arbitrary executions with a counter-revolutionary spirit; an absurd piece of jargon, characteristic of the times. He was beheaded 16th of December, 1794. There is a very curious memoir concerning Carrier and his trial in the 'Mémoires historiques et littéraires,' by M. de Barante.

COMMODORE (*Comendador*), in the royal navy, is the officer commanding a small number of ships of war, when detached for any particular service from the fleet. His rank is immediately below that of a rear-admiral, and he is classed with a brigadier-general in the army. His ship is distinguished by a red pendant at the mast-head. The title is sometimes given to the senior captain in a fleet of merchant ships.

In the French service, the commander of a detachment of ships is called *Chef d'Escadre*; and in the time of Louis XIII. the commander-general of the fleet was so called when he had not the rank of admiral.

CO'MMODUS, LUCIUS ÆLIUS AU'RELIUS, son of Marcus Aurelius and of his wife Faustina, was born A.D. 161. At the age of 16 he accompanied his father in his journey to Syria, which had been disturbed by the revolt of Avidius Cassius. On his return to Rome Commodus obtained his first consulship. He next accompanied his father in his last expedition against the Quadi and the Marcomanni, during which Aurelius died at Vindebona (Vienna), and Commodus became his successor A.D. 180. Having made peace with the northern tribes he returned to Rome, where he enjoyed a triumph. For a short time he appears to have governed with moderation, while several experienced officers, Albinus, Pescennius Niger, Severus, Pertinax, and others, made the name of Rome respected on the frontiers of the empire. Commodus, however, having dismissed the counsellors and friends of his father, gave himself up to the society of freedmen, gladiators, and loose women, with whom he spent his time in debauchery. His elder sister Lucilla conspiring against him with Pompeianus, Quadratus, and other senators, they were all seized and executed. Having put to death his own wife Crispina, Commodus took for his concubine Marcia, a mistress of Quadratus, who seems to have maintained some sort of influence over him till his death. But a succession of unworthy favourites engrossed all political power, and committed every kind of injustice and cruelty. Conspiracy after conspiracy was discovered or invented by them, and a number of the principal senators were put to death, and their property confiscated. The favourites themselves destroyed each other in succession. One of them, Perennis, was put to death with all his family, and was replaced by Cleander, a Phrygian freedman, who put up to sale all the honours and offices of the empire as well as the lives of the citizens. Meantime the legions in Britain mutinied, and Commodus sent Pertinax, who had been exiled by Perennis, to appease the mutiny. In Gaul also a soldier called Maternus collected a numerous band of deserters, but Pescennius Niger being sent against him, Maternus found means to escape with several of his followers, and came secretly to Rome with the intention of killing the emperor, but he was discovered and put to death. A dreadful pestilence afflicted Rome about the same time, which lasted three years, according to Dion. Commodus, to avoid the contagion, retired for a time to Laurentum, where he continued his usual dissolute mode of life. At last a revolt broke out at Rome against the favourite Cleander; the people repulsed the Prætorian cavalry sent against them, and Commodus, to appease the storm, ordered the favourite to be put to death. In the year 191, under the consulate of Apronianus and Bradua, the Temple of Peace, one of the most splendid buildings of Rome, took fire, and vast treasures, as well as collections of books, which were deposited in it, were consumed. The fire spread to the Temple of Vesta, from whence the Vestals ran away to the imperial palace, carrying the Palladium with them. The flames extended to the imperial palace also, and consumed part of it. In the following year Commodus was consul, for the seventh time, with Pertinax, whom he had recalled to Rome. Having had repeated information of Severus aspiring to the empire. Commodus wrote to Albinus in Britain offering him the title of Cæsar, which was refused. [CLAUDIUS ALBINUS.] At the close of his career, Commodus set no bounds to his extravagancies: he disregarded common decency, exhibited himself in the circus and the amphitheatre with the gladiators, dressed himself as Hercules, whose name he assumed, and on one occasion danced naked before the spectators. (Herodian., i. 15.) Being dissuaded by Marcia and some of his officers from degrading himself in public in the company of gladiators, it is said that he wrote down their names for execution, and that the scroll being found by Marcia led to a plot against his life. However this may be, poison was administered to him, and while suffering under its effects, a powerful athleta was sent in, who strangled him, A.D. 192, in his 32nd year and the 13th of his reign. Pertinax, who succeeded him, had his body buried privately, but it was afterwards transferred to the Mausoleum of Hadrian. (Dion, lib. 12, Lampridius, and Herodianus, i. 6—16.)

Commodus had the advantage of a good education and the example of a most virtuous father; he found the empire prosperous after a succession of wise reigns for nearly a century, with a number of able officers civil and military. He left it a prey to confusion, sedition, ill-repressed irruptions of barbarians, the army demoralized, and rival generals disputing for the supreme power. The visible and rapid decline of the Roman empire may be said to date from his reign. The plea of insanity, which is put forth for Caligula's short career of frenzy, cannot be extended to Commodus; his was decidedly a vicious and depraved disposition, which had a full opportunity of displaying itself in the possession of unlimited power.

Coin of Commodus.

British Museum. Actual size. Bronze. 338 grains

COMMON CHORD, in music. [Chord.]

COMMON LAW. In its most general signification the expression common law denotes the ordinary law of any country; when used in this sense it is called *common*, as prevailing generally over a whole country, in contradistinction to *particular* laws, the operation of which is confined to a limited district or to a peculiar class of inhabitants. In this manner the phrase is used in many countries which have adopted the civil law. In English jurisprudence the Common Law is that body of customs, rules, and maxims which have acquired their binding power and the force of laws in consequence of long usage, recognised by judicial decision, and not by reason of statutes now extant. The common law is therefore called, in early periods of our legal history, the 'lex et consuetudo Angliæ,' and at the present day the appellation is always used to denote the 'lex non scripta,' in opposition to the 'leges scriptæ,' or statutes. In addition to customs and usages, whose particular origin is unknown, many portions of the common law consist of statutes passed before the time of legal memory, viz., the beginning of the reign of Richard I., and which, though known historically to have been acts of parliament, have no authority as laws in that character, but derive their obligation from immemorial usage, recognised by judicial decision. The provisions of the common law are, however, quite as binding upon the subjects of England as acts of the legislature, being, as already said, impressed with the character of law by force of judicial decisions. In very early times it is probable that the system of rules which composed the common law was wholly traditional. As civilization advanced, the decisions of the king's ordinary courts of justice were carefully recorded, and became the most authoritative evidence of such customs and maxims as formed part of the common law, in precise analogy to the rule of the civil law, that what the emperor had once judicially determined was to serve as a guide in all like cases for the future. (Cod. I., tit. 14. 12.) In addition to the recorded judgments of courts, technically called precedents, the treatises of learned men, such as Bracton, Fleta, Britton, Staundforde's Pleas of the Crown, and Coke's Commentary upon Littleton, are acknowledged as depositories of the common law. Of the whole system the judges of the superior courts are the expositors; they declare the law by applying certain rules and principles to cases which come before them for judgment; but they have no power directly to add to or vary the law.

Learned writers have indulged in much speculation respecting the origin of the common law of England, though Sir Matthew Hale says it is 'as undiscoverable as the head of the Nile.' It seems however to be well ascertained that the customs which in antient times were incorporated with it, were of compound origin, and introduced at various times in conformity with the political vicissitudes of the country; some being Saxon, others Danish, and others Norman. It is also quite evident, from the adoption of the Roman terms of art and several Roman provisions, that many of the rules and maxims which the common law has adopted were derived from the civil law. Again, many parts of the common law have gradually arisen from the necessary modification of its antient doctrines and principles, in order to render them applicable to new states of society produced by enlarged commerce and advancing civilization. From this cause some branches of our system of jurisprudence have wholly sprung into existence in modern times. Thus almost the whole of the law of evidence, now perhaps the most important part of our practical jurisprudence, has appeared as part of the common law so lately as the time of the Commonwealth. But perhaps the most remarkable instance of the total change in common-law institutions with the progressive improvement of society, is the trial by jury, which may be traced through all its gradations, from a rude kind of trial, in which the jury were merely witnesses called from the neighbourhood in order that they might declare the truth to the judge, to the present artificial system, where the jury themselves decide upon the truth of facts by the testimony of witnesses examined before them. On the other hand, many rules and provisions of the common law have wholly disappeared, having either become obsolete from disuse, or been gradually abrogated by decisions of the judges as they became inapplicable to the altered state of society. So great has been the alteration of the common law which these accessions and abstractions have occasioned, that it can scarcely be termed with propriety the same body of laws that it was 600 years ago, unless it be upon the principle upon which Sir M. Hale maintains its identity, viz.: that the changes have been only partial and successive, whilst the general system has been always the same, 'as the Argonaut's ship was the same when it returned home as it was when it went out, though in that long voyage it had successive amendments, and scarce came back with any of its former materials.' (See Hale's *History of the Common Law;* Blackstone's *Commentaries*, vol. i., p. 63; and Reeve's *History of English Law*, vol. i.; Hallam's *Middle Ages*, vol. ii., *on the origin of the Common Law.*)

COMMON MEASURE, any magnitude which is contained an exact number of times in two other magnitudes. Thus in the case of numbers, 7 is a common measure of 56 and 700. The method of finding the greatest common measure is precisely the same both in the science of arithmetic and in that of concrete magnitudes. The proof may be briefly stated as follows: let A and B be two magnitudes, of which B is the less. Let A contain B m times, with a remainder R, or $A = m\,B + R$. Then it is easy to show that every magnitude which measures (or is contained exactly a number of times in) A and B both, measures m B and $A - m\,B$ or R; and also that every magnitude which measures B and R measures m B and $m\,B + R$ or A. That is, all measures common to dividend and divisor are common to divisor and remainder, and all measures common to divisor and remainder are common to dividend and divisor. Therefore, the greatest of the common measures of either pair is that of the other. Now carry on the division as follows until there is no remainder, which suppose to happen at the fourth step:—

$$\begin{array}{llll} \text{Let } A = m\,B + R & R & \text{is less than} & B \\ B = n\,R + R' & R' & ,, & R \\ R = p\,R' + R'' & R'' & ,, & R' \\ R' = q\,R'' & & & \end{array}$$

Then R'' measuring itself, and also R' or $q\,R''$, must be the greatest measure common to both, for nothing greater than itself can measure R''. But the greatest common measure of R'' and R' has been shown to be that of R' and R, which has been shown to be that of R and B, which has been shown to be that of B and A.

In the case of two numbers or fractions, a common measure must be found; for two whole numbers it must be a whole number, 1 at least, if not higher; for two fractions it must be a fraction. But in concrete magnitudes the process may continue without end, which indicates that the magnitudes are [Incommensurables], (which see for proof.) Hence the necessity, in all correct reasoning, of treating concrete magnitudes in the manner laid down in the fifth book of 'Euclid.'

In Algebra the corresponding process does not ascertain the greatest common measure, which depends upon the specific values of the letters; but only the highest common factor, or that which has the highest dimensions. This part of algebra is frequently rendered singularly obscure by the application of the arithmetical word. Thus, though the highest algebraical factor of $a^2 - x^2$ and $a^3 - x^3$ is $a - x$; this last is not the greatest common measure in all cases, as the reader may try by supposing a and x to be 8 and 6.

COMMON PLEAS, COURT OF, a superior court of record, having jurisdiction over England and Wales in all common pleas or civil actions commenced by subject against subject. It is at present composed of five judges, one of them being chief justice and the other four *puisne* justices. All are created by the king's letters patent.

This court has become stationary at Westminster Hall for several centuries. During the existence of the Aula or Curia Regis, established by the Conqueror in the hall of his usual residence, the palace at Westminster, that single tribunal exercised supreme jurisdiction over all temporal causes, which were adjudicated by the principal officers of the royal household, often assisted by persons learned in the law, called the king's justiciars. In this state of things, the poorer class of suitors in the common civil pleas or actions between man and man, in which neither the king's revenue, nor his character of prosecutor of offences on behalf of the public were concerned, laboured under the heavy inconvenience of either attending the frequent and distant progresses of the court, or of losing their remedies altogether. This evil, as well as the jealousy entertained by the crown of the ascendancy of the chief justiciar, who presided over the whole Aula Regis, occasioned the article in Magna Charta, that common pleas should not follow the king's court, but be held in some certain place. This court thereupon became gradually detached from the Aula Regis, and assumed its present separate form. It has ever since continued its sittings daily during the four terms of each year, without removal from the palace of Westminster or its immediate vicinity, except on a few occasions, in time of plague or contagious disease.

Before the passing of the late statute of 3 & 4 Will. IV., c. 27, this court had an exclusive jurisdiction in all those actions, which, as they concerned the right of freehold or realty, were called real, including as well those on which the common assurances of fines and recoveries passed, as the others which were commenced by the king's original writ out of Chancery. On this account it was styled by Coke the 'lock and key of the common law.' Since the abolition of the great mass of real actions by the above-mentioned act, dower and quare impedit are the only forms of action in which this court has exclusive jurisdiction; for in mixed and personal actions the King's Bench and Exchequer of Pleas have long exercised concurrent power.

In the original constitution of this court, and down to the beginning of the present reign, its proceedings in actions between persons not its officers were founded on original writs issued out of the Court of Chancery, though in process of time they did not actually issue except in cases where it became necessary to perfect the record. But now by a statute (2 Will. IV., c. 39,) introduced by the late Lord Tenterden, to secure the uniformity of process in personal actions in the three superior courts of law, certain forms of process, called writs of summons and capias, are provided as the only means for commencing personal actions in any of those courts, and may be issued from any of them.

Before 1830, the appeal from the judgments of this court was by writ of error to the justices of the King's Bench, a vestige of superiority resulting to the latter as constituting the remnant of that Aula Regis from which this court as well as those of Chancery and Exchequer have been gradually carved out. But now by 11 Geo. IV. & 1 Will. IV., c. 70, the judgments of this court can only be reviewed by the judges of the King's Bench and the barons of the Exchequer forming a court of error in the Exchequer Chamber; the further appeal is by writ of error returnable in the Lords' House of Parliament.

Till recently, the only persons admitted to audience as advocates in this court during its sittings in Term were serjeants-at-law. [SERJEANT-AT-LAW.] But by a royal warrant of his present Majesty, directed to the lord chancellor, in April, 1834, the right of practising, pleading, and audience in his Court of Common Pleas during Term time, was directed to cease to be exercised exclusively by the serjeants-at-law; and other counsel are to have an equal right with them so to practise there. The same warrant conferred on the existing serjeants, not being of counsel for the king, precedence at the bar (according to their seniority among themselves) next to the then junior king's counsel not being a serjeant. Those of the serjeants who had been specially retained for the crown, and were on that account styled king's serjeants, retained their old precedence before all other advocates, except the attorney and solicitor-general for the time being.

The rank of serjeant-at-law being no longer imposed by the crown without the consent or application of the individual, it is apprehended that this most antient and honourable degree will rarely be sought for by the modern barrister, it being lower in rank than the king's serjeants and king's counsel, without conferring a right to exercise exclusive advocacy in any court. It seems however that all persons elevated to the rank of judges of any of the three superior courts must still, as heretofore, be called to the degree of the coif.

COMMON, RIGHTS OF, in law, is the right of taking a *profit* in the land of another in *common* with him, whence the name arises. Such a right enjoyed in exclusion of the owner of the land seems not to be properly common, though belonging to several persons together.

The profits which may be the subjects of common are the natural produce of land (or water, which is included in the legal signification of land); such as grass and herbage, turf, wood, and fish. The commons relating to these subjects are accordingly called common of pasture, turbary, estovers, and piscary. Other things which cannot be called products of land, but rather part of the land itself, as stones and minerals, may also be the subjects of common right. Rights of way and other accommodations in the land of another, though enjoyed in common, do not bear that name, but are called *easements*.

Of all commons, that of pasture is the most frequent. It is the right of taking grass and herbage by the mouths of grazing animals. It differs from that general property, which may exist in the *vesture* or vegetable produce of the land, without any property in the land itself, and which is a corporeal hereditament; whereas all commons are incorporeal, 'as appears,' says Blackstone, 'from their very definition, an incorporeal hereditament being a right issuing out of a thing corporate, or concerning or annexed to the same.' 2 Bl. *Com.*, chap. 3. The same remark applies to other commons, the subjects of which—as for instance woods and mines—may belong as corporeal hereditaments to one, while the land generally belongs to another.

Common of turbary is the right of taking turf for fuel; and common of estovers is the right of taking *wood* for fuel, and for the repairs of houses, fences, and implements of husbandry. These supplies of wood are called fire bote, house bote (which includes the former), plough bote, and hedge or hay bote. These estovers or botes may also be taken by every tenant for life or years from the land which he himself occupies, but they are not then the subjects of *common* rights.

Common of piscary is the right of *fishery* in rivers not navigable; the right of fishing in the sea and in navigable rivers being common to all the subjects of the realm.

The extent of rights of common depends very much upon the *title* to them. There are four titles on which such rights may be founded; common right (which seems to be nearly the same thing as the common law), prescription, custom, and grant.

The title by common right arose with the creation of manors, when land was granted out in fee to be *held* of the grantor as *lord*. As such grants were forbidden by the statute '*quia emptores*' (18 Edw. I., c. 1), it follows that all commons appendant now existing must have been created before the date of that statute. The law allowed to every such grantee, of course, and of common right, common of pasture, turbary, estovers, and piscary in the *waste* of the lord, or that part of his lands which was neither taken by him into his *demesnes* or actual occupation, nor granted out by him to others. These implied rights of common however were allowed no farther than necessity seemed to require, and rights of common thus originating are still confined nearly within their antient limits. Springing from grants of land, they were considered as inseparably *appendant* to the land, so that they could not be severed from it without extinguishment. The common of pasture was confined to the purpose of maintaining, from seed time to harvest, the cattle of the commoner which were used by him in cultivating his land, and which that land would maintain through the winter, or which were, as the law styled it, *levant* and *couchant* upon it. Horses, oxen, kine, and sheep, used either for tilling or manuring land, were the *commonable* cattle. The land to which the common was appendant must have been originally arable, though the subsequent change of arable into meadow, &c. does not extinguish the right. Common of turbary appendant was confined to the purpose of supplying fuel for the domestic use of the tenant; and so strictly must this right be still confined within its antient limits, that it must be appendant to an antient messuage, and no more turves can be taken under it than will be spent in the house. Common of estovers appendant gives, as it gave originally, only the right of taking wood for the repair of antient fences and houses. Common of piscary appendant was only for supplying the tenant's own table with fish, and it must be still limited to this purpose.

Commons claimed by prescription (which supposes a grant) may be as various as grants may be. A right of common thus founded may be either annexed to land (when it is said to be appurtenant), or altogether independent of any property in land, when it is said to be *in gross*. If common of pasture, it may be for any kind of animals, whether commonable or not, as swine and geese. The number of animals may be fixed, or absolutely unlimited, and they need not be the commoner's own.

Common appurtenant may be severed from the land to which it was originally annexed, and then it becomes common in gross

The title to common by custom is peculiar to copyholders and may also give the commoner various modifications of right.

Right of common of pasture may also be claimed because of *vicinage*, or neighbourhood. This is where two wastes belonging to different lords of manors adjoin each other, without being separated by a fence. The cattle lawfully put upon the one common may then stray, or rather are excused for straying, into the other.

The rights of the owner of the soil over which a right of common exists, are all such rights as flow from ownership, and are not inconsistent with the commoner's rights.

Rights of common are conveyed, like all other incorporeal hereditaments, by deed of grant. When they are annexed to land, they will pass with the land by any assurance adapted to transfer the latter.

Rights of common are liable to be extinguished in several ways, and often contrary to the intentions of parties. It is a rule, that if the owner of common appurtenant purchases *any part* of the land over which the right extends, the right of common is *altogether* extinguished; it is the same if he release his right over any part of the land. This unreasonable rule however does not extend to common *appendant*, though that will be extinguished if the commoner becomes the owner of *all* the land in which he has common, and partial extinguishment of the common will follow from acquisition of part of the land. The enfranchisement of a copyhold to which a right of common is annexed extinguishes the right.

The most common mode of extinguishing rights of common in modern times is by inclosure under act of parliament. (See INCLOSURE; also generally on this subject Woolrych, on 'Rights of Common'; Comyn's *Digest*, tit. 'Common'; and Blackstone's *Commentaries*, book ii., chap. 3.)

COMMON, TENANCY IN, is one of the modes in which property may be held by several persons together. It comes the nearest to separate ownership, from which it differs in little else than that the shares held in common are not actually divided or marked out. As to alienation, transmission by descent, and other incidents of property, the law of undivided and of divided shares is the same. From the blending, however, of the shares, there necessarily arises some peculiarity in the mode of their enjoyment. When the profits of the thing held in common are partible (as corn growing in a field), they are generally actually divided among the tenants, and then the property of each most closely resembles separate property. It frequently happens, however, that this cannot be done; in which case the thing held in common must either be used alternately by the tenants (as a horse), or they must join in using it, as tenants in common of an advowson are required by law to concur in presenting to the church.

The shares of tenants in common may be either equal or unequal, and the quantity of their interests may be either equal or unequal. All may be tenants in fee, tenants for a term, &c., or one may be tenant in fee, and another tenant for a term, &c. It is necessary, however, that the possession of all be contemporaneous: successive interests are not a tenancy in common.

A tenancy in common may be created in several ways. If a joint-tenant, or coparcener, aliences his share to a stranger, the latter is a tenant in common with the remaining joint tenant or coparcener. If the sole owner of property alienes an undivided part of it, and retains the rest, the grantor and grantee are tenants in common. As to the words which, in a transfer of property to two or more persons, create a tenancy in common, or a joint-tenancy, many nice distinctions exist in the law. At common law, a conveyance of land to two simply, and without other words, made them joint-tenants, and not tenants in common; except in a few particular cases. (Litt., 283, 284.) This rule of law was founded on the feudal policy, which favoured the mode of holding property in joint-tenancy rather than in tenancy in common, because the former afforded room for the re-union of the property by survivorship (which is the characteristic incident of joint-tenancy) in a single individual, who might more effectually perform the duties belonging to the feudal tenure than several persons among whom the same burden was divided; and it is probable therefore that in the times of feudalism the intentions of grantors were fulfilled by involving joint-tenancy rather than tenancy in common. For a long time past however the courts have endeavoured, whenever they could, to raise by construction tenancies in common rather than joint-tenancies. But a tenancy in common might always be created by express words, and no technical expressions being necessary for the purpose, the courts have been enabled to lay hold of any words in a deed or will which appeared to them sufficiently expressive of a tenancy in common, in order to establish one. The misfortune however is that they have assumed greater latitude in this respect in the construction of wills and uses and trusts, than in the construction of common-law conveyances; so that the same words, as for instance the words 'equally to be divided,' often have different effects in different instruments.

The Courts of Equity have decided that in certain cases a simple conveyance to two or more makes them in equity tenants in common, and not joint-tenants, unless there is an express declaration to the contrary. This is the rule where a mortgage is made to two or more, and when an estate purchased by two or more is conveyed to them in unequal shares. This doctrine is sometimes in practice found very inconvenient.

A tenancy in common ceases as a matter of course, when the ownership of the several shares exists in a single individual: it can also be destroyed by partition made by the tenants. Any one of the tenants may compel the others, by suit in equity, to make partition of lands or houses held in common, except when the subject is in its nature not partible, as in the case of a living animal for instance.

Notwithstanding its many inconveniences, tenancy in common often occurs, being frequently created by wills and settlements in which property is given by suitable words to classes of persons together, as to children, or to a number of individuals by name.

COMMONS are wastes and pastures which have never been exclusively appropriated by any individual, but used in common by the inhabitants of a parish or district. Where extensive common rights exist, the mode of cultivating the inclosed land is greatly affected by it. All the cattle being maintained on the commons for a great part of the year, less land is laid down to grass, and only so much is kept in meadow as will produce hay to feed the cattle in winter weather, and when the commons will not sustain them. The consequence is, that the arable land is not well cultivated, little manure is made in the yards, and the rent is paid by the stock which runs on the commons, and which increases and grows without any expense to the owner. But it is a wasteful disposition of the land. Common pastures are never improved; no one will drain or clear them of weeds, still less manure them. The stock kept upon them is not by any means so numerous as could be kept on the same surface divided and improved. Hence most of the commons and common fields in Great Britain have been divided and inclosed within the last forty years. Wherever an inclosure has taken place the public has gained, even when the individuals immediately connected with the land may have suffered some loss, by not receiving an equivalent for the profit they had from the cattle which they contrived to keep on the commons.

The soil of commons within a manor belongs to the lord: if there is no manor, it belongs to the king. The herbage belongs in general to the tenants and other inhabitants of the manor or districts, according to fixed rules. Where commons are very extensive there is sometimes no restriction on the number of cattle which may be turned out on them. This is called *common without stint*.

The usual proportion given to the lord for his right in the soil on an inclosure is one-sixteenth. The remainder is divided among those who have a right of common in proportion to the land they possess, and on which their right depends.

Common fields differ from commons, in that they are divided for the purpose of cultivation; but as soon as the crop is off the ground, the cattle of all the proprietors, or of all the parishioners, as the custom may be, have a right of pasture over the whole in common. This system is incompatible with an improved husbandry, and common fields have been very generally divided and inclosed by particular acts of parliament. A late act greatly facilitates these inclosures, and will no doubt soon convert every remaining common field into enclosed farms.

COMMONS, HOUSE OF. The object of this article is to present a distinct though compendious view of the history and actual state of the House of Commons as a part of the Imperial Parliament of Great Britain and Ireland. In tracing the history of the English borough system, we have shown the origin of this house in the union of the assembled representatives of the cities and boroughs with those of the counties. It should be borne in mind that the original basis of the representation, in the time of Edward I., was very different from what we must suppose it would have been made, had the crown and its advisers at that period contemplated in this arrangement any such thing as the composition of a legislative assembly. The very large proportion of the whole number of its members that were sent from the towns, at a period when the population and general importance of the towns, as compared with those of the counties at large, were vastly less than they are now, was manifestly a circumstance repugnant to all the political notions and tendencies of the government of that day. It will be seen, on inspecting the subjoined table, that under Edward I. the town representatives bore so large a proportion to those of the shires as 246 to 74; and under Edward III. as 282 to 74. The reason why, on the first settling of the representative system into regularity and permanency, each constituency was uniformly summoned to elect *two* members, without regard to its known or presumed proportion of wealth or populousness, seems to have been very simple and very natural. So long as the parliamentary voice of the commons was confined to matters of taxation merely, the only thing that appears to have been seriously regarded in fixing the number of delegates was the securing such a delegation from each constituency as at the smallest inconvenience and expense to the latter should have full power to treat of the pecuniary business in question; and *two*, being the smallest number compatible with the important conditions of mutual consultation and joint testimony, was fixed upon as the number that imposed the smallest burden on the constituents, and was also most convenient for avoiding a too crowded assemblage of representatives. And thus it seems to have been that the periodical and frequent shire and borough courts presenting the most natural and convenient modes and occasions of appointing the parliamentary deputies of the several communities, two representatives, and two only, were summoned indifferently from the shire as from the borough, and from the largest shire or borough as from the smallest.

When the power and authority of the commons in parliament had become so firmly consolidated under the first three Edwards as to exercise an effective control over all the great measures of government, the composition of the representative body was an object of constant attention and solicitude to the crown. As the number and names of the counties entitled to send members admitted neither of doubt nor of dispute, the right of the *boroughs* became the first object of attack from that quarter. We have shown elsewhere how the attempts of this nature, made through the arbitrary exercise of the presumed power of the sheriff to select or omit boroughs, were defeated by parliamentary enactment of the 5th of Richard II.; as, in like manner, statutes were passed in the three following reigns to restrain the corrupt and irregular proceedings of the sheriffs both in county and in borough elections.

Hitherto, however, the parliamentary determinations of the commons, as regarded the constitution of their own house, had constantly tended to maintain the political rights of their constituents against invasion on the part of the crown. But that firm and lasting establishment of their own power as a distinct legislative body, which may be dated from the great revolution that first brought the house of Lancaster to the throne, seems, by that very additional security which it gave them against royal encroachment, to have tended to embolden the house, not, as formerly, to maintain the elective franchise to the utmost with the same zeal with which they upheld their own interest and independence as a legislative chamber, but to commence a sort of reaction against the constituent bodies by narrowing the basis of the suffrage itself. The earliest of these disfranchising enactments, and one of the most remarkable, is that of the 8th Henry VI., restricting the county franchise, formerly possessed by all freeholders, to such only whose freeholds were worth clear forty shillings a year, a sum at least equal to twenty pounds of the present day. The next remarkable instance, though very different in its nature, of legislative enactment respecting the constitution of the commons' house, appears in the parliamentary incorporation of Wales and Cheshire in the reign of Henry VIII (noticed more particularly in our account of the boroughs of England and Wales), which brought an accession of sixteen county and fifteen borough members.

The *borough* representation in general was still the great object of attention to the crown in undermining the independence of the House of Commons. Under the appropriate title we have traced at length the development of that part of its policy, as diligently pursued under the later reigns of the Tudors, and carried to the utmost limit by the Stuarts; 1st, by creating or reviving parliamentary boroughs, and at the same time remoulding their municipal constitutions according to the views of the court; 2nd, by proceeding to assimilate the municipal constitutions of the old parliamentary boroughs to those of this newly-created class. Here again we refer the reader to the subjoined list, and would particularly direct his attention to the fact, that of the 46 parliamentary boroughs first created in the reigns of Edward VI., Mary, and Elizabeth, no fewer than 27 appear in schedule (A) of the Reform Act of 1832, besides five of the same number which are in schedule (B): a very clear indication as to the description of places which were chiefly selected at that period to exercise for the first time the parliamentary franchise. In the same place we have shown that the last addition to the English representation, previous to the recent changes, was, under Charles II., the enfranchisement by statute of the county and city of Durham, and the creation by charter of the parliamentary borough of Newark. Nor must we forget to mention that James I., by virtue of his royal prerogative, had conferred the right of electing two members upon each of the two universities of Oxford and Cambridge, quite independently of the city and borough representation of those places already existing: thus introducing an anomaly, as well as novelty, into the representative system, a sort of forced alliance between learning and politics, emanating from the peculiar mental constitution and training of that prince.

Those who conducted the revolution of 1688 made much more effectual provision against the return of Roman Catholic ascendency than they did for the purification of the representative system. The Bill of Rights does, indeed, express, 'that the election of members of parliament ought to be free;' but this vague declaration seems to have amounted to nothing more than an indication of the prevailing public opinion on the subject. We find another strong proof that the public attention had now begun to be directed, not merely, as in former times, to upholding the authority of the Commons' House as constituted in parliament, but to the nature of the relations, on the one hand between the house and the constituent body of the nation, on the other between the several members and their individual constituencies, in the enacting of the statute commonly called 'the Triennial Act,' which deprived the crown of the power of continuing the same House of Commons for a longer period than three years. The Triennial Act of 6 and 7 William and Mary, c. 2, was an enactment wholly on the side of electoral freedom. The discretionary power previously exercised by the crown, not only of dissolving, but of continuing at pleasure, was highly favourable to any such view, on the part of the crown, as that of forming a tacit compact with a corrupt or servile majority of the Commons' House, and was therefore, as had been lately seen under Charles II., exceedingly convenient both to king and commons, when the latter happened to be sufficiently pliant. So strongly however was the popular opinion on this point expressed at the period in question, that it compelled the commons to persist in the measure in spite of King William's refusal of assent to the bill after its first passing the two houses, so that on the second occasion his assent was reluctantly yielded. The same activity of the public opinion of that day respecting the composition of the commons, produced the several Acts of that reign which disqualify various classes of placemen for seats in the house.

In this place we must notice the legislative union with Scotland, effected in 1707 by statute 6 Anne, c. 8, only to mention that it brought an accession to the English (which thereby became the British) House of Commons, of thirty members for counties, and exactly half that number for cities and boroughs; exhibiting between the numerical amount of the county and that of the borough representation a proportion quite the reverse, not only of that which existed in England, but of that which had previously appeared in the Scottish parliamentary representation.

The same reign presents us with an enactment of the

British House of Commons respecting its own future constitution, totally different in character from those of William III.'s time just referred to. This is the very important Act (9 Anne, c. 5), which established the qualification of landed property for English members, whether for counties or boroughs. In the reign of Henry VI., which gave birth to the enactment disfranchising the smaller county freeholders, was passed an Act, in the same spirit, restricting the choice of those freeholders who still retained the franchise. The very terms of this statute imply, that in the case of the counties as in that of the boroughs, there was originally no legal distinction between the qualification of the electors and that of the elected, but that the former were simply called upon to return two of their own number according to their own best discretion. The circumstance, too, of the daily expenses uniformly paid under legal obligation by the constituents to each representative while absent on parliamentary duty, may in this place be properly mentioned as a striking evidence of the fact, that the qualification of considerable property, how much soever it might be regarded in the judgment of the constituents, was, originally, not at all contemplated by the law. The statute in question (23 Henry VI., c. 14) declares, that thenceforward the county representatives shall be 'notable knights of the same counties, or shall be able to be knights,' that is, shall have freehold to the amount of 40*l* per annum, and that no man shall be eligible 'that stands in the degree of a yeoman or under.' On this legal footing the county representation remained until the ninth year of Queen Anne, when not only was the landed property qualification re-enacted for the counties on a scale nearly proportioned to the decrease in the nominal value of money, but an unprecedented step was taken, by including in the very same clause of the same Act a provision, that while every knight of the shire should possess a freehold or copyhold estate of clear 600*l*. per annum, so also every citizen, burgess, or baron of the Cinque Ports should have the like landed qualification to the amount of 300*l*. per annum. The statute of the 1st of George I., commonly called the Septennial Act, which extended the legal duration of parliaments from three years to seven, how cogent soever might be the political motives of the chief promoters of the measure, is another memorable instance of the lengths to which the House of Commons could now venture in dealing in a wholesale manner with the elective rights of its constituents.

After all that royal prerogative and parliamentary enactment had now done to undermine the originally free and independent basis of the national representation in general, little more seemed necessary in order to render the subversion of this part of the legislative constitution complete; and the door was permanently shut against the prosecution of any scheme for reforming or improving the constitution of the Commons' House, originating within that assembly. It would require volumes to describe the operation and effects of this great political machine during the period that followed—the period of its most absolute perversion to ministerial and to party purposes, and at the same time to trace the fearful and fluctuating conflict thus excited and protracted between the vitiated constitution of the house and the growing strength and intelligence of public opinion. It is no matter of conjecture; it is a momentous and significant fact in the history of this great political institution, that it was 'the pressure from without,' and that alone, forcibly stimulated, indeed, by the recent success of a popular revolution of government in a neighbouring country, that drove the House of Commons to compel, first the formation of a ministry pledged to amend the constitution of the representative body in general, and secondly, by adopting and perseveringly supporting the measure of amelioration consequently brought forward, to force the acquiescence of the hereditary chamber of the legislature in this degree of purification of the representative.

One of the most important operations of the British House of Commons during the period above mentioned, was the enacting of the statute, passed in 1800 and taking effect from January 1st, 1801, by which it incorporated the parliamentary representation of Ireland with that of Great Britain. For the previous history of the Anglo-Irish representation, and the degree of alteration made in it by the Act of Union, we refer to [PARLIAMENT OF IRELAND]. Sixty-four members for counties, thirty-five for cities and boroughs, and one for Dublin university, were thus added to the number of the British House of Commons. In this instance, as in that of the Scottish union, the antient proportion between the city and borough representation was reversed, and an additional weight consequently thrown into the scale of the county representation of the United Kingdom at large.

We now proceed to exhibit, in one general view, the state of the representative system of the United Kingdom as now existing, showing at the same time, under each of the appropriate heads, the nature and extent of the several important changes made by the Reform Acts of 1832. The following tabular form, to which reference is made in the subsequent paragraphs, will be found, on comparing it with the historical summary given under BOROUGHS OF ENGLAND AND WALES, to afford, besides the convenience of chronological and alphabetical arrangement, some interesting and useful illustration of the progress of the English borough system. In considering this table we must observe, that in stating the counties and boroughs as sending members continuously from the several reigns in which they respectively began to send, we have been obliged, for the sake of brevity and clearness, to abstain from distinguishing some of the boroughs, and, we believe, two or three of the northern counties, which, for reasons given above, and in our account of the boroughs of England and Wales, occasionally omitted sending in some of the earlier reigns. Nor could we conveniently specify such boroughs as, having once sent members, discontinued electing a long time ago, and have never since resumed their parliamentary existence. The most important as well as interesting object in exhibiting such a view, has appeared to us to be the showing the several epochs of English representative history that respectively gave birth to the parliamentary constituencies which subsisted at the introduction of the Reform Bill in 1831.

Parliamentary Representation of the United Kingdom, before the Reform Acts of 1832.

COUNTIES.

ENGLAND AND WALES.

[Continuous from the reign of Edward I.]

	Counties	Members.		Counties.	Members.
	Bedfordshire	2	F	Staffordshire	2
F 2	Berkshire	2	F	Suffolk	2
F 2	Buckinghamshire	2	F	Surrey	2
F 2	Cambridgeshire	2	F	Sussex	2
F	Cornwall	2	F	Warwickshire	2
F	Cumberland	2		Westmorland	2
F	Derbyshire	2	F	Wiltshire	2
F	Devonshire	2	F	Worcestershire	2
F 2	Dorsetshire	2		Yorkshire (2 added in 1821*)	4
F	Essex	2			
F	Gloucestershire	2		[From Henry VIII.]	
F	Hampshire	2		Anglesey	1
F 2	Herefordshire	2		Brecknockshire	1
F 2	Hertfordshire	2		Cardiganshire	1
	Huntingdonshire	2		Carmarthenshire	1
F	Kent	2		Carnarvonshire	1
F	Lancashire	2	F	Cheshire	2
F	Leicestershire	2		Denbighshire	1
	Lincolnshire	2		Flintshire	1
	Middlesex	2		Glamorganshire	1
F	Norfolk	2		Merionethshire	1
F	Northamptonshire	2		Monmouthshire	2
F	Northumberland	2		Montgomeryshire	1
F	Nottinghamshire	2		Pembrokeshire	1
F 2	Oxfordshire	2		Radnorshire	1
	Rutlandshire	2			
F	Shropshire	2		[From Charles II.]	
F	Somersetshire	2	F	Durham	2

* Transferred from the Cornish borough of Grampound, disfranchised for *too* flagrant bribery.

SCOTLAND.

In the British Parliament, from the Union under Anne.

Counties.	Members.	Counties.	Members
Aberdeen	1	Linlithgow	1
Argyle	1	Orkney and Shetland	1
Ayr	1	Peebles	1
Banff	1	Perth	1
Berwick	1	Renfrew	1
Dumbarton	1	Ross	1
Dumfries	1	Roxburgh	1
Edinburgh	1	Selkirk	1
Elgin	1	Stirling	1
Fife	1	Sutherland	1
Forfar	1	Wigton	1
Haddington	1	Bute and Caithness, alternately	1
Inverness	1	Clackmannan and Kinross, alternately	1
Kincardine	1		
Kirkcudbright	1	Cromarty and Nairn, alternately	1
Lanark	1		

IRELAND.

In the Imperial Parliament, from the Union under George III.

Counties.	Members.	Counties.	Members.
Antrim	2	Clare	2
Armagh	2	Cork	2
Carlow	2	Donegal	2
Cavan	2	Down	2

Counties.	Members.	Counties.	Members.
Dublin	2	Mayo	2
Fermanagh	2	Meath	2
Galway	2	Monaghan	2
Kerry	2	Queen's County	2
Kildare	2	Roscommon	2
Kilkenny	2	Sligo	2
King's County	2	Tipperary	2
Leitrim	2	Tyrone	2
Limerick	2	Waterford	2
Londonderry	2	Westmeath	2
Longford	2	Wexford	2
Louth	2	Wicklow	2

CITIES AND BOROUGHS.

England and Wales.

[Continuous from the reign of Edward I.]

City or Borough.	County wherein situated.	Members.
A Amersham	(Bucks)	2
Andover	(Hants)	2
A Appleby	(Westmorland)	2
B Arundel	(Sussex)	2
B Ashburton	(Devon)	2
Barnstaple	(Devon)	2
Bath	(Somerset)	2
Bedford	(Bedfordshire)	2
A Bedwin	(Wilts)	2
Beverley	(Yorkshire)	2
A Blechingley	(Surrey)	2
Bodmin	(Cornwall)	2
A Bramber	(Sussex)	2
Bridgenorth	(Shropshire)	2
Bridgewater	(Somerset)	2
Bridport	(Dorset)	2
Bristol	(co. of itself, locally between Gloucestershire and Somerset)	2
Bury St. Edmund's	(Suffolk)	2
B Calne	(Wilts)	2
Cambridge	(Cambridgeshire)	2
Canterbury	(co. of itself, locally in Kent)	2
Carlisle	(Cumberland)	2
Chichester	(Sussex)	2
Chippenham	(Wilts)	2
Cockermouth	(Cumberland)	2
Colchester	(Essex)	2
Coventry	(co. of itself, locally in Warwickshire)	2
Cricklade	(Wilts)	2
B Dartmouth	(Devon)	2
Derby	(Derbyshire)	2
Devizes	(Wilts)	2
Dorchester	(Dorset)	2
A Downton	(Wilts)	2
B Droitwich	(Worcestershire)	2
A Dunwich	(Suffolk)	2
Evesham	(Worcestershire)	2
Exeter	(co. of itself, locally in Devon)	2
Gloucester	(co. of itself, locally in Gloucestershire)	2
Great Marlow	(Bucks)	2
B Grimsby	(Lincolnshire)	2
Guildford	(Surrey)	2
A Hedon	(Yorkshire)	2
B Helston	(Cornwall)	2
Hereford	(Herefordshire)	2
Hertford	(Hertfordshire)	2
Honiton	(Devon)	2
B Horsham	(Sussex)	2
Huntingdon	(Huntingdonsh.)	2
A Ilchester	(Somerset)	2
Ipswich	(Suffolk)	2
Lancaster	(Lancashire)	2
B Launceston	(Cornwall)	2
Leicester	(Leicestershire)	2
Leominster	(Herefordshire)	2
Lewes	(Sussex)	2
Lichfield	(co. of itself, locally in Staffordshire)	2
Lincoln	(co. of itself, locally in Lincolnshire)	2
B Liskeard	(Cornwall)	2
Liverpool	(Lancashire)	2
London	(co. of itself, locally in Middlesex)	4
A Lostwithiel	(Cornwall)	2
A Ludgershall	(Wilts)	2
B Lyme-Regis	(Dorset)	2
Lynn	(Norfolk)	2
B Malmesbury	(Wilts)	2
Malton	(Yorkshire)	2
Marlborough	(Wilts)	2
A Milborne Port	(Somerset)	2
Newcastle-upon-Tyne	(co. of itself, locally in Northumberland)	2
Newport	(Hants)	2
New Sarum, or Salisbury,	(Wilts)	2
B Northallerton	(Yorkshire)	2
Northampton	(Northamptonsh.)	2
Norwich	(co. of itself, locally in Norfolk)	2
Nottingham	(co. of itself, locally in Nottinghamshire)	2
A Okehampton	(Devon)	2
A Old Sarum	(Wilts)	2
A Orford	(Suffolk)	2
Oxford	(Oxfordshire)	2
B Petersfield	(Hants)	2
Plymouth	(Devon)	2
A Plympton	(Do.)	2
Pontefract	(Yorkshire)	2
Portsmouth	(Hants)	2
Preston	(Lancashire)	2
Reading	(Berkshire)	2
B Reigate	(Surrey)	2
Ripon	(Yorkshire)	2
Rochester	(Kent)	2
St. Alban's	(Hertfordshire)	2
Scarborough	(Yorkshire)	2
A Seaford	(Sussex)	2
B Shaftesbury	(Dorset)	2
Shoreham	(Sussex)	2
Shrewsbury	(Shropshire)	2
Southampton	(co. of itself, locally in Hants)	2
Southwark	(Surrey)	2
Stafford	(Staffordshire)	2
Stamford	(Lincolnshire)	2
A Steyning	(Sussex)	2
Taunton	(Somerset)	2
Tavistock	(Devon)	2
B Thirsk	(Yorkshire)	2
Totnes	(Devon)	2
A Tregony	(Cornwall)	2
Truro	(Cornwall)	2
B Wallingford	(Berks)	2
B Wareham	(Dorset)	2
Warwick	(Warwickshire)	2
Wells	(Somerset)	2
A Wendover	(Bucks)	2
A Weobly	(Herefordshire)	2
Wigan	(Lancashire)	2
B Wilton	(Wilts)	2
Winchester	(Hants)	2
Windsor	(Berks)	2
B Woodstock	(Oxfordshire)	2
Worcester	(co. of itself, locally in Worcestershire)	2
Wycombe, Chipping	(Bucks)	2
A Yarmouth	(Hants)	2
Yarmouth	(Norfolk)	2
York	(co. of itself, locally in Yorkshire)	2
[Edward II.]		
A East Grinstead	(Sussex)	2
Retford	(Notts)	2
[Edward III.]		
Dover	(Kent)	2
Harwich	(Essex)	2
Hastings	(Sussex)	2
B Hythe	(Kent)	2
Kingston-upon-Hull	(co. of itself, locally in Yorkshire)	2
Maldon	(Essex)	2
B Midhurst	(Sussex)	2
Newcastle-under-Lyne	(Staffordshire)	2
Poole	(co. of itself, locally in Dorsetshire)	2
Richmond	(Yorkshire)	2
A Romney	(Kent)	2
B Rye	(Sussex)	2
Sandwich	(Kent)	2
Weymouth and Melcombe-Regis	(Dorset)	4
A Winchelsea	(Sussex)	2
[Henry VI.]		
A Gatton	(Surrey)	2
A Heytesbury	(Wilts)	2
A Hindon	(Do.)	2
B Westbury	(Do.)	2
A Wootton Basset	(Do.)	2
[Edward IV.]		
Grantham	(Lincolnshire)	2
Ludlow	(Shropshire)	2
Wenlock	(Do.)	2
[Henry VIII.]		
Beaumaris	(Anglesey)	1
Berwick-upon-Tweed	(co. of itself)	2
Brecon	(Brecknockshire)	1
Buckingham	(Bucks)	2
Cardiff, sharing with Aberavon, Cowbridge, Ken-fig. Llantrissent, Loughor, Neath, and Swansea	(Glamorganshire)	1
Cardigan, sharing with Aberystwith, Adpar, and Lampeter	(Cardiganshire)	1
Carmarthen	(co. of itself, locally in Carmarthenshire)	1
Carnarvon, sharing with Conway, Criccieth, Nevin, and Pwllheli	(Carnarvonshire)	1
Chester	(co. of itself, locally in Cheshire)	2
Denbigh, sharing with Holt and Ruthin	(Denbighshire)	1
Flint, sharing with Caergwrley, Caerwys, Overton, and Rhyddlan	(Flintshire)	1
Haverfordwest	(co. of itself, locally in Pembrokeshire)	1
Monmouth, sharing with Newport and Usk	(Monmouthsh.)	1
Montgomery	(Montgomerysh.)	1
Pembroke, sharing with Tenby and Wiston	(Pembrokesh.)	1
Radnor, sharing with Kevinleece, Knighton, Knucklar, and Rhayder	(Radnorshire)	1
[Edward VI.]		
A Bossiney	(Cornwall)	2
Boston	(Lincolnshire)	2
A Brackley	(Northamptonshire)	2
A Camelford	(Cornwall)	2
Maidstone	(Kent)	2
A Newport	(Cornwall)	2
Penryn	(Cornwall)	2
Peterborough	(Northamptonshire)	2
A St. Michael's	(Cornwall)	2
A Saltash	(Do.)	2
Thetford	(Norfolk)	2
A West Looe	(Cornwall)	2
Westminster	(Middlesex)	2
[Mary.]		
Abingdon	(Berks)	1
A Aldborough	(Yorkshire)	2
Aylesbury	(Bucks)	2
Banbury	(Oxfordshire)	1
A Boroughbridge	(Yorkshire)	2
A Castle Rising	(Norfolk)	2
A Higham Ferrers	(Northamptonshire)	1
Knaresborough	(Yorkshire)	2
B Morpeth	(Northumberland)	2
B St. Ives	(Cornwall)	2
[Elizabeth.]		
A Aldeburgh	(Suffolk)	2
A Beeralston	(Devon)	2
A Bishop's Castle	(Shropshire)	2
A Callington	(Cornwall)	2
B Christchurch	(Hants)	2
Cirencester	(Gloucestershire)	2
B Clitheroe	(Lancashire)	2
A Corfe Castle	(Dorset)	2
A East Looe	(Cornwall)	2
B Eye	(Suffolk)	2
A Fowey	(Cornwall	2
A Haslemere	(Surrey)	2
Lymington	(Hants)	2
A Minehead	(Somerset)	2
A Newtown	(Hants)	2
A Newton	(Lancashire)	2
A Queenborough	(Kent)	2
A St. Germain's	(Cornwall)	2
A St. Mawe's	(Cornwall)	2
A Stockbridge	(Hants)	2
Sudbury	(Suffolk)	2
Tamworth	(Warwickshire)	2
A Whitchurch	(Hants)	2
[James I.]		
Bewdley	(Worcestershire)	1
Tewkesbury	(Gloucestershire)	2
Tiverton	(Devon)	2
[Charles II.]		
Durham	(Durham)	2
Newark	(Notts)	2

Scotland.

In the British Parliament, since the Union under Anne.

Edinburgh city . . . 1 member.

Districts of Burghs.

Districts.	Burghs.	Counties wherein locally situated.	Members.
1	Dingwall	Ross	1
	Dornock	Sutherland	
	Kirkwall	Orkney	
	Tain	Ross	
	Wick	Caithness	
2	Forres	Elgin	1
	Fortrose	Ross	
	Inverness	Inverness	
	Nairn	Nairn	
3	Banff	Banff	1
	Cullen	Banff	
	Elgin	Elgin	
	Inverury	Aberdeen	
	Kintore	Aberdeen	
4	Aberdeen	Aberdeen	1
	Aberbrothwick	Forfar	
	Brechin	Forfar	
	Inverbervie	Kincardine	
	Montrose	Forfar	
5	Cupar	Forfar & Perth	1
	Dundee	Forfar	
	Forfar	Forfar	
	Perth	Perth	
	St. Andrew's	Fife	
6	Anstruther Easter	Fife	1
	Anstruther Wester	Fife	
	Crail	Fife	
	Kilrenny	Fife	
	Pittenweem	Fife	
7	Burntisland	Fife	1
	Dysart	Fife	
	Kinghorn	Fife	
	Kirkaldy	Fife	
8	Culross	Perth	1
	Dunfermline	Fife	
	Inverkeithing	Fife	
	Queensferry	Linlithgow	
	Stirling	Stirling	
9	Dumbarton	Dumbarton	1
	Glasgow	Lanark	
	Renfrew	Renfrew	
	Rutherglen	Lanark	
10	Dunbar	Haddington	1
	Haddington	Haddington	
	Jedburgh	Roxburgh	
	Lauder	Berwick	
	North Berwick	Haddington	
11	Lanark	Lanark	1
	Linlithgow	Linlithgow	
	Peebles	Peebles	
	Selkirk	Selkirk	
12	Ayr	Ayr	.
	Campbelstown	Argyle	
	Inverary	Argyle	
	Irvine	Ayr	
	Rothsay	Bute	
13	Annan	Dumfries	1
	Dumfries	Dumfries	
	Kirkcudbright	Kirkcudbright	
	Lochmaben	Dumfries	
	Sanquhar	Dumfries	
14	New Galloway	Kirkcudbright	1
	Stranraer	Wigton	
	Whithorn	Wigton	
	Wigton	Wigton	

Ireland.

In the Imperial Parliament, from the Union under George III.

Cities and Boroughs.	Counties wherein locally situate.	Members.	Cities and Boroughs.	Counties wherein locally situated.	Members.
Armagh	(Armagh)	1	Enniskillen	(Fermanagh)	1
Athlone	(Roscommon and Westmeath)	1	Galway	(co. corporate)	1
Bandon	(Cork)	1	Kilkenny	(co. corporate)	1
Belfast	(Antrim)	1	Kinsale	(Cork)	1
Carlow	(Carlow)	1	Limerick	(co. corporate)	1
Carrickfergus	(co. corporate)	1	Lisburn	(Antrim)	1
Cashel	(Tipperary)	1	Londonderry	(Londonderry)	1
Clonmel	(Tipperary)	1	Mallow	(Cork)	1
Coleraine	(Londonderry)	1	New Ross	(Wexford)	1
Cork	(co. corporate)	2	Newry	(Down)	1
Downpatrick	(Down)	1	Portarlington	(King's County and Queen's County)	1
Drogheda	(co. corporate)	1	Sligo	(Sligo)	1
Dublin	(co. corporate)	2	Tralee	(Kerry)	1
Dundalk	(Louth)	1	Waterford	(co corporate)	1
Dungannon	(Tyrone)	1	Wexford	(Wexford)	1
Dungarvan	(Waterford)	1	Youghal	(Cork)	1
Ennis	(Clare)	1			

Universities.

[From the reign of James I.]

Places.	Members	Places.	Members.
Cambridge	2	Oxford	2

[From the Irish Union under George III.]

Dublin . . . 1

With the aid of the foregoing table we now lay before the reader a view of the present state of the representative system, carefully indicating the alterations made by the acts of 1832 in those branches of it to which they apply.

1. *As regards the number and local limits of constituencies, and the number of representatives.*

COUNTIES.

England and Wales.—The number of county constituencies before the Reform Act was 52, returning collectively 94 members: viz. two for each county of England, except Yorkshire; four for the latter county; and one for each county of Wales. The several cities and boroughs which are counties-corporate were excluded from the limits of the several shires within which they were locally situated: viz., from Carmarthenshire, the town of Carmarthen; from Kent, the city of Canterbury; from Cheshire, that of Chester; from Warwickshire, that of Coventry; from Gloucestershire, that of Gloucester; from Yorkshire, the town of Kingston-upon-Hull, and the city of York; from Lincolnshire, the city of Lincoln; from Middlesex, London; from Northumberland, the town of Newcastle-upon-Tyne; from Dorsetshire, Poole; from Worcestershire, the city of Worcester; and from Hampshire, the town of Southampton.

The act has increased the number of constituencies to 82, by dividing into two electoral districts each of the 25 counties in schedule (F) of the act, and marked F in the foregoing table: constituting each of the three ridings of Yorkshire a distinct district for the same purpose; and in like manner severing the Lindsey division of Lincolnshire from the other portion of that county, and the Isle of Wight from Hampshire. The number of county members is raised from 94 to 159, as follows:—Two are assigned to each division of each of the counties in schedule (F) and of Lincolnshire; two to each riding of Yorkshire: one member is added to each of the seven undivided counties included in schedule (F 2) of the act, and marked F 2 in the above table; one to each of the three Welsh counties of Carmarthen, Denbigh, and Glamorgan; and one is assigned to the Isle of Wight, separately from Hampshire.

Scotland.—The number (30) of county constituencies and of county members, as existing before the Reform Act, remains unaltered. But for two of the 27 counties mentioned in the foregoing table, as returning one member each, viz., Elgin and Ross, are substituted Bute and Caithness, which before sent only in alternate parliaments; and the remaining six counties, instead of electing alternately as before, now return jointly as follows:—Elgin and Nairn, one member; Ross and Cromarty, one; Clackmannan and Kinross, one. To the last-mentioned electoral district are also annexed three whole parishes, and part of two others, detached by the act from the shire of Perth, and one entire parish from that of Stirling. And, to obviate the inconvenience arising from the great irregularities in the boundaries of some of the Scottish counties, it is enacted that all detached portions of counties shall, for election purposes, be held to be in the several shires within which they are locally included.

Ireland.—The Irish Reform Act of 1832 has made no change in the county representation as to local limits or number of representatives; two members being still returned for each of the 32 counties enumerated in the preceding table.

CITIES AND BOROUGHS.

England and Wales.—The whole number of the cities and boroughs, or districts of boroughs, previously to the act, was 208, returning collectively 415 members. For total extinction as parliamentary boroughs, those were selected the population of each of which, according to the parliamentary returns of 1831, was below 2000. Within this description came the 56 English boroughs in the above list to which the letter A is prefixed, returning collectively 111 members. For reduction from the sending of two representatives to that of one only, those were selected the population of which, according to the same census, was under 4000. These were the 30 English boroughs in the above list to which the letter B is prefixed, from whose proportion of the representation 30 members were deducted; to these must be added two members deducted from the four formerly sent by the united boroughs of Weymouth and Melcombe Regis; making altogether a total of 143 borough members struck out of the old frame of the representation.

Of the distribution of this number among the new constituencies of the United Kingdom (as the total number of members remains unaltered), we have here to speak only of the portion assigned to the populous parliamentary boroughs now created in England and Wales. To these was transferred the election of 63 members out of the 143 thus taken from the old constituencies. Of the 43 new boroughs, 22, containing each a population of 25,000 and upwards, and including the great metropolitan districts, were empowered to return two members each; and the remaining 21, containing each 12,000 inhabitants or upwards, to send one member.

New Boroughs created by the Reform Act, passed June 7, 1832.

City or Borough.	County wherein situated.	Members.	City or Borough.	County wherein situated.	Members.
Ashton-under-Lyne	(Lancash.)	1	Merthyr-Tydvil	(Glamorgansh.)	1
Birmingham	(Warwickshire)	2	Oldham	(Lancashire)	2
Blackburn	(Lancashire)	2	Rochdale	(Do.)	1
Bolton	(Do.)	2	Salford	(Do.)	1
Bradford	(Yorkshire)	2	Sheffield	(Yorkshire)	2
Brighthelmstone	(Sussex)	2	South Shields	(Durham)	1
Bury	(Lancashire)	1	Stockport	(Cheshire)	2
Chatham	(Kent)	1	Stoke-upon-Trent	(Staffordshire)	2
Cheltenham	(Gloucestershire)	1	Stroud	(Gloucestershire)	2
Devonport	(Devon)	2	Sunderland	(Durham)	2
Dudley	(Worcestershire)	1	Swansea, sharing with Aberavon, Ken-fig, Loughor, and Neath: formerly contributory to Cardiff, now detached	(Glamorganshire)	1
Finsbury	(Middlesex)	2	Tower Hamlets	(Middlesex)	2
Frome	(Somerset)	1	Tynemouth	(Northumberland)	1
Gateshead	(Durham)	1	Wakefield	(Yorkshire)	1
Greenwich	(Kent)	2	Walsall	(Staffordshire)	1
Halifax	(Yorkshire)	2	Warrington	(Lancashire)	1
Huddersfield	(Do.)	1	Whitehaven	(Cumberland)	1
Kendal	(Westmorland)	1	Whitby	(Yorkshire)	1
Kidderminster	(Worcestersh.)	1	Wolverhampton	(Staffordshire)	2
Lambeth	(Surrey)	2			
Leeds	(Yorkshire)	2			
Macclesfield	(Cheshire)	2			
Manchester	(Lancashire)	2			
Marylebone	(Middlesex)	2			

Contributory Boroughs added by the Reform Act in Wales.

To Beaumaris—	Amlwch Holyhead Llaugefrii	Anglesey
To Carmarthen—	Llanelly	Carmarthenshire
To Carnarvon—	Bangor	Carnarvonshire
To Denbigh—	Wrexham	Denbighshire
To Flint—	Holywell Mold St. Asaph	Flintshire
To Haverfordwest—	Fishguard Narberth	Pembrokeshire
To Montgomery—	Llanfyllin Llanidloes Machynlleth Newtown Welsh Pool	Montgomeryshire
To Pembroke—	Milford	Pembrokeshire
To Radnor—	Presteigne	Radnorshire

In the important matter of *boundaries*, two great objects were to be attained; the fixing of appropriate limits to the boroughs of large population newly created, and the extending the limits of the old boroughs in the many instances in which a considerable population had, in the lapse of ages, accumulated without the ancient boundary. A large agricultural district was also annexed, for the purposes of parliamentary election, to each of the four boroughs of Aylesbury, Cricklade, East Retford, and New Shoreham. And as regards the Welsh districts of boroughs, it may be observed that the principle laid down in the act of Henry VIII., that *all* the boroughs in each county should share the representation—a principle which the arbitrary interference of the Crown, and the decisions of election committees, had since rendered in many instances inoperative—was now restored in its full vigour.

Scotland.—The number of town representatives is raised from 15 to 23; two instead of one being assigned to the city of Edinburgh; two to that of Glasgow, detached from the district of burghs numbered 9 in the foregoing table; one to that of Aberdeen, detached from district No. 4; one each to the towns of Dundee and Perth, detached from district No. 5; and one each to the large modern towns of Greenock and Paisley. As regards the districts of burghs, their number, their general locality, and their proportion of members (one to each district), remain nearly as before; but as regards the particular places joined in the respective districts, the following alterations are made by the Reform Act:—To district No. 1 is added the town of Cromarty in the shire of that name, not before included in any district. To No. 3, in like manner, is added the town of Peterhead, in the shire of Aberdeen, before unrepresented. To No. 4, from which Aberdeen is detached, Forfar is transferred from No. 5; and the towns of Dundee and Perth being also detached from No. 5, the two remaining towns of that district, Cupar and St. Andrews, are now joined with the five previously forming district No. 6. The city of Glasgow being detached from district No. 9, the towns of Kilmarnock and

Port-Glasgow, before unrepresented, are added to it. In district No. 11, Peebles and Selkirk being disfranchised by the act, and merged in the counties in which they are respectively situated, the three formerly unrepresented towns of Airdrie, Falkirk, and Hamilton, are joined in their stead with the antient burghs of Lanark and Linlithgow. In No. 12, in like manner, the burgh of Rothsay is merged in the shire of Bute, and the town of Oban is substituted in its place. The great increase in the population of the maritime vicinity of Edinburgh has occasioned the creating of one district entirely new, comprising the three towns of Leith, Portobello, and Musselburgh, without, however, increasing the previous number of districts, the towns of No. 5, in the old arrangement, being all distributed in the new as above described. New and suitable parliamentary limits are assigned in the schedules of the act, as well to the several antient boroughs as to those newly created.

Ireland.—In the list of cities and boroughs sending representatives, no alteration is made by the Irish Reform Act; but two members each, instead of one, are assigned to Belfast, Galway, Limerick, and Waterford, thus raising the whole town representation from 35 members to 39. The limits of the parliamentary boroughs are defined, and to the greater number of them new limits are assigned, by the Boundary Act annexed.

UNIVERSITIES.

One member is added by the Irish Reform Act to the one previously returned by the university of Dublin.

2. *Elective Franchise.*

COUNTIES.

England and Wales.—Until the Reform Act, the parliamentary franchise in counties had remained without extension or alteration, as limited full three centuries before by the statutes of the 8th and 10th of Henry VI., the former of which confined the right to such 'as had freehold land or tenement to the value of 40*s.* by the year at least above all charges;' the latter to 'people *dwelling and resident* within the county, &c., whereof every man shall have freehold to the value of 40*s.* by the year. In order to render a man a freeholder, and complete his qualification for voting, it was necessary, not only that he should have a freehold interest in his lands and tenements, but that he should hold them by freehold tenure: consequently copyholders, holding by what is technically termed *base* tenure, as well as *termors*, having only a chattel interest in their estates, were excluded from voting. Doubts having been raised as to the right of copyholders, it was expressly enacted by the 31 Geo. II., c. 14, that no person holding by copy of court-roll should be thereby entitled to vote. The Reform Act extends the franchise by admitting not only copyholders, but leaseholders, and even occupiers, under certain limitations; and abridges it in some cases of freeholds not of inheritance, as also in all cases of land situate in a city or borough, and which being occupied by the proprietor would give him a parliamentary vote for that city or borough. In establishing the right to the county franchise, questions of tenure and interest have become of comparatively little importance, except as they are connected with value; for now what is commonly, though improperly, called a tenant at will (that is, from year to year) occupying land of the annual rent of 50*l.* has a right to vote for a county, without reference to the tenure by which the lessor holds the land, or the interest that he may have in it. By 18 Geo. II., c. 18, s. 5, it was enacted that no person should vote for a county unless he had been for *twelve* calendar months in actual possession of the rents and profits to his own use, except in particular cases. But by the statute of 1832, by s. 26 it is enacted, that no person shall be registered as a freeholder or copyholder, unless he was in actual possession of the rents and profits for *six* months previous to the last day of July of the year wherein he claims to be registered. Leaseholders and their assignees, and yearly tenants, must have occupied for *twelve* months before the same period, except in the cases excepted by the abovementioned statute of George II. Value, therefore, has now become the criterion upon which, in many cases, the right of voting wholly depends; and in all cases it is a most material subject of inquiry, in order to determine in what character, whether as freeholder, copyholder, leaseholder, or occupier, an elector should make his claim to be registered.

1. If lands or tenements are held at a yearly rent of 50*l.*, bare occupation, as tenant from year to year, is sufficient to qualify; no further interest in the lands, &c., being necessary, and it being immaterial by what tenure they are held. 2. So also is the occupation of lands, &c., of 50*l.* yearly value, as sub-lessee or assignee of any under-lease created originally for a term of not less than 20 years, how small a portion soever of the original term may remain unexpired. 3. The original lessee of a term created originally for 20 years, of lands of 50*l.* yearly value, or the assignee of such term, is entitled to vote in like manner, whether or not he is the occupier of such lands. 4. The occupier of lands of 10*l.* yearly value, as sub-lessee or assignee of any under-lease of a term of not less than 60 years. 5. So likewise the original lessee or the assignee of such a term of the lands of 10*l.* yearly value, is entitled, whether occupying or not; nor is the nature of the tenure material in any of the above cases; but twelve months' possession previous to the last day of July is required in all. 6. The being seised of an estate—whether of inheritance or for a life or lives—whether freehold, copyhold, or of any other tenure, to the like yearly value of 10*l.*, entitles.

Freehold lands or tenements of 40*s.* yearly value are still sufficient to give a vote in the four following cases:—

1. If it be an estate of inheritance. 2. If not an estate of inheritance, but only an estate for life or lives, if the elector was seised previously to the 7th of June, 1832 (the day on which the act received the royal assent), and continues so seised at the time of registration and of voting. 3. If acquired subsequently to that day, if the elector be in actual and *bonâ fide* occupation at the time of registration and of voting. 4. Or if acquired subsequently to that day, if it came to the elector by marriage, marriage settlement, devise, or promotion to any benefice or any office.

Of freehold or copyhold estates six months' possession, and of leasehold estates twelve months', is required, previously to the last day of July, in the year of registration, except they come by descent, succession, marriage, marriage settlement, devise, or promotion, &c.

Now, also, it has become material to consider how the lands or tenements are locally situated: for if they are freehold within a city or borough, and in the freeholder's own occupation, so as to confer a right to vote for such city or borough,—or if copyhold or leasehold, and occupied by him or any one else so as to give the right of voting for such city or borough to him or any other person,—they cease to qualify for a county vote.

However, by the 16th section of the act, an express reservation is made of all *existing* rights of suffrage possessed by county freeholders, provided they are duly registered according to the provisions of the act itself.

Scotland.—Under George II. enactments were made which rendered the proving of the old forty-shilling votes yet more difficult, so that many more of them disappeared, and at the close of the last century very few remained. Although the Scottish act of 1681 enacted that the right of voting should be in persons publicly infeoffed in property *or* superiority of lands of 40*s.* old extent, or of 400*l.* Scots valued rent, thus making a distinction, it should seem, between property and superiority, yet it was constantly interpreted to mean that superiors, that is, tenants-in-chief, or persons holding immediately of the crown, were *alone* entitled to vote. Thus proprietors of estates, of whatever value, holding from a subject, were excluded from the franchise. It is computed that in several counties nearly one-half the lands were held in this manner, and in the whole kingdom one-fifth of the lands were so held. The class of landholders thus excluded comprised not only the middling and smaller gentry, and the industrious yeomen and farmers who had inherited or acquired some portion of landed property, but also some men of estates worth from 500*l.* to 2000*l.* per annum; while many persons, who had not the smallest actual interest in the land, possessed and exercised the elective franchise. When a person of great landed property wished to multiply the votes at his command, his course was, to surrender his charter to the crown, to appoint a number of his confidential friends, to whom the crown parcelled out his estates in lots of 400*l.* Scots valued rent, and then to take charters from those friends for the real property, thus leaving them apparently the immediate tenants of the crown, and consequently all entitled to vote. This operation being open as well to peers as to great commoners, they availed themselves of it accordingly, thus depreciating or extinguishing the franchises of the smaller proprietors. This legal fraud began in the last century, and was chiefly practised subsequently to the accession of George III. Among the various modes by which it was performed, the most common were by life-rent charters, by charters on *wadset* or mortgage, and by charters in fee. The parliamentary representation of the Scottish counties therefore had, according to the expression of a learned lord, 'completely slid from its basis.' The total number of county voters, as compared with the number of persons directly interested in the property of the soil, was extremely small, and of these the number of real votes scarcely exceeded that of the fictitious ones.

The new basis of county suffrage appears, by the Reform Act for Scotland, to be assimilated, as closely as the difference between the modes of possessing and occupying lands, &c., in the two countries will permit, to the system established for England and Wales. While the old class of rights to the suffrage are preserved to the individuals in actual possession of them before March 1st, 1831, provision is made against their perpetuation; while the body of electors newly admitted consists of owners to the value of 10*l.* a year,—of leaseholders for 57 years or for life, whose clear yearly interest is not less than 10*l.*—of leaseholders for 19 years where such yearly interest is worth not less than 50*l.*,—of yearly tenants whose rent is not less than 50*l.* per annum,—and of all tenants whatsoever who have paid for their interest in their holding an amount not less than 300*l.* The same difference is made as in the English act, between the freeholder and the mere occupier, as to the *six* months' proprietorship required in the former case and the *twelve* months' occupancy in the latter; and the like exceptions from this condition as to the length of possession in favour of cases wherein either ownership or lease comes to a person by inheritance, marriage, marriage settlement, "*mortis causâ* disposition," or appointment to any place or office.

IRELAND.—The act of union made no alteration in the parliamentary suffrage of the Irish counties. The qualification of a freeholder remained the same as before, a clear annual forty-shilling interest for a life: and as it was customary in Ireland to grant leases on lives, freeholders were thus created whose votes, from their extreme poverty, and consequent inability to discharge their legal obligations to their landlord, were disposable by him as a matter of course. This practice of multiplying freeholds for election purposes merely was carried to an excessive and most mischievous extent, reducing the franchise almost to universal suffrage, among individuals who, by the very instrument by which they were professedly made free, were reduced to the most abject state of political bondage. Thus many of the counties, in choosing their representatives, lay under the absolute dictation of some great territorial proprietor; and there were few in which a coalition of two or three of the principal landowners would not determine the election according to their own wishes. Under these circumstances, the provision of the Catholic Emancipation Act of 1829, which raised the freehold qualification in the counties of Ireland from 40*s.* to 10*l.*, can hardly be regarded as a virtual disfranchisement.

The whole civil organization of Ireland having been introduced directly from England, and the system of tenures in particular being the same in both countries, the provisions of the Irish Reform Act which have reference to the territorial franchise are more strictly analogous to those of the act for England than those of the Scottish act could well be made, at least in appearance. The existing freehold rights being preserved here, as in the other two divisions of the empire, to their individual possessors, and the 10*l.* freehold franchise being already established by the above-mentioned provision of the act of 1829, the classes of electors newly created are—1, the 10*l.* copyholders; 2, lessees or assignees having a clear yearly interest of 10*l.* in a leasehold created originally for 60 years or upwards, or of 20*l.* in a leasehold of not less than 14 years, whether in their actual occupancy or not; 3, sub-lessees or assignees of any underlease in either of the two cases just mentioned, actually occupying; 4, the immediate lessees or assignees, and they only, having a 10*l.* yearly interest in a 20*l.* lease, and actually occupying. The like provision is made as in the English act, against any title to the county franchise being derived from any holding whatever that would entitle to vote for a city or borough.

CITIES AND BOROUGHS

ENGLAND AND WALES.—The want of any uniform basis of suffrage in the parliamentary boroughs, the endless diversity of the claims to its exercise derived from the various political as well as local influences that had operated upon them in the course of ages,—a diversity which the numerous, various, and often conflicting decisions of election committees of the House of Commons had additionally complicated and confused—was one of the most grievous defects of the old representative system. The generally prevailing custom, too, that the non-residence of borough voters entailed no disqualification, was one of the most serious evils comprised under this head. The new act has prepared the way for sweeping off all the claims to the franchise founded on the old and long-abused titles to borough freedom, by establishing a uniform qualification, resting chiefly on the basis of inhabitancy.

It provides, that in every city or borough which shall return members, every male person of full age and not subject to any legal incapacity, who shall occupy, within such city or borough, or within any place sharing in elections with it, as owner or tenant, any house, warehouse, counting-house, shop, or other building, either separately or jointly with any land, of the clear yearly value of not less than 10*l.*, shall, if duly registered, as directed in another part of the act, be entitled to vote in the election of members for such city or borough; provided always, that no such person shall be so registered in any year, unless he shall have occupied such premises for twelve calendar months previous to the last day of July in that year; nor unless such person, where there shall be a rate for the relief of the poor, shall have been rated to all rates for the relief of the poor made during such his occupation; nor unless such person shall have paid, on or before the 20th of July in the same year, all the poors' rates and assessed taxes due from him previously to the 6th of April preceding; provided also, that no such person shall be so registered unless he shall have resided for six calendar months previous to the last day of July within the city or borough, or within the place sharing in the election, or within seven miles thereof. The premises in respect of the occupation of which any person shall be entitled to be registered as a voter, need not be always *the same* premises, but may be different premises occupied in *immediate* succession by such person during the twelve calendar months previous to the last day of July: such person having paid, on or before the 20th of July, all the poors' rates and assessed taxes due before the 6th of April preceding, in respect of *all* such premises so occupied by him in succession.—Furthermore, when any premises in any such city or borough, or place sharing in the election, shall be *jointly* occupied by more persons than one, each of such joint occupiers shall be entitled to vote, in case the clear yearly value of such premises shall be of an amount which, when divided by the number of such occupiers, shall give a sum of not less than 10*l.* for each occupier. And in every city, borough, or place sharing in election, it shall be lawful for any person occupying as above specified in any parish or township in which there shall be a rate for the relief of the poor, to claim to be rated; and upon such occupier so claiming, and actually paying or tendering the full amount of the rates, the overseers are to put the name of such occupier upon the rates; and in case such overseers shall neglect or refuse so to do, such occupier shall nevertheless be deemed to have been rated.

The formerly anomalous position of cities and towns which are counties of themselves, as regards the possession of the elective franchise, is rectified by the act. Such counties of cities and towns are now included, for the purposes of county elections, in the several counties at large, or divisions of counties, in which they are locally situated—with this restriction only as regards freeholds *for life*;—that no person shall be entitled to vote in the election of knights of the shire, or of members for any city or town a county of itself, in respect of any freehold whereof such person may be seised for his own life, or for the life of another, or for any lives, except such person shall be in the actual occupation, or except the same shall have come by marriage, marriage settlement, devise, or promotion to any benefice or to any office, or except the same shall be of the clear yearly value of not less than 10*l.* It is further provided that in every city or town being a county of itself, in the election for which freeholders or burgage tenants, either with or without any superadded qualification, now have a right to vote, every such freeholder or burgage tenant shall be entitled to vote, if duly registered; but no such person shall be so registered in respect of any freehold or burgage tenement, unless he shall have been in actual possession thereof, or in receipt of the rents and profits for his own use, for twelve calendar months previous to the last day of July (except where the same shall have come to him, within such twelve months, by descent, succession, marriage, marriage settlement, devise, or promotion to any benefice or office), nor unless he shall have resided for six calendar months previous to the last day of July within such city or town, or within seven miles of it;—the limits of such city or town a county of itself, being, for the purposes of this enactment, those settled by the general parliamentary Boundary Act for England and Wales. Similar provision as to length of occupancy, &c., is made in the case of persons having a previous freehold qualification to vote for any of the boroughs of Aylesbury, Cricklade, East Retford, or New Shoreham.

Such are the provisions which constitute what is popularly called, by reference to their most prominent feature, 'the ten-pound householder qualification.'

But as in the settling of the places which were thenceforward to elect, and in apportioning the members, the new act made a large compromise with the old system, so also it made no inconsiderable one, for a season at least, in sparing to a certain extent the rights to the parliamentary franchise grounded on the old titles to borough freedom. In all such cases, however, it imposes the very important condition of *residence*. It provides that every person who would have been entitled to vote in the election of members for any city or borough as a burgess or freeman, or in the city of London as a freeman and liveryman, shall be entitled to vote if duly registered; and that every other person having, previous to the act, a right to vote in the election for any city or borough by virtue of any other qualification than those already mentioned, shall retain such right so long as he shall be qualified as an elector according to the usages and customs of such city or borough, or any law in force at the passing of the act, and shall be entitled to vote if duly registered; but in both of the above cases it is enacted that no such person shall be so registered unless he shall, on the last day of July, be qualified in such manner as would entitle him then to vote if such day were the day of election; nor unless for six calendar months previous to that day he shall have resided within such city or borough, or within seven miles from the place where the poll shall heretofore have been taken, or, in the case of a contributory borough, within seven miles of such borough. As regards the second class of voters last mentioned, it is further enacted that every such person shall for ever cease to enjoy such right of voting if his name shall have been omitted for two successive years from the register of parliamentary voters for such city or borough, unless he shall have been so omitted in consequence of his having received parochial relief within twelve calendar months previous to the last day of July in any year, or of his absence on naval or military service.

The expedient to which, to serve party purposes during the agitation of the Reform measure, many of the governing bodies of corporations had resorted, of admitting unusually large numbers of freemen, occasioned the following limitations of the above reservation of the elective franchise of freemen to be introduced into the act, viz.:—That no person who shall have been elected, made, or admitted a burgess or freeman since March 1st, 1831, otherwise than in respect of birth or servitude, or who shall hereafter be so, shall be entitled to vote; that no person shall be entitled as a burgess or freeman in respect of birth, unless his right be originally derived from or through some person who was a burgess or freeman, or was entitled to be admitted as such, before the said 1st of March, 1831, or from some person who since that time shall have become, or shall hereafter become, a burgess or freeman in respect of servitude; and that no person shall be entitled to vote for any city or borough (except it be a county of itself) in respect of any estate or interest in any burgage tenement or freehold which shall have been acquired by such person since the same 1st of March, 1831, unless it shall have come to such person previously to the passing of this act, by descent, succession, marriage, marriage-settlement, devise, or promotion to any benefice or office.

It is also provided in general that no person shall be entitled to be registered in any year as a voter for any city or borough who shall, within twelve calendar months previous to the last day of July in that year, have received parochial relief or other alms which, according to the previously existing law of parliament, disqualified from voting.

SCOTLAND.—Owing to the previous absence of all pretence or shadow of popular suffrage in the Scottish boroughs, the revolution made in their parliamentary constituencies by the Reform Act of 1832 is effected simply, completely, and at once. The franchise is taken from the members of the town councils and their delegates, in whom as such it was before exclusively vested, and a 10*l.* qualification, by ownership or occupancy, substituted in its place, with the like conditions, as in the English act, of twelve months' previous occupancy, payment of assessed taxes, registration, and non-receipt of parochial relief.

IRELAND.—In the Irish cities and boroughs the change immediately worked by the Parliamentary Reform Act is relatively greater than in England, owing chiefly to the fact that the municipal corporations of the former country existed in a state yet more thoroughly anomalous and corrupt than those of the latter. [CORPORATIONS (MUNICIPAL) OF IRELAND.] Here again, the actually existing and the inchoate titles to the parliamentary suffrage being reserved, as in the English act, on condition of residence within seven miles, and honorary freemen created since March 30, 1831, being excluded, the 10*l.* ownership or occupancy qualification is established as the new basis of suffrage, on condition of registration with *six* months' previous occupancy and payment of all rates due for more than one half-year. Reservation is also made, as in the English boroughs, of rights by freehold under 10*l.*, when accruing before the passing of the act, by descent, marriage, &c. The clause of the Catholic Emancipation Act, which raised the freehold qualification in counties at large to 10*l.*, left it at the old amount of 40*s.* in the several counties of cities and towns; but the Reform Act raises it there to the same scale as in the counties at large (only reserving for life the existing 40*s.* rights), and at the same time gives the parliamentary franchise for such corporate counties to the same classes of leaseholders, and on the same conditions, whom it admits in the counties at large.

UNIVERSITIES.

In the two English universities the parliamentary suffrage is independent of residence, property, or occupancy, being vested in the doctors and masters of arts of Cambridge and Oxford respectively, so long as they keep their names on the boards of their respective colleges. In that of Dublin, in like manner, it is possessed by the fellows, scholars, and graduates of Trinity College, on the like condition.

The establishment of a general and uniform system of registration of voters, calculated to obviate much of the inconvenience of contested returns, is another very important feature of the Reform Acts; for the various and rather complicated details of which we must refer the reader to the acts themselves.

Having thus given a view of the qualifications for exercising the parliamentary franchise as now established throughout the British Islands, it remains to notice the principal of those legal disqualifications which are of a personal nature, and operate independently of all proprietorship or occupancy.

Every woman, of whatever age, and however independently situated as to property and social relations, is as much excluded from voting as from being elected. As to age in male persons, the only exception is that which excludes all minors, that is, all who have not completed their twenty-first year. The exception which regards *aliens* is so natural and obvious that the bare mention of it may here suffice, as this is not the place in which to examine the various difficulties that in many cases have arisen and still arise in strictly defining who are aliens and who are not. By the antient 'law of parliament,' which forms an integral portion of the common law, lunatics are very reasonably incapacitated, as also are paupers in city or borough elections. It was resolved by the House of Commons in 1699 (14th December), that 'no peer of parliament' has a right to vote for members of that house. After the Union with

Ireland, this resolution, which was usually repeated at the beginning of every session, was altered into the following form: 'That no peer of this realm, except such peer of that part of the United Kingdom called Ireland as shall for the time being be actually elected, and shall not have declined to serve, for any county, city, or borough of Great Britain, hath any right to give his vote in the election of any member to serve in parliament.' The vast increase, since the commencement of the last century, owing to the establishment of so many new branches of revenue, in the number of persons employed immediately by the crown as revenue-collectors, occasioned the enactment of several statutes of exclusion from the parliamentary franchise. Thus the 22nd George III., c. 41, excludes every class of officers concerned in the collection or management of the excise, customs, stamp duties, salt duties, window and house duties, or in any department of the business of the post-office. By 3 George IV., c. 56, s. 14, it was first enacted that no justice, receiver, surveyor, or constable, appointed by that act at any one of the eight police-offices of the English metropolis, shall be capable of voting for Middlesex, Surrey, Westminster, or Southwark; and by 10 George IV., c. 44, which established the new system of police in certain districts of the metropolis (the operation of which has since been extended to meet the local extension of the police-system), it was enacted that no justice, receiver, or person belonging to the police-force appointed by virtue of that act, shall be capable of voting for Middlesex, Surrey, Hertfordshire, Essex, or Kent, or for any city or borough within the metropolitan district. Persons legally convicted of perjury or subornation of perjury, or of taking or asking any bribe, are thereby for ever incapacitated from voting.

As regards religious grounds of disqualification in general, it should be observed, that as no oaths are now required to be taken, nor declarations to be made, as a preliminary either to registration or to voting, all such disabilities as might have arisen from refusal to take or make them are of course removed.

3. *Qualifications of Candidates.*

Of the close relation so long subsisting between the grounds of the elective franchise and of eligibility, and which had sprung from their original identity, we find distinct traces in the similarity between the heads of disqualification in either case. Women, minors, aliens, and lunatics are of course excluded in the latter case as well as in the former. It would be needless to remark, that peers of *parliament*, that is, actual members of the House of Lords, are ineligible to the House of Commons, except in order to point out this distinction—that any Irish peer, not being among the twenty-eight sitting in the House of Lords for the time being as representatives of the Irish peerage, and being, therefore, though a peer of the realm, not a peer of parliament, is eligible to represent any constituency in the United Kingdom, although such is not the case with Scotch peers who are not representative peers. No person concerned in the management of any duties or taxes created since 1692 (except commissioners of the treasury), nor any officer of the excise, customs, stamps, &c., nor any person holding any office under the crown created since 1705, is eligible. In like manner, pensioners under the crown during pleasure, or for a term of years, are wholly excluded. Any member, however, who accepts an office of profit under the crown existing prior to 1705, though he thereby vacates his seat, is capable of being re-elected. Contractors with government are ineligible; and it is enacted, that if any person so disqualified shall sit in the house, he shall forfeit 500*l.* per day for so doing; and that if any person having a contract of this nature admits a member of the house to share in it, he shall forfeit 500*l.* to the prosecutor. Again, by 3 Geo. IV., c. 55, no police justice of the metropolis can sit in parliament.

The twelve judges for the time being are disqualified, as sitting in the House of Peers, though, as judges, they have merely a *consultative* voice there. The vice-chancellor also is excluded, though the master of the rolls is not. The exclusion of ecclesiastics from seats in the commons' house, seems not only to have been a natural result of the presumed urgency of their pastoral duties, but to have reference to the period when their share of those general contributions to the extraordinary exigencies of the state, the business of settling which, as we have already seen, first gave form and consistency to the parliamentary representation in general, was yielded by them as a distinct body. Sheriffs of counties, and mayors and bailiffs of boroughs, as being themselves returning-officers in parliamentary elections, are ineligible for the several districts respectively for which it is their duty to make returns.

The repeal of the Corporation and Test Acts in 1828, and the passing of the Catholic Emancipation Act in 1829, have worked one very important alteration in the constitution of the commons' house, by removing nearly altogether the widely-operating religious disqualifications which previously existed. The engagement, 'on the true faith of a Christian,' to abstain from all designs hostile to the Church as by law established, which the latter act has substituted for the oath and declaration formerly required, excludes no man professing Christianity in however general terms, and seems indeed to have no effective operation but against individuals of the Jewish race and creed, to whose admission this bar is still opposed.

Such are the chief personal disqualifications, at common law or by statute, from sitting in the commons' house of parliament; presenting, as already remarked, a general analogy to those existing against the voter.

We now come to the other branch of the subject, the qualifications by property and residence; and here, in the case of the English and Irish representation at least, the analogy no longer holds good. The landed qualification for an English, Welsh, or Irish member, remains as before the Reform Acts, viz., for a county member an estate of 600*l.* a year, and for a city or borough member, of 300*l.* To represent a university no property qualification is requisite. The only *personal* exceptions from this condition are in favour of the eldest sons of peers, of *bishops having seats in the House of Lords*, and of persons legally qualified to be county members. The qualifying property may be situated in any part of England, Wales, Ireland, or Berwick-upon-Tweed. As regards the Scottish part of the representation, it is worthy of especial remark, that the property qualifications enacted for England within a very few years after the union with Scotland, have never been extended to the latter portion of the kingdom; and that consequently the conditions of suffrage and of eligibility have remained there, according to the original constitution of the representative system in both countries, one and the same, excepting only the antiently essential condition of *residence*, which has long been done away throughout the United Kingdom without any reservation or limitation whatever; and excepting also that the Scottish Reform Act of 1832 has rendered unnecessary for county members the qualification of an *elector* formerly required.

Issuing of Writs for a General Election; Election Proceedings and Returns.

An essential and very important part of the representative machinery is that which regards the due transmission from the central to the local authority of the summons to elect, the superintendence of the election proceedings, and the due return from the local to the central authority of the names of the individuals chosen. When the Lord Chancellor, the highest officer of state, has received the written command of the king in council for the summoning of a new parliament, he thereupon sends his warrant or order to the highest ministerial officer acting under him, the clerk of the crown in chancery, to prepare and issue the *writs*, or written authorities for that purpose, to the several sheriffs, whether of counties at large or of counties corporate.

In the early periods of our history, when the shire-motes, or county courts, were held regularly once a month, and the borough courts once a week or once a fortnight, there was no need to incur the trouble and inconvenience of a special meeting of the members of those courts, that is, of the freeholders in the former case and the burgesses in the latter to elect the parliamentary representatives; and accordingly the sheriff was simply required to cause the election of the county members at the next county court, held in the regular course, or at an adjourned meeting of that court, in case such adjournment were necessary in order to allow time for giving due notice of the election. It was not until the importance of the county courts declined, that a different arrangement became necessary, nor was it until the 25th of George III., that it was enacted that the sheriff, on receipt of the writ, should call a *special* county court for the purpose of the election.

The writ, thus addressed under the great seal to the sheriff of a county at large, requires him not only to cause the election of the county representatives, but also of those of each city and borough within his jurisdiction. And accordingly, on receiving this command, he issues a *precept* under his own seal to the head of each municipality enjoying the elective franchise, which precept is to be returned to him within a limited time, together with the name of the person or persons chosen[*]; in like manner as he himself is bound to return, before a certain day previous to that on which the parliament is summoned to assemble, to the clerk of the crown, from whom he received it, the writ, with the names of the persons chosen, whether as county or as borough members. Such, in brief, as regards the returning-officers and responsible conductors of elections, has been the system from the commencement of the general representation.

In fourteen of the forty-three new and populous parliamentary boroughs created by the Reform Act for England and Wales, which had already a municipal or other chief civil officer or officers in whom this function could be appropriately vested, it is so entrusted by the Act. As regards the others, it is provided, that the sheriff of the respective counties shall, in the month of March in each year, by writing under his hand, to be delivered to the clerk of the peace for that county within a week from its date, and be by him filed with the records of his office, appoint for each of such boroughs a fit person resident therein to be the returning-officer until the nomination to be made in the March following. In case of such person's death or incapacity from sickness or any other sufficient impediment, the sheriff, on notice thereof, is forthwith to appoint in his stead a fit person, resident as aforesaid, to be the returning-officer for the remainder of the year. No person so nominated as returning-officer shall, after the expiration of his office, be compellable thereafter to serve again in the same office. Neither shall any person in holy orders, nor any churchwarden or overseer of the poor, be so appointed; nor shall any person so nominated be appointed a churchwarden or overseer during the time he shall be such returning-officer. Any person qualified to serve in parliament is exempted from such nomination as a returning-officer, if within one week after receiving notice of such appointment he make oath of his qualification before any justice, and forthwith notify the same to the sheriff. In accordance, however, with all previous usage, it is provided that 'in case his majesty shall be pleased to grant his royal charter of incorporation to any of the said boroughs named in the said schedules (C) and (D), which are not now incorporated, and shall by such charter give power to elect a mayor or other chief municipal officer for any such borough, then and in every such case such mayor or other chief municipal officer for the time being shall be the only returning-officer for such borough; and the provisions hereinbefore contained with regard to the nomination and appointment of a returning-officer for such borough shall thenceforth cease and determine.'

The division of both counties and boroughs into convenient polling-districts,—the shortening of the time of polling in contested elections, from the old period of fifteen days to two days in England, Wales, and Scotland, and to five in Ireland,—the restriction of inquiry at the poll into the elector's right to the ascertaining the identity of name and qualification with those contained in the register of voters (thus abolishing the old tediously litigious practice of election scrutinies),—and the limitation of the necessary expense of election proceedings, borne by the candidates or their proposers,—are among the more important of the recent improvements. For details, as we have already done in the case of the new system of registration, we must refer to the several Reform Acts of 1832.

Having thus given, we believe, a tolerably just though succinct view of the history and present state of the representative system of the British empire, so far as it can be distinctly shown without continual reference to the other branches of the legislature, we refer for an account of the organization and operations of the Commons, 'in parliament assembled' to a subsequent volume of this work. [Parliament, Imperial.]

There too may be the fit occasion for offering some indications of the future changes in its relative position as a branch of the legislature, to which the revolution recently commenced in its internal constitution must eventually lead. A word as to the progress of this internal revolution itself must conclude the present notice.

We have seen how the popular representation arose, first as a convenient, then as a necessary appendage to the feudal parliament of the Anglo-Normans. We have seen how, as early at least as the parliamentary settlement of the crown upon the house of Lancaster, that popular representation, under the title of the House of Commons, had become an effective, integral, independent, and solemnly recognized branch of the legislature. We have traced, from that period downwards, the twofold operation, of the crown in undermining this equal and sometimes preponderating independence of the Commons' House, and of that House itself in contracting the limits and abridging the rights of the constituent bodies, until the original constitution of the representative body itself was absolutely subverted. And last of all we have seen that which, in the present day, it is most interesting to consider,—the re-action of an enlarged and enlightened public opinion on the legal constitution of the House. In an historical view it is far less important to examine the merits of the late measures of representative amelioration in detail, than to mark the maturity of a new political element which they indicate, and the new line of constitutional progression which they have begun. No matter that the Reform Acts, as they are called, have made but a compromise with the exceeding corruptions and anomalies of the old system, and have left some of its most important usurpations untouched: no matter that the Commons' House, which in the days of its pristine vigour was democratic in the fullest sense of the term, is still, though somewhat popularized by the recent changes, a highly aristocratic body: we do not the less find in these changes a successful effort of the national intelligence and will, not so much to replace the legislative representation on the basis on which it stood at the close of the fourteenth century, and which, from the causes we have previously stated, was fixed without any scientific or symmetrical proportioning even of the number of representatives to that of constituents, but to mould it into some shape more accordant with the present advanced state of general information in the great body of the people; to render it, in short, a popular representation in fact as well as in name. Towards this point, how much soever they have fallen short of it, the late alterations by parliamentary enactment distinctly tend. The spirit that predominates in them plainly shows from what quarter the impulse came to which they owe their being; and it is a reasonable, at least, if not a necessary inference, that nothing short of a retrogression of the public intelligence can prevent the impulse from being repeated until the great object we have stated shall be completely attained.

COMMONS, IRISH HOUSE OF. [Parliament of Ireland.]

COMMONS, DOCTORS'. [Doctors' Commons.]

COMMUNION (the Latin *communio*, the Greek *κοινωνία*, *koinónia*) is used to designate the uniformity of belief by which a number of persons are united in one denomination or church, as the Roman Catholic, Anglican, or Lutheran communion. *Communio* is employed repeatedly in this sense in the canons of the Council of Elvira (Illiberitanum) A.D. 313. For the examination and comparison of scriptural passages, containing the words *κοινωνία* and *κοινωνεῖν*, the Greek Concordances of the New Testament may be consulted.

Communion is used more especially for the common or public act of sharing or participating in the sacrament, eucharist, or Lord's Supper. Of the origin and use of the word communion in this sense an account is given by Casaubon, *Exercitat.* 16, § 30. During the first three centuries the communion was celebrated every Sunday. (Bingham's *Origines Ecclesiasticæ*, vol. v. c. 9.) It was subsequently administered only three times in the year, namely, at Easter, Whitsuntide, and Christmas. By the general council of Lateran, in 1215, it was decreed, in order to check the apparent inclination in many to neglect it entirely, that every one should at least communicate at Easter, that is, once a-year. This injunction was afterwards renewed by the council of Trent. For an ample account of the antient communion service, *Missa Fidelium*, as well as of the ante-communior service, *Missa Catechumenorum*, we refer to Bingham, vol. v. c. 1 to 9

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[*] In the universities, the vice-chanceller, as returning-officer, receives and returns the sheriff's precept of election.

There was one form for the clergy, a second for the laity (vol. vi. c. 2 and 3), and a third and lowest form for strangers or foreigners. Degradation of the clergy to the lay form of communicating in one kind, that is, with bread and no wine, appears to have been an antient mode of canonical punishment. (*Apost. Can.* c. 14.) The bread appears never to have been omitted: the difference between communicating under one or two species or kinds, as it is termed, being solely in the omission or inclusion of the wine. The communion in two kinds seems to have continued in the Latin church until the end of the 11th century; for in 1099 Pope Paschal II. decreed that little children only should omit the wine, and that the wine alone should be given to those who, from extreme illness, could not swallow the bread. After this period the custom began to prevail of taking the wine by sopping it into the bread instead of drinking it out of the chalice. A letter by Ernulphus, bishop of Rochester, who died in 1124, commends this expedient for several reasons, one of the quaintest of which is, to avoid the profanation of wasting the consecrated wine by the dipping of bushy beards into the chalice. The communion under one species, that is, with bread alone, was authorized in 1415 by a decree of the council of Constance, and was confirmed by the council of Trent in 1562: but, with the exception of the Latin church, all the various sects of Christians have retained the communion under two species. During the first seven centuries the mixing of water with the wine was very generally considered as indispensable to the proper and efficient performance of the eucharistic rite. Justin Martyr, in his 'Apology,' written probably about the end of the first or beginning of the second century, observes that the mode of communicating was with a chalice of wine and *water*. It is unnecessary to quote passages from the subsequent fathers in confirmation of this fact. They all appear to have believed the water to be an essential ingredient; and several (Cyprian, *Epist.* 63, and Athanas. *in Psal.* 74) assign as the reason of it, that the pure wine of the mystic chalice represents the unmixed nature of God; the pure water represents the nature of faithful Christians; and the commixture of the wine and water represents the union of God and the faithful. A decree of the Œcumenic council, A.D. 691, denounces the Armenians as heretics for celebrating the communion with wine unmixed with water; and the 32nd canon of the council of Trullo decrees the deposition of every bishop or priest who shall omit the water. From the writings of Germain, patriarch of Constantinople; of Cabasilas; of Simeon of Thessalonica; of Balsamon, patriarch of Antioch; of Goar, in his Euchologia; and from the Greek Ritual, it appears to have been a long established custom in the Greek church to dilute the eucharistic wine with *hot* water, and to administer the mixture hot. To these remarks on the matter of the eucharist, we may add that Epiphanius (*Hæres.* c. 49) and Augustin (*Hæres.* c. 28) speak of an antient sect of Christians in Phrygia, followers of Montanus, who were called Artotyrites (*ἄρτος, τυρός*), because, in the communion, they used not bread and wine, but bread and cheese. (Pluquet, *Dict. des Hérésies.*) Others, the followers of Tatian, in the second century, made use of bread and water without wine, and hence were called Aquarians, and Hydroparastai. (Epiphan. *de Hæres.* 47; Augustin *de Hæres*, c. 25; Cyprian, *Epist.* 63.) This sect is also spoken of by Clemens Alexandrinus, and Chrysostom, and in the fifth century it was revived, with a declaration of motives of sobriety. There appears to have been a custom of communicating with consecrated bread and milk, for it is condemned by the council of Braga, in Spain, A.D. 675. The prevalent report in the first centuries, that the Christians celebrated the communion with flour which was kneaded in or with bread which was dipped in the blood of infants, slain or punctured for this purpose, appears to be applicable only to the Christian sects included under the denomination of Gnostics and Montanists; at least several of the Catholic fathers, in repelling the accusation from the orthodox, distinctly fix it upon these heretical sects. (Epiphan. *Hæres.* 26 and 48; Philastrius, *Hæres. Bib. Patr.* tom. 4, p. 13; Cyril, *Catech.* 16, p. 178; Augustin, *Hæres.* c. 26; Tertull. l. 2, *ad Uxor.* c. 5; Baronius, *An.* 120-129.) Until the seventh century the communion bread was that commonly used for food; a particular kind began then to be prepared exclusively for the purpose, of a circular form, and impressed with the sign of the cross. The Greek church adopts a leavened bread, but the Roman church has it unleavened; and this difference has been the cause of much controversy, though it seems easy to decide which kind was used by Jesus, the last supper having been on one of the 'days of unleavened bread,' when no other kind could be eaten in the land of Judæa. It has been a subject of still greater contention whether the proper posture of communicants is that of sitting, reclining, kneeling, or standing. In the third century standing appears to have been the usual posture. See Euseb. *Hist.* l. vii. c. 9; Tertull. *De Orat.* c. ult.; Chrysost. tom. i., *Hom.* 22, p. 260, *παραστῆναι τῇ ἱερᾷ τραπέζῃ*. It is also a subject of dispute whether the antient Agapæ (*αἱ ἀγαπαί*), which some modern sects continue under the name of love-feasts, were identical with the celebration of the eucharist. Probably these friendly repasts, so zealously continued throughout the four first centuries, were commenced or terminated by the act of communion; for they often took place in the churches until A.D. 360, when they were excluded from the churches by the council of Laodicea, on account of their having become scenes of indecorous conviviality. Tertullian, in his *Apol.* c. 39, minutely describes the proceedings of one which was conducted with propriety. The fathers frequently speak of the consecrated elements being carried home by the communicants, who gave them to the sick, or kept them deposited in their coffers as a charm against evil spirits, or bore them as a viaticum about their persons in travelling, and in voyages by sea. (Cyprian, *de Caps.* p. 176; Basil. *Epis.* 289; Ambrose, *de Obit. Satyri*, t. iv. p. 315; Cyprian, *de Spectac.*, p. 292; Justin. Mart. *Apol.* 1; Baronius, *An.* 57, n. 151.) Among the many purposes to which the sacramental symbols have been applied, we may notice an instance related by St. Augustin (*Contr. Julian.* l. iii. c. 164) of a child born blind who was perfectly enabled to see, after his mother had put upon his eyes a poultice made of the eucharistic bread and wine. In the first centuries it was customary to bury the eucharist with the dead; and though, by the council of Carthage, A.D. 419, and the Œcumenic council in 691, the custom was condemned, it still continued to prevail; and St. Cuthbert and many others were entombed with the consecrated bread on their breasts, as a safeguard against the molestation of demons. To heighten the intensity of a solemn asseveration, a few drops of 'the vivifying blood' were sometimes put into the ink with which the signature was written. Thus, in the eighth council of Constantinople, all the bishops signed the deposition of Photius with a pen 'dipped in the blood of the Saviour.' Thus Pope Theodore signed depositions; and thus Charles the Bold signed treaties of peace. (Baronius, *An.* 648.) It appears to have been always required that, after the serving of all the communicants, any portion of the consecrated elements which might be left should be immediately eaten by the officiating priests; and by the council of Toledo, in 693, the consecration of a prudent and moderate quantity is enjoined, in order to prevent repletion from eating all that remained. Hesychius (in *Levitic.* l. 2, c. 8) says, that, in the church of Jerusalem these remnants were burned; and Evagrius (*Hist.* l. iv. c. 35) informs us that, in the churches of Constantinople, the priests sent for a school of children to eat up any large quantity of fragments. To the work entitled 'An Inquiry concerning Infant Communion in the first Ages of Christianity,' we must refer for information on that point of the subject (vol. ii. p. 75); and also to the Essays on the Eucharist, by Pierce and Waterland. In the fifth century the communion was sometimes administered by women, and they continued to officiate at the altar in Italy and France until after the tenth century. (Pope Gelasius, *Epis.* 9 *to Bishops of Lucania*; *Epis. Ratherius Bishop of Verona.*) In the second century the eucharist began to be celebrated in the churches with closed doors, with the exclusion of all but the initiated, on which the Pagan philosophers accused the Christians of having adopted the Eleusinian mysteries of Ceres and Bacchus, bread and wine. (Augustin. *Contr. Faustum*, l. xx. c. 13.) 'The fathers,' says the Rev. Mr. Abthorp (*Letters on Christianity*, p. 365), 'adopted the language of the Eleusinian mysteries, and most incautiously applied it to the Christian worship: especially to baptism and the eucharist.' Many learned writers have noticed some remarkable points of resemblance in the Eleusinian mysteries and the Eucharistic rites, such as their being commemorative, and designed to effect a moral regeneration (*παλιγγενεσία*), or new-birth. See Abthorp *ubi supra*; and Casaubon *in Baronii Ann. exercit.* xvi. p. 478. On the different sorts of communion, see Albaspinæus; Du Pin; Anton. Dominicus; and the very elaborate *Histoire de l'Eucharistie*, by L'Arroque.

COMNENI FAMILY. [Alexis Comnenus.]

COMO, the province of, in the Lombardo-Venetian kingdom, is bounded to the north by the province of Valtellina, and the Swiss cantons of Grisons and Ticino, from which it is separated by several offsets of the Rhætian Alps; to the west by the Lago Maggiore, which divides it from the Sardinian territory, south by the province of Milan, and east by that of Bergamo. The length of the province of Como, north to south, is about forty miles, from Mount S. Giori, on the frontiers of the Grisons, to the borders of the province of Milan, near Missaglia. Its breadth is very irregular. The east or larger division of the province incloses the whole length of the lake of Como, the Larius of the Romans, a fine piece of water, long, narrow, and tortuous, full of promontories, gulfs, and little bays. Its most northern extremity forms a sort of distinct lake, called Laghetto, which is joined to the other part by a narrow channel. At the junction of the Laghetto with the great lake, the Adda, coming from Valtellina, enters it on the east side. The lake then extends nearly due south for fifteen miles; after which it divides into two branches: one to the south-west, which is about eighteen miles in length, retains the name of Lake of Como, the city of that name being at the extremity of it; the other branch runs south-east for twelve miles, and is called Lago di Lecco, from the town of that name. The Adda issues out of the lake at Lecco. The breadth of the lake is very unequal; towards the middle, just above the separation of the two branches, it is about three miles, but in most other places it is only between one and two miles. Two ridges or projections of the Rhætian Alps encompass the basin of the lake: one proceeding from the group of the Splugen runs parallel to the west bank, and divides it from the basin of the Lake of Lugano, the level of which is more than 200 feet above that of the Lake of Como. The highest summit in this ridge, called Monte S. Giori, or Iöri Berg, which rises on the north borders of the province of Como, and between it and the Canton Ticino, is about 9000 feet above the sea. The other or east ridge is an offset of the chain which divides Valtellina from Lombardy, and which forms a high summit to the north-east of the Lake of Como, called Monte Legnone, about 9000 feet, and then runs south, parallel to the east bank of the lake, dividing the province of Como from the Val Brembana, in the province of Bergamo. These two ridges sink lower and lower as they advance to the south, until at last both merge into the great plain of Lombardy. They send out many offsets towards the lake, forming transverse valleys, which are drained by numerous streams which empty themselves into the lake. The banks of the lake are one of the most delightful regions of Italy, the climate being mild and genial, the soil productive in fruits and vegetables, and the country studded with thriving villages, and fine villas or mansions of noble and wealthy families. Sailing up the lake from Como, we see a succession of villas on both banks, the Villa d'Este, those of Tanzi, Pasta (belonging to the celebrated singer of that name), the Villa Belvedere near Blevio, and those of Mugiasca and Passalacqua near Moltrasio. Opposite Moltrasio, and on the right or east bank, is the pretty village of Torno, and the villa called Pliniana, on account of the intermittent spring which Pliny the naturalist (ii. 103) describes, and which continues to exhibit the same phenomena, which are described also, though with some discrepancy, by the younger Pliny (iv. 30). The palace of La Pliniana was built about 1570, by Anguissola, one of the four nobles of Piacenza who murdered the Duke Pier Luigi Farnese, and threw his body out of the window of the ducal palace of Piacenza. Proceeding north we see on the right Palanza, Careno, and the fine cascade of Nesso, and to the left Brienno, with groves of laurel trees, Cologno, Balbiano, with the island called Comacina opposite to it, Lenno, Cadenabbia, and La Tramezzina, which last is a small district full of hamlets and country-houses, in one of the most delightful situations on the lake. The Villa Sommariva, a splendid mansion, with a gallery of good paintings, is in this neighbourhood. On the opposite side, on the promontory which divides the two branches of Lecco and Como, is Bellagio, where Pliny's seat, which he called Comædia, is believed by some to have been, on account of the gay appearance of the landscape. His other villa, which he calls Tragædia, was probably at Lenno, on the west bank, where the landscape is wild and stern. (Valery, *Voyages littéraires en Italie.*)

At Bellagio is the Villa Melzi, once inhabited by the vice-president of the Italian republic in the first years of Bonaparte's dominion. Farther north on the east bank is a fine cascade, called Fiume di Latte, with a glass manufactory near it; next comes Varena, in a sheltered warm situation, where the olive, vine, and orange and lemon trees, and other southern plants are seen thriving. Higher up on the same side is Bellano, at the entrance of the Val Sassina; a district subject to very cold winds from the Alps. A wild romantic spot in this neighbourhood, where the stream Pioverna forms a cascade among the rocks, is called L'Orrido di Bellano. Farther north is Colico, from whence the high-road of the Stelvio, or Stilfser Joch, began, but it is now being continued as far as Lecco. A branch road strikes off to the left near Colico, leading by Chiavenna to the pass of the Splugen. Returning southwards by the west bank, we see Donaso, where the steam-boat from Como stops; Gravedona, a large village, with the vast marble palace of the Dukes d'Alvito; Dongo, with its iron mines and works; the castle of Musso, cut in the rock, where the Condottiere Gian Giacomo Medici of Milan, brother of Pope Pius IV., defended himself for eight months against all the forces of Francesco Sforza II., duke of Milan, whom he obliged at last to grant him 35,000 gold sequins, and a full amnesty, in 1532. Near Musso are quarries of white marble, which has been used for the cathedral of Como. Lower down are Crenna, Rezzonico (Rhœtionicum), and Menagio, another large village, from whence a road leads over the mountains to Porlezza, on the north extremity of the Lago of Lugano, which here protrudes into the province of Como.

In the triangle formed by the two south branches of the lake are two ranges of hills, one parallel to each branch, both meeting near Bellagio on the extreme point. Between these ranges is the valley called Assina, in which the river Lambro takes its source, with the town of Asso, the little lake of Sagrino, and two villages, with the classical names of Castel Marte and Proserpio. At the south entrance of the valley stands the little town of Erba, in the middle of a plain encircled by hills, the southernmost of which form the group known by the name of Colline di Brianza, which extend between the Lambro and the Adda, and on the borders of the two provinces of Como and Milan, to within a few miles of Monza. These are the nearest hills to Milan, and the favourite resort of the wealthy Milanese in the summer and autumn. They are full of mansions, country-houses and gardens, and cheerful villages, such as Merate, with a splendid villa of the Belgioioso family; Robiate, on Mount Robio, or Orobio, a name derived from that of the Orobii, the first known inhabitants of this region, and known for its good wine; Inverigo, with the fine rotunda of the marquis and architect Cagnola, and the palace Crivelli; Lurago, with the palace Sormanni; Galbiate, Brianzola, Monticello and Montebello, which was for a time the residence of General Bonaparte after his conquest of Lombardy in 1797. Near Erba are three little lakes, Alserio, Pusiano, and Annone, which are said to have once formed one lake, known to the antients by the name of Eupilis. On the banks of the Alserio are the villa Carcano, and that of Appiani, called Soldo. Parini, the amiable and moral poet of Lombardy in the last century, was a native of this district. The roads are good as in every part of Lombardy: they have been much improved of late years, considerable sums being devoted annually to this branch of administration. The communal, or cross-roads of the province of Como, cost in 1831, 268,000 livres; in 1832, 288,000; and in 1833, 252,000 livres. The length of roads repaired, or newly opened, in the province during those three years alone, was of about 200 miles. (Bollettino, *Statistico di Milano*, 1835.)

The west division of the province of Como consists of the district of Varese and the east coast of the Lago Maggiore. Varese is a bustling town near the little lake of that name, in a fine hilly country, where some of the best silk in Lombardy is produced. This is another favourite place of resort of the Milanese, and is full of handsome country-houses. On a steep hill north of Varese is the sanctuary of La Madonna del Monte, to which the country people resort in the month of September. A road leads from Varese to Laveno, where boats cross over the Lago Maggiore to Pallanza, in the Sardinian state, from whence a branch road joins the high road of the Simplon. On the Como side of the lake is Luvino, near the river Tresa, an outlet of the lake of Lugano into the Lago Maggiore. The district of Cuvio, or Valcuvio, not far from Luvino, has been lately drained of an extensive marsh. To the east of Valcuvio, and separated from it by a range of hills, is Viconago, on the west bank of the lake of Lugano, which on this side touches the province of Como, and where are lead mines and works. Towards the south end of the Lago Maggiore is the town of Angera, Anghera, or Angleria, the birth-place of Pietro Martire, who was employed at the court of Ferdinand and Isabella, and wrote 'De rebus Oceanicis et Orbe Novo Decades.' Going in a south direction towards the borders of the province of Milan, the hills gradually sink, and the southern verge of the province of Como merges into the great plain of Lombardy. The districts of Tradate and Appiano are situated at this end.

Upon the whole, the province of Como is one of the finest in north Italy. It is well cultivated, though not so fertile as the plain; it produces corn, wine, fruit, and silk. The lake abounds with fish, especially trout. The people are industrious, active, and ingenious: many distinguished artists and literary men have come from this province. Gian Battista Giovio has given a long list of them in his 'Dizionario degli Uomini Illustri della Comasca Diocesi.' A great number of young men from the mountain districts emigrate in quest of employment; many follow the trade of masons and lapidaries, as in antient times, when under the Lombard kings master-masons in Upper Italy were generally styled 'magistri Comaceni;' others go to various countries as pedlars, carrying barometers, spectacles, looking-glasses, &c., which are manufactured at Como.

There is hardly a district in all Italy that has been so often and so much celebrated in antient and modern times. The principal writers who have described the banks of the lake of Como, are the younger Pliny in his 'Epistles;' Paolo Giovio, 'Larii Lacus Descriptio;' his brother, Benedetto Giovio, 'Historiæ Patriæ;' Giambattista Giovio, 'Opuscoli Patrii et Lettere Lariane;' Amoretti, 'Viaggio ai trè Laghi;' besides many others.

The province of Como contains twenty-six districts, namely, Como, first and second, Bellagio, Menagio, Porlezza, San Fedele, Dongo, Gravedona, Bellano, Laveno, Lecco, Oggiono, Canzo, Arcisate, Maccugno, Luino, Tradate, Appiano, Brivio, Missaglia, Mariano, Erba, Angera, Gavirate, Varese, and Cuvio. These contain, in all, 528 communes, and 362,000 inhabitants. (*Bollettino Statistico*, 1835.) The province is divided, for judicial purposes, into ten circondarii, with local magistrates; the civil, criminal, and commercial courts for the whole province are at Como. There are 486 elementary schools of the first and second class, attended by about 20,000 boys, and 80 female schools attended by 3130 girls, besides holiday schools, charitable foundations, and private schools authorized by the government. (*Report* of 1833.)

COMO, the capital of the province, and a bishop's see, is situated at the S.W. extremity of the lake, surrounded by hills, on which are several old castles, in 45° 48′ N. lat., and 9° 6′ E. long., 22 miles N. by W. of Milan, 16 S. by E. of Lugano, and 23 miles E. of the nearest point of the Lago Maggiore. The population of Como, with its suburbs, is 15,000. Como has a Royal Lyceum, a public gymnasium, besides a diocesan one for theological students, a college of boarders called Gallio, and an institution for female education under the direction of the nuns of St. Francis de Sales. There are besides, in the province of Como, six private gymnasia at Cernusco, Lombardone, Cugliate, Daverio, Incino, and Oltrena. (Serristori, *Saggio Statistico*, 1833.) The cathedral of Como, a structure of the middle ages, is reckoned among the fine churches of Italy. The exterior is cased with white marble. The church of St. Fedele is still older, and remarkable for its architecture. The palace of the Giovio family, called Ædes Joviæ, has a collection of antient inscriptions placed under its portico and round the court. A handsome casino, or literary club-house, has been lately built, which Valery says is superior to all the establishments of the same sort at Paris. (*Voyages Littéraires en Italie.*) The theatre is also a handsome building with a good façade. The Broetto, or old town-house, contains the public archives. The suburb called Borgo Vico, which stretches along the lake, contains several fine palaces of the nobility; that called dell' Olmo, belonging to the Odescalchi family, is the most remarkable. The Lyceum, a handsome building, erected in 1824, has a good library attached to it. On a hill south of Como, and near the road to Milan, is the old tower Del Baradello, in which Napoleone della Torre, the popular chief, and lord of Milan, being defeated by his rival, Ottone Visconti, in 1277, was shut up in an iron cage, in which he died after nineteen months' confinement. Como is the native country of the two Plinys, of Paolo Giovio, of Innocent XI. (Odescalchi), and of Alessandro Volta.

Comum is said to have been built by the Orobii, the oldest known inhabitants of the country. It was afterwards occupied by the Gauls with the rest of Insubria. In the year 196 B.C., M. C. Marcellus having defeated the Boii and the Insubres, occupied Comum. The place was afterwards ravaged by the Rhetians. C. Pompeius Strabo, father of the great Pompey, sent a colony to Comum, and Cæsar is said to have sent a fresh colony, among whom were 500 Greeks of distinguished families. It then assumed the name of Novum Comum. It has been remarked that many names of places in this neighbourhood seem to be of Greek derivation. Greek inscriptions have also been found. After the fall of the empire, Como passed under the Goths, Longobards, and Franks, and became at last an independent municipal community. It was one of the chief towns of the Guibelines in Lombardy, and as such quarrelled repeatedly with the Milanese, who took it after a long siege, and burnt it in 1127. It was afterwards gradually rebuilt where it now stands.

Como has several considerable manufactories of silks, and also of woollens. Of late years we have seen several new works from the Como press.

COMORIN, CAPE, the southern extremity of the peninsula of Hindustan, situated in the territory of the rajah of Travancore, in 8° 4′ N. lat. and 77° 37′ E. long., fourteen miles south-east from the town of Kotaur. It was noticed by Marco Polo in 1295 under the name of Cape Comari. The approach to this cape is unsafe for ships, on account of the many rocks by which it is surrounded. It is about 150 miles direct distance from the nearest point of Ceylon, and about 175 miles from Columbo.

COMORN (in Hungarian, Komárom), a county in the north-western part of Hungary, divided into two parts by the Danube, is bounded on the north-west by the county of Pressburg. That portion which lies on the left bank of the Danube is perfectly level; but the other, on the right bank, is mountainous, owing to the interposition of the Bakonye and Vertes ranges. The Danube is joined by its northern arm close to the town of Comorn, after receiving the Neutra and Waag: the Dotis is another of the numerous streams in this county. Considerable tracts, which are now swamps, were cultivated and enlivened with villages in the time of Mathias Corvinus, king of Hungary. The soil is one of the most fertile in the kingdom, and well adapted for agricultural and grazing pursuits. The climate is salubrious. The surface available for production is estimated at 596,860 acres; of which 209,800 are employed as arable land, 32,100 as pastures, 16,300 as vineyards, and 221,280 are occupied by woods and forests. The whole area is about 1127 square miles. Large herds and flocks are reared, and there is a royal stud at Babolna: there is much game, and an abundant supply of fish. Beautiful marble is got at Tandos and Dotis, and the county also produces limestone, sandstone, and coal. It is divided into 4 circles, and contains 1 town, 6 market-towns, 81 villages, and 70 privileged settlements. The population is about 120,000, mostly Magyars, of whom the majority are Calvinists.

COMORN, the chief town, is a royal free town and fortress at the eastern extremity of the island of Schütt, opposite the efflux of the Waag into the Danube. It lies in 47° 45′ N. lat. and 18° 8′ E. long. The town is irregularly built, and the streets are dark and narrow; but it is well situated for trade, which it carries on to a great extent in grain, honey, wine, timber, and fish. It contains four Roman Catholic churches, of which that of St. Andrew is of considerable dimensions, two places of Protestant worship, a Greek church, and a synagogue; a council-house, town-hall, Roman Catholic and Protestant gymnasium, grammar school for the citizens, and hospital. It is the seat of the only native association for insuring the vessels which navigate the Danube and other Hungarian rivers, and their cargoes. To the east of the town, and at the point where the Waag and Danube form a junction, stands the maiden fortress of Comorn, which is defended by extensive works and *têtes-de-pont* on both banks of the Danube; it was built by Mathias Corvinus, and has been rendered one of the strongest places in Europe by the additional fortifications commenced in 1805. The Danube is crossed at this spot by a flying bridge as well as a bridge of boats. Comorn contains about 1160 houses, and 17,500 inhabitants.

COMORO ISLANDS are situated in the channel of Mozambique, between 11° and 13° S. lat., and 42° and 45° E. long., about 150 miles from the coast of Africa, and somewhat more from the western coast of Madagascar. They are four in number; the largest, Comoro or Angazaye, which extends about thirty miles south and north, is very little known. The principal island is Anzuan or Hinzuan, where the sovereign who calls himself sultan resides: this is the only island visited by European vessels. [ANZUAN.] The third is Majotte, or rather Mayotte, which is said to have 1500 inhabitants. The smallest is Mohilla or Molalle. These islands have recently been often devastated by the Maratis, or inhabitants of the coast of Sekelava in Madagascar, who come over in large boats, besiege the fortified towns for months together, and carry away cattle and men. The population is said to have much decreased, and the smaller islands are nearly abandoned by their inhabitants.

COMPANIES, JOINT STOCK. [JOINT STOCK COMPANIES.]

COMPANIES, or GUILDS. [BOROUGH, p. 201; COLLEGIUM.]

COMPANY, in military affairs, is the body of men which constitutes one of the principal divisions of a battalion of infantry, and which corresponds to the troop in a regiment of cavalry. The strength of a company in the regiments of Guards and of the Artillery, is 120 men, but in the regular infantry, 100 men. In each battalion there is one which is denominated the grenadier company, and another bearing the name of the light company; and these are called flank companies from their stations, which, when the battalion is drawn up in line, are at its extremities. The grenadiers acquired that denomination from the grenades, or small shells, which they were appointed to throw by hand into an enemy's works; and the light companies were so called from the activity required in the men, who are frequently detached from the line in order to act as skirmishers, according to circumstances, about the battalion or brigade to which they belong. Every company of the line and militia is commanded by a captain, under whom are a lieutenant and an ensign, besides the non-commissioned officers; but in the regiment of artillery, the rifle brigade, and the corps of engineers and marines, each company has, instead of an ensign, a second lieutenant.

In France, the first formation of bodies of men under the denomination of companies, may be said to have taken place in 1373. [CAVALRY.] But the institution, in that country, of what approaches nearer to the present signification of the word, occurred in 1557, when Henry II. divided a French legion into fifteen bodies of 400 men; each of which, except the two first divisions or companies, was commanded by a captain, a lieutenant, and an ensign, besides two serjeants and eight corporals. Those two companies were considered as being immediately under the command of the colonel himself, and therefore had no officer of higher rank than lieutenant. This regulation seems to have been followed in the British service, since formerly in each regiment there were two, called the colonel's companies, which were commanded by lieutenants only, who, however, were by courtesy entitled captains.

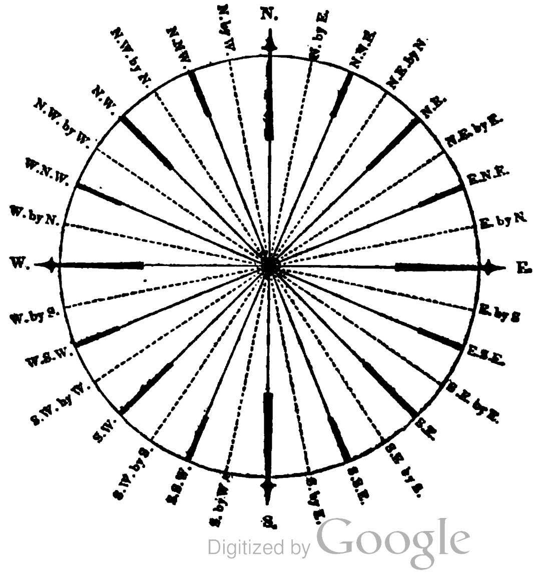
It is observed by Grose, that probably from the time of the Conquest the English infantry was divided into corps, consisting of 1000 men, which were subdivided into hundreds and tens. And he remarks that in the list of the army engaged at the siege and battle of St. Quentin in 1557, each company is stated to consist of 100 men, and to be commanded by a captain, a lieutenant, and an ensign, as at present, besides a serjeant, a harbinger, or quartermaster, and a drummer.

COMPASS, AZIMUTH, is a compass with plain sights, (generally vertical wires), attached to it in such a manner as to be moveable round a vertical axis independently of the compass-card. A pointer shows the angle which the position of the telescope, or sights, marks out on the card, that is, the bearing of the object towards which the sights are directed. This angle is the azimuth of the object, when the correction for magnetic variation is made. But when the bearings of two objects are measured, the correction need not be applied in merely determining the difference of bearings, since the error affects both equally.

The azimuth compass is a rough instrument, owing to the lightness and slender material of the compass-card, &c. When more exactness is required, a Theodolet, or some instrument of the kind, must be used.

COMPASS, THE MARINER'S. A magnetic needle balanced on a pivot, will, subject to a correction for the variation of the magnet, point out the true direction of north and south. A card bearing the points of the compass, and unalterably attached to any apparatus, such as a globe, will therefore afford the means of adjusting it north and south, if the centre of the card be made the pivot of a magnetic needle. In the mariner's compass, however, it is usual to affix the needle to the card, pointing towards its north and south point, so that the card travels with the needle; and if a pointer (fixed with respect to the ship) mark out the point on the edge of the card which lies in the line drawn through the pivot parallel to the plane which symmetrically bisects the ship, the bearing of the ship's head is shown by the part of the card to which the pointer directs for the time being. To insure the horizontality of the compass-card, the cylindrical box in which it is enclosed is supported in a hoop at opposite points, by pins projecting from it, so as to allow the box to revolve inside the hoop. This hoop is supported in the same manner on pivots, the line of which is at right angles to the first pivots; so that between the rotation of the compass-box in the hoop, and the hoop itself, the former can always find its position of equilibrium, which is the horizontal position. The small oscillations of the apparatus are immediately destroyed by the friction. The apparatus is then said to be supported on gimbles, or gimbals.

The notation of the mariner's compass is as follows: any point in the card being taken as north (marked N.), the opposite point is the south (marked S.), and the intermediate points are the east and west (E. and W.) The juxta-position of any two letters denotes the point which is half way between the points marked by these letters (N.E., N.W., S.E., S.W., north-east, north-west, &c., half way between north and east, &c.). The repetition of any of the preceding with any of the *cardinal* points (*cardo*, a hinge or pivot, points on which all the rest depend), has a similar meaning; thus E. S. E., or east-south-east, means the point which is half way between east and south-east. The intermediate points lie half way between the sixteen points hitherto explained: but instead of continuing the same notation, it is usual to express each by that one of the preceding points to which it is nearest, followed by the cardinal point towards which its departure from its nearest point leads it, the two being separated by the word 'by.' Thus the point half way between east and east-south-east, is east by south (nearest to east looking towards south). This admirable notation gives thirty-two points, as follows, which are sufficient for all purposes of description.



The distance between any two consecutive points subtends one thirty-second part of the circumference, or 11° 15′. This angle is called a point: and two objects, whose bearings differ by such an angle, are said to bear one point from each other. Thus a ship is said to sail within three points of the wind when the angle which her track makes with the line in which the wind comes is less than three times 11° 15′, or 33° 45′. The convenience of the preceding notation is combined with greater accuracy (the edge of the card being divided into degrees as well as points) by noting the number of degrees between the direction in question and the nearest point, together with the direction of departure. Thus E.N.E. 7° 21′ E., would imply a direction which makes an angle 7° 21′ with E.N.E., towards the east. If fractions be used, they mean fractions of a point: thus N.E. ¼ E. means a quarter of a point from north-east towards the east.

COMPASS, HISTORY OF THE. The knowledge of the directive power of the magnet was unknown to the Greeks, the Romans, and to European nations generally, till late in the twelfth century; and does not appear even then to have been brought into common use for nautical purposes. It has however been so known and so used in China, Japan, India, and Arabia from periods of high antiquity. Doubts, indeed, have been often expressed of the validity of the claims of the Chinese, and of the authenticity of the dates attributed to the notices of it in the grand annals of their empire: but the most careful examination of the Chinese claims does not warrant our scepticism on one point or the other. The Jesuit missionaries, who went to China in the beginning of the 17th century, were of course little likely to admit the high antiquity claimed by those annals without rigorous inquiry; nor without evidence of great force, to give up in any degree, even implicitly, the chronological authority of the Vulgate Scriptures: yet this was not only the case, but upon their return they unanimously agreed in the conviction that those records were authentic, and several of them published that conviction to the Catholic world, at no small degree of risk to their reputation for orthodoxy. No exact translation into any European language of the passages from which they drew their accounts of the directive properties of the magnet, had, however, been given till last year, when the lamented scholar Klaproth published his 'Lettre à M. A. Humboldt sur l'Invention de la Boussole,' at Paris; and a translation of the passage in question has been again given in English by Mr. Davies in his 'Early History of the Mariner's Compass,' just published in the 'British Annual for 1837.' The circumstance, from its incidental mention, seems to give greater authority to the passage. It relates to the date 2634 years before our æra.

'Houang-ti punishes Tchi-yeou at Tchou-lou.

'The Waï-ki said: Tchi-yeou bore the name of Khiang; he was related to the Emperor Yan-ti. He delighted in war and turmoil. He made swords, lances, and large cross-bows to oppress and devastate the empire. He called and brought together the chiefs of provinces: his grasping disposition and avarice exceeded all bounds. Yan-ti-yu-wang, unable any longer to keep him in check, ordered him to withdraw himself to Chao-hao, in order that he might thus detain him in the west. Tchi-yeou nevertheless persisted more and more in his perverse conduct. He crossed the river Yang-choui, ascended the Kieou-nao, and gave battle to the Emperor Yan-ti at Khoung-sang. Yan-ti was obliged to retire and seek an asylum in the plain of Tchou-lou. Hiuan-yuan (the proper name of the Emperor Houang-ti) then collected the forces of the vassals of the empire, and attacked Tchi-yeou in the plains of Tchou-lou. The latter raised a thick fog, in order that by means of the darkness he might spread confusion in the enemy's army. But Hiuan-yuan constructed a *chariot for indicating the south, in order to distinguish the four cardinal points*; by means of which he pursued Tchi-yeou and took him prisoner. He caused him to be ignominiously put to death at Tchoung-ki. The spot received, from this circumstance, the name of the plain of the broken curb.'

Other Chinese accounts vary as to language and as to circumstances relating to the personal character of Tchi-yeou; but they all agree in the statement respecting the *Tchi-nan* (or chariot of the south) being constructed by the emperor on that occasion; and it is remarkable that the very name by which the instrument is denoted, like every thing else Chinese, is retained almost unvaried from the earliest period of their history down to the present times.

Though numerous other passages of various dates speak equally explicitly of the use of the compass for land purposes, yet no mention of the use of the magnet for *navigation* occurs in any of their books that have come to the knowledge of Europeans, till the dynasty of Tsin, which lasted from the year 265 to 419 of Christ. It is in the great dictionary Poi-wen-yeu-fou; and it is there stated that 'there were then ships directed to the south by the needle.' Mr. Davies contends that this passage rather refers to the magnitude of their ships and the extent of the voyages which they performed, than to the introduction of the needle into marine affairs. In the ninth century, two Mohammedan travellers travelled into Arabia, an account of whose journey was published from an Arabic MS. (which bears internal marks of being written as early as the close of the eleventh century) by Eusebius Renaudot, at Paris, in 1718. In this it is stated that the Chinese at that period (the ninth century) traded in ships to the Persian Gulf and the Red Sea; and though the compass is not mentioned, it is utterly improbable that the Chinese should have known the directive property of the magnet, and have *used* it on land for thirty centuries, and yet not have employed it at sea. It was known on the Syrian coast before it had come into general use in Europe, as is obvious from the following passage from a MS. written in 1242, by Baïlak Kibdjaki, which is very explicit in its description of the nautical compass:—'We have to notice, amongst other properties of the magnet, that the captains who navigate the Syrian sea, when the night is so dark as to conceal from view the stars which might direct their course according to the position of the four cardinal points, take a basin full of water, which they shelter from wind by placing it in the interior of the vessel; they then drive a needle into a wooden peg or a corn-stalk, so as to form the shape of a cross, and throw it into the basin of water prepared for the purpose, on the surface of which it floats. They afterwards take a loadstone of sufficient size to fill the palm of the hand, or even smaller; bring it to the surface of the water, give to their hands a rotatory motion towards the right, so that the needle turns on the water's surface; they then suddenly and quickly withdraw their hands, when the two points of the needle face north and south. They have given me ocular demonstration of this process during our sea voyage from Syria to Alexandria in the year 640' (of the Hegira). An older passage than this might have been quoted, did the limits of our article allow of amplification; but this has been chosen on account of the distinctness of the description. When we consider the jealousy with which all knowledge was guarded by its possessors, especially that of *commercial* value, we cannot but admit that the use of the compass must have been very common at a period when a passenger was initiated into the complete knowledge of the mode of magnetising the steel needle, as well as the mode of using it.

In 1260, when Marco Polo returned from his travels in Cathaï, he is believed to have brought a knowledge of the compass, as well as other Chinese inventions, back to Europe with him; but there is no known authority for this opinion that can lay claim to authenticity. It is certain, however, that before the close of the fifteenth century, when Vasco de Gama found his way round the Cape of Good Hope, the pilots of the Indian Seas were expert in the use of sea-charts, the astrolabe, and the compass.

A passage extracted from the *Landnamabok* of Are Frode, who lived about the close of the eleventh century, has been brought forward by Professor Hansteen to prove the use of the magnetic needle for purposes of navigation at least as early as that date, in Norway: '*for in those times seamen had no loadstone in the northern countries.*' But this passage is most probably an interpolation by the continuator of the chronicle: which view is supported both by the remark of the editor, Finæus of the chronicle itself, as well as by the circumstance of the whole passage not being found in three different MSS. Its authentic origin cannot reach higher than the fourteenth century. (*Brit. Ann.*, p. 296.)

The mariner's compass is however minutely described by Guyot de Provins, who wrote his satire entitled 'La Bible,' about the year 1190. This has usually been assumed to contain no indication that the mariner's compass was a recent discovery or only little known in France at the time of the composition of the satire; but Mr. Davies considers that the minuteness of the description itself, as well as other collateral evidence, proves clearly that it was an instrument at that time not only not much known, but a total novelty. Guyot, a minstrel by profession, had probably seen it in use during the crusades, to one of which most likely he had previously attached himself. At all events Cardinal de Vitry and Vincent de Beauvais, both Frenchmen, and both crusaders, writing at a later period by a quarter or half a century than Guyot, speak of it as a great curiosity which they saw in the east, and as a thing perfectly new in Europe would be spoken of. There is not hence the slightest foundation for the belief that it was used by European seamen at so early a period, though there can be but little doubt that by the middle of the thirteenth century it had come into partial use and into general knowledge; since, in one of the songs of Gauthier d'Epinois, is an *allusion*, which no one would have made had not his auditors been familiar with the magnetic needle.

Considerable doubts rest upon the character to be given to a MS. known as the Leyden MS. of Adsiger. This (which has been published by Cavallo in the supplement to his 'Treatise on Magnetism,' pp. 37—62), makes the compass known for *land* purposes in 1269, and, what is more remarkable, it does not appear to have been known to the writer, Petrus Peregrinus, as capable of use at sea, whilst its declination from the true meridian is distinctly expressed. Klaproth does not even mention this; Libri throws doubts upon the authenticity of the MS. itself; Windebanke has very recently published a commentary on it, which we have not seen; and Davies waives the discussion of it till a future period. Under these circumstances there can be no impropriety in leaving it as an open question; and we feel the more disposed to do this, as there is very clear proof that the needle was at least partially known in Europe before the period when that letter, *ad Sigerium*, was written; and moreover that it throws no especial light upon the progress of the improvement of the instrument.

It was long contended that the inventor of the compass as a *nautical* instrument was Flavio Gioja, a native of Amalfi, near Naples, and the date given by the Italians is from 1300 to 1320. It will be obvious from what we have already said, that there is no foundation for this opinion; and independently of this, the authority of the statements themselves are invalidated by an appeal to the facts which are affirmed in proof of it, as may be seen either in Klaproth's letter or in the 'British Annual.' Before this assigned period, even the *Trésor* of Brunetto Latini (the master of the Divine Dante) bears evidence that the compass was not a rarity. It is however highly probable that Gioja greatly improved the compass, either by its mode of suspension, or by the attachment of the card to the needle itself, or in some other important particular.

The French have laid claim to the discovery of the compass, or at least to the attachment of the card to the needle, from the circumstance of the north point being marked with the *fleur-de-lis;* but in the absence of all distinct evidence on this point, it is much more probable that the view taken by Mr. Davies is correct—that the figure is an *ornamented cross*, and originating in the devotion of an ignorant and superstitious age to the mere symbol. Or, again, he observes, as the compass undoubtedly came into Europe from the Arabs, the *fleur-de-lis* might possibly be a modification of the *mouasala* or dart, the name by which the Arabs called the needle.

The discovery of the variation of the needle was, generally, before the appearance of Cavallo's 'Treatise on Magnetism,' attributed to Columbus, and since that time it has been assumed as being very early known. [DECLINATION OF THE COMPASS.]

By whom the suspension, now generally used, was invented, is altogether unknown from any document, or other evidence. The suspension of the whole machine itself on two circles, whose suspending diameters are at right angles to each other, technically called gimbals (or jimbals), is however, on all hands, admitted to have been English, though we are still ignorant both of the person who invented it or the period of the invention. It appears to be traditional evidence on which the opinion rests; but a tradition in which rival nations agree, bearing on an invention which would be honourable to any one to have a power to claim, can hardly be supposed an erroneous one. Still, even in England, in the time of Queen Elizabeth, the construction was very rude in its execution.

The dip of the needle, or its *inclination*, was also the undoubted discovery of an Englishman, Robert Norman, a nautical-instrument maker at Wapping, who published an interesting account of the course of his experiments in 1594, under the title of the 'New Attractive.' [DIPPING NEEDLE and MAGNETIC INTENSITY.]

The VARIATION OF DECLINATION is also an English discovery, being made, as is well authenticated, by Stephen Burrowes, of Limehouse, and fully determined by Gillebrand, professor of geometry in Gresham College; and the diurnal variation of the declination also unquestionably belongs to another Englishman, Mr. Graham, about 1719.

After the time of Norman, it appears to have been the general practice to follow his plan, that of suspending the needle by its mechanical centre of gravity, and when it was magnetised, bringing it from the natural magnetic position to a horizontal one by means of a counter weight, which could be slid along the needle to bring it to the required position. Few attempts of any moment were made till very recently to examine the magnetic conditions and changes to which the needle was subjected, or the advantages of one form of the needle itself over another. The only improvements were those which insured greater nicety of construction; and except in this respect, the needle was, at the beginning of the nineteeth century, in precisely the same state as it was three centuries before. The two chief improvements in the completion of a needle to be aimed at, besides its accuracy of suspension, were the symmetrical diffusion of the two opposite species of magnetism in the two arms of the needle, and the communication of the greatest total directive intensity to it as a whole. The method of effecting the first of these is generally conceded to be the method of double touch, invented by our countryman Michel; and on the latter the experiments of Captain Kater have been usually held to be decisive, although it does appear that the anomalous results which he obtained, so far as the *figure* of the needle is concerned, do not justify the inference that the question is properly decided. They however leave no doubt that the greatest directive power (whatever method of magnetising be employed) is given to the needle, which has been prepared by hardening it throughout at a red heat, and then softened from the middle to within about an inch of each end, till the blue colour which arises has again disappeared. (See *Phil. Trans.*, 1821.)

The iron employed so extensively in modern vessels has created great but generally unsuspected deflections of the magnetic needle from the position which under the influence of terrestrial magnetism only it would take in any given place and at any given time. Numerous vessels have been wrecked in consequence of this alone. Mr. Barlow invented a simple apparatus, which considerably diminishes the danger from this source, and this is the last improvement which navigation, so far as the compass is connected with navigation, has received. It is described under the head [CORRECTING PLATE]. The employment of so much *malleable* iron as is usual in vessels (especially steamers) does however threaten to render the compass altogether nugatory, as is shown in the place just referred to.

COMPASSES. This term we suppose to be synonymous with *compassers*, instruments by which we compass or go round a space. We shall here only give such a general notion of different kinds of constructions as will perhaps suggest the most convenient for any particular purpose.

1. Common Compasses, or Dividers.—There are simply two pointed legs on a common pivot, for transferring distances. For drawing a circle the lower end of one of the legs is removed, and its place supplied by a holder for a pencil, or by a steel pen.

2. Hair Compasses.—One of the legs has a part attached to the upper part by a spring, so that by means of a screw a very small motion may be given to the lower end. It is convenient for very accurate dividing, but must be used with care.

3. Triangular Compasses.—These have three legs and two pivots, so that the three points of a triangle can be at once transferred. This is useful only in rough work, as the instrument is difficult to handle.

4. Proportional Compasses.—These consist of two dividing compasses with a common pivot, which, when open, present vertically opposite angles; consequently, the intervals between the points of one and the other are in the same proportion as the legs of one to the legs of the other. The pivot is a clamping screw, which can be transferred along the interval between the pairs of points, and a scale points out how to adjust the instrument to alter any line, or surface, or solid, in a given proportion. These compasses sometimes have an apparatus for slight adjustment; but on the whole we consider it as an instrument for rough work.

5. Beam Compasses.—This instrument is a cylindrical bar, perpendicular to which, with clamping screws, slide a point and a pencil. The use of it is to describe large circles, or measure large distances, the common compasses being very liable to slip when opened very wide. It is a very safe and sure construction.

6. There is a method of describing a small arc of a very large circle, as follows. An elastic rod of metal is furnished with a rigid bar, on which it can be drawn up by screws, so that the rod shall form an arc, the chord of which is a part of the bar. This may be adjusted so as to pass through three given points nearly in the same straight line, and though the curve then described by guiding the point of a pencil along the rod be not exactly an arc of a circle, yet, for all small flexures, it will come sufficiently near for practical purposes.

Many other species of compasses have been constructed, but these are all we have ever seen in use. [Calibre; Elliptic Compasses.]

COMPIEGNE, a town in France, in the department of Oise, on the left bank of the river Oise, just below the junction of the Aisne, and on the road from Paris to St. Quentin. It is 43 miles N.N.E. of Paris in a straight line, or 46 miles by the road through Senlis: in 49° 25′ N. lat. and 2° 49′ E. long.

Compiègne was originally a hunting residence of the kings of France, of the Merovingian and Carlovingian races. Charles Le Chauve founded here an abbey, and built two castles: the abbey with its church was rebuilt by Charles Le Simple. Several of the Carlovingian princes resided here, and some of them are buried here; but, under the third race, that of Capet, the town fell into some degree of neglect. In the contests of the Bourguignon and Armagnac factions, and in the wars of France and England, Compiègne changed hands frequently. It was in a sally from this place that Jeanne d'Arc was taken prisoner.

The town is agreeably situated, partly on the summit, and partly on the slope, of an eminence. The streets are badly laid out and the houses ill built, except in the neighbourhood of the château, where there are some good houses; there is a bridge over the river of three elliptical arches. There were formerly three parish churches, of which only one and a chapel of ease remain in use. The town-hall is a remarkable Gothic building, with a lofty tower rising from the roof.

A large and magnificent royal château was gradually rebuilt under Louis XV., according to the designs of the architect Gabriel. The gardens are more extensive than those of the Tuileries. This castle was the residence of Charles IV. of Spain, his queen and their suite, during the first part of their captivity in France, A.D. 1808. Here Napoleon and Maria Louisa, archduchess of Austria, first met on occasion of their marriage in 1810.

The population of Compiègne in 1832 was 8879. There are some manufactories of hosiery and cotton yarn, and a fine rope-walk; a number of boats, suited for the navigation of the Oise, are built here. There is a considerable trade carried on in corn and wood; the latter is sent to Paris by water carriage. There are a college or high school and a public library.

In the immediate neighbourhood of the town is a forest of considerable extent, used for the chase: this forest is attached to the château. A great quantity of wooden wares is made near the town for the supply of the neighbouring departments. The arrondissement of Compiègne contained, in 1832, 97,812 inhabitants.

COMPLEMENT, that magnitude which, with another, makes up a given magnitude. This is the general meaning of the term; but the most usual specific uses are as follows:—Complements of the parallelograms about the diagonal of a parallelogram: through a point in the diagonal draw parallels to the sides; the whole is then divided into two parallelograms on the diagonal, and two which only touch the diagonal at one angle. The latter pair are called by Euclid complements to the former.

The complement of an arc or angle is the arc or angle by which it falls short of a quadrant or a right angle.

The complement of a logarithm is the number by which a logarithm falls short of 10: thus comp. log. 2 is 10 — ·30103 or 9·69897.

The arithmetical complement of a number is the number by which it falls short of the next higher decimal denomination. Thus, ar. co. 936 is 1000 − 936, or 64; arith. comp. of 83 is 100 − 83, or 27. Beginning from the left, subtract every figure from 9, up to the last significant figure, which subtract from 10.

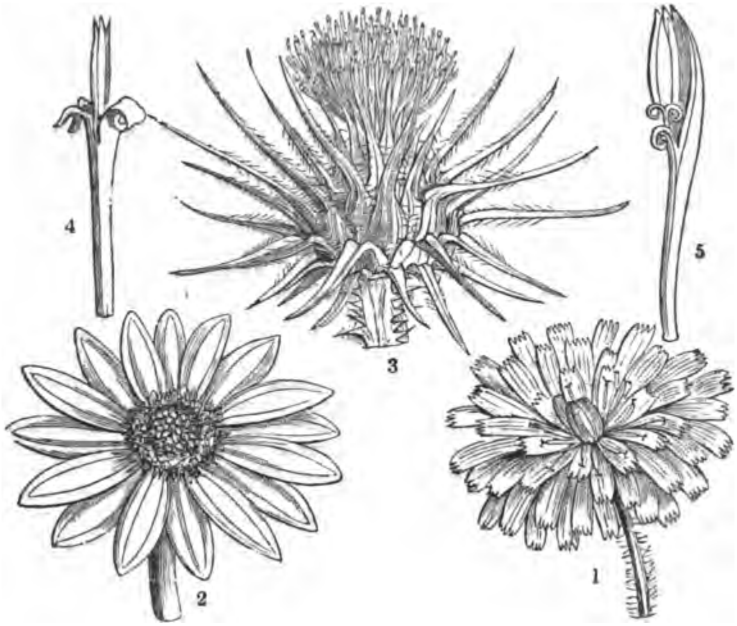
For the complement of life, see De Moivre's Hypothesis.

COMPLEXION. [Race.]

COMPLUTENSIAN POLYGLOTT. [Polyglotts.]

COMPO'SITÆ, the largest known natural order of plants, if, indeed, it is really an order, and not a group of a higher designation, consists of monopetalous exogens with syngenesious stamens, and an erect solitary ovule in a simple one-celled inferior ovary, the style of which is divided into two arms; the flowers are always arranged in dense heads, or capitula, and are surrounded by one or more external rows of bracts forming an involucre. Professor Lindley regards it as an alliance of several natural orders. It consists of herbs, shrubs, or trees, found in all parts of the world, but assuming an arborescent character only in warm latitudes: they occur in every conceivable variety of situation, are often exceedingly similar to each other in appearance, and have always been, from the birth of botany as a systematic science, the puzzle and reproach of systematists. Every succeeding writer, with a few exceptions, rendered the subject more complicated and difficult, till Cassini, a Frenchman, of good powers of observation, much patience in investigation, and a clear head, with the command of the rich materials included in the Paris herbaria, set steadily about a re-formation and re-examination of the whole order; he pointed out for the first time, that differences in the stigma are of primary importance in arranging these plants; he purged common genera of species wrongly referred to them; he boldly proposed the adoption of a host of new genera for the reception of those species, and he led the way to a logical and natural disposition of the previously unwieldy mass. Unfortunately, however, he was more skilful in separating than in combining; he stated the result of his investigations in a manner unreasonably prolix and wearisome, and he altogether failed in effecting any general reformation of the order; he was a mere man of detail. Improving upon the discoveries of Cassini, with far greater skill in forming combinations, and with fully as intimate a knowledge of the subject, the German botanist Lessing gave the world, in 1832, a synopsis of the genera of *Compositæ*, in which for the first time, a clear, compendious, intelligible view of the order was systematically taken; and his work will not cease for a long time to be a standard book of reference. But the arrangement of his matter was not favourable for comparative examination; the characters of his genera were too strictly differential for so difficult a group of plants; and moreover his style was disfigured by numerous unnecessary instances of troublesome neology. It is only within a few weeks before the appearance of this article that De Candolle, the celebrated botanist of Geneva, has achieved the difficult task of systematizing Compositæ in an unexceptionable manner. A profound master of his subject in all its bearings, with immense materials at his disposal, with a particularly clear systematic mind, and of a sound and solid judgment, he has reduced the whole subject to as satisfactory a state as any part of the vegetable kingdom. One 8vo volume of 706 pages, and containing about 4500 species, has appeared under the name of 'Prodromus Systematis Naturalis Regni Vegetabilis; pars quinta;' and the remainder, comprehending about as much more, is far advanced in the printing. It is probable that the changes in genera are too numerous in this work, as indeed is almost always the case when old enormous errors are suddenly and violently corrected; but such blemishes are hardly perceptible even to the critical eye, and are of no real importance to the general question.

The old and generally adopted plan of breaking up Compositæ into primary divisions, is that of Jussieu, which may be explained thus:—Every head of flowers, or florets, as they are technically named, has a central part, or disk, and a circumference, or ray: of these florets some are regularly tubular, with their limb cut into four or five segments; others are slit up on one side, opened flat, and turned towards the circumference of the head; the latter are named ligulate florets. When in a head of flowers all the florets are alike and ligulate, it belonged to the division CICHORACEÆ, (*fig.* 1), as in the dandelion; if the florets of the disk were tubular, and of the circumference only ligulate, it was referable to CORYMBIFERÆ (*fig.* 2), as in the marigold; and when all the florets are alike tubular, both in the disk and ray (*fig.* 3), it belonged to CYNAROCEPHALÆ, provided the involucre was at the same time stiff and ovate, as in the thistle. The latter character was necessary in order to distinguish Cynarocephalæ from those Corymbiferæ in which the ray is not developed, as common groundsel. To these three divisions a fourth has in later times being added under the name of LABIATIFLORÆ, in consequence of the florets having distinctly two lips of unequal size (*figs.* 4 and 5.)



These divisions have however been thought objectionable on several accounts, and De Candolle, following Cassini and Lessing, has trusted more to modifications of the style; the result of which is the following arrangement of the order in eight tribes.

* Tubulifloræ; namely, with the hermaphrodite florets regularly tubular, and five-(seldom four-)toothed.

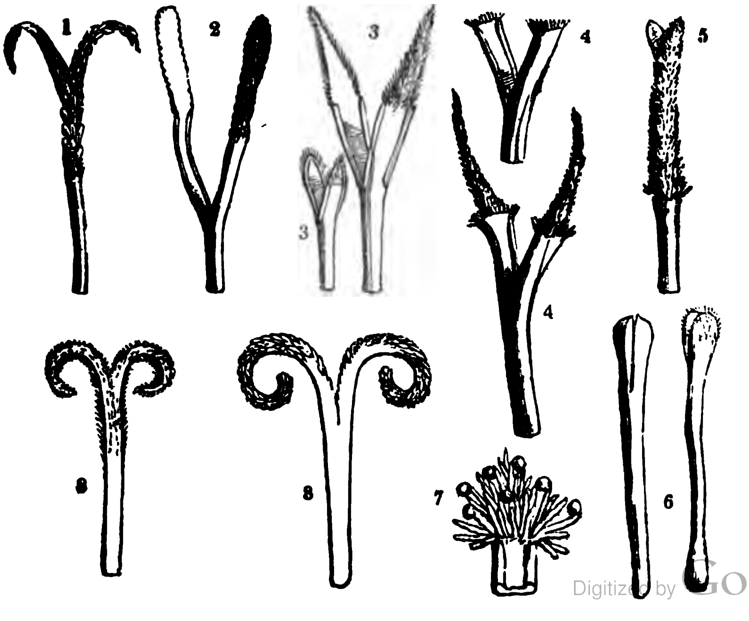
Tribe 1. VERNONIACEÆ. Style of the hermaphrodite flowers cylindrical, its arms usually lengthened and subulate, rarely short and obtuse, always equally hispid in about all the length. The true stigma ending short of the middle of the arms of the style. A part of the rayless Corymbiferæ. (*fig.* 1.)

Tribe 2. EUPATORIACEÆ. Style of the hermaphrodite flowers cylindrical, with long somewhat club-shaped arms, which are covered externally near the end with papillose down. The true stigma but little prominent, and usually ending short of the middle of the arms of the style. A part of the rayless Corymbiferæ. (*fig.* 2.)

Tribe 3. ASTEROIDEÆ. Style of the hermaphrodite flowers cylindrical, with linear arms, rather flat externally and towards the end equally and finely downy. The true stigma produced about as far as the origin of the external down. A part of Corymbiferæ. (*fig.* 3.)

Tribe 4. SENECIONIDEÆ. Style of the hermaphrodite flowers cylindrical, with linear arms having a pencil of hairs at the point; either truncated, or produced beyond the pencil into a short cone, or a long narrow hispid appendage. The true stigma broad and prominent as far as the pencil. A part of Corymbiferæ. (*fig.* 4.)

Tribe 5. CYNAREÆ. Style of the hermaphrodite flowers thickened and knobby towards the upper end, and often



pencilled at the knob, the arms either distinct or grown together, and downy externally. The true stigma not prominent, reaching the apex of the arms, and then becoming confluent. All the Cynarocephalæ. (*fig.* 5.)

* * Labiatifloræ, namely, with the hermaphrodite florets usually two-lipped.

Tribe 6. Mutisiaceæ. Style of the hermaphrodite flowers cylindrical at the upper end, or rather knobby, the arms usually obtuse or truncated; very convex on the outside, and at the upper part covered with minute even down, or naked. (*fig.* 6.)

Tribe 7. Nassauviaceæ. Style of the hermaphrodite flowers never knobby and thickened; the arms linear, rather long, truncated and pencilled at the point only. (*fig.* 7.)

* * * Liguliflorae, namely with all the flowers hermaphrodite and ligulate.

Tribe 8. Cichoraceæ. Style cylindrical at the upper end, with rather long arms, which are somewhat obtuse and equally hairy; the true stigma terminating short of the middle of the arms. (*fig.* 8.)

De Candolle estimates Compositæ at one tenth of the whole vegetable kingdom. They are in some cases soporific, as lettuce and succory; in others, they are diuretic, as various conyzas; some are tonic and stomachic, as wormwood and chamomile; but they are not of great medicinal importance to man, the last plants being the most valuable among them. Common artichokes with their succulent receptacles, and Jerusalem artichokes with their succulent tubers, are the only esculents. Many are beautiful objects to look upon, as dahlias, marigolds, coreopsis, asters, &c.

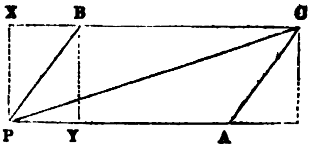
COMPOSITE ORDER. [Civil Architecture; Column.

COMPOSITION. In the gradual progress of mathematical language, this word has acquired a general meaning, as follows. Any one magnitude is said to be compounded of two others, when it produces the same effect as the other two put together. For instance, if we increase a length in the proportion of 3 to 7, and then increase the result in the proportion of 2 to 5, the original line is increased in the proportion of 3×2 to 7×5, or of 6 to 35. Hence the proportion of 6 to 35 is said to be the proportion compounded of (out of) the proportions of 3 to 7 and 2 to 5

The effects of which it is in our power to form a distinct conception are of two kinds. 1. Those in which there are only two kinds imaginable, and those two diametrically opposite, with one neutral intermediate state. 2. Those in which the diametrically opposites have an infinite number of intermediate gradations. Loss or gain of money is an instance of the first; change of direction of the second. If, at the rate of an inch to a shilling, gains were measured northward from a given point, and losses southward, we could immediately make it a necessary consequence that the balance, if any, is represented by a line northward or southward, according as it is for or against. But draw a line eastward, and it will readily be admitted that such line will not present itself in any necessary connexion with a sum lost or gained, or neither lost nor gained. For if the latter, why should a line eastward be preferred to a line westward, or in any other direction?

An immense number of modes of composition will readily suggest themselves, in which addition and subtraction are the processes by which composition takes place. If I go three miles northward, and then two miles farther, I go in all 3 + 2, or 5 miles northward. Other modes, as in the instance first given, will suggest themselves, in which multiplication and division are the compounding processes, and so on ad infinitum. These are all cases in which magnitude only is concerned; but whenever we have both magnitude and direction, it is plain that we have now both magnitude and direction to consider in the effect. If I go a mile northward and then a mile eastward, the whole effect, as to direction, will be, that I go to the north-east; as to magnitude, that I go not two miles, but only $\sqrt{2}$ miles, or 1·414 miles very nearly. Here is an instance in which the components are represented in magnitude and direction by two sides of a triangle, while the total effect is similarly represented by the third side. In the article Centre will be found various instances in which the meaning of that term implies the point at which a single action must take place, which will produce the same effect as a number of different actions produced on a number of points.

In mechanics, we have to consider the combined effects of different velocities, pressures, moments, rotations, &c., communicated at the same moment of time to the same body In all, the law of composition is found to be as follows:—



In what sense soever the actions at P can be represented in magnitude and direction by P A and P B, in that same sense can the joint effect be represented by P C, the diagonal of the parallelogram, in both magnitude and direction: or P A and A C being the actions (A C being equal to P B in magnitude and direction), P C, the third side of the triangle, is the united action. Thus, if at the same instant we communicate motion to P in the directions P A and P B, with velocities P A and P B per second, we thereby merely communicate to P a velocity P C per second, in the direction P C. The same holds of momenta and pressures; and even if we give P two separate rotations, which would separately carry it round the axes P A and P B in angles per second which are in the same proportion as P A and P B, the joint effect is a rotation round the axis P C with an angle per second which is to the angle of P A (or P B) as P C is to P A (or P B).

We have here not to prove these things, but only to illustrate the word composition. But this we must remark, that our preconceived notions will never allow us to say that A is the effect of P and Q, and B of R and S, unless the application of P, Q, R, and S together will be the same in effect as that of A and B together. We shall show that this necessary condition of our notions of cause and effect is preserved in the method of composition just described. Let P X, B Y, and C Z be parallel to each other; then, if our law of composition be general, P B is the effect of P X and P Y. Therefore P X, P Y, and P A should be together equivalent to P C. But A Z is equal to P Y, and P Z is therefore equivalent to P A and P Y. Therefore A C should be the effect of P Z and P X, which we immediately see it is, being as much the diagonal of P X C Z as it is of P B C A.

As another, and a very curious instance of composition, we shall notice the following. Suppose x and y are to be measured, and both are subject to error, every error entailing loss in proportion to its magnitude, and causing equal loss, whether it be an error of excess or an error of defect. Suppose also that the errors are of such a kind that the average of any number of measurements is more probably right than any other. Let a and b be the sums which it would be equitable to pay for insuring x and y, that is, which should be given to any one who would agree to bear the loss on x and y separately. The sum which should then be given to one who would bear the total loss arising from the possible error in $x+y$ is not $a+b$, as might at first appear, but $\sqrt{a^2+b^2}$, or the hypothenuse of a right-angled triangle, of which a and b are as the sides.

Our limits will not allow us to enlarge on this subject we shall add the two following remarks.

1. The fact of the law of composition being the same both for velocities and pressures, has caused many writers on mechanics to confound the two, as if the one proved the other, which is neither true, nor even *very* probable. And other writers on mechanics, while proving this general law, that actions which can be represented by the two sides of a triangle produce an action which can be represented by the third side, have restricted the proposition, and seem to imagine that what they prove is true of *forces* only. This, with great deference to such a writer, we conceive M. Poisson to have done in the well-known proof at the beginning of his mechanics, a work which we may take this opportunity of saying, we hold in higher estimation than any other elementary mathematico-physical work whatsoever.

2. The difficulties of negative quantities in algebra arose from a want of generality, which gave rise to the attempt to express composition by addition only or by subtraction only, where either addition or subtraction might be requisite; and the difficulties of impossible quantities arose out of a similar deficiency, bearing the most complete analogy to trying to compound in magnitude only, in cases where both diversity of magnitude and of direction should have been considered.

COMPOSITION OF MOTION, of VELOCITY, of FORCE, &c. [Composition.]

COMPOST. [Manure.]

COMPOSTE'LA, SANTIAGO DE, the capital of the province of Galicia in Spain, and an archbishop's see, is situated on a hill near the river Tambro, in 42° 52′ N. lat., and 8° 17′ W long. It has two collegiate churches and a number of other churches and convents. Besides the great hospital, which is one of the finest in Spain, there are other hospitals and asylums for orphans and the destitute of both sexes. The number of beggars in the streets is very great. The cathedral, dedicated to the apostle St. James, is above 300 feet in length, forming a cross, with seven gates, and twenty-three chapels, some of which are ornamented with marble, jasper, and other valuable stones. The church was once very rich in silver lamps and other ornaments, but the French carried off most of the plate in 1809. The chapter is numerous and wealthy, and the archiepiscopal see is one of the richest in Spain. Among the convents, those of San Francisco and St. Martin of the Benedictines are the handsomest. The principal square, called Plaça Real, and one or two streets, are good; but the rest are steep, narrow, and ill-paved. The situation of the town itself, surrounded by mountains, which leave it a very confined horizon, is gloomy, and the climate damp and cold in winter. The university has a good library, four colleges, and the faculties of theology, philosophy, law, and medicine. There is besides a diocesan seminary for clerical students. Compostela has a population of 28,000 inhabitants, among whom are many wealthy landed proprietors. It carries on a considerable trade, and has manufactures of paper, hats, leather, ribands, and lace. (Miñano, *Diccionario Geografico de España.*)

The Moors took Compostela A.D. 997, and set fire to it. They carried away the ornaments of the cathedral and its bells, which they took to Cordova, but they were restored by the king St. Ferdinand, after he took Cordova. In the middle ages, and even down to the last century, Compostela was a place of great resort for pilgrims from all parts of Europe, who repaired to the shrine of the apostle St. James, from whose name it is often called simply Santiago, or Santiago of Galicia. It is 40 miles S. by W. of Coruña, 300 N.W. of Madrid, and 24 miles E. of the nearest point of the sea, which is at the mouth of the Tambro, S. of Cape Finisterre.

COMPOUND, that which results from composition. [Composition.]

COMPOUND ADDITION, &c. [Addition, &c.]

COMPOUND FLOWERS are the flower heads of Compositæ; they are masses of small flowers collected upon a depressed axis, or receptacle, and surrounded by an involucre of floral leaves or bracts.

COMPOUND INTEREST. [Interest.]

COMPOUND QUANTITIES [Arithmetic], quantities in which more than one unit is employed, as in 2 pounds, 3 shillings, and 6 pence; 2 miles, 3 yards, and 4 inches.

COMPOUND RATIO. [Composition, Ratio.]

COMPRESSION. [Expansion.]

COMPURGATOR. In the middle ages a practice prevailed, derived from the canon law, of permitting persons accused of certain crimes to clear themselves by purgation. In these cases the accused party formally swore to his innocence, and, in corroboration of his oath, twelve other persons, who knew him, swore that they believed in their consciences that he stated the truth. These twelve persons were called compurgators. (Ducange *ad vocem Juramentum.*) This proceeding appears to have existed among the Saxons, and, in process of time, it came into use in England in civil cases of simple contract debts. [Wager of Law.] The ceremony of canonical purgation of clerks-convict, which was nothing more than the formal oath of the party accused, and the oaths of his twelve compurgators, continued in England until it was abolished by the stat. 8 Eliz. c. 7. [Benefit of Clergy.]

COMTAT D'AVIGNON, LE, and LE COMTAT VENAISSIN, two small provinces in France, which up to the period of the French revolution, were subject to the pope, and are in most maps represented as one district, under the general designation of Le Comtat.

Le Comtat was situated between Provence, Dauphiné, and Languedoc. It was bounded on the north and northeast by Dauphiné, on the east and south by Provence, from which, on the south, it was separated by the Durance, and on the west by Languedoc, from which it was parted by the Rhône. Within these limits however was included also the principality of Orange, which was enclosed on three sides by the Le Comtat, but formed no part of it. Le Comtat is watered by various streams, the Ouvèze, the Auzon, the Nesque, the Sorgue, and others, which, uniting their waters, flow into the Rhône. The surface is not uniform; in the plains the temperature is similar to that of the neighbouring part of Provence; in the mountains it is colder: the banks of the Rhône and Durance are rendered less agreeable by the prevalence of north winds. The soil produces abundance of grain (especially excellent wheat), wine, and oil: many silk-worms are reared. There is little timber, but mulberry, olive, and almond trees are common.

The district includes some considerable towns, as Avignon, an archbishopric (population 25,956 for the town, 29,889 for the whole commune); Carpentras (pop. 6294 for the town, 9817 for the whole commune); Cavaillon (pop. 3845 for the town, 6911 for the commune); and Vaison—all these formerly were of episcopal rank: L'Isle (pop. 4717 for the town, 6052 for the whole commune); Pernes (pop. 3264 for the town, 4593 for the whole commune); Valréas (pop. 2883 for the town, 4348 for the whole commune); Bollène (pop. 2779 for the town, 4672 for the whole commune); Mazan (pop. 2670 for the town, 3851 for the whole commune); Malaucène (pop. 2209 for the town, 3069 for the whole commune); Monteux (pop. 2106 for the town, 4760 for the whole commune). Perhaps the population of the communes, which is greater in this district than in the rest of the department of Vaucluse (in which Le Comtat is now included), and the proportion which the rural population of each commune bears to that of their respective towns, may be taken as indications of the prosperity which the district enjoyed under the sway of its ecclesiastical rulers. Avignon was the capital of Le Comtat d'Avignon, and Carpentras of Le Comtat Venaissin.

During the sovereignty of the pope the government was in the hands of his vice-legate, who resided at Avignon; under him Le Comtat Venaissin was governed by a magistrate, called recteur. The dominion of the popes over Le Comtat Venaissin originated in 1273, when it was bestowed on Pope Gregory X. by Philippe III. *le Hardi*, king of France. Avignon was not acquired by the pontiffs till several years after. The whole is now comprehended in the department of Vaucluse. [Avignon; Vaucluse, Department of.]

COMTE. [Count.]

CONCAN, NORTH AND SOUTH, a district of Bejapore, comprising the entire sea-coast of that province, and extending from the sea to the Western Ghaut mountains, which form its eastern boundary. Its length from north to south is about 220 miles; its breadth in no part exceeds 50 miles, and on the average is 35 miles. The district includes many fertile places, which yield abundant harvests of rice; but the surface is in general very rough, and much intersected by steep and rocky hills. Towards the ghauts the country is in most places extremely strong, being divided by hills, intersected by ravines, and covered with thick forest. The range itself is from 2000 to 4000 feet high, and exceedingly abrupt on the west: the passes are numerous but steep, and very seldom practicable for carriages. The table-land on the east is nearly as high as many parts of the ghauts, but in general the hills rise above it to the height of from 1000 to 1500 feet.

The northern part of the chain of ghauts and that part of this district which lies at the base is inhabited chiefly by Bheels. More to the south the country is inhabited by Coolies, who are less predatory in their habits and altogether more civilized than the Bheels: these latter, although they live quietly when in the open country, resume all their wildness in places that are strong either from hills or jungle. The Bheels are small of stature and black; they wear few clothes and are always armed with bows and arrows. In the hills both Bheels and Coolies live under Naiks or chiefs of their own, who in general have been little interfered with by the Mahratta government.

The northern Concan, which extends from the district of Surat on the north, or about 20° 20′ to about 18° 50′ N. lat., was ceded to the British by the Peishwa in 1817; and the Southern Concan, which extends further in the same direction to about 16 N. lat., was obtained partly by cession and partly by conquest from the same ruler in 1817 and 1818. A great part of the Northern Concan was once held by the Portuguese, who divided the lands into large estates, which were given to Europeans, whose opulence is proved by the remains of many splendid public buildings and private dwellings which they erected, and some of which are now standing in places at present mere wastes.

The district is traversed by numerous mountain streams, but has no river of magnitude: it contains along the coast a great number of small bays and harbours, which, although they offer but little facility to commerce, serve to shelter pirates, who have always frequented this coast in great numbers. The land and sea breezes blow alternately during the twenty-four hours; the former are not felt at a greater distance than forty miles from the shore.

The Northern Concan is divided into 46 pergunnahs, containing 2111 villages and about 420,000 inhabitants. The Southern Concan comprises 47 pergunnahs and 2291 villages; and according to a census transmitted by the Bombay government to the directors of the East India Company in 1822, its native population amounted to 640,865 persons, of whom 597,150 were Hindus, 42,035 Mohammedans, and 1680 Portuguese and Jews, the descendants of former settlers. This population was composed of

males under 12 years of age .	131,933	
Above ditto . .	202,258	
		334,191
Females under 12 years .	79,784	
Above 12 years .	226,882	
		306,666
Total .		640,857

The number of houses in this southern division was 131,624; the number of ploughs, 58,535; and of oxen and buffaloes employed in agriculture, 120,089. The amount of land revenue in 1829-30 was, in

Northern Concan . .	10,65,823	rupees,
Southern . . .	10,55,421	„
Together .	21,21,244	
	or 212,124*l.*	

The roads throughout the district are for the most part very indifferent, being little more than paths, excepting near the sea-coast, where, at some of the more difficult and precipitous places, steps of an easy ascent have been constructed, mostly at the expense of private individuals.

From reports made by the government collectors in 1828, it appears that there were in the Northern Concan 137 schools, in which instruction was given to 2678 scholars; and in Southern Concan, 282 schools, with 6721 scholars, being in the proportion of one scholar to 113 inhabitants.

(*Report of Committee of House of Commons on the Affairs of India*, 1832, *Political Revenue and Public Sections; Revenue Selections from Documents in the India House.*)

CONCAVE and **CONVEX—CONCAVITY** and **CONVEXITY.** A curve or surface is concave on the side on which straight lines drawn from point to point in it fall between the curve or surface and the spectator; that side is convex on which the curve or surface falls between such lines and the spectator. A surface may be either entirely concave, as the inside of a sphere, or entirely convex, as the outside; or concave in some directions and convex in others, as the surface of a dice box, or that made by the revolution of an hyperbola about its minor axis.

For the mathematical tests of convexity or concavity, see CURVES, THEORY OF—SURFACES, THEORY OF—POINT OF CONTRARY FLEXURE.

CONCAVE LENSES. [LENS.]

CONCAVE MIRRORS. [MIRROR.]

CONCENTRIC, having the same centre; thus concentric circles are those described about the same point.

CONCEPCION. [CHILE, p. 64.]

CONCEPCION, a town of Chile, about seven miles from the shores of an extensive bay of the same name. It is situated on the north side of the river Biobio, and about a quarter of a mile from it; but during the floods the river washes the houses of the town. It occupies nearly a square mile, and is quite open, without any defences. Being built after the Spanish style, the streets cross each other at right angles with great uniformity. It has a fine open square, in which are the cathedral and the public buildings. The present site was chosen after the old city of Penco was destroyed by an earthquake in 1763, and Concepcion itself has frequently suffered from the same cause. In February, 1835, almost every house was thrown down; even the cathedral and a convent became a mass of ruins. At Talcahuano the sea is said to have risen 30 feet, and driven the vessels from their anchorage: in retiring it swept away the whole village. The population of Concepcion is estimated at about 7000. It has no manufactures and little commerce.

The bay, which is deep and commodious, is well sheltered by the fertile island of Quiriquina, which lies across the entrance with a safe channel on each side. At the head of the bay is the Puerto of Talcahuano, a small miserable town containing altogether about 1000 inhabitants, off which place ships generally lie. Along the shores of the bay are several villages, though the country is little cultivated. A bad sort of coal is found about Penco and Talcahuano. Refreshments of all kinds are plentiful; this district is indeed famous for its vines, grain, fruits, and esculent roots. Wine is made of an inferior quality, and arrow-root is raised. The bay abounds in fish: wood and water may also be had.

Talcahuano is about 240 miles to the south of Valparaiso, in 36° 42½′ S. lat., and 72° 57′ W. long. The tide rises about six feet. (Beechey's *Voyage to the Pacific*, &c.)

CONCERT, in music, a performance of several pieces of either vocal or instrumental music, but commonly of both, by different voices, and on various instruments. The earliest concert of which we find any record is that of the *Filarmonici*, at Vicenza, which must have been founded previously to 1565; for in that year another society, the *Incatenati*, was joined to it. But to England is due the credit of having instituted the first regular series of concerts, under the title of *The Academy of Antient Music*, which had its birth in 1710, and continued to exist upwards of eighty years. The *Concert Spirituel* of Paris was indebted for its origin to an elder brother of Philidor, the well-known composer and renowned chess-player, who in 1725 obtained a licence for the performance of sacred music during Lent. This proceeded without interruption till the French Revolution. The year 1776 is distinguished in musical history by the institution of the *Concert of Antient Music*, which became the asylum of classical compositions at a time when fashion threatened their extinction, and has ever since proved a school of music of inestimable value, by keeping alive a taste for the finest productions of the old masters. In 1791, Salomon, the celebrated violinist, commenced a series of subscription concerts at the Hanover-square Rooms, for which he engaged Haydn not only to write those twelve grand symphonies which are among the glories of the art, but to come to London to conduct their performance. These concerts went on till 1796; then ceased; and with them seemed to die away all relish for grand instrumental compositions. But in 1813, a party of eminent professors, with a view to rescue orchestral music of the highest class from the neglect into which it had fallen, formed themselves into a body under the title of the *Philharmonic Society*, and that season gave eight subscription concerts, the success of which, both as regards the main design and the support they received, was without any parallel. They constitute an æra in the art, and by their continuance act powerfully in promoting the advance of music.

Our space will only allow us to name some few other concerts which have risen up in the British metropolis, flourished for a time, then fallen to decay. Bach (John-Christian) and Abel in 1763 established subscription concerts, which have flourished for twenty years. These were succeeded by *The Professional Concert*, which, after a struggle, yielded to the enterprise and ability of Salomon. The *Vocal Concerts* of Harrison and Knyvett began in 1792 at Willis's Rooms, and were discontinued at the end of the season of 1794. They were revived in 1801 by Messrs. Bartleman, Harrison, Knyvett, and Greatorex, and conducted on a much larger scale. Their success at first was great, but they gradually fell off, and in 1821 were finally abandoned. In 1808 and two following years, Mrs. Billington, Mr. Braham, and Signor Naldi had subscription concerts at Willis's Rooms, and were opposed by Madame Catalani at the Hanover-square Rooms. In 1823, a weak and futile attempt was made to establish *British Concerts*, for the performance of music by native composers. Upon the same principle—absurd because exclusive—a concert was founded in 1834 under the name of the *Society of British Musicians*, the continuance of which has this year

(1836) been announced; but it has hitherto failed entirely in accomplishing its object. In 1833, a *Vocal Society* of thirty professional members sprang up at the Hanover-square Rooms, and gave six concerts, consisting almost entirely of vocal music, antient and modern, of every school. They are continued, and conducted on a principle so laudable that every lover of the art must feel an interest in their success.

CONCERT-PITCH, in Music, is the *pitch*—the degree of acuteness or gravity—generally adopted for some one given note, and by which every other note is, of course, governed. *Concert-pitch* has frequently much varied, and musicians have hitherto made little if any effort to obtain a fixed standard, though so desirable, and so easily established.

CONCERTO, in Music (an Italian word adopted in our language), a composition in which many performers play in concert, *i. e.* in unison, but in which some one or two instruments take rather a more prominent part than the others. Such are the concertos of Corelli, Handel, Geminiani, Avison, &c. But from the latter part of last century the term has been applied to the species of composition written for one principal instrument, with accompaniments for a full orchestra. Of this description are the piano-forte concertos of Mozart, Dussek, Cramer, Beethoven, &c.; and the violin concertos of Viotti, Rode, &c. It must be observed, however, that in the concertos of Mozart and Beethoven the orchestral parts are so full, so essential, that those compositions may, if the expression is allowable, be designated as symphonies with a piano-forte part *obbligato*.

CONCHA'CEA, M. de Blainville's eighth family—M. Rang makes it the ninth, and places it in the second division, Dimyaires, containing those families which have two muscular impressions in each valve—of his third order (*Lamellibranchiata*) of his third class (*Acephalophora*) of *Malacozoa*, or mollusks. The following is De Blainville's definition of the family. *Mantle* closed before (en avant), above, and behind, where it is prolonged by two tubes more or less long, extensile, and either separated or united; abdomen constantly provided with a foot of slightly variable form, serving for locomotion. *Shell* nearly always regular, entirely closed, equivalve; umbones curved forward; hinge dorsal, complete, that is to say, with teeth and a ligament; this last either external or internal, short, and swollen (bombé); two distinct muscular impressions united below by a *ligule* more or less large, and very often inflected or returning backwards (rentrée en arrière).'

'All the animals of this family live plunged more or less deeply in the sand or in the mud, but they are still able to come out of it sometimes.'

M. Rang thus modifies De Blainville's definition, principally for the introduction of Iridina (which according to the observations of M. Deshayes could no longer be retained among the *Submytilacea*) and *Gratelupia*, a fossil species.

'*Mantle* closed, furnished with a considerable antero-inferior opening, for the passage of a foot, and presenting two posterior tubes more or less elongated, extensile, united or separated longitudinally, the lower one serving for respiration, and the upper one for dejections. *Shell* equivalve, generally regular, rarely gaping; umbones more or less curved forwards; hinge almost always with teeth; ligament short and swollen, internal or external; muscular impressions very distinct; united by a pallial impression more or less excavated posteriorly.'

'Animals marine, rarely freshwater.'

Cuvier (last edition of *Règne Animal*), at the foot of his definition of the *Cardiacea*, the fourth family of his *Testaceous Acephala*, has the following note. 'M. de Blainville en fait la famille des *Conchacées*.' The following is Cuvier's definition of his *Cardiacés*. 'Mantle open in front (par devant), and, moreover, with two separate openings, one for respiration and the other for the excrements, which are prolonged into tubes sometimes distinct, sometimes united into a single mass. There is always a transverse muscle at each extremity, and a foot which, most frequently, serves for creeping. It may be regarded as a sufficiently general rule, that those which have long tubes live plunged in the mud or sand. One may recognize on the shell this condition of organization by the more or less developed contour contour plus ou moins rentrant), which the impression of the attachment of the borders of the mantle describes before uniting with the impression of the posterior transverse muscle.'

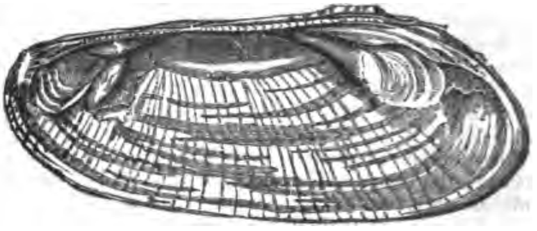
These definitions appear contradictory, but in reality they are meant to convey the same ideas. The mouth is placed anteriorly, the foot is exserted inferiorly, and the tubes open posteriorly.

*

Hinge linear and toothless—freshwater. (Rang.)

Genera. Iridina.

Animal elongated, straight, rather thick on the back, thinner towards its inferior border; mantle delicate, terminated anteriorly by a thick border, open from the anterior muscle to two-thirds of the lower border for the passage of the foot; borders of the mantle united throughout the whole posterior part, whence spring two short and unequal tubes, with no retractor muscle to the siphons; foot compressed and sharp-edged. *Shell*, with an epidermis, nacreous or iridescent internally, tolerably thick, oval oblong, elongated, inauriculated, equivalve, inequilateral, the anterior end shorter than the posterior, a little gaping at either end; umbones small and projecting but little, slightly inclined; hinge very long, linear, attenuated towards the middle, often crenulated, as it were, throughout its length; ligament very long, marginal, external; muscular impressions very distinct. Example. *Iridina exotica*, Lam. *Irid. elongata*, Sow.



[Iridina exotica, one-third of natural size.] (Sow. Gen., No 7.)

Lamarck gives the rivers of warm climates as the locality. The specimens were supposed to come from China. M. Caillaud found them in considerable abundance in the Nile; and from his specimens preserved in spirit M. Deshayes made his examination. Mr. G. B. Sowerby figures another which he considers to be a new species (*Zool. Journ.*, vol. i., tab. 2), and describes it (p. 53) under the name of *Iridina Nilotica*, obtained from Sennaar by M. Caillaud, and sent to England by M. D'Audebard. It very much resembles the species given here as an example, but its hinge margin is not crenulated or dentated. M. Deshayes, in his last edition of Lamarck, makes it identical with *Iridina exotica*, Lam. and Desh., *Anadonta exotica*, Blainv., and *Le Mutel*, Adanson.

**

Hinge with teeth.

a

Regular; hinge-teeth lateral and wide apart (marine).

Cardium (Cockle).

Animal very much rounded, having a very large cylindrical foot with a subconical termination, bent, elbow like, about the middle, and directed forwards. The lobes of the mantle, which is bordered inferiorly by tentacular papillæ, are united posteriorly; but in the commissure, instead of elongated siphons, there are only very short ones; sometimes mere perforations in lieu of them: these are ciliated on their edge like the siphons are at their free extremity. Those parts are so short that they are without proper retractor muscles; whence it happens that the pallial impression in the shell is simple. Mouth transverse, infundibuliform, with small triangular appendages; gills short, unequal, joined upon the same line. *Shell* very much rounded, often subglobular, subcordiform or heart-shaped, equivalve with radiated ribs; borders of the valves toothed, or plaited, umbones a little curved forwards; hinge formed by four teeth in each valve, two cardinal, oblique, and two lateral and distant; ligament posterior and very short.

Geographical Distribution.—Very wide. Mr. Gray records a species, *C. radiatum*, brought home by Captain Parry (*Supplement to Voyage of* 1819-20); and the seas of almost every warm and temperate climate abound with them.

Habits.—The genus is generally found buried in sand near the shore. It has been observed in mud and gravel at depths varying from the surface of the sea to thirteen fathoms. By means of its large and long elbow-like foot it can leap well.

The species are numerous, and some grow to a very large size. M. Deshayes in his edition of Lamarck gives forty-eight, including *Hemicardium;* a form which Cuvier proposes to separate from the others, comprehending the species with compressed valves strongly carinated in the middle; observing that it is difficult to suppose that the animal is not modified in unison with this singular conformation. M. Rang corroborates Cuvier's observation, from the examination of many living individuals of *Cardium Cardissa*, the type; but M. Deshayes considers that the form can only be admitted as a section.

De Blainville divides the genus into the following sections.

1.

Species more or less gaping posteriorly, and with the ribs of the shell as large as the channellings. Example. *Cardium exoticum.*

2.

Species not gaping, and with the ribs as large as the channellings. Example. *C. tuberculatum* (but see below).

3.

Species not gaping, with the ribs larger than the channellings. Example. *C. edule.*

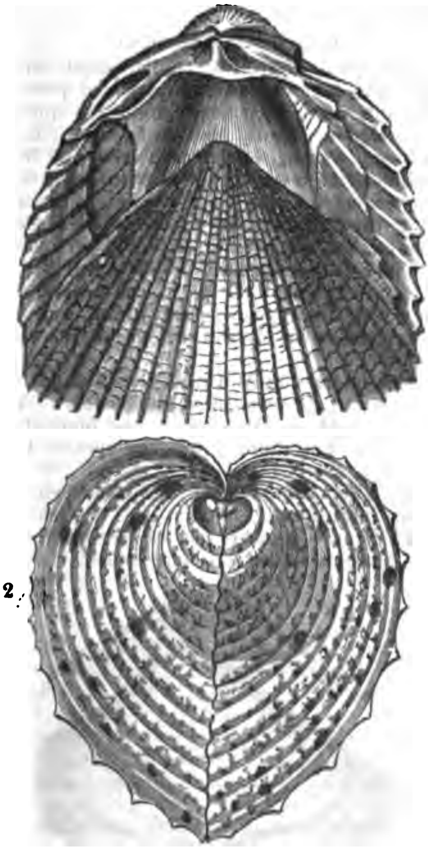
4.

Smooth, or almost smooth species. Example. *C. lævigatum.*

5.

Species whose anterior side is very short, and nearly flat. Example. *C. Hemicardium.*

Mr. G. B. Sowerby has added fourteen new species, and Mr. Broderip one, brought home by Mr. Cuming. (*Zool. Proc.*)



1. Hinge of Cardium lævigatum, natural size. 2. Cardium (Hemicardium) Cardissa, natural size; spotted variety.

Fossil Cardiadæ.

M. Deshayes in his tables gives fifty-three living species and thirty-nine fossil (tertiary), and *C. ringens, ciliare, echinatum, sulcatum, edule, tuberculatum,* and *planatum,* as both living and fossil species (tertiary). Of the recent species M. Deshayes, in his edition of Lamarck, where they are given as forty-eight, considers *Cardium Indicum, C. ringens, C. echinatum* (of which last he makes *C. tuberculatum* to be only a variety), *C. sulcatum,* and *C. edule* (common cockle) as identical with fossil species described by Brocchi and others under different names. The fossil species he makes amount to thirty. Of these he refers *C. echinatum* to its living analogue, *C. Burdigalinum* to the recent *C. Indicum, C. rhomböides* to the recent *C. edule,* and considers *C. diluvianum,* Lam., as identical with *C. hians,* Brocchi. The fossils occur in nearly all the fossiliferous strata from the Supracretaceous to the Grauwacke group, and appear to be most abundant in the crag, London clay and green sand, and the contemporaneous beds. *Cardiola,* Brod., was found by Mr. Murchison in the Lower Ludlow rock, *i. e.*, the lowest part of his first or uppermost *Silurian Formation.*

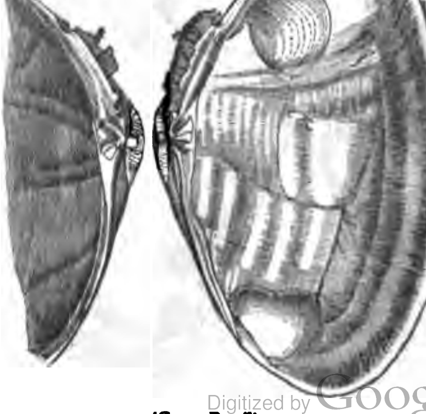
Capsa.

Animal with the mantle considerably open at its ante-inferior border for the passage of a compressed and very large foot: tubes separated and of considerable length, with tentacular papillæ at their orifices. Shell transverse, equivalve, inequilateral, not gaping; cardinal teeth diverging from a point close to the umbo, no lateral teeth in one valve, in the other, one distinct bifid cardinal tooth, and two distant very obsolete lateral ones; ligament external on the anterior side of the umbones; a large sinus in the pallial impressions.

Geographical Distribution.—Temperate and warm seas.

Habits.—Buried at a small depth in the sand, where they are said to lie with the posterior part upwards to facilitate the influx of the water for respiration. The genus has been found in sandy mud and soft mud, at depths varying from five to twelve fathoms from the surface of the sea.

Mr. G. B. Sowerby considers, that of the two species *C. lævigata* (*Donax lævigata*), and *C. Brasiliensis,* now remaining in the genus which he says appears to have been instituted by Lamarck in his Systême, adopted by Bruguière in the 'Encyclopédie Méthodique,' by De Blainville in the 'Dictionnaire des Sciences Naturelles,' and other authors, the second is figured among the *Donaces* by Bruguière: they are, he adds, very nearly related to *Donax,* but the characters of the hinge, and the absence of crenulation round the edge of the valves, will serve to distinguish them. M. Rang observes, that they approach *Donax* so closely, that the example of M. de Blainville in uniting the two may be followed. Mr. G. B. Sowerby says, that *Donax complanata,* Mont., is the only English *Capsa* with which he is acquainted; and that the genus differs from *Sanguinolaria* in not gaping, but resembles it very much in the hinge teeth. M. Deshayes remarks, that Bruguière was the founder of the genus *Capsa,* and that he assembled under it the shells to which Lamarck has since given the name of *Sanguinolaria,* and some others belonging to the *Tellinæ.* When, he adds, Lamarck dismembered the genus, he should not have retained the name of *Capsa,* on account of the confusion consequent on the application of it to shells which Bruguière placed among the *Donaces.* M. Deshayes only records two species, *C. lævigata* (Lam.) and *C. Brasiliensis* (Lam.), in his edition of Lamarck, and is of opinion that the genus should be altogether suppressed and referred to *Donax.* Mr. G. B. Sowerby has added a new species, *C. altior,* brought home by Mr. Cuming. (*Zool. Proc.*)



Capsa Brasiliensis.

Donax.

Animal rather compressed, more or less triangular, having the mantle bordered with tentacular appendages; labial appendages large; mouth small; branchiæ very unequal, on the same side; foot compressed, trenchant, angular; tubes separate and elongated, returning into a sinus of the mantle.

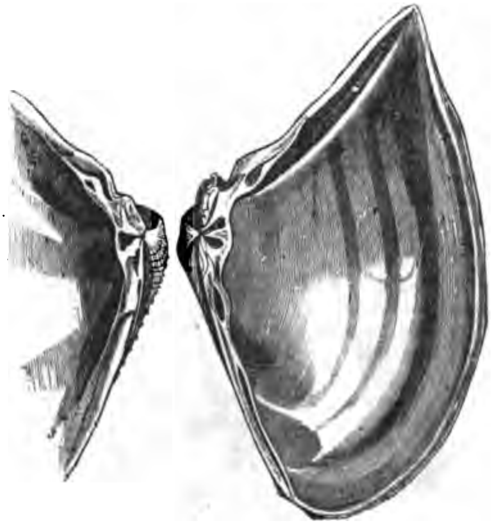
Shell more or less triangular and compressed, always longer than it is high, regular, equivalve, very inequilateral, posterior side shorter than the anterior; umbones but little prominent, and nearly vertical; hinge composed of two cardinal teeth, sometimes upon both valves, sometimes upon one only, and one or two lateral teeth more or less distant; ligament external, short and swollen; muscular impressions rounded, united by a pallial impression, which is straight and very much excavated posteriorly.

Mr. G. B. Sowerby observes, that 'Lamarck is at issue with himself, when he calls the ligament posterior in *Donax;* for the sake of consistency, we must continue to call the side on which the ligament is placed, as well as the sinus in the muscular impression of the mantle, whether it be the shorter or the longer, the anterior side. We are aware that Cuvier has pointed out the impropriety of this; but the term anterior is generally adopted for the side which bears the ligament, and posterior for the opposite side.' M. Deshayes, in his edition of Lamarck, well observes, that the terms anterior and posterior, as used by that zoologist, are badly applied, and that it must not be concluded, as some have done, that the *Donaces* and *Tellinæ* have the ligament on the anterior side. Adanson, he remarks, has doubtless assisted in confirming the error, that the former have the ligament placed on the anterior side; for, probably through inadvertence, in representing the animal of a *Donax* which he names *Pamet*, he makes the foot protrude from the short side which bears the ligament, and the siphon from the long side; but, argues Deshayes, all the *Donaces* examined have the siphons coming out of the shorter side of the shell. The presence of the siphons in a great number of the conchiferous mollusks, is indicated on the shell by a more or less deep sinuosity of the pallial impression, and this sinuosity directed posteriorly shows the position and the direction of the siphons; and in Adanson's figure this sinuosity is seen on the short side, showing that the siphons there come out, and not the foot, as the neighbouring figure would indicate. The consequence, concludes M. Deshayes, is that the *Donaces* come within the rule common to the *Conchifera;* the ligament is on the posterior side where the siphons are protruded.

Geographical Distribution.—Widely extended. De Blainville says that the species occur in all parts of the world.

Habits.—Plunged in sand and sandy mud, where the animal lies with the short side of the shell uppermost, at a depth ranging from the surface of the sea to ten fathoms.

The species are numerous. M. Deshayes, in his tables, enumerates twenty-nine living, and in his edition of Lamarck thirty of these. He considers *D. pubescens*, Linn., as having been established on a young individual of *D. Scortum; D. granosa*, Lam., as a variety of *D. cuneata*, *D. triquetra*, as approaching nearer to the *Cytheræa* than the *Donaces; D. ringens*, as belonging to the genus *Capsa*, Lam., if Lamarck's characters are rigorously followed; *D. cardiöides* (the animal), as a proper subject for study, as it is very probable that it does not belong to the *Donaces;* the pallial impression is not notched posteriorly, and the hinge comes nearer to that of *Cardium medium* than those of the *Donaces;* and *D. Meröe* and *D. scripta*, as having more of the characters of *Cytheræa* than *Donaces*.


[Donax scortum.]

Lamarck divides the species into two sections: first, those which have the internal border of the valves entire or nearly so; second, those that have the internal border distinctly crenulated or dentated.

De Blainville separates them into five divisions, according to the shape, sculpture, and markings of the shell. His fifth division is the genus *Capsa* of Lamarck.

FOSSIL DONACES.

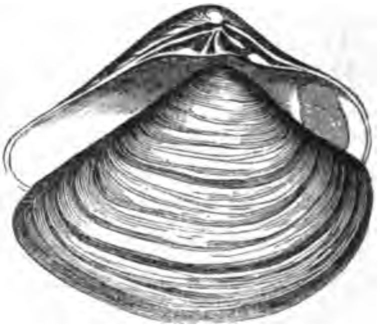
Mr. G. B. Sowerby in his *Genera of Shells* (No. 10, published some time since), says, 'Of fossil species there are very few: Brocchi mentions two, and we possess a small one from Bordeaux, but we believe they are very scarce.' De Blainville quotes Defrance for seventeen, three of which are analogues, one at Loignan, near Bordeaux, one in Italy, and a third in the environs of Paris. Deshayes in his tables gives fifteen fossil (tertiary), and one only (*D. elongata*), as both living and fossil (tertiary). In his edition of Lamarck, the last-mentioned species is passed without any notice of its occurring in a fossil state; but *D. trunculus* is noted as fossil, and Brocchi, Conch., t. ii., p. 537, No. 1, is quoted: nine fossil species only are given. The fossils are said to have occurred principally in the blue marls of the south of France*, &c., the beds at Bordeaux and Dax and in the oolitic group.

Gratelupia (fossil only).

Shell subtrigonal, equivalve, regular, nearly equilateral, a little attenuated at its posterior part, and presenting at the postero-inferior border a slight sinuosity; umbones very small, not projecting, hardly inclined forwards; hinge with three cardinal diverging teeth in each valve, and from three to six cardini-serial teeth, lamellar with finely dentelated edges, converging towards the summits, and situated a little below them, under the ligament; a single lateral tooth, anterior, beneath the lunule, in the left valve, corresponding with a hollow similarly situated in the right valve; ligament external, long, swollen, passing beyond the serial teeth; muscular impressions nearly equal, oval, united by a pallial impression largely and very deeply excavated posteriorly.

This genus, founded by M. Charles des Moulins, was confounded with the *Donaces* by M. de Basterot. M. Rang, who agrees with M. des Moulins on the propriety of this separation, says that there is but one species, *G. donaciformis*.

Locality.—The marine beds of Mérignac (tertiary). Mr Lea, in his interesting 'Contributions to Geology†,' describes and figures another species, *G. Moulinsii*, from Claiborne, Alabama (America), here copied.


[Gratelupia Moulinsii.]

Tellina and Tellinides.

Animal generally very much compressed, considerably elongated; mantle moderately open at its antero-inferior part, and bordered with tentacular appendages; branchiæ unequal, on both sides; foot very much compressed, trenchant, and pointed before; tubes very much elongated, separated, and capable of being returned into a fold of the mantle.

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* The term 'blue marls of the south of France,' &c., is here used in the same sense as it is by M. Marcel de Serres and in De La Beche's Manual.

† Philadelphia, 1833. Mr. Lea considers the strata of Claiborne as tertiary, and refers them to the same period as the London clay of England, and the Calcaire grossier of Paris,—Eocene period of Lyell.

Shell generally elongated, and very much compressed, equivalve, regular, sometimes slightly inequilateral; the anterior side not being always much longer than the posterior one, which is often angular, with a flexuous and irregular bend or fold at its lower border; umbones very small; hinge with three cardinal teeth, and two lateral ones which are often distant, with a hollow at their base in each valve; ligament posterior, swollen and elongated; a very small second ligament near the umbo; muscular impressions rounded; pallial impression straight, and very deeply excavated.

Lamarck makes the forms of *Tellina* and *Tellinides* distinctly generic. Mr. G. B. Sowerby follows Lamarck's arrangement, observing that of the *Tellinæ* there are many species, some of a form very much elongated in a transverse direction, as *T. rostrata*, *Spengleri*, &c.; others of an oval shape, some of which are rough on the outside, *T. Lingua-felis*, for example; others, again, nearly orbicular, *T. scobinata*, *T. carnaira*, &c.; a very few have one valve more flat than the other, *T. opercularis*, for instance: while both valves are remarkably deep in others, as in *T. lacunosa*. Of *Tellinides*, he says that the number of shells that may be ranged under it is rather considerable, although Lamarck has mentioned only one.

Both M. de Blainville and M. Rang think that these two forms belong to one genus, and M. Deshayes is of the same opinion. In his edition of Lamarck, he observes that the *Tellinæ* are allied by almost insensible gradations to the *Psammobiæ* (*Psammobia* and *Psammotea*, Lam. *Psammocola*, De Blainv.) on one side, and to the *Donaces* on the other, not only in the characters of the shells, but in that of the animals. Under *Psammobia*, however, it would appear that his observations on the animal are founded on the figure in Poli, for he says that in a species made known to him by MM. Quoy and Gaimard from the voyage of the Astrolabe, characters were observed which, up to that time, the *Tellinæ* had not offered. The lobes of the mantle of this animal were very thick, dentelated, and reaching beyond the shell, which thus became demi-internal. [Psammobia.]

Geographical Distribution and Habits.—Found in almost all seas, but more particularly in those of warm climates, where, like the *Donaces*, they live plunged in the sands and sandy mud; *Tellina* having been found in the former at depths varying from the surface of the sea to seventeen fathoms, and *Tellinides* in sandy mud at depths ranging from five to sixteen fathoms. Mr. G. B. Sowerby observes that they are commonly the prey of *Aporrhaides*, *Buccina*, and other carnivorous *Trachelipods*, which pierce the shell to devour the inhabitant.

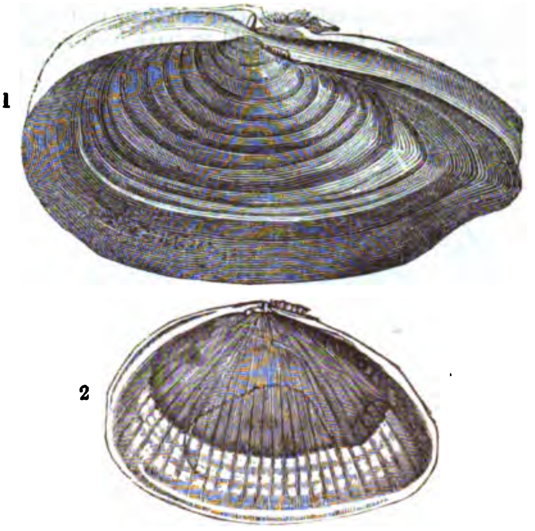
The species are very numerous. M. Deshayes, in his tables, makes the number of living species sixty-eight, and that of *Tellinides*, one. In his edition of Lamarck (1835), he records sixty-two only, the number of species of Tellinides being still one. Of these, he considers some as repetitions or varieties (*Tellina unimaculata*, *Tellina sulphurea*, for example, the first of which he considers a white variety of *T. radiata*, and the second as identical with *T. latirostra*, the only difference being that of colour), and others as founded merely on the difference of age (*T. chloroleuca*, for example).

Lamarck divided the species into the following divisions.

1. Those with the shell transversely oblong. (Ex. *T. radiata*.)
2. Those with the shell orbicular, or rounded oval. (Ex. *T. scobinata*.)

De Blainville divides the genus thus:—

1. Subtriquetral species. (Ex. *T. bimaculata*.)
2. Elongated species, but which have the posterior side shorter and narrower (plus étroit) than the anterior. (Ex. *T. radiata*.)
3. Oval, or suborbicular, and nearly equilateral. (Ex. *T. scobinata*.)
4. Equilateral species, sufficiently elongated, almost without a flexuous fold; two divergent cardinal teeth, and two distant lateral ones, of which the anterior is but little distant from the umbo. (*Tellinides*, Lam.)



[1. Tellina rostrata. 2. Tellinides.]

FOSSIL TELLINIDÆ.

Mr. G. B. Sowerby, in his '*Genera*,' says that the fossil species are not numerous, and only found in the newer tertiary beds. De Blainville gives the number (1825) at twenty-three, of which there are four analogous in the Plaisantin, according to Brocchi, and three identical at Grignon, according to M. Defrance. M. Deshayes, in his tables, makes the number of fossil (tertiary) species fifty-four, and he records twelve species as both living and fossil (tertiary). In his edition of Lamarck (who, at the end of the notice of his fourth and last fossil species, printed in both editions, refers to the seventh volume of the 'Annales du Museum,' for other fossil Tellens), he gives sixteen.

Among the fossil shells collected from the western borders of the Red Sea, by Mr. James Burton, communicated to Mr. Lyell by Mr. Greenough, then President of the Geological Society, are the following species not noticed in the tables: *Tellinæ Lingua-felis*, *rugosa*, *virgata*, *rostrata*.

The fossil species are recorded as occurring in the Supracretaceous group, in the Cretaceous group, and in the Oolitic group (Coralline Oolite, Yorksh.; Kimmeridge clay; Bernese Jura). Mr. Murchison mentions two species (probably) in the Salopian outlier of Lias.

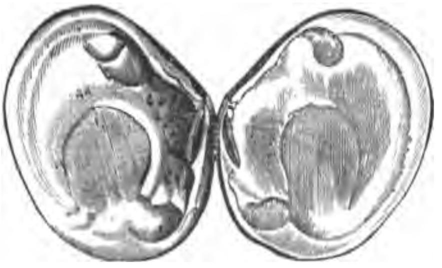
Amphidesma.

Lamarck, after having founded the genus *Donacilla*, thought it necessary to suppress it and unite it to *Amphidesma*. But, observes M. Deshayes in his edition, he did not perceive that many other shells which he placed among the *Mactræ* and *Crassatellæ*, had absolutely the same characters with Donacilla, and differed, generally, from the greater part of the *Amphidesmata*, *Mactræ* and *Crassatellæ*. In consequence of these observations, and from examinations both of shells and of the animal communicated to him by MM. Quoy and Gaimard, M. Deshayes formed his genus *Mesodesma*. We return to *Amphidesma*, reminding the reader that M. Deshayes remarks that it should be studied with attention, that it is 'peu naturel,' and ought not to be retained till it has undergone the necessary reforms. M. Rang, who observes that M. de Blainville had confounded the last named genus with *Lucina*, gives the following characters.

Shell suboval or rounded, of little thickness, longer than it is high, inequilateral, sometimes a little gaping; hinge with one or two cardinal teeth, and sometimes lateral teeth more or less projecting; ligament double; one ligament external and short, the other internal and fixed in a narrow (étroite) hollow of the hinge.

Geographical Distribution, Habits, &c.—As the genus was left by Lamarck, it would appear to be widely spread, for it is recorded as occurring in the European seas (Northern, English channel, Mediterranean); those of New Holland and the south; and on the coasts of Brazil. But it should be remembered that *Amphidesma corbulöides*, Lam., *Mya Norwegica*, Chemn., is the example given by Deshayes for his genus *Osteodesma*, while *A. glabrella* (seas of New Holland and Kanguroo isles) is one of his *Mesodesmata*. The species, which are tolerably numerous in their undisturbed state (*Amphidesma*, Lam.), are said to have been found in sands and mud at depths varying from the surface of the sea to forty fathoms. Lamarck gives sixteen species; Mr. G. B. Sowerby has added twelve, brought home by Mr. Cuming. (*Zool. Proc.*)

Example, ***Amphidesma variegatum.*** Locality, coast of Brazil.



[Amphidesma variegatum.]

Fossil Amphidesmata.

Mr. G. B. Sowerby (*Genera*) says he does not recollect to have seen Amphidesma in a fossil state. Deshayes, in his tables, notes three living species and one fossil (tertiary), probably the new species without a name, recorded by Mr. Lyell, as having been found by the latter at Caltagirone. Five species are recorded by Phillips in the oolitic group. In Dr. Fitton's paper, one species from the green-sand is figured, and described as doubtful.

Mesodesma (Deshayes).

Animal inclining to oval or subtrigonal, flattened; lobes of the mantle united for two-thirds of the posterior length, and provided, at their posterior extremity, with two short siphons prolonged within by a very delicate membrane; foot very much flattened, quadrangular, hidden in part by the branchiæ, which are short, truncated, and fixed (soudées) posteriorly, the external pair smallest and subarticulated. Shell oval, transverse or triangular, thick and ordinarily closed. Hinge with a spoon-shaped hollow, straight and mesial for the ligament, and, on each side, an oblong and simple tooth. (Deshayes.)

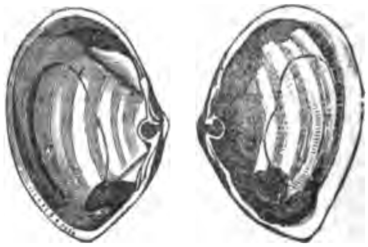
M. Deshayes remarks that the shells of this genus are easily recognized. The shell is always thicker than that of the *Mactræ:* they are more compressed, more completely closed (mieux fermées) and in this respect approach the *Crassatellæ*. The hinge is particularly remarkable; in the middle of the border and immediately below the umbo, is placed a spoon-shaped, triangular, deep hollow, the border of which projects within the valves as in the greater part of the *Lutrariæ*. On each side of this spoon-like process, in which the ligament is inserted, is seen in each valve a large thick tooth, and behind, a hollow to receive the tooth of the opposite valve. Muscular impressions unequal; the anterior largest, elongated; the posterior somewhat rounded. The Pallial impression in the species which approach the *Mactræ* has a moderate posterior sinuosity which diminishes more and more in proportion as the species have more resemblance to the *Crassatellæ*. The sinuosity exists, however, in all the species of the genus.

M. Deshayes concludes, from these and other observations, that the *Mesodesmata* constitute a distinct genus, differing more from the *Amphidesmata* than the *Mactræ* and *Crassatellæ;* and he purposes to place it in the method between these genera as intermediate, or being the point of junction, serving to confirm the relations established by Lamarck between the *Mactræ* and *Crassatellæ*, relations which, he observes, many zoologists have wished to destroy without sufficient reasons. M. Deshayes then gives a list of ten species which are either *Mactræ*, *Crassatellæ*, *Amphidesmata*, or *Erycinæ* of authors. In his tables only seven species, and those living, are recorded. The genus is there placed between *Mactra* and *Erycina*. No fossils mentioned.

Cumingia (G. B. Sowerby).

'A genus which should be placed near to Amphidesma. It is remarkable for the dissimilarity of the hinge of the two valves, one having a strong lateral tooth on each side of the ligament, and the other being entirely destitute of lateral teeth. Having only met with a small West Indian species, we could not venture to consider this genus as established, until Mr. Cuming showed us several species in his rich collection of South American and Pacific shells, one of which is sufficiently large to show the characters distinctly. (Genera of Recent and Fossil Shells, No. 40.) Mr. Sowerby characterizes the shell as inequilateral, equivalve, with the anterior side rounded and the posterior rather acuminated. A single small anterior cardinal tooth observable in each valve: one strong lateral tooth on each side of the hinge in one valve, but no lateral tooth in the other valve; ligament internal, and affixed to a somewhat spoon-shaped pit in each valve. Muscular impressions two in each valve, lateral and distant, the anterior irregular and oblong, the posterior rounded. A very large sinus in the muscular impression of the mantle.

Geographical Distribution and Habits.—Tropical seas as far as is yet known, in clay, mud and sand, in the fissures of rocks, at a depth varying from the surface of the sea to six fathoms. No fossil species known. Example, *Cumingia mutica* (Sow.)



[Cumingia mutica.]

Mactra.

Animal oval, somewhat thick, with the borders of the mantle thick and simple, furnished posteriorly with two tubes but little elongated, and united; branchial laminæ small and nearly equal; foot oval, trenchant, very long, angular. Shell transverse, inequilateral, subtrigonal, sometimes a little gaping at the sides; umbones protuberant; hinge with one cardinal tooth, folded into the shape of the letter V, the point being nearest the umbo, and the branches diverging from it; posterior to this and very close to it is a very thin sharp tooth; sometimes the branches of the folding tooth are separated at the base, forming two diverging teeth; ligamental pit immediately behind the angular tooth and projecting within the shell. Lateral teeth, two on each side in one valve, one on each side in the other, diverging from the umbones, and very near the margin, thin, mostly elongated, and the inner ones more prominent than the outer, but in some species very short, in the thicker species perpendicularly striated. Muscular impressions two, lateral, distant; pallial impression with a small sinus. Ligament consisting of two portions (as usual), one, by far the larger, internal; the other external. In some species the umbones are separated, and the ligament forms a deep pit extending both within and without to the point of the beaks: of this *M. Spengleri* is an example. (G. B. Sowerby, principally, for the shell.)

'This genus,' says Mr. G. B. Sowerby, 'contains a great number of species, some of which are handsome and others very singular shells; upon examining a number of species, we think it might be desirable to divide it into several genera, because we find several distinct forms in it.' (Genera.)

Geographical Distribution.—Wide. Europe, East and West Indies, Africa, North America, &c.

Habits.—Buried generally in sandy mud and sands, at a depth varying from the surface of the sea to 12 fathoms.

The species are numerous; Deshayes, in his tables, gives 32 living: in his edition of Lamarck 33; but, in his opinion, one of these, *M donacia*, is not a *Mactra* but a *Mesodesma*, and others are repetitions or varieties.

De Blainville thus divides the genus:—

1. Species whose cardinal teeth become nearly non-existent in consequence of the enlargement of the ligamental hollow. (Ex. *M. gigantea*).
2. Species all of whose teeth are very large, lamellar, and not striated. (Ex. *M. stultorum*).
3. Thick and solid species without an epidermis; the lateral teeth finely striated; mantle pierced with two openings, but almost without tubes. (Ex. *M. trigonella*).
4. Very thick solid species striated longitudinally, cardinal teeth none or next to none; lateral teeth very

thick, approximated, raised; an external ligament besides the internal one. (Ex. *M. crassa*).

[Mactra Brasiliana.]

Fossil Mactræ.

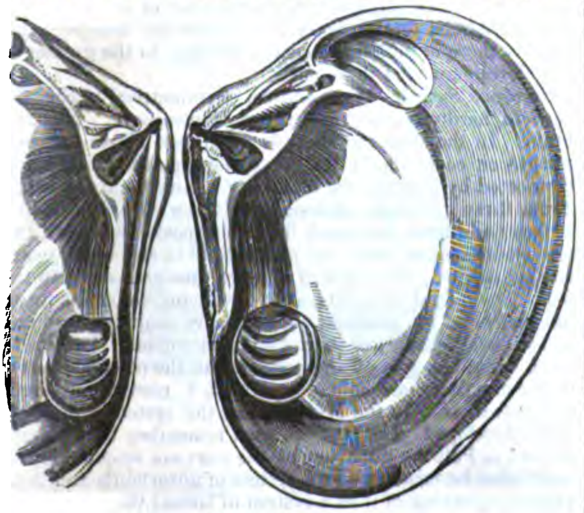
Mr. G. B. Sowerby says, 'The fossil species are not numerous; they are only found in the tertiary beds, unless, indeed, some very singular fossils found in the secondary strata, particularly oolite, be truly referable to this genus; of this, however, we cannot be certain, because we know not their hinges; they will be found represented in Sowerby's Mineral Conchology.' De Blainville quotes M. Defrance for 18 fossil species, one identical, one analogue in the Plaisantin, and another analogue 'dans la Caroline du Nord.' Deshayes, in his tables, gives 14 fossil (tertiary), and four as both living and fossil (tertiary): in his edition of Lamarck, but three species are given as fossil only. Among the fossil shells from the borders of the Red Sea, collected by Mr. J. Burton and communicated by Mr. Greenough to Mr. Lyell, we find *M. stultorum* with a (?) Mr. Lea gives three species, *M. dentata*, *Grayi*, and *pygmæa*, from the Claiborne beds.

Crassatella.

Shell equivalve, transverse, inequilateral, not attached nor gaping. In one valve two strong, cuneiform, rugose, sometimes perpendicularly-grooved cardinal teeth: in the other only one; ligament internal, attached to a concave space placed on the anterior side of the hinge; the pit divided by a carina into two portions, and that part of the ligament attached to the outer portion visible externally when the valves are closed: two strong oblong depressions may then be observed, one on the anterior side of the umbo, rather elongated, and not so distinct as the other on the posterior side. Muscular impressions two, distant, lateral, rather oblong; lateral teeth none, or nearly obsolete. Shell very thick, particularly in old specimens: the recent ones with a brownish somewhat horny epidermis; all more or less transversely grooved near the umbones.

Geographical Distribution.—Seas of New Holland.

M. Deshayes, in his tables, gives the number of living species at nine. In his edition of Lamarck, he makes them eleven, the fifth and the four last of which, he says, belong to his genus *Mesodesma*, and he observes that, by reducing the genus *Crassatella* to those species only which have two cardinal teeth, and, at their sides, the ligamental hollow large and superficial, it will be rendered much more natural than Lamarck left it. Thus the number of known living species would be reduced to seven or eight, and the others, which have the ligamental hollow, mesial and deep, and a cardinal tooth on each side, would, he says, be placed in his genus *Mesodesma*; but these numbers do not agree. The shells of the two genera, he adds, will be distinguished, moreover, by means of the pallial impression, which is always simple in the *Crassatellæ*, and always sinuous posteriorly in *Mesodesma*. Mr. G. B. Sowerby (*Zool. Proc.*) has described two new species brought home by Mr. Cuming.



[Crassatella Kingicola.]

Fossil Crassatellæ.

Mr. G. B. Sowerby, in his '*Genera*,' mentions *C. tumida* and *C. compressa* from the calcaire grossier of the environs of Paris, and *C. sulcata* as very common at Hordwell, and as appearing to be characteristic of the London clay. M. Deshayes remarks upon that shell, that Lamarck regarded the fossils at Beauvais and those living at New Holland as analogues; but that he has satisfied himself that those fossils and *C. sulcata* are different species. *Crassatella tumida*, he observes, approaches *C. Kingicola* nearer than any other.

De Blainville states that there are seven, at least, fossil in France, and that M. Defrance mentions twenty from the lower chalk, with some doubt. In his tables, M. Deshayes gives 24 fossil species (tertiary): in his edition of Lamarck he records 14 only. It appears, in the catalogues, in the supracretaceous and cretaceous groups.

Of the other genera belonging to the *Conchacea*, *Venerupis*, *Petricola*, *Coralliophaga*, and *Clotho*, will be found under title Lithophagidæ*, and the genera separated from *Venus*, or allied to that family, under Veneridæ.

CONCHI'FERA. Lamarck's name for that large class of molluscous animals which are protected by shells consisting of two principal pieces; shells commonly known under the denomination of Bivalves. It comprises the whole of the acephalous mollusks of Cuvier, including the *Brachiopoda*.

Lamarck divided the class into two great orders, the *Dimyaria* (Dimyaires), or conchifers, furnished with two adductor muscles, and the *Monomyaria* (Monomyaires), or conchifers furnished with one adductor muscle only. M. Deshayes would separate the class into three subclasses. 1. The *Polymyaria*, or *Brachiopoda*. 2. The *Dimyaria*. 3. The *Monomyaria*. He founds this order of arrangement on the principle that the organization of the Brachiopoda is more simple than that of the other conchifers, while that of the *Dimyaria* is somewhat less complex than that of the *Monomyaria*.

Organization.

Digestive System.—*Mouth*, without any hard parts, situated anteriorly: in the Dimyarians concealed between the foot and the anterior retractor muscle: in the Monomyarians under a sort of hood made by the mantle. Labial palps or lips flattened, sometimes truncated, sometimes laminated internally, more or less elongated, extending on either side. No salivary gland. *Œsophagus* varying in length and capacity; often wanting altogether both in Dimyarians and Monomyarians. *Stomach* sometimes, not often, lengthened and narrow, sometimes subcircular, generally pear-shaped; interior surface with irregular depressions, or biliary crypts. *Intestine* arising posteriorly, convoluted within the liver and ovary, and so brought towards the back and mesial line of the animal, and continued posteriorly to the vent, nearly of the same diameter all through. *Rectum*, which commences with the dorsal part of the intestine, shorter in the Monomyarians than in the Dimyarians: in the former it is convoluted behind the single central adductor, and terminates in a floating vent between the edges of the mantle; in the latter the vent is situated above the superior adductor. *Liver* very large, supported by muscular fibres, which traverse it, pouring the bile into the stomach by the biliary crypts.

Absorbent System.—Generally agreed to be non-existent, the veins performing the office of absorbing vessels.

Circulatory and Respiratory System.—*Circulation*, a simple circuit, of two vascular systems, viz., a ventricle and an arterial system,—a venous system and two auricles, the ventricle firmly and closely embracing the rectum, so that it *appears* to pass through it. The arterial system not complicated, the venous system upon a considerable scale of development. (Poli, *Testacea utriusque Siciliæ*.) *Circulating fluid* nearly colourless, or white, scarcely tinged with bluish, slightly viscid, and with very little *crassamentum*. [Blood, vol. v., p. 4.] 'Circulation then is an extremely simple function in the conchiferous mollusks: an aortic ventricle gives the blood impulse enough to carry it through the two systems of vessels, to expel it from the heart, and to bring it back again to the auricle. In other branchiferous animals, the auricle is sometimes adapted to give the blood a new impulse when it is about to pass through the branchiæ; here, on the contrary, the auricles do not receive the blood until it has been exposed to the revivifying influence of the organs of respiration.' (Deshayes.) *Respiration.*—By means of branchiæ variously disposed, as will be noticed in the different families.

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* Perhaps, also, Ungulina; M. Rang having of late made observations confirmatory of its perforating habits.

Generative System.—Simply an ovary enveloped in the visceral mass. Taking the common oyster for example, it rests, a whitish mass of considerable size, upon the adductor, and may be seen through the mantle. It occupies the whole upper part of the mollusk, and creeps down along the sides and lower parts, being filled at the time of reproduction with a milky fluid, containing multitudes of small granules of a whitish colour. These are the eggs; and, in many of the family, they are not, at the time of their exclusion, abandoned at once, but are deposited between the two membranes of the branchial laminæ, where they undergo a kind of incubation. In some the shell is developed in the ovum before it quits this receptacle. This fostering of the eggs seems to be analogous to the gestation of the eggs in the crustacea and the pipe-fishes. Sir Anthony Carlisle (*Hunterian Oration*, 1826) says, 'Oysters are viviparous, and their young are found within the tracheal passages, and between the folds of the coverlet (mantle) during the months of June and July in this climate. In its first state, the oyster exhibits two semiorbicular films of transparent shell, which are continually opening and closing at regular intervals. The whole brood are associated together, by being involved in a viscid slime, and in that state called the *spat*, it being common among viviparous animals of this kind to have their spawn posited in contact with the lungs; the involving slime serves as the first nutriment: and, we may infer, that the fœtal food so influenced by the gills, is at the same time a respiratory supply to the imperfectly formed young.' In the siphoniferous branch of the family, the longer the siphons the larger, as a general rule, is the mass of the ovary: in those forms which have the siphons short, and the foot comparatively large, the ovary is comparatively small. As far as anatomy has hitherto detected this part of the organization, here we have hermaphroditism in the true sense of the word. The whole business of reproduction is apparently carried on within the two valves of the shell without the aid of a second individual, as it is in a hermaphrodite flower. But it will occur to most observers that the conchifera are gregarious; the fixed conchifers (oysters, spondyli, chamæ, &c., for instance) eminently so; and it is by no means clear that this congregation may not be a necessary condition for the fecundation of the ova; and that there may not be a mutual diffusion of some influence analogous to that of the milt in fishes. M. Prevost, who made his experiments upon the *Uniones*, would make it appear that though there can be no coitus, still no propagation takes place without an assemblage of these animals upon the same spot.

Muscular System, as it regards motion.—Twofold; valvular and locomotive The first consists in the adaptation of muscular fibre to the movement of the valves, and indeed this muscular apparatus may in some cases be made ancillary to locomotion, as in the Pectens, for example. These adductor muscles are attached to opposite points in each valve, and their office is to close the valves by their contractility, or suffer them to expand by their relaxation. In the greater number (Dimyaria) there are two. one anterior near the oval aperture, the other posterior. The Monomyaria have *apparently* one only; but Poli has shown that this muscle is in reality an approximation of two, and thence most probably arose the slight regard manifested by Cuvier for the division of Lamarck. The second or true locomotive organ is called the foot, and is formed of various layers of fibres, which, by their counteraction, bestow on it great power of motion, when the organ is well developed. Though in some species merely rudimentary, it is found in all the Dimyaria—not so in the Monomyaria, some of which are entirely without it. Its place may be defined by stating that the mouth is generally hidden between its base and the anterior adductor. Where well developed it is of various shapes, cylindrical, flattened, &c. In some it is a digging organ, or kind of ploughshare for making a furrow in the sand or mud wherein the animal means to lie hid; in others, as in the cockle, &c., it becomes a leaping organ, and enables the conchifer to clear a boat's gunwale when laid on the bottom boards. The foot is the instrument which produces the Byssus. Under that title De Blainville's theory will be found. Deshayes has since given a very different account of the structure:—'If the byssus and foot of a byssiferous mollusk be placed under a powerful lens, the last filaments of the byssus are first seen to be nearest to the base of the foot; and, if the inferior edge of the foot be inspected, a fissure will be found running completely along it, at the bottom of which a brownish and semicorneous filament is often to be perceived: this is neither more nor less than a filament of the byssus prepared to be detached by the animal, in order to which the animal stretches forth its foot until it encounters the object upon which the other fibres of the byssus are fixed; to this it applies the point of the foot, which then secretes a small quantity of glutinous matter, continuous with the silky filament lying along the bottom of the furrow of which we have spoken. When the pasty matter has acquired sufficient consistency, and is firmly fixed to the stone or other body at the bottom, the animal retracts its foot, and in doing so detaches the new fibre at the base of the pedicle. The mode in which the filaments of the byssus are formed is consequently entirely different from that in which hair or the horns of the higher animals are evolved, and it is easily understood when the intimate structure of the foot of the byssiferous mollusks is known, when we are aware that this organ consists in its centre of a pretty considerable fasciculus of parallel and longitudinal fibres. By a faculty peculiar to the class of animals that now engages our attention, the fibres situated at the bottom of the groove of the foot become horny, and are detached in succession in the form of threads as they become consolidated.'

The siphons are retracted by means of two lateral fan-shaped muscles, situated posteriorly.

Mantle and Cuticular System.—Two thin fleshy laminæ applied over the back of the animal, extending over its sides, and with its edges meeting along the anterior middle aspect of the body, covering, or closely in contact with, the whole interior surface of the shell, form the mantle, in the thickened edge of which is the principal apparatus that secretes the shell: there are also frequently rows of contractile tentacular cilia fringing it. The whole of these parts are exquisitely sensible, and highly contractile. The mantle becomes free at the origin of the branchiæ, and forms a cavity round the lower part of the animal, containing the visceral mass, the foot, for the extrusion of which there is an opening, and the branchiæ. This is the pallial sac, and is the area wherein the currents for respiration and nutrition are formed. The siphons, where they exist, project from the mantle, with which they are continuous. They are sometimes very long, and sometimes reduced to mere perforations; sometimes separate, and sometimes conjoined; but in any case the superior siphon is that destined for dejections, and is called the anal siphon, while the office of the lower one is to conduct the water to the branchiæ, whence it is termed the branchial siphon. The structure of these posterior siphons or tubes is eminently contractile, and their apertures are fringed with a number of papillæ of great sensibility, capable of giving notice of the contact of any prejudicial foreign body. The retractor muscle is generally more or less developed, according to the greater or less development of these parts.

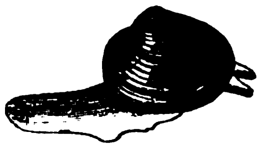
Nervous System.—Very simple. Symmetrical in the *Dimyaria*, hardly symmetrical in the *Monomyaria*. No true brain. In the Dimyaria there is a ganglion above the œsophagus on each side of the mouth towards the labial palps, connected by a transverse filament crossing the œsophagus. From these ganglions filaments are given off to the mouth, anterior adductor, &c.; and, from their posterior edges, two nervous branches go to the stomach, liver and heart, ovary and branchiæ. A branch of some volume goes down to the foot. The lateral filaments, after advancing along the internal surface of the posterior adductor, are conjoined into one or two ganglions larger than the anterior ones. These posterior ganglions give off the nerves to all the posterior parts: if the ganglions are much separated, a nervous filament connects them. In the Monomyaria the system is less perfectly developed. The student must remember that though we owe to Poli the discovery of the nervous system of the conchifers, he mistook it for a system of absorbents and lymphatics, speaking of it as a system of lacteal vessels.

The *senses* of these animals must, reasoning from this part of their organization, be very confined; and indeed there is no good ground for attributing to the generality of them anything beyond a sense of touch and taste. That most of them may be conscious of the presence or absence of light is possible. 'Not having any especial organs for seeing, hearing, or smelling,' says Sir Anthony Carlisle, speaking of the common oyster in his Hunterian Oration (1826), 'the creature is limited to perceive no other impressions but those of immediate contact; and yet every part of its exterior seems to be sensible to light, sounds, odours, and liquid stimulants. It is asserted by fishermen, that oysters, in confined beds, may be seen, if the water is clear, to close their shells whenever the shadow of a boat passes over them.'

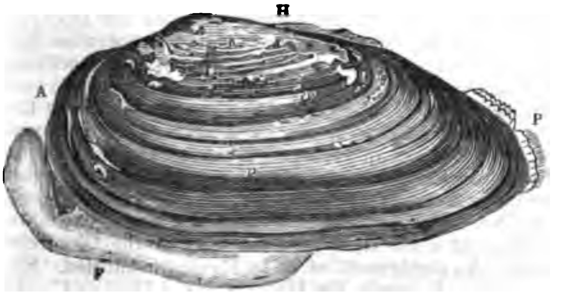
M. Deshayes goes so far as to say that no especial organ of sense can be detected among them, unless, perhaps, those of touch and taste; but we must not forget what have been called the eye-specks in the Pecten, to the animal of which Poli gave the name of Argus, from the supposed number of its visual organs. The pectens are free swimmers, and, from their rapid and desultory motions, we have heard them termed the butterflies of the ocean. The manner in which these motions are executed, especially on the approach of danger, indicates the possession of a sense analogous, at least, to that of ordinary vision. These eyespecks may be seen in the pecten placed at short intervals round the thickened edge of the mantle, on the outworks, as it were, of the internal part of the animal fabric. 'As locomotion so vision' is a general aphorism, not without its particular exception; for there is good reason for believing that *Spondylus*, which is a fixture in its adult state, is furnished with these visual specks.

Shell.—The lobes of the mantle, the thick edges of which form the principal secreting organ, determine, apparently, the form of the shell. The general structure of this substance will be given elsewhere. [SHELL, PEARL.] At present it will only be necessary to state that the shell of the *conchifera* is bivalve, or composed of two pieces, often covered with an epidermis, joined at their upper edge (corresponding to the dorsal part of the animal) by a *hinge*.

The hinge is entirely formed by the inner layer of shell, and consists of either a simple cardinal process, or a serrated edge, or of projections, or teeth as they are called, and corresponding cavities into which they are inserted. To this hinge is superadded a ligament, which binds the two parts together and keeps the parts composing the hinge in their places. The ligament is either internal or external, internal when it is hidden by the outside of the cardinal edge, external when it appears beyond it, and is highly elastic, being composed of a number of fibres parallel to each other and perpendicular to the valves which they connect. This is a beautiful contrivance for the necessities of the animal. When undisturbed, the elastic ligament keeps the valves open, and the animal functions are carried on without any effort; when danger is apprehended, or circumstances require it, the adductor muscle or muscles contract, overcome the resistance of the hinge, and shut the valves close till they may be opened in safety. One of the earliest signs of the loss of vitality in the conchifers is the more than ordinary wide gaping of the shell. This arises from the state of the adductor muscle, which being relaxed by death is no longer an antagonist to the elastic ligament.



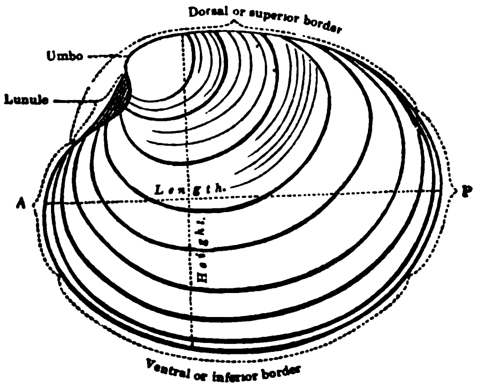
[Cyclas cornea.]



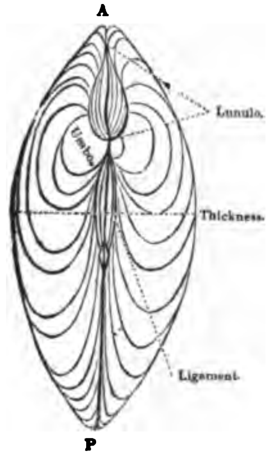
[Unio pictorum.]

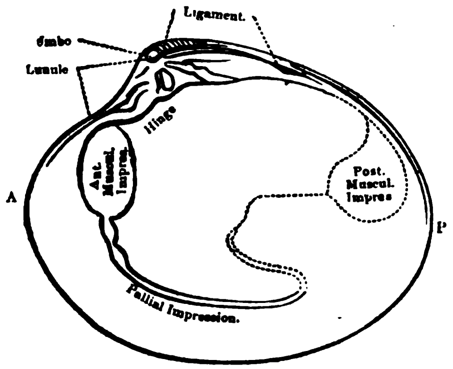
A. Anterior, or oral extremity. P. Posterior, or anal extremity, with the siphons or tubes. H. Hinge. F. Foot.

The common oyster will serve as an example of the Monomyarians, and the cuts will give a general idea of the Dimyarians, their shell, and its muscular impressions.



A. Anterior, or oral extremity.
P. Posterior, or anal extremity.





[Shell of Cytheræa.]

The student should more especially consult the works of Poli, Cuvier, Lamarck, De Blainville, Rang, and Deshayes. The last-named author has lately proposed an amended arrangement, which will be found at the end of his article "Conchifera," in the Encyclopædia of Anatomy and Physiology *.

CONCHOID, (κογχοειδής, resembling a shell.) This name was given by Nicomedes (in the second century) to a curve, by which he proposed the finding of two mean proportionals, and the duplication of the cube. It is found in the commentary of Eutocius on the sphere and cylinder of Archimedes, and in the fourth book of Pappus.

This curve is described by a revolving line, which passes through a fixed point, and is always produced to meet a certain fixed line. On the revolving line, from the point in which it meets the fixed line, set off a given line both ways. The two points thus laid down trace out the upper and lower conchoid, two different branches of the same curve. The lower conchoid has two points of contrary flexure, a cusp, or a loop, according as the given line is less than equal to, or greater than the perpendicular from the pivot of revolution to the fixed line. Taking the pivot of revolution as the origin, and the perpendicular just named as the axis of x, the equation of the conchoid is,

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* In the article 'Conchacea,' p. 427, under the cut in the first column, for 'Cardium lævigatum,' read 'Cardium elongatum.'

$$(x^2+y^2(x-b)^2=a^2x^2,$$

where a is the given line, and b the distance of the pivot from the fixed line. [Duplication of the Cube: Trisection of the Angle.]

CONCHO'LEPAS. [Entomostomata.]

CONCHOLOGY, Conchyliologie of the French. The science which teaches the arrangement of the shells of the testaceous mollusks into classes, sub-classes, families, subfamilies, genera, and species. Formerly the great bulk of conchologists, as they were by courtesy called, consisted of mere collectors, who looked upon these beautiful and in many instances richly-coloured forms, as mere luxuries for the eye, mere toys to decorate a cabinet, much after the fashion of old china. But of late years this science has assumed its proper rank, and is justly considered as holding a high place, whether considered zoologically or geologically. To the geologist it has become a power of the greatest value in indicating the difference of strata and their comparative ages; while Linnæus, Poli, Cuvier, Lamarck, and a host of other philosophers, both dead and living, have shown its high zoological importance. We could not pass the title altogether unnoticed, but we must dismiss it for the present. It is, in our opinion, necessary in the existing state of our knowledge, that the student should consider *shells* as what they really are, *skeletons of molluscous animals*, forming a principal ingredient in their organization with which they are intimately blended, and not mere insulated bodies, mere stones as we have heard them termed, unconnected with the soft parts of the animals. For these reasons the reader will find the general view of this subject under the title Malacology.

CONCINNOUS INTERVALS, in Music, are the various concords. [Concords.]

CONCLAVE (a Latin word, which signifies a private room), is the name given to the assembly of cardinals when they meet for the purpose of electing a pope. [Cardinal.] The day following the last of the funeral of the late pope, the cardinals, after hearing a solemn mass de Spiritu Sancto, proceed to one of the pontifical palaces, generally the Vatican, where rooms have been prepared for each of them, and where they remain shut up till the election has taken place. The keys of the palace are left in the care of a prelate, chosen previously by the cardinals, and who is styled governor of the conclave. Each cardinal has with him a secretary, called conclavista, and two domestics. They meet once a day in the chapel of the palace, where a scrutiny is made of their votes, which are written and placed in an urn: this is repeated every day till two-thirds at least of the votes are in favour of one candidate for the pontifical chair, who is then considered as duly elected. Each cardinal in giving his written vote accompanies it by his name, written in a separate sealed paper, which is not opened till the pope is elected, when the names of the voters are made known. When the election is strongly contested, and the cardinals grow weary of being shut up in conclave, negotiations in writing are carried on between the leaders, and a compromise is entered into by which two or more parties, not being able singly to carry the election of the irrespective candidates, join in favour of a third person, who is acceptable to them all, or at least not obnoxious to any of them. This often gives an unexpected turn to the election. During the conclave the ambassadors of Austria, France, and Spain, have a right to put their veto each upon one particular cardinal, whose election would not be acceptable to their respective courts. The new pope being elected, and his assent being given, he proceeds to dress himself in his pontifical robes; after which he gives his blessing to the cardinals, who give him the osculum pacis (kiss of peace). After this the name of the new pontiff is proclaimed to the people from the great balcony of the palace, and the castle Sant' Angelo fires a salute, and all the bells of the city of Rome ring a merry peal for one hour. (Calindri, *Saggio Geografico Statistico dello Stato Pontificio*, 1832.)

Regulations for the conclave, and the mode of election, have been issued by several popes, beginning from Nicholas II., in the council of Lateran, A.D. 1059, down to Gregory XV., by his bull of 1621, and Urban VIII. in 1625. In times of war or civil disturbance the conclave has been held in other places besides Rome; that in which Pius VII. was elected was held at Venice. Accounts of particular conclaves have been given by numerous writers who have treated of the history of the popes. (Meuschen, *Cæremoniale Electionis et Coronationis Pontificum Romanorum*, Frankfort, 1732.)

CONCORD, in Music, two combined sounds which are universally agreeable to the ear. It is commonly held, that the more frequently the vibrations of two strings coincide, and—which amounts to the same thing—the lower the terms in which the proportions of vibrations are expressed, the more pleasing the concord: but the 4th, an interval much less agreeable than either the 3rd or 6th, is a formidable exception to those rules, proving their fallibility by the test of experience. Rousseau is of opinion—and we agree with him—that the pleasure afforded by concords is attributable to their source, namely, the perfect chord [Chord], which is itself the product, or combination, of nature. This, and its inversions, furnish us with all the concords.

Concords are the 8th (or octave), 5th, 3rd, and 6th. Their ratios are, 2 : 1, 3 : 2, 5 : 4, 5 : 3. The two first are called *perfect*, because, as concords, not liable to any alteration by sharps or flats. The two last are called *imperfect*, because alterable.

The 4th has always proved a stumbling-block to writers on harmony, for the reason above alluded to; but as a component part of an inversion of the perfect chord, it has some claim to be admitted among the concords. A great and recognised authority, of the modern French school, says, that it is treated as a discord in relation to the bass, as a concord in relation to the middle and upper parts. M. Catel, however, has not in this instance proved as correct as usual except in the chords of $\frac{4}{3}$ and $\frac{4}{2}$, the 4th, as an inner part, is, and can only be, treated as a discord.

CONCORDANCE, 'a book which shows in how many texts of Scripture any word occurs.' (Dr. Johnson). More particularly, it is a dictionary or index of all the important words in the Bible, alphabetically arranged for the purpose of finding passages and of comparing the various significations of words. To critical interpreters this class of books is justly considered of the greatest utility, as furnishing an instrument by which the determination of the meaning of obscure expressions may be greatly facilitated by reference to all the parallel passages. 'A good concordance,' says Dr. Geddes (Prospectus, p. 71), 'is undoubtedly the best means of understanding the Hebrew Scriptures.' While the Bible remained in manuscript, and was not divided into chapters and verses, indices of the words and phrases could neither be formed nor used; but as soon as these divisions began to be made, the great importance of concordances, or alphabetical indices, was at once perceived, and several learned men employed much time and labour in constructing them. The compiler of the first concordance in any language was Hugo de St. Caro, or Cardinal Hugo, who died in 1262. The earliest concordance of the Hebrew text is by Rabbi Mordecai Nathan, printed at Venice in 1523. Its Hebrew title is, 'The Light of the Way.' It contains all the Hebrew roots, branched into their various significations, and is said to be the produce of ten years of incessant labour. A more correct edition was published at Basil in 1581, and a Latin translation by Reuchlin in 1556; but both the Latin and the Hebrew editions are extremely inaccurate. The errors are, for the most part, corrected in the work by Calasius, which combines the labours of Nathan and Reuchlin. It is entitled 'Concordantiæ Sacr. Bibliorum Hebr. et Lat.,' 4 tom. fol. 1621. The additions by Calasius consist of very learned and laborious etymological remarks. The reprint of this ponderous work in London in 1747-9 contains among its subscribers all the crowned heads of Europe, including the Pope. The work by the elder Buxtorf, 'Concordantiæ Bibliorum Ebraicæ nova et artificiosa methodo dispositæ,' &c., fol. 1632, is more correct than Nathan's; but the references are made by Hebrew letters, and to the Rabbinical divisions of the Old Testament. An abridgment of it, by Ravius, is entitled, 'Fons Zionis, sive Concordantiæ Hebr. et Chald.,' 8vo. 1677. Dr. John Taylor, under the patronage of the English and Irish bishops, published, in 2 vols. fol. 1754, 'A Hebrew Concordance, after the manner of Buxtorf, adapted to the

English Bible. It is a complete and useful book for the English scholar. The 'Concordantiæ Particularum Ebræo-Chaldaicarum,' fol. 1675, and 4to. 1679, by Noldius, Theological Professor at Copenhagen, is very valuable for the explication of passages dependent on the Hebrew particles, a comparison of which is made with the Greek. The best edition is that of Jena, in 4to. 1734, with a Lexicon of Particles, by Michaelis, extremely useful to the Hebrew critic.

With respect to concordances of the Greek Septuagint, we may notice especially, Kircheri 'Concord. Vet. Test. Græcæ, Ebræis vocibus respondentes,' 2 tom. 4to. 1607; but the Hebrew being placed first, it is more useful for consulting the Hebrew than the Greek text. The most complete and accurate work of this description is Trommii 'Concord. Græcis Versionis dictæ LXX.' 2 tom. fol. 1718. 'I wish,' says Michaelis, 'this Concordance were in the hands of every theologian.' It contains Heb. et Chald. Indices; but the book of Daniel is omitted, the Septuagint version of it being at that time unknown.

The most important concordances of the Greek New Testament are, Betuleii 'Concord. Græcæ Nov. Test.,' fol. 1546. This is the first which appeared: it is now extremely scarce. 'Concord. Græco-Latinæ Nov. Test. ab Hen. Stephano Concinnatæ,' fol. 1594, 2nd ed. 1624, is a work unworthy of so distinguished a man, on account of its great inaccuracy. Schmidii 'Nov. Test. Græci *ταμιεῖον*,' fol. 1638, revised ed. 1717 at Gotha, was beautifully reprinted in 2 vols. 8vo. at Glasgow, 1819. It is much more correct and valuable than that by Stephens. The 'Lexicon Anglo-Græco-Lat. Nov. Test.,' by Andrew Symson, fol. 1658, is a work of prodigious labour, but rendered almost useless by its bad arrangement. The 'Concordance to the Greek New Testament,' with the English to each word, by Dr. Williams, 4to. 1767, is sufficiently complete for ordinary purposes. The first concordance to the Latin Vulgate is that by Cardinal Hugo, entitled, 'Concord. Bibliorum et Canonum,' fol. 1479. After the revision of the Vulgate by Pope Sixtus V., a new and amended edition of Hugo's work appeared at Antwerp in 1617, and subsequently at Geneva in 1625, and at Paris in 1683. There have since been a great number of reprints. The best is that of Avignon, 2 vols. fol. 1786. In compiling the original MS. it is said that the cardinal engaged the services of 500 Dominican monks.

The first Concordance to the English New Testament was 'imprinted by Thomas Gybson' previous to the year 1540. The first to the entire Bible is by 'Jhon Marbeck,' London, in folio, 1550. Subsequent to these there have been several, the principal of which are, Knight's 'Concordance Axiomatical,' fol. 1610; Cotton's Concordance, fol. 1618; Newman's large and complete Concordance, fol. 1643; Bernard's 'Thesaurus Biblicus,' fol. 1644; Wilkins's Concordance, 4to. 1647; Powell's, 8vo. 1671; the 'Cambridge Concordance,' fol. 1689; Butterworth's, 8vo. 1767. But by far the most complete and valuable is the one by Alexander Cruden, the merits of which are too well known to require any remark. The first edition was in 4to. 1737; but the most correct is that of 1810. An 8vo. edition, beautifully printed, appeared in 1824. We must notice finally the 'Concordance of Parallels,' by the Rev. C. Crutwell. 4to. 1790. It is a work of great value, compiled with immense labour from a multitude of Bibles and Commentaries in the Hebrew, Latin, French, Spanish, and other languages. For further details respecting the Concordances here mentioned, and several others, see Watt's *Bibliotheca Britannica* and Orme's *Bibliotheca Biblica*.

CONCORDAT is the name given to a formal agreement between the see of Rome and any foreign government, by which the ecclesiastical discipline of the Catholic clergy and the management of the churches and benefices within the territory of that government are regulated. It is, in fact, a diplomatic negotiation and treaty concerning ecclesiastical affairs, including also temporalities belonging to the church. The frequent disputes between the popes and the various states of Europe touching the right of appointing to vacant sees and benefices [BENEFICES], and also about the claims of the see of Rome to part, or in some cases the whole of the revenues of vacant sees and livings, and of the first fruits and tenths of those which it had filled, as well as the immunities claimed in various times and countries by the clergy and supported by Rome, such as exemption from taxation, and from the jurisdiction of the secular courts, the right of asylum for criminals in the churches, and other similar claims, the particulars of which are found in the history of every country of Europe;—al. these have given occasion to concordats between the popes and particular states, in order to define the rights of each party, to draw a line between the secular and ecclesiastical jurisdictions, and thus put an end to controversy and scandal. By the concordat of 1516 between Leo X. and Francis I., the king abolished the right exercised by the chapters of electing the respective bishops, a right assured to them by St. Louis and by the states of the kingdom under Charles VII. in 1438. The parliament refused for two years to register this concordat, as contrary to the spirit of the general councils and the liberties of the Gallican church; it registered it at last March 19, 1518, 'by express and repeated commands of the king.' (Gregoire, *Essai Historique sur les Libertés de l'Eglise Gallicane.*) Concordats have become most frequent since the middle of the eighteenth century, an epoch from which the European governments have made themselves more independent of the ecclesiastical power, and the popes have been for the most part men of an enlightened and conciliatory spirit. Benedict XIV., by a concordat with the king of Sardinia, in 1741, gave up to the latter the right of nomination to benefices in various provinces of the Sardinian monarchy, which the see of Rome had claimed till then, as well as the temporalities of the same during a vacancy. A concordat was made between the pope and Charles, king of Naples, about the same time, by which the property of the clergy became subject to taxation, and the episcopal jurisdiction in temporal matters was greatly limited. By another concordat between Clement XIV. and the king of Sardinia, the right of asylum to criminals in the churches was much restricted, and full power was given to the respective bishops to expel and give up to the secular power those guilty of heinous offences. But the most celebrated concordat is that agreed upon between Cardinal Consalvi, in the name of Pius VII., and the first consul Bonaparte, in July, 1801. By it the head of the state had the nomination to the vacant sees, but the pope was to confer canonical institution, and the bishops had the appointment to the parishes and their respective dioceses, subject however to the approbation of the government. The clergy became subject, in temporal matters, to the civil power, just like laymen. All immunities, ecclesiastical courts, and jurisdictions, were abolished, and even the regulations of the public worship and religious ceremonies, and the pastoral addresses of the clergy, were placed under the control of the secular authorities. Most of these provisions remain in force in France to the present day. Regulations nearly similar exist in Austria and other German states. Other concordats have been made with some of the Italian states. By that of 1818 with Naples, the king proposes the bishops, subject to the pope's scrutiny, and the pope consecrates them; the bishops have the right of censorship over the press, and the ecclesiastical courts are re-established for matters of discipline and for ecclesiastical causes as defined by the council of Trent. Appeals to Rome are allowed. It appears from the above facts, that the ecclesiastical authority and influence in Roman Catholic countries vary considerably according to the concordats, if there be any, entered into with Rome, or according to the civil regulations adopted and enforced by the respective governments towards the clergy as towards laymen.

CONCRETE, *concrētum*, in philology and metaphysics, is an epithet applied to the conception or expression of a quality which refers to or implies some particular subject in which the quality exists. It is used to denote a term having a naturally implied union with a subject; in other words, it signifies a quality accompanied with its particular subject, without any mental separation or abstraction, as learned, long, wise, round. It is therefore directly opposed to *abstract*, which denotes a quality conceived generally and separately, without reference to any object to which it belongs, as learning, length, wisdom, roundness. Thus the names of classes are abstract, and the names of individuals concrete; and from concrete adjectives are made abstract substantives. (Dr. Watts's *Logic;* Dr. Johnson's *English Gramm.*) Concrete numbers are subject to the same explanation, being such as indicate or directly imply a subject; as two men, five shillings, in contradistinction to abstract numbers, which denote a conception simply of the aggregate of two or five units. Concrete terms, in the scholastic phraseology, are called *paronyma*. The following remark is from Locke's Essay (b. 3, c. 8, sec. i.)—'This distinction of names shows us the difference of our ideas; for if we observe them, we shall find that our simple ideas have all abstract as well as concrete names, the one a substantive, the other an adjective, as whiteness, white, sweetness, sweet.'

CONCUBINAGE is the cohabitation of a man with a woman, to whom he is not united by marriage. Among the Romans, concubinage was in use before the time of the Emperor Augustus, yet without being formally permitted by law. Augustus, with the view of preventing celibacy and encouraging marriage, A.D. 10, caused the famous law called Lex Julia and Papia Poppæa to be passed, which may be considered as much an ordinance of moral police as a measure in favour of population. This law contained several conditions advantageous for those who had the greatest number of children. By the same law, concubinage was legally allowed to unmarried men, with the restriction that not more than one concubine could be taken, and she must be a woman with whom marriage was not permitted, as women of mean descent, freedwomen, &c. The concubine did not enjoy the same rights as a wife, and the children begotten in concubinage were not considered as legitimate, but were called natural (naturales), a distinction which was of importance as to the right of succession.

Concubinage being inconsistent with the principles of Christianity, the Emperor Constantine the Great enacted laws against the institution, and it is now in all countries considered unlawful. Yet in Germany, among the reigning families, a left-handed marriage (Trauung an die linke hand or morganatische ehe) still sometimes occurs. This kind of marriage resembles the Roman concubinage, as well in its conditions as its consequences.

CONCUSSION of the BRAIN, SPINE, &c. [Head, Injuries of the.]

CONDAMINE. [La Condamine.]

CONDE', a town in France in the department of Nord, at the junction of the little river Haine with the Scheldt or Escaut, 124 miles in a direct line N.N.E. of Paris, or 132 miles by the road through Senlis, Peronne, Cambray, and Valenciennes: in 50° 28′ N. lat., and 3° 35′ E. long.

Condé, after passing through other hands, came, about the close of the fifteenth century, into the possession of one of the branches of the house of Bourbon, which took from it the title of Prince of Condé. It was taken from the French by Charles V.: it was besieged and taken three times by the French, the last time, in 1676, by Louis XIV., to whom it was ceded at the peace of Nimeguen, A.D. 1678. In 1793 it was taken by the Austrians, and a few weeks after retaken by the French. It is now a place of war of the first class, and one of the bulwarks of the northern frontier. During the French revolution it bore the name of Nord Libre. The streets are irregular: there are only two or three *places* or open spaces, and those small.

The population in 1832 amounted to 3498 for the town, or 5350 for the whole commune. There are some coal-pits in the neighbourhood, and the situation of the place on the Escaut enables the townsmen to carry on considerable trade.

CONDE'-SUR-NOIREAU, a town in the department of Calvados in France, on the little river Noireau, a feeder of the Orne, and on a cross road leading from Mayenne by Domfront to Caen. It is 128 miles west of Paris in a straight line; in 48° 51′ N. lat., and 0° 34′ W. long.

Of the town itself, situated in a valley, the soil of which is far from productive, our authorities give no description: it had, according to Expilly, two parish churches and an hospital in the middle of the last century. The population in 1832 was 4904 for the town, or 5562 for the whole commune. They are engaged in the manufacture of linsey-woolsey, drugget, and cotton goods. Nails also of various sizes and qualities are made, especially for the ship-builders of St. Malo and Granville.

CONDE', LOUIS II. DE BOURBON, PRINCE DE, born at Paris in 1621, was the son of Henri II. de Bourbon, and grandson of Henri I. of the same name, who, with his cousin Henri of Navarre (afterwards Henri IV.), figured in the civil and religious wars of France, under the reigns of Charles IX. and Henri III. [Henri IV.] The house of Condé was a branch of the house of Bourbon. The town of Condé, in Hainaut, from which it took its title, came to the house of Bourbon in 1487 by the marriage of Francis of Bourbon, Count of Vendôme, with Mary of Luxembourg, heiress of St. Paul, Soissons, Enguien and Condé. Charles de Bourbon, the son of Francis, had many children; the eldest, Antoine, became king of Navarre by marrying Jeanne d'Albret, by whom he had Henri IV.: Louis de Bourbon, another son of Charles, and the first who assumed the title of prince of Condé, was killed at the battle of Jarnac, 1569. [Coligny]. He had married Eléonore de Roye, Dame de Conty or Conti, by whom he had Henri I. of Bourbon, prince of Condé above mentioned, and François, who took the title of prince of Conti.

Louis II., prince of Condé, the subject of the present article, has been styled the Great on account of his military abilities and great success. At the age of 22 he won the battle of Rocroi in Flanders, 1643, against a superior Spanish force. He afterwards fought against the troops of the emperor, and gained the battles of Fribourg and Nordlingen. In 1647 he was sent into Catalonia. In the following year he returned into Flanders and defeated the imperial army commanded by the Archduke Leopold, brother to the Emperor Ferdinand III., at Lens in the Artois. Meantime the civil war of the Fronde broke out at Paris; Condé was courted by both parties, and he served both in succession. He was the means of bringing back young Louis XIV., the queen mother, and Cardinal Mazarin, into Paris in August, 1649. Condé, however, put a high value on his services: he was haughty and warm-tempered, and the cardinal was jealous and suspicious. The result was, that after several vile court intrigues, and plots and counterplots, Condé was arrested by order of the queen and the cardinal, and kept in prison for about one year, when the Parliament of Paris at last obtained his deliverance. Being appointed governor of Guienne, he treated with Spain, and soon after raised the standard of revolt, ostensibly against the cardinal, who continued to exercise the whole political power of the state in spite of the general dissatisfaction. Condé marched upon Paris; engaged Turenne in the faubourg St. Antoine, and entered Paris, where he had the parliament in his favour. The cardinal having at last consented to quit the court, the king published an amnesty, and re-entered Paris, 1652; but the prince of Condé retired to Flanders, where he served for several years in the Spanish armies. He fought, in 1654, at Arras against Turenne, who obliged him to retire, but the retreat was effected with great skill. In 1656 Condé, with Don Juan of Austria, defeated the Marshal de la Ferté, and obliged Turenne to retire from before Valenciennes. In 1658 Condé was defeated by Turenne near Dunkerque, which town was taken by Louis XIV., and given up to the English, according to an agreement with Cromwell. By the peace of the Bidasoa, 1659, Condé was reinstated in all his honours with a full amnesty. In 1668 he served under Louis XIV. in the conquest of Franche Comté. In 1672 Louis, having declared war against Holland, Condé commanded one of the corps d'armée which invaded that country; he took Wesel, and was wounded at the passage of the Rhine. In 1674 he gained the bloody battle of Senef, in Flanders, against the prince of Orange (William III. of England), and relieved Oudenaarde. In 1675, after Turenne was killed near Satzbach, Condé took the command of his army, and obliged Marshal Montecuccoli, who commanded the imperial troops, to retire. This was Condé's last campaign. Being tormented by the gout he left the service and retired to his estate of Chantilly, where he spent his latter years in the society of men of letters. Racine, Boileau, Bossuet, and Bourdaloue were often his guests. He died at Fontainebleau in 1586. His personal character has been variously represented. Bossuet is too panegyrical. The memoirs of Count Jean de Coligny, who knew him intimately, and which were published in 1799, are too unfavourable, and probably exaggerated. (*Œuvres de Lemontey*, tome 5.) Like most of the men high in office at the court of Louis XIV., their master included, Condé seems to have had but imperfect notions of moral principle. Desormeaux has written the 'Life of Condé,' 4 vols. 12mo. The narrative of his campaigns is interesting in a military point of view.

The line of Condé became extinct in 1830 by the death of the duke of Bourbon, son of the last prince of Condé, who, in the wars of the revolution, commanded a corps of French emigrants on the Rhine. The duke of Bourbon never assumed the title of prince of Condé. His only son, the young duke d'Enguien, was put to death by Bonaparte in 1804. The Duke de Bourbon himself died at Chantilly soon after the revolution of July, 1830, in a mysterious manner, which was much commented upon in the newspapers of the time.

CONDENSATION. [EXPANSION.]

CONDILLAC (ETIENNE BONNOT DE), was born at Grenoble in the year 1715, and was distinguished at an early age for his taste for metaphysical inquiries. The works of Locke chiefly attracted his attention, and were the cause of his publishing, in the year 1746, his 'Essai sur l'origine des connoissances humaines,' a work intended to promulgate principles founded on those of the English philosopher. The tendency which Locke's works had naturally produced of tracing all knowledge back to sensations, induced him to publish, in 1749, his second work, the 'Traité des Systêmes,' which was designed to oppose the theories of Leibnitz, Spinosa, and others, as based upon abstract principles, rather than what he conceived the more solid foundation of experience. His third work, 'Traité des Sensations,' is his master-piece. The author supposes a statue, which he has the power of endowing with one sense at a time. He first gives it *smell* alone, and then traces what may be the pleasures, pains, abstract ideas, desires, &c. of a being so limited with regard to its faculties; the other senses are then added, and the statue gradually becomes a complete human being. His works seem to have made but little impression on the mass in his time, but he was much sought after by those of high attainments. Diderot, J. J. Rousseau, and Duclos were among the number of his most intimate friends, and his celebrity spread so far, that he was appointed preceptor to the Prince of Parma. In this capacity he published his 'Cours d'études,' divided into 'L'Art d'écrire, l'art de raisonner, l'art de penser, and Histoire générale des hommes et des empires,' a series of works calculated to promote his own philosophical views. Having completed the education of his pupil, he retired to philosophical meditations. In the year 1768 he was admitted a member of the academy in the room of Abbé l'Olivet, though, strange to relate, he never afterwards attended the meetings of this learned body. His labours only terminated with his life, as he published his 'Logique' but a few months previous to his death, which happened in the year 1780. His 'Langue des Calculs,' a posthumous work, did not appear till the year 1798.

As a philosopher, Condillac rather deserves the term *ingenious* than profound. He has the art of developing his own views in the most entertaining manner possible; and in working out his theories he almost becomes prolix. Not satisfied with giving his statue smell alone, examining its situation in that state, and then adding the other senses, he considers it endowed with each of the other senses alone, and thus extends his 'Traité des Sensations,' which is at best but a pleasing example, to a thick volume.

Professor Stewart has justly censured the French for taking for granted that Condillac was a correct interpreter of Locke, and at the same time is somewhat severe on their Locke mania. He observes that this nation rarely takes up a system till every other nation has done with it; that it began to take Descartes in the place of Aristotle, when Newton had overthrown Descartes everywhere else; and looked upon Locke (as interpreted to them) as infallible, when England had already modified his doctrines. It is clear enough that Condillac was not a faithful interpreter of Locke. He had, perhaps wilfully, overlooked a very short chapter in the 'Essay on the Human Understanding'—'Of simple Ideas of Reflection.' Locke traced all our knowledge to sensation *and reflection;* Condillac stopped at sensation alone, and thus produced a system which cannot be surpassed in sensualism. When his statue has smell alone, he tells us, that if a rose be presented to it, it is certainly, with respect to us, a statue smelling a rose; but is, with respect to itself, nothing but the smell of the flower; the very perceiving subject is to itself nothing but an odour. And this was supposed to be a faithful exposition of the doctrines of Locke—of Locke, who allows the mind ideas of reflection, 'when it turns its view inward upon itself, and observes its own actions about those ideas it has;' and therefore can never have conceived that a perceiving being cannot divide itself in thought from the thing perceived. Some have thought that Condillac imbibed this notion, of a sensation being to the mind only a modification of itself, from Berkeley: but though Berkeley denied an inanimate substratum to our sensations, he certainly never went so far as to make the mind take itself for a self-perceiving sensation.

Condillac's opinion of the importance of words is much more akin to Berkeley's views: without them he contends we should have had no abstract ideas (in the Locke language); that we can only think of a particular image, and our thinking of any general idea, as *man*, is an absurdity; that having observed something in common to several individuals, as *Peter*, *John*, &c., we agree to call them all by the term *man*, and that the general idea is nothing but an idea of such term, or an acknowledgment that the term may fit each of the individuals equally well. Something very like this may be found in Berkeley's Introduction to his 'Treatise concerning the principles of Human Knowledge.'

The knowledge of our own and of other bodies, according to Condillac, commences with the sensation of touch. He gives his statue that sensation, and making it strike itself with its hand, states that while this hand as it were, says, on the consciousness of a sensation, '*C'est moi*' (It is I), the part touched echoes the declaration: thus the statue concludes that both parts belong to its individual self, in other words, that it has a corporeal body. On the other hand, if the statute touch an extraneous body, though the hand says '*C'est moi*,' it perceives there is no echoing sensation, and therefore concludes there is another body besides its own.

Condillac is much lauded by M. La Harpe for his ingenious views of the progress of language. He begins with the language of action, and in the absence of abstract ideas among some American tribes, who have scarcely any language but that of cries and gestures, he finds a support for his hypothesis that these ideas depend on words. The language of action, he says, preceded that of words, and this latter language still preserved much of the character of its predecessor. Thus the elevation and depression of the voice succeeded the various movements of the body. Variation of accent was so much the more necessary as the rude people, who were beginning to lay aside their language of gesture, found it easier to express their meaning by changing emphasis than inventing words. This emphatic style of speaking is in itself a sort of prosody, which insensibly leads to music, and the accompanying of these sounds by gestures leads to dancing, all of which the Greeks called by the common name *μουσική*, music. He then proceeds to trace the drama, rhetoric, and even the peculiarity of the Greek language by regular steps, the language of action having formed the basis of all.

On the whole, the philosophy of Condillac is a system of ultra-sensualism; by omitting reflection (in Locke's sense of the term[*]), he makes the mind perceive nothing but sensations, itself being to itself nothing but a combination of sensations, and thus turn which way we will, there is no escape from the world of sense.

The fullest account of Condillac's philosophy for those who do not wish to peruse his voluminous works, will be found in La Harpe's 'Cours de la Littérature:' a short account of the influence of Locke on France through his medium is given in Professor Stewart's 'Philosophical Essays;' but those who wish to hear Condillac himself without much trouble, will find his system most fully and pleasantly developed in the 'Traité des Sensations.'

CONDIMENTS. [AROMATICS.]

CONDITION. Two possible events, A and B, may be so related, that (1) when A becomes event or effect, B also shall become event or effect: (2) or so that B being already event or effect, when A becomes event or effect, B may either cease to be event or effect, or may be diminished as to event or effect, or enlarged as to event or effect. This kind of relationship may be expressed by the term, condition, and the words by which this condition is made, may be any that are free from ambiguity. In case (1) where A must happen before B can, this may be called a condition precedent. In case (2) where B, already being event or effect, is extinguished or modified by the subsequent event A, this may be called a condition subsequent. The events may be more than two, and the condition which expresses their relation may be more or less complicated, but the general nature of the relation will still subsist. The application of this principle to legal questions is simply this:—Conditions precedent are conditions annexed to any gift of an estate or interest which at law must be strictly performed, before such estate or interest can vest in the person designated by the gift. Conditions subsequent are when the estate or interest is already vested, but its continuance in the person in whom it is vested, depends on the breach or performance of the conditions.

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[*] We insert this parenthesis, because the word '*reflection*' may be found in the works of Condillac, but signifying nothing more than the looking back on past impressions.

Cases may arise, and in construction of agreements and particularly of wills often do arise, in which it is not easy to say whether the condition is precedent or subsequent; but in general, the difficulty arises rather from certain technical rules of law applicable to the construction of instruments, than from the bare terms in which conditions are expressed.

Littleton's description of an estate upon condition is this: (325) 'Estates which men have in lands or tenements upon condition, are of two sorts, viz., either they have estate upon condition in deed, or upon condition in law, &c. Upon condition in deed is, as if a man by deed indented, enfeoffes another in fee simple, reserving to him and his heires yearely a certaine rent payable at one feast, or divers feasts per annum, on condition that if the rent be behind, &c., that it shall be lawful for the feoffor and his heires into the same lands or tenements to enter, &c. And if it happen the rent to be behind by a week after any day of payment of it, or by a moneth after any day of payment of it, or by half a yeare, &c., that then it shall be lawful to the feoffor and his heires to enter, &c. In these cases, if the rent be not paid at such time, or before such time limited and specified within the condition comprised in the indenture, then may the feoffor and his heires enter into such lands and tenements, and them in his former estate to have and hold, and the feoffee quite to ouste thereof. And it is called an estate upon condition, because that the estate of the feoffee is defeasible if the condition be not performed,' &c.

An estate thus given is liable to be defeated, that is, the gift upon non-performance of the condition may be resumed by the giver, or his heirs: this is a condition subsequent, that is, subsequent to the vesting of the estate in the feoffee or grantee

The following example from Littleton will show the difficulty which has been introduced into the construction of conditions by the peculiar character of the laws of England (Litt. 350): 'If land be granted to a man for term of five yeares, upon condition, that if he pay to the grantor within the two first yeares, forty markes, that then he shall have fee, or otherwise but for term of the five yeares, and livery of seisin is made to him by force of the grant, now he hath a fee-simple conditionall, &c. And if in this case the grantee do not pay to the grantor the fortie markes within the first two yeares, then immediately after the first two yeares past, the fee and the freehold is and shall be adjudged in the grantor, because that the grantor cannot after the said two yeares presently enter upon the grauntee, for that the grauntee hath yet title by three yeares to have and occupie the land by force of the same grant. And so because that the condition of the part of the grantee is broken, and the grantor cannot enter, the law will put the fee and the freehold in the grantor.'

On this Coke remarks, that many are of a different opinion from Littleton, because the fee-simple is to commence upon a condition precedent (of which class the condition in the case put by Littleton clearly is), and yet 'here Littleton, of a condition precedent doth (before the performance thereof) make it subsequent.' And yet Littleton is right, for the legal effect of the livery of seisin is to pass a present estate of freehold.

It is a rule of law that none but the grantor and his heirs can have the benefit of a condition; and that any conditions are good which are not unlawful, impossible, immoral, or absolutely inconsistent with the nature of the estate given. An instance of the last kind of condition (Littleton, 360) would be a feoffment, or a devise in fee, upon condition that the feoffee or devisee should not alien the land to any person: such a condition, being inconsistent with the estate given, is void.

Before the Statute of Westminster 2, *De Donis Conditionalibus*, if lands were given to a man and the heirs of his body, as soon as he had issue of his body, this fee-simple conditional became for some purposes, and among them, for alienation, an absolute fee-simple. The effect of this statute was to convert conditional fee-simples into estates tail. [Tail, Estates.]

Conditions in English law were of feudal origin. The rents and services of the feudatory were considered as conditions essentially annexed to his fief, and were called conditions in law, or implied conditions. The neglect of these conditions was a forfeiture of the fief to the lord of whom he held his lands. Expressed conditions, or conditions in deed, were subsequently introduced, but as we have already shown, they savoured of their origin in this, that the donor's remedy for breach of conditions was limited to him and his heirs. But the doctrine of conditions has long ago been extended to all such cases as the complicated relations of a rich and populous country require, and, as in the Roman law, so now in the law of England, conditions may form a part of every written instrument by which men regulate their mutual dealings, or dispose of their property. These conditions and the construction of them, vary with the nature of the instrument of which they form a part; and the construction of such conditions is further subject to some variations, owing to the different aspect under which they are regarded by courts of law and equity.

Those conditions which are of most practical importance, are the conditions of Bonds, Leases, Mortgages, and Wills. The last head includes conditions annexed to portions and Legacies, which have given rise to a great number of disputes, and to numerous and not always consistent judicial decisions.

As to conditional limitations of real property, and the difference between them and remainders and conditions (this being a matter purely technical), the reader is referred to Fearne's *Essay on Contingent Remainders;* and Butler's note on Co. Litt., note 94.

CONDITION (Mathematics) is used in nearly the same sense as in common life. Thus the proposition, to describe an equilateral triangle upon a given straight line, is not to describe *any* triangle, but a triangle under the following *conditions;* that it must be equilateral, and that it must have a given line for its base.

An *equation of condition* means an equation which will not always be true, but requires certain conditions to be satisfied; and is distinguished from an *identical equation*, or one which is true independently of all conditions. Thus, $x + x = 2x$ and $(a + x)\ (a - x) = a^2 - x^2$ are identical equations: they are true for all values of x and a. But $x + 2 = 3$, and $4x - x^2 = 3$ are equations of condition· the first cannot be true unless $x = 1$, nor the second unless $x = 1$, or $x = 3$.

But the term *equation of condition* has a more technical meaning in the application of mathematics to the sciences of observation. Suppose, for example, that x, y, and z are certain quantities to be found, but which cannot be observed directly: they are however connected with each other by an equation, say $a\,x + b\,y + c\,z = h$, where, a, b, c, and h are different at different times, or for different circumstances of observation, but still are so connected that the preceding equation must be true; and where a, b, c, and h can either be observed, or computed from observations. Let a_1, b_1, c_1, and h_1 be the results of a first observation; a_2, b_2, &c., of a second; then for n different observations, we have the n following equations:—

$$a_1\,x + b_1\,y + c_1\,z = h_1$$
$$a_2\,x + b_2\,y + c_2\,z = h_2, \text{ \&c.}$$

If the observations be all correct, any three of these will give the same values of x, y, and z: but if, as must happen, there be errors in every observation, the results of each triad will differ slightly from those of the rest. For the method of solving the whole set, so as to produce the most probable result, see Probabilities, Theory of, and Least Squares, Method of. This is what is called the formation of *equations of condition.*

CONDOM, a town in the department of Gers in France, situated on the river Baise, a tributary of the Garonne, about 350 miles in a direct line south by west of Paris, in 43° 58′ N. lat., and 0° 22′ E. long.

Before the revolution, this town contained several religious houses, and a college directed by the Fathers of the Oratory. There are at present two hospitals for sick children and for soldiers. The population in 1832 amounted to 3878 for the town, or 7144 for the whole commune. The town is quite surrounded with vineyards, and considerable trade is carried on in the wine and brandy that these produce; but the chief trade is in wheat and flour. The river on which Condom stands gives motion to a great number of corn-mills. A considerable quantity of leather, esteemed the best in this part of the country, is made and sent to Bordeaux; some woollen-yarn is spun, and quills are prepared for writing: cork-cutting is also an important branch of the trade of the place, and paper, tiles, and pottery are made. Several roads meet at Condom; and it has been proposed to open a further line of communication by rendering the Baise navigable between this town and Nérac, where the navigation now commences. Condom was pillaged by the Huguenots in the religious wars of the sixteenth century.

Condom was formerly an episcopal town. The bishopric was established in 1317 by a division of that of Agen. The revenue of a Benedictine abbey formed the revenue of the see, the abbot became the first bishop, and the monks (who were afterwards secularized) formed the chapter. Bossuet filled for some time the see of Condom.

Condom is the chief town of an arrondissement containing, in 1832, 71,487 inhabitants. The district of Condomois, of which it was formerly the capital, was bounded on the north by the Agenois and Bazadois, on the east by La Lomagne (a part of Armagnac), on the south by Armagnac Proper, and on the west by the district of Marsan. [CHALOSSE.] Some of our authorities comprehend the district of Marsan in the Condomois. In it were the towns of Nérac (pop. 3566 for the town, 6327 for the whole commune) and Mezin (pop. 1962 for the town, 3146 for the whole commune).

CONDOR, or CUNTUR (Zoology), one of the largest of the known *Vulturidæ*, of whose size and strength such exaggerated accounts were formerly current, and whose true history and dimensions have been ascertained only within these few years. The bird was compared to the Roc of the Arabian romance writers; nay, by some, it was considered identical with that monstrous oriental conception. In the 'Musæum Tradescantianum,' under title 'Clawes,' we find 'the claw of the bird Rock, who, as authors report, is able to trusse an elephant.' This may have been the claw of a condor, exaggerated by some of the artists who wrought extraordinary zoological forms for the collectors of the day. Near the passage quoted there is a notice of a toucan's (Aracari's) bill, and other parts of birds from Brazil and 'the West Indias.' In the old French Encyclopédie, after noticing Condamine's statement, the writer adds that it is believed that these birds exist also in the region of Sophala, of the Caffres, and of Monomotapa, as far as the kingdom of Angola, and that it is supposed that they do not differ from those which the Arabians call *rouh*.

Ray, in his Synopsis, confesses that, such was the enormous and almost incredible magnitude attributed to it, that he at one time considered the Condor the mere offspring of fiction, that he dared not insert the bird in Willughby's Ornithology, and that it was to Sir Hans Sloane, who possessed a feather plucked from the wing of one shot on the coast of Chile, and presented to him by Captain Strong, who gave him at the same time the measurement of the bird, that he first owed his belief of its existence.

Joseph Acosta, Garcilasso de la Vega, and John de Laet, all speak of this vulture. Acosta says that the birds called condors are of great magnitude, and of such strength that they are not only able to eviscerate and devour a sheep, but even an entire calf. Garcilasso enumerates among the rapacious birds those called *Cuntur*, and corruptly by the Spaniards *Condor*, and states that some of those killed by the Spaniards measured fifteen or sixteen feet from tip to tip of the extended wings. He further observes that nature, in order to temper their ferocity and strength, has denied them the crooked talons which she has bestowed on the eagle, and given them claws more like those of the gallinaceous birds; but that she has, however, endowed them with a beak sufficiently strong to perforate and tear off a bull's hide, and to rip out its entrails. Two of them, he adds, will dare to attack a cow or a bull, and will devour it; 'neither do they abstain from the human race; but will set upon and slay, single-handed, boys of ten or twelve years, and it is by a providence of nature, for the protection of the flocks and the natives, that many are not hatched; for, if they were numerous, they would cause great slaughter among the herds, and the greatest damage to the inhabitants.' The account given by John de Laet, who speaks of the 'vasta moles' of the bird, is much the same with that of Garcilasso.

In relation to the condor's alleged attack upon children, Condamine notices a story of the Indians setting up a figure of a child made of very viscous clay; on this the condors were said to pounce, and so entangle their claws that they were held fast.

Feuillée and Molina speak more moderately of the condor; and the former gives the extent of the wings as eleven feet four inches only. The latter can hardly have seen the bird, though he was a native of Chile; for he lays down false characters for the distinction of the sexes, says nothing of the singular comb, and observes that the condor does not differ from the lämmergeyer (*Gypäetus barbatus, Vultur barbatus*).

Abbeville assures his readers that it is twice the size of the most colossal eagle. Desmarchais gives eighteen feet as the extent of the wings, which, he says, are so enormous that the bird can never enter the forest; and he adds that it will attack a man, and carry off a stag. Linnæus seems to have drawn up his account of the habits of the bird from the writers above noticed, some of which he quotes. 'It preys,' says Linnæus, 'on calves, sheep, nay, on boys of ten years; a pair will tear up and devour a cow;' and he adds that the rushing of its wings, as it nears the earth, renders men planet-struck, as it were, and almost deafens them—'in terram devolans, susurro attonitos et surdos fere reddit homines:' he makes the alar extent from thirteen to sixteen feet. These marvellous stories were left to work upon the minds of men always prone to receive the wild and the wonderful; for, till within the last twenty-five years, one or two specimens, and those not perfect, were the only evidences of the condor in the cabinets of Europe.

The *Great Vulture of the Andes* was a striking instance of the way in which things imperfectly known are exaggerated; it was with the Condor, observes Vieillot, as it was with the Patagonians,—both shrank before examination. To the scrutiny of the Baron Von Humboldt and of M. Bonpland we owe the reduction of the bird to its proper dimensions. Nestling in the most solitary places, often upon the ridges of rocks which border the lower limit of perpetual snow, and crowned with its extraordinary comb, the condor for a long time appeared to the eyes of Humboldt himself as a winged giant, and he avows that it was only the measurement of the dead bird that dissipated this optical illusion. The grand scenery amid which it is found had a precisely contrary effect on Lieutenant Maw[*], who, in describing his descent into the deep and narrow valley of Magdalena, says, 'whilst descending, several condors hovered round us, and about the rocks on which they build their nests; but so vast was the scale of the rocks and mountains, that even these immense birds appeared quite insignificant, and I doubted for a time that they were condors.'

Under the name of *zopilote*, a word derived from the Mexican word *tzopilotl*, which is said to signify 'king of the vultures,' M. Vieillot places the condor in the same genus with the bird usually termed 'the king of the vultures' (*Vultur papa* of Linnæus and others), and the Californian vulture (*Vultur californianus*, Lath. and others). His Latin name for this genus is *gypagus*. Mr. Bennett adopts this arrangement, and, as his description of the bird is accurate, and evidently made from personal observation, we give it the preference. 'The condor,' writes Mr. Bennett, whose loss is deeply felt by zoologists in general, and by the Zoological Society in particular, 'forms the type of a genus, a second species of which is the *Vultur papa* of Linnæus, the king of the vultures of British writers. They are both peculiar to the New World, but approach in their most essential characters very closely to the vultures of the Old Continent, differing from the latter principally in the large, fleshy, or rather cartilaginous, caruncle which surmounts their beaks; in the large size of their oval and longitudinal nostrils, placed almost at the very extremity of the cere; and in the comparative length of their quill-feathers, the third being the longest of the series. The most important of these differences, the size and position of their nostrils, appears to be well calculated to add to the already highly powerful sense of smell possessed by the typical vultures, and for which these birds have been almost proverbially celebrated from the earliest ages. There is also a third species, the Californian vulture, two noble specimens of which, the only pair in Europe,' are preserved in the Society's museum, rivalling the condor in bulk, and agreeing in every respect with the generic characters of the group, except in the existence of the caruncle, of which they are entirely destitute.

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[*] 'Journal of a Passage from the Pacific to the Atlantic,' &c.; by Henry Lister Maw, Lieut., R.N.

'In size, the condor is little, if at all, superior to the bearded griffin, the lämmergeyer of the Alps, with which Buffon was disposed conjecturally to confound it, but to which it bears at most but a distant relation. The greatest authentic measurement scarcely carries the extent of its wings beyond fourteen feet; and it appears rarely to attain so gigantic a size. M. Humboldt met with none that exceeded nine feet, and was assured by many credible inhabitants of the province of Quito that they had never shot any that measured more than eleven. The length of a male specimen somewhat less than nine feet in expanse was three feet three inches from the tip of the beak to the extremity of the tail; and its height, when perching, with the neck partly withdrawn, two feet eight inches. Its beak was two inches and three-quarters in length, and an inch and a quarter in depth when closed.

'The beak of the condor is straight at the base, but the upper mandible becomes arched towards the point, and terminates in a strong and well-curved hook. The basal half is of an ash brown, and the remaining portion, towards the point, is nearly white. The head and neck are bare of feathers, and covered with a hard, wrinkled, dusky reddish skin, on which are scattered some short brown or blackish hairs. On the top of the head, which is much flattened above, and extending some distance along the beak, is attached an oblong firm caruncle or comb, covered by a continuation of the skin which invests the head. This organ is peculiar to the male. It is connected to the beak only in its anterior part, and is separated from it at the base in such a manner as to allow of a free passage of the air to the large oval nostrils, which are situated beneath it at that part. Behind the eyes, which are somewhat elongated, and not sunk beneath the general surface of the head, the skin of the neck is, as it were, gathered into a series of descending folds, extending obliquely from the back of the head over the temples, to the under side of the neck, and there connected anteriorly with a lax membrane or wattle, capable of being dilated at pleasure, like that of the common turkey. The neck is marked by numerous deep parallel folds, produced by the habit of retracting the head, in which the bird indulges when at rest. In this position scarcely any part of the neck is visible.

'Round the lower part of the neck, both sexes, the female as well as the male, are furnished with a broad white ruff of downy feathers, which forms the line of separation between the naked skin above and the true feathers covering the body below it. All the other feathers, with the exception of the wing-coverts and the secondary quill feathers, are of a bright black, generally mingled with a greyish tinge of greater or less intensity. In the female, the wing-coverts are blackish grey; but the males have their points, and frequently as much as half their length, white. The wings of the latter are consequently distinguished from those of the female by their large white patches. The secondary quill feathers of both sexes are white on the outer side. The tail is short and wedge-shaped. The legs are excessively thick and powerful, and are coloured of a bluish grey, intermingled with whitish streaks. Their elongated toes are united at the base by a loose but very apparent membrane, and are terminated by long black talons of considerable thickness, but very little curved. The hinder toe is much shorter than the rest, and its talon, although more distinctly curved, is equally wanting in strength; a deficiency which renders the foot much less powerful as an organ of prehension than that of any other of the large birds of the raptorial order.'

Geographical Distribution.—The Andes, and the greater part of the vast mountain-chain which runs up South America, to lat. 7° N., but most common in Peru and Chile.

Habits, Nest, &c.—The condor is found most frequently at an elevation of from 10,000 to 15,000 feet above the level of the sea, and there they are to be seen in groups of three or four, but never in large companies, like the true vultures. Many of the clusters of rocks and of the elevated plateaux are named after them: *Cuntur Kahua*, *Cuntur Palti*, and *Cuntur Huacana*, for example—names which, in the language of the Incas, are said to signify, the Condor's Look out, the Condor's Roost, and the Condor's Nest. In this rarefied atmosphere the bird breathes freely, and resorts to the plains only when impelled by hunger. Then two of them will attack the vicuna, the guanaco, the heifer, and even the puma, the lion of South America, persecuting the tormented quadruped till, overpowered, it falls beneath the wounds inflicted by their claws and beaks, groaning, and protruding its tongue. Upon this and the eyes, their favourite morsels, the condors instantly seize, and the bloody banquet is continued till they are quite gorged. Humboldt saw them after such repasts sitting sullen and sombre on the rocks; and when thus overloaded, they will suffer themselves to be driven before the hunter rather than take wing. But he has also seen them, when on the look-out for prey, and especially on serene days, soaring at a prodigious height, as if for the purpose of commanding the most extensive view. 'C'est l'oiseau,' says Cuvier, speaking of the condor, 'qui s'élève le plus haut.' With regard to the stories of their carrying off children, Humboldt never heard of an instance, although the infants of the Indians who gather snow for sale are frequently left sleeping in the open air in the midst of the haunts of these birds. He often approached within a few feet of three or four of them as they sat on the rocks, but they never manifested any disposition to attack him; and the Indians of Quito assured him that men have nothing to fear from condors: he admits indeed that two of these vultures would be dangerous antagonists for a single man to cope with; and Sir Francis Head describes a severe struggle between one of them and a Cornish miner with his usual graphic power. When the bird descends into the plains, it rarely perches on trees, preferring the ground, for standing and walking on which its toes and straight claws are better adapted.

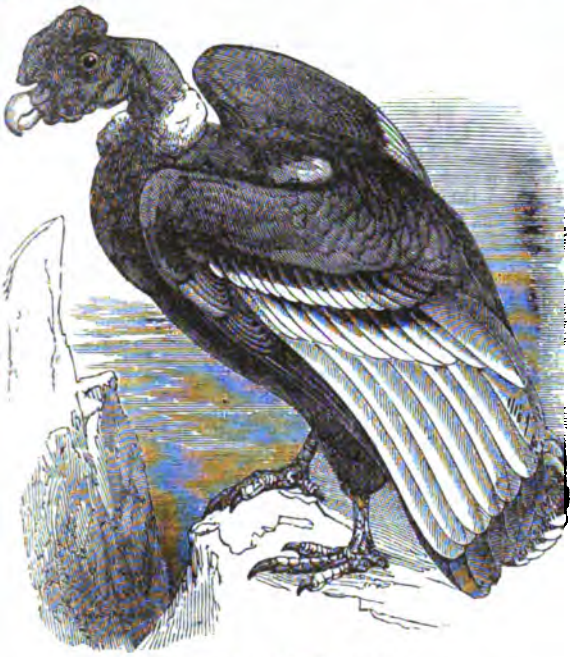
Humboldt was assured that the eggs, which are white, and three or four inches in length, are deposited on the bare rock without any border of straw or other defence. The young ones are said to remain with the female during one year. The nestlings have no feathers; their bodies for some months are covered with a very fine curling whitish down or hair, something like that of young owls; and they are so puffed out by this envelope, that they look almost larger than adults. At the age of two years, the condor is not yet black, but of a yellowish brown; up to this time, the female has no appearance of the white ruff (*gollila* of the Spaniards), and it is owing to want of observation on this change of plumage that many naturalists and travellers, nay, the inhabitants of Peru themselves, talk of two species of condor, the black and the brown (*Condor negro y Condor pardo*). Thus Lieutenant Maw, in the sequel to the passage above quoted, says, 'There were two kinds of condors; one dark brown, the other white on the back, with half the upper side of the wings next the back, and a white ring round the neck.'

Chace.—At Peru, Quito, and in the province of Popayne, condors are taken alive with the lasso. To this end a cow or a horse is killed. Down come the condors, and are permitted to gorge themselves. Then the Indians, with their lassos, appear on the scene, and soon capture them. When one of the birds finds itself hampered, it makes incredible efforts to raise itself in the air, and succeeds, after vomiting freely. The Spaniards call this sport *correr buitres*, and it is, next to the bull-feasts, the great amusement of the country people. In other countries it is said that poisonous herbs are placed in the belly of the quadruped that serves as a bait, and then the condors appear as if intoxicated after their meal.

The tenacity of life exhibited by the condor almost rivals the account which we have given of the endurance of the grisly bear. (BEAR, vol. iv. p. 88.) Humboldt relates that at Riobamba he saw some Indians first strangle one with a lasso and hang it on a tree, pulling it forcibly by the feet for some minutes. The lasso was hardly removed when the condor arose, and walked about as if nothing extraordinary had happened. At less than four paces, three balls were then discharged from a pistol at it, all of which entered its body, wounding it in the neck, chest, and abdomen: the bird still kept its legs. Another ball broke its thigh, and brought it to the ground; but the wretched creature did not die till after an interval of half an hour. Ulloa asserts that in the colder parts of Peru the skin of the condor is so closely covered with feathers, that eight or ten balls may be heard to strike it without penetrating its body.

This celebrated vulture, *Vultur Gryphus* of Linnæus, *Gypagus Gryffus* of Vieillot, *Sarcoramphus Gryphus* of Duméril, is said to possess a most exquisite sense of smelling. It may be doubted, however, whether, as in other vultures, the eye is not at least as great an assistant to the bird in discovering its prey as the nostrils are. (BIRDS, vol. iv. p. 429). Lieutenant Maw saw the condor's quill used as a pen in the Cordillera (Toulea).

The Zoological Society of London have now made this form, of which such romantic tales were told and credited, familiar to the whole population of the metropolis. It is a striking contrast, to rise from the perusal of one of these marvellous stories, and look at the living bird in the Regent's Park



[Sarcoramphus Gryphus, male.]

CONDORCET, MARIE-JEAN-ANTOINE-NICOLAS CARITAT, MARQUIS DE, was born in Picardy in 1743. His family owed their name and title to the castle of Condorcet, near Nion, in Dauphiny. His uncle, the bishop of Lisieux, who died in 1783, superintended his education, and was the means of procuring for him the most powerful patronage as soon as he was old enough to be introduced into public life. He first distinguished himself as a mathematician, and his success in this department soon opened to him the door of the Academy of Sciences.

It is on his application of philosophy to subjects connected with the happiness of mankind and the amelioration of social institutions that his fame chiefly rests. The friend of D'Alembert and of his illustrious contemporaries, Condorcet was one of the warmest and most distinguished of Voltaire's disciples. He cannot, it is true, be placed in the first rank, either as a deep thinker or original writer; nevertheless his meditative and lofty mind, his unabated zeal in the pursuit of truth, his generous ardour, which never cooled or shrunk from the difficulties which it had to encounter, his perseverance in applying himself to all sorts of useful pursuits, and the multiplicity of his labours, have all contributed to assign him a conspicuous place among those who have exercised an influence over the destinies of his country.

His philosophical views have been widely circulated, and the practical effect of them is still visible in our days. The main doctrine which he sought to inculcate, and which is contained in his 'Esquisse des Progrès de l'Esprit humain,' was the perfectibility of man, considered both in his individual and social capacity. According to him, the human frame and intellect, by the aid of time and education, would infallibly attain to perfection. This was the creed which he proposed to substitute in the place of the sanctions of morality and religion. This singular notion, with which he was so deeply imbued, has given to his philosophy a peculiar and special character, which distinguish it alike from the sceptical fatalism of Voltaire and the gloomy dogmatism of Diderot. In the philanthropic mind of Condorcet philosophical speculations were blended with the deepest sympathy for his fellow men, and the most unwearied activity in promoting all such reforms as he thought useful. Of his magnanimity and elevation of soul he gave ample proof in the heroic conduct which he pursued in the hour of difficulty and danger. Proscribed by the Convention as a *Girondin*, he voluntarily quitted the house of his friend Madame Verney, which had afforded him an asylum during eight months of the first revolution, rather than expose her to the consequences of a decree which might have made it a capital crime to harbour or conceal an outlawed deputy.

Houseless, and wandering about the country round Paris, he endeavoured to conceal himself in the numerous quarries with which its neighbourhood abounds. At last the pressure of hunger drove him into a small inn in the village of Clumart, where he incautiously betrayed himself by exhibiting a pocket-book obviously too elegant for one in so destitute a condition. He was arrested, and though exhausted by want and fatigue, and with a sore foot occasioned by excessive walking, he was conveyed to Bourg-la-Reine and thrown into a dungeon. On the morrow (28th March, 1794), he was found dead in his cell, having put a period to his existence by swallowing poison, which he always carried about him in order to avoid the ignominy of the scaffold. His mathematical works are numerous, consisting in great part of memoirs in the Transactions of the academy. In pure mathematics he devoted himself mostly to the development of the differential and integral calculus: he lived during the time when the higher parts of that science began to assume their present powerful form; and his labours on the subject of differential equations must preserve his name in connection with their history. His applications of mathematics are,—1, the problem of three bodies, in which he had no particular success; 2, the application of the mathematical theory of probabilities to judicial decisions, at that time a new and ingenious speculation, the grounds of which are generally misunderstood, but which was treated by Condorcet with a degree of power which entitles his work to no mean rank among those which have led the way to a perception of the extensive bearings of the integral calculus. Condorcet is not in the very first rank of mathematicians, but very high in the second. As a literary author, his 'Eloges des Académiciens morts depuis 1699,' procured for him the perpetual secretaryship of the Academy of Sciences, and furthered his election to the French Academy. Though decidedly inferior to Fontenelle's 'Eloges Académiques,' both in point and simplicity, they nevertheless show Condorcet to be a pure and elegant writer, as well as a good judge of the merit of others. His Lives of Voltaire and Turgot, in which these qualities are most apparent, are moreover distinguished by the enlightened philanthropy, the philosophical zeal, and that desire for improvement, which was always the strongest feeling in the author's heart. The style in which they are written is clear, and if somewhat monotonous, is not altogether devoid of force and spirit. Besides his numerous works (of which he had not time to undertake a regular and careful revision), he contributed several articles to the papers entitled the 'Feuille Villageoise,' and the 'Chronique de Paris.' But the grand work of Condorcet was his Esquisse du Progrès de l'Esprit humain, which he wrote while he was seeking refuge from proscription, and for which he had no other materials except such as he had treasured up in his own vast and capacious memory: it is a work more remarkable for depth of thought than brilliancy of style.

Another of his most remarkable productions was his 'Plan for a Constitution,' which he presented to the Convention, at whose request he had undertaken to draw up a report on public instruction. His treatise on this subject abounds in enlarged and lofty views, and contains the justest notions on the art of expanding the faculties and forming the character.

Good-nature and kindness were the foundation of his dispositions. If he was deficient in any thing, it was in imagination. His outward deportment was cold and reserved, and characterized by a certain degree of awkwardness and timidity. Nevertheless he possessed more real warmth of feeling and greatness of soul than those unacquainted with him would have suspected. D'Alembert used to characterise him as a volcano covered with snow. His private as well as public conduct was firm, disinterested, and straightforward; and being fully satisfied that a system of equality was the only one compatible with the happiness and real interests of mankind, he made no account of his own rank, title, or fortune, but was willing to sacrifice them all to promote the darling object of his hopes and wishes.

Under the old régime, he refused the request of the Academy in 1777 to pronounce an éloge on the Duc de la Vrillière, minister of Louis XV. He subsequently resigned the place which he held under the administration, that he might avoid being brought into contact with M. Necker, whom he suspected of having intrigued against his friend Turgot. In the earlier period of the Revolution, Condorcet used every effort to bring about those changes which he had so often desired to see accomplished for the good of his country, and became an active member of the Comité des Subsistances.

It was on the occasion of being summoned, in 1789, by Louis XVI., to deliberate upon the best mode of providing for the wants of Paris, that he was forcibly struck with the intelligence displayed by the king in the discussion of this difficult and important question. 'After listening to him,' says Condorcet, 'we all looked at each other with astonishment, and felt at once that the course which he advised was in fact the only real one.'

Being called to the Convention, after the fall of the monarchy, he rallied round the Girondins in order to oppose that portion of the Assembly known by the name of Montagnards from their occupying the highest seats in the Convention.

In his efforts to found a republic in France upon a philosophical basis, Condorcet sacrificed his life to his opinions. The purity and benevolence of his intentions, and his magnanimous devotion of himself to the cause in which he had embarked, are the imperishable records of his fame. His wife, who was of the family of Grouchy, and one of the most beautiful women of her day, distinguished herself by a correct and elegant translation of Adam Smith's 'Theory of Moral Sentiments.'

Condorcet's works have been collected and published in 21 volumes 8vo.

CONDOTTIE'RI, a word in the Italian language signifying captains, chiefs, or leaders, but most usually employed to designate soldiers of fortune, who raised corps of cavalry and infantry at their own expense, and engaged with princes and governments for their services as mercenaries. The practice of employing these mercenaries, which commenced in the early part of the fourteenth century, originated in the Italian princes and republics commuting the personal services of their subjects in war for pecuniary payments, with which they were enabled to hire mercenaries. As early as 1225, Genoa took the Count of Savoy into pay with 200 horse. Florence retained 500 French lancers in 1282. After the expedition of the Emperor Henry VII. in 1310, many soldiers of fortune remained in the service of Milan, Florence, and other states. Pisa appears, in 1343, to have disbanded a corps of German mercenaries, whose leader, Guarnieri, refusing to lay down his arms, levied contributions throughout the Italian states. In 1353, a band under the command of Fra Moriale, afterwards of Conrad Lando, called the Great Company, appeared in Italy, and extorted money from many of the Italian states. During the long and bloody wars between our Edward III. and France, foreigners from different parts of Europe, attracted by his fame and liberality, and allured by the hope of plunder, flocked to his standard. They were for the most part men of desperate fortunes, or unable to live at home according to their wishes. At the conclusion of the treaty of Bretigni in 1364, which restored peace to England and France, these soldiers, unable to relinquish a course of life to which they were accustomed, and being without other means of subsistence, were dispersed into the several provinces of France, where they possessed themselves of castles and fortresses, and associating themselves with the banditti of their vicinities, levied contributions on all within their power, and under the names of *companies* or *companions**, they became the terror of the peaceable inhabitants of the country. These ruffians formed altogether a body of 40,000 men, and were headed in many instances by some of the most experienced leaders of the time. They fought pitched battles with the troops of France, in which they gained victories. The misery which they occasioned only served to increase their numbers; for poverty and despair drove their victims to their standard. Even their excommunication by the Pope produced no abatement in their ferocity and rapine. At length, the war between Henry de Transtamare and Peter the Cruel for the succession to the crown of Castile furnished an opportunity to rid France of this scourge. Du Guesclin proposed to Charles V., King of France, to enlist these companies into his service and lead them into Castile. They accordingly engaged in this expedition, and in their way forced the Pope, then residing at Avignon, to give them a sum of money. From this time war became a trade in many parts of Europe, particularly in the Italian states, in which needy and desperate adventurers raised forces either by their pecuniary means or by their personal influence and reputation for conduct and courage, and engaged them for hire without the least consideration for the real or supposed justice of the cause in which they embarked. These forces were recruited from the refuse or the vagabonds of every state in Europe. The idle and profligate found in joining their bands a way of life which flattered their indolence and gratified their rapacity. The mode adopted for assembling them was by contracts with nobles who had authority over the loose and disorderly inhabitants of their estates, with captains whose address or bravery could allure adventurers to their banners, or with individuals whose poverty or choice made them offer themselves to princes or governments. In their discipline, though it was far from exact, and in courage and conduct in war, they were superior to the troops which could be then raised under the powers of the feudal system. Besides the profit which they gained on the ransom of their prisoners, their pay, according to the then value of money, appears to have been high (assuming them to have been as well paid as the other troops), and that of the private soldiers to have been at a much higher rate in proportion to the commanders and officers than in modern times. At the siege of Calais, in 1346, Edward Prince of Wales, for himself and retinue, for his wages of war, had 20*s*. a day. The pay of Henry Earl of Lancaster, for his 'wages of war,' was 6*s*. 8*d*. a day; 11 bannerets, 4*s*. a day; 193 knights, 2*s*.; 512 esquires, 1*s*.; 46 men-at-arms and 612 archers on horseback each 6*d*. a day. From the known rapacity of these mercenaries, it is not likely that they would have accepted lower terms than the other troops engaged in the same enterprize. According to Villani, they frequently demanded and received double pay with a premium or bounty-money of a month's pay on their engagements. It is difficult to state what was the exact amount, but it is conjectured that the pay of a private cuirassier was more than that of a subaltern officer of the present day. But their chief inducement to serve was the plunder of the towns or castles which they took, the contributions they levied, and the ransom of the prisoners. From this motive they were induced not only to spare their own men as much as possible, but to give quarter to their enemies. This rendered some of their battles nearly bloodless, a ludicrous instance of which occurred in one of the Italian wars. Piccinino advanced to attack Florence with an army of several thousand men. The place was defended by Capponi with another body, principally composed of mercenaries. The two armies engaged at Anghiari, a short distance from Florence. The battle lasted four hours. Piccinino was totally defeated, and fled to Borgo San Sepolcro with about a thousand men. The rest were made prisoners; only one man was killed, and this owing to the accident of his falling from his horse and being trodden under foot. Capponi, however, was unable to follow up his success, and his troops refused to advance till they had secured their plunder. Several other battles, equally bloodless, were fought in the wars of this period.

The Condottieri were notorious for bad faith in their engagements with the states they served. Their rapacity was equal to their bad faith; besides their pay, they exacted gratifications for every success. Such was the terror they inspired, that some of the Italian states paid them large sums not to pass through their territories. With the improvement of artillery and the introduction of musquetry the condottieri declined; but it is difficult to state the period of their extinction. Our countryman, Sir John Hawkwood, is said to have been the last, as he was beyond comparison the most eminent for his skill in military affairs. Sir John died at Florence in 1393 at an advanced age, and was buried with great pomp by the Florentines. There is a cenotaph to his memory in the church of Sible Heding-

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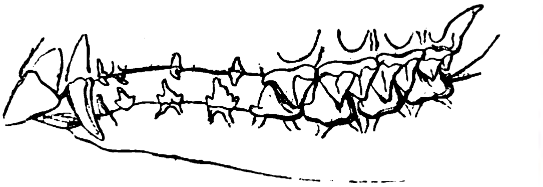
* They were sometimes called cotelli, probably a corruption of coltelli, from their bearing knives, or large daggers.

ham, Essex, where he was born. (Froissart, Villani, Machiavelli, Aretin).

CONDYLU'RA (Zoology), Illiger's name for a genus of insectivorous mammifers, founded on the *sorex cristatus* of Linnæus. Cuvier observes that Desmarest was the first who made the dentition of the genus known.

Generic character.—*Body* thick, furry; *muzzle* much elongated, bordered with membranous crests, disposed star-like round the opening of the nostrils; no external *auricles; eyes* extremely small; *anterior feet* short, large, with five toes, furnished with robust claws proper for digging; *posterior feet* slender, with five toes; length of tail moderate.

Dental formula: incisors $\frac{2}{4}$, canines $\frac{1-1}{1-1}$, molars $\frac{8-8}{7-7}=40$.



[Teeth of Condylura cristata. F. Cuv.]

Lesson observes that the generic name rests on an error made by La Faille, who had represented the radiated mole with knotty swellings on the tail; but it is generally received by zoologists, and will be retained. The genus is analogous to the Moles and to *Scalops*.

Geographical distribution.—Entirely confined to North America, as far as is known at present. Speaking of some specimens of *Condylura longicaudata* in the Museum of the Zoological Society, obtained from Moose Factory, Hudson's Bay Dr. Richardson says, 'They were not accompanied by any account of their habits, or notice of the exact locality where they were killed; but, as the most southern fur posts depending upon Moose Factory are situated upon the borders of Lake Superior, it is probable that they came from that quarter. Pennant's specimen was received from New York.'

The known species are not numerous. Example:—*Condylura macroura* (Harlan). *Thick-tailed, star-nose.* The following is Dr. Richardson's description of a specimen presented to him by the unfortunate Mr. David Douglas, and which the latter had procured on the banks of the Columbia River.

'The *head* is remarkably large; the body is thick and short, and becomes narrower towards the tail, and the hind legs are consequently nearer to each other than the fore-ones. The nose is rather thick, and projects beyond the mouth; it is naked towards its end, is marked with a furrow above, and terminates in a flat surface, which is surrounded by 17 cartilaginous processes, with two more anterior ones situated above the nostrils, and a pair of forked ones immediately below the nostrils. The surfaces of these processes are minutely granulated. Some white whiskers spring from the side of the nose, and reach about half the length of the head. There are others not so long on the upper and under lips. The *fur* on the body is very soft and fine, and has considerable lustre. It is longer than the fur of the other two known species. Its colour on the dorsal aspect is dark umber brown, approaching to blackish-brown. On the belly it is pale liver-brown. When the fur is blown aside, it exhibits a shining blackish-grey colour towards its roots. It is longer on the hind-head and neck than on the belly. The *tail* is narrow at its origin, but it suddenly swells to an inch and a half in circumference; it then tapers gradually until it ends in a fine point, formed by a pencil of hairs, about half an inch long. It is round, or very slightly compressed, and is covered with scales about as large as those on the feet, and with short, tapering, acute hairs, which do not conceal the scales. The hairs covering the upper surface of the tail are nearly black; those beneath are of a browner hue. The *extremities* are shaped almost precisely like those of the *Condylura longicaudata*. Only the palms and toes of the *fore-feet* project beyond the body. The palms are nearly circular, and are protected by a granulated skin, like shagreen. The sides of the feet are furnished with long, white hairs, which curve in over the palms. The five toes are very short, equal to each other in length, and, together with the back of the hands, are covered with hexagonal scales. The *fore-claws* are white. nearly straight, broadly linear, and acute, convex above and flat beneath. The palms turn obliquely outwards, which causes the fourth claw to project rather furthest, but the third one measures as much, the second is shorter, and the first and fifth are equal to each other, and a little shorter than the rest. The *hind-feet* are also turned obliquely outwards, and are scaly, with a few interspersed hairs above, and granulated underneath. The sides are narrow, and present a conspicuous callous tubercle, posterior to the origin of the inner toe. The hind legs are very short, and are clothed with soft brown hair, a tuft of which curves over the heel. There are no hairs on the sides of the hind-feet, like those which form a margin to the fore ones. The hind toes are longer than the fore ones, and are armed with more slender claws, which are white, awl-shaped, curved, and acute. They have a narrow groove towards their points underneath. Length of the head and body, 4 inches 3 lines; of the head, 1 inch 6 lines; of the tail, 2 inches 6 lines, including the pencil of hairs at its extremity, 3 inches 3 lines; naked part of the nose, exclusive of the awl-shaped processes, 2½ lines,' &c. (*Fauna Boreali-Americana*, vol. i., p. 284.)

Dr. Godman observes, that though the external ear in *Condylura cristata* is destitute of auricle, it is very extensive, and is situated at a short distance from the shoulder, in the broad triangular fold of integument connecting the fore-arm and head.

[Condylura Macroura.]

N.B.—M. Latreille has employed the term *Condylura* to designate a genus of *Branchiopoda*. [BRANCHIOPODA, vol. v. p. 340.]

CONE (Mathematics). In the most general sense, a cone is a surface formed by the motion of a straight line indefinitely extended in both directions, and which always passes through one given point (called the vertex). Any curve in space may be a guiding line (or directrix) through which the moving straight line may be made to pass.

But in common language the term cone is only applied to those general cones in which the directrix is a circle. Of these there are two kinds: the *oblique* cone, when the vertex is not in the axis of the directing circle (the axis being the perpendicular drawn to the plane of the circle through its centre); the *right* cone, in which the vertex is in the axis. The most prominent distinction between these two kinds of cones is this: that the oblique cone has two distinct sets of circular sections, whose planes are not parallel to each other [SUBCONTRARY], while the right cone has only one set of circular sections, all parallel to the directing circle.

The right cone is an infinitely extended surface, or consists of two cones (according to the most common notion) joined together by the vertex: but out of mathematics a portion of such cone is called a cone contained between the vertex and the directing circle, then called the *base*. In the rest of this article we shall use this meaning of the word.

The surface of a cone is one half the circumference of its base multiplied by the distance from the vertex to the circumference of the base (called the *slant side*). Thus the diameter of the base being 10 inches, or the circumference 31·416 inches, and the slant side being 20 inches, the surface of the cone is ½ × 20 × 31·416, or 314·16 square inches. The cone unrolled gives a sector of a circle, the angle of which, in theoretical units (see ANGLE), is the circumference of the base divided by the slant side. Thus in the preceding instance 31·416 ÷ 20 or 1·5708 is the angle of the unrolled cone, which is a right angle.

The solidity of a cone is one third of the product of the area of the base and the perpendicular distance of the vertex from the axis. In the preceding instance the perpendicular aforesaid is

$$\sqrt{(\text{slant side})^2 - (\text{rad. of base})^2}, \quad \text{or } \sqrt{400 - 25}.$$

or $\sqrt{375}$, or 19·3649 inches. The area of the base is 3·1416 × 25, or 78·54 square inches: and this multiplied by one third of 19·3649, or 6·455, is 506·976, the number of cubic inches in the cone. The centre of gravity of a cone is in the axis, at a distance from the centre of the base equal to one fourth the distance of the vertex.

CONESSI BARK, the produce of Wright's anti-dysenterica, an apocynaceous plant, native of the coasts of the peninsula of India, especially in Malabar.

CONFARREATION. [MARRIAGE.]

CONFEDERATION OF THE RHINE. [BONAPARTE, p. 134.]

CONFERENCE at Hampton Court, was held on the 14th, 16th, and 18th January, 1604, in the presence of King James I., who took a leading part in the discussion, between nineteen bishops and inferior clergymen of the Church of England, and four Presbyterian or Puritan divines, to argue certain objections to the doctrine and discipline of the Church, respecting which the Puritans had petitioned his Majesty. It was followed by no result.

CONFERVÆ, a name sometimes considered synonymous with Algæ. [ALGÆ.] It is limited in systematic botany to a section of Algæ, consisting of simple tubular jointed species inhabiting fresh water.

CONFESSION means a solemn acknowledgement of some principle or fact. Hence the early Christians, who suffered imprisonment and other penalties from the Roman magistrates for having publicly declared their belief in the gospel, were called confessors. Others, in later times, acquired the same title from having embraced a life of austerity, or retired to some solitude or convent to do penance for their sins. Confession thus became synonymous with penitence, in which sense both words are understood by the Roman Catholics. The practice of confessing one's sins either in public before the congregation of the faithful, or privately to a priest, dates undoubtedly from the earliest ages of the church. In those times the Christians, scattered about the Roman world, and exposed to persecution, formed many small communities, living under the discipline of their presbyters, who knew every individual of their respective flocks, the members of which watched carefully over each other's conduct. Any gross irregularity or any compliance with heathen rites by one of the flock was sure to be known to the rest, and the offender was thereby subject to interdiction from Christian worship and communion. If he wished to be re-admitted to the communion of the church, he must publicly acknowledge and repent of his guilt, and submit to the penance imposed by the presbyter. This appears to have been the original mode of confession. It does not seem to be clearly determined when the practice of private, or 'auricular,' was substituted for public, confession. Cyprian, who lived towards the middle of the third century (*Epist.* Rom. 12), defines several kinds of sins for which penance ought to be done before the transgressor could be admitted to the communion; and in his treatise *De Lapsis in Persecutionibus*, he exhorts those who have fallen into heathen practices to confess their sins to the ministers of God, and thus unburthen their souls of their weight, 'because this satisfaction and the remission by the priest are acceptable to God.' Tertullian, who lived at the beginning of the same century, says (*De Pœnitentiâ*, ch. ix.) that penitence consists of three parts, confession, contrition, and satisfaction. In the eastern churches the custom of confessing sins before the assembled congregation was prevalent down to the fourth century, but the practice having led to scandal, especially on the occasion of a lady revealing that she had been seduced by a deacon, Nacterius, patriarch of Constantinople, abolished the custom, and removed the pœnitentiarius or priest ('qui præpositus erat pœnitentiæ') by whose advice the revelation had taken place. (Sozomen, *Histor.*, lib. vii.) Some passages of Chrysostom have been urged against the obligatory practice of confession. In Homily 11, he says, 'God commands that to him alone we should give account of our conduct, and to him we should confess;' which agrees with the principle and practice of the Protestant and reformed churches. Yet in his Homily of the Samaritan woman, he says, 'He who blushes now to reveal his sins to a man, and will not confess, at the last day will be arraigned not before one or two persons, but before the whole world.' In the fifth century, Pope St. Leo I., called the Great (*Epist.* Rom. lxxx. ch. 5), says that the priests ought not to enforce 'public confession of secret sins,' but that it is enough if the penitent confess them privately to a priest. This passage seems to throw some light on the transition from public to private confession. When and under what circumstances, confession, either public or private, was deemed absolutely necessary for the remission of sins, is another subject of controversy. Innocent III., in the fourth Lateran council, A.D. 1215 (Canon 21), made confession (meaning auricular or private) obligatory upon every adult person once a year, and that continues to be one of the rules of the Roman Catholic church to the present day, which numbers penitence among the sacraments. The Council of Trent, in its Catechism, defines it to be 'a declaration by the penitent of his sins, made to a priest in order to receive the penance and absolution.' Penitence therefore consists of four parts, confession, contrition, absolution, and penance; and it is a positive doctrine of the same church, that without the concurrence of all these parts or conditions, the sacrament is null and void. The penitent is also obliged to confess all the sins that he can recollect having committed and not confessed before, at least all the mortal sins, for Roman Catholic dogmatists draw a distinction between mortal and venial sins. By contrition it is meant that the penitent should fully repent of his guilt, and form at the same time a firm resolution not to sin again, without which repentance and resolution the absolution of the priest is of no avail, being always conditional upon a corresponding disposition on the part of the penitent. It is not therefore true, as it is often erroneously stated, that the priest can absolve from any sins by merely pronouncing the words, 'Ego te absolvo,' &c.; it is the penitent who, by his contrition and trust in the merits of the Saviour only, can give effect to the words of the priest, and in this respect the principle is common to all the Christian churches, except the formula of the absolution, which differs in some, while others omit it altogether. [ABSOLUTION.] The indispensable condition for obtaining absolution is often explained and inculcated from the pulpits and chairs of theology in Catholic countries, though it happens of course that ignorant or weak people overlook or misconceive the absolute necessity of inward contrition, and think that by merely confessing their sins and reciting the formula of repentance with their lips, they have acquitted themselves of their part, and that the priest can do the rest. Again, the priest absolves 'à culpâ, sed non à pœnâ;' he removes the guilt, but not the punishment, here or hereafter; and accordingly Roman Catholics admit a purgatory. The penance which the priest imposes consists generally of satisfaction to be given if the penitent has injured any one in his property, honour, &c., in a manner that can admit of reparation, and also of prayers, abstinence, or other religious practices to be performed. A really virtuous and enlightened confessor can often effect much good in this manner, and restore peace and happiness to families. The secrecy imposed on confessors is strict and unconditional; whatever be the crime of which a penitent may accuse himself, they are solemnly bound to keep it secret, under the most severe denunciations and penalties, both here and hereafter, that of excommunication ipso facto included. Notwithstanding the number of individuals who have exercised the office of confessors all over the Catholic world, and the manifold temptations to which they are exposed, there are few authenticated instances of their having betrayed their trust. That there may be other inconveniences likely to result from private confession, is another question, which it is not our business to discuss. Every priest is not a confessor, although every incumbent of a parish is. The qualifications of age, studies, character, &c. required in a candidate for the office of confessor, the solemn engagements he enters into, and the formalities with which he is consecrated by the bishop, may be seen in the professional works of discipline of the church of Rome, and, among others, in the *Bibliothèque Sacrée* des Pères Richard and Giraud, Paris, 1825, art. 'Confession' and 'Confesseur.'

The box in which the priest sits in the church to hear the penitent is called a confessional. But the act of confession may be performed out of church, in private houses, in the field, in any place in short, provided it be not within hearing of any person except the priest and the penitent.

The Greek church retains the practice of auricular confession, but differs from that of Rome in the form of the absolution. The Protestant and reformed churches, including those of England and Scotland, do not admit the practice, but recommend every one to confess his sins to God, and to repent in order to obtain forgiveness.

Confession is also the name given to the solemn profession of faith of various Christian churches which dissent from that of Rome, such as the Lutheran [Augsburg, Confession of]; that of the reformed churches of France, in 40 articles, signed by Henry, king of Navarre, the prince of Condé, Coligny, and others, and presented to Charles IX. in 1561; that of the Helvetic reformed churches proclaimed in 1566 [Zuingli]; that of the churches of the Netherlands, consisting of 37 articles, and published in 1562, afterwards approved and signed by the members of the synod of Embden, in 1571, and lastly examined and confirmed in 1619 by the synod of Dordrecht [Arminius]; and also that of the Protestant churches of Poland, printed in 1570 at Dobrzin, and afterwards approved at the synod of Sendomir.

Some sepulchres of martyrs have been styled by antiquaries confessions; for instance, the subterraneous chapel, in which are the sepulchres of St. Peter and St. Paul, under St. Peter's at Rome, is called 'the Confession of St. Peter.'

CONFESSION OF AUGSBURG. [Augsburg.]

CONFIRMATION is, according to the Church of England, 'the rite of laying on of hands upon those who have been baptized, and are come to years of discretion.' Such only are qualified to be confirmed as can say the Creed, the Lord's Prayer, the Ten Commandments, and the Church Catechism; to the end that children having learned what their godfathers and godmothers promised for them in baptism, they may themselves ratify and confirm the same; acknowledging themselves 'bound to believe and to do' all which those persons undertook for them. It is affirmed in the sixtieth canon of the Anglican church, that confirmation is 'a solemn, antient, and laudable custom in the church of God, continued from the apostolic times.' On the other hand, among the Protestant Dissenters it is regarded merely as the remnant of a Popish ceremony; with the assertion, that there is no more authority for that which is retained of it than for that which is rejected. The passages of scripture which are always adduced in support of this episcopal imposition of hands are the three following; namely, Acts viii. 14-17, Acts xix. 6, and especially Hebr. vi. 1, where *ἐπίθεσις χειρῶν*, 'the imposition of hands,' appears to be mentioned as an important rite of the Christian religion. But Dissenters disallow this mode of proving the propriety of the imposition of episcopal hands. They deny it to be a legitimate inference from the miraculous act of inspired Apostles to the act of modern bishops. What warrant, they ask, has a bishop to declare that God has given unto an assemblage of several hundreds of individuals 'the forgiveness of all their sins,' because they can say the Church Catechism? (See on this question, Towgood's *Letters on Dissent*; De Laune's *Plea for the Nonconformists*,' &c.) Dr. Whitby observes that, unless the Apostles laid hands on all who were baptized, it makes nothing for confirmation; and that if they did, then Simon Magus received the Holy Ghost. The early fathers certainly believed the Holy Ghost to be indeed conveyed by the imposition of hands. 'When we come out of the water,' says Tertullian (*De Baptismo*, c. 7, 8), 'we are anointed with the holy chrism (perunguimur benedicta unctione), then we have the imposition of hands, which calls down the Holy Ghost (tradit Spiritum Sanctum Paracletum).' *De Resurrec. Carnis*, c. 8; Hieron. *advers. Lucif.*, tom. ii., p. 47; Cyprian, *Epis. 73-74 ad Jub.*, and *72 ad Steph.*) Confirmation was originally thus administered immediately after baptism, of which it formed the concluding rite or complement, and was called *βεβαίωσις*; that is, confirmation; nor was there any exception to this time of administering it in the case of baptism in infancy. In the Greek church, and in Asia, it still accompanies baptism. The remonstrance of the Protestants at the Reformation caused the rite to be discontinued to infants, and to be administered only to adults; and afterwards the Council of Trent altered the time for confirmation to the seventh year.

The earliest mention, by the Fathers, of the use of chrism or sacred ointment in confirmation is believed to be in the passage of Tertullian *de Baptismo*, already quoted (Bingham, b. xii., c. 3); but the church of Rome adduces the authority of the Epistle of James, ch. v., v. 14. The anointing the forehead with this holy unction, which was composed of oil and balsam, constituted the first act of the ceremony of confirmation. The consignation, or signing with the sign of the cross, was the second; and the third and last was the imposition of the bishop's hands with the invocation of the Holy Ghost. The person was then qualified to partake of the eucharist. Confirmation in the Greek church is named *μυρὸν*, 'ointment'; *χρίσμα*, 'unction'; *μυρὸν τοῦ χρίσματος*; *σφραγὶς*, 'the seal'; and *ἐπισφράγισμα*. In the Roman church this rite is one of their seven sacraments, and it consists in the bishop's anointing the forehead of the person, saying, 'A. B., I sign thee with the sign of the cross, and confirm thee with the chrism of salvation, in the name of the Father, and of the Son, and of the Holy Ghost.' The bishop then gives a slight blow on the cheek, and concludes with pronouncing the words Pax tecum, 'Peace be with thee.'

Lord King, in his *History of the Primitive Church*, p. 91, has shown that confirmation was originally the same thing as absolution, and that it was frequently repeated on the same individual. On the reiteration of the rite, see also Morinus *de Pœnitentiâ et Ordinatione*, l. 9.

The Puritan contempt for the hierarchy occasioned confirmation to become greatly neglected after the Protestant Reformation in England (Hooker, l. 5, 66; Bishop Hall's *χειροθεσία*); but subsequent to that period the church of England has observed the rite with much more strictness than the Lutheran or any other church.

Du Pin (*Study of Divinity*, p. 216) gives a numerous list of writers on the subject. (Bingham's *Origines Ecclesiasticæ*, vol. iii., p. 286, *et seq.*; Hammond *de Confirmatione*; Bishop Parker *on Confirmation*; Goar's *Euchologia*, p. 368; Gratian, *Concordantia Discordantium*, part. iii.)

CONFIRMATION (in law). [Deed.]

CONFUCIUS. The real name of Confucius was Koongfoo-tse: the Jesuit missionaries gave it the latinized form in which we use it. According to some authorities, he lived five centuries and a half, and, according to others, only four centuries and a half, before the Christian æra. There is a difference of opinion as to the place of his birth, but that honour is now generally given to the state of Loo, within the district now called Keo-fow Hien, a little to the eastward of the great canal in Shan-tung province, where he was educated, and where he married in the nineteenth year of his age. He was the only son of a woman of illustrious birth. His father, who had several other sons by another wife, held a high government office, but dying some three years after his birth, seems to have left the future philosopher very indifferently provided for. Marvellous stories are told of his love of study when a child, and of his early proficiency in learning and philosophy. The Chinese also record a little fact that may interest phrenologists, namely, that Confucius's head was remarkable for the elevation of its crown. His object in acquiring knowledge was to turn it practically to the purposes of good government, and he accordingly devoted himself exclusively to moral and political science. He divorced his wife after she had borne him a son, 'in order,' say the Jesuits, who excuse this part of his conduct, 'that he might attend to his studies with greater application.' When he thought himself sufficiently qualified to instruct the barbarous age in which he lived, he quitted his solitude for the courts of princes. China was not then united under one emperor: this union did not take place until two or three centuries after the philosopher's death. But when Confucius began his mission, there seem to have been as many independent kings in China as there were in England under the Saxon heptarchy. From the vast extent of the country, each of these states or kingdoms was probably as large as all England put together. The Chinese were not then more pacific than the rest of mankind: the neighbouring states made war upon each other, and every part of the Celestial Empire was in its turn deluged with blood. Not long before the birth of Confucius, the horrors of internal warfare had been augmented by some of the belligerents calling in the foreign aid of the Tartars; but when the philosopher commenced his travels, a powerful international confederacy had been formed, under which the whole of China was comparatively tranquil. He journeyed through these various states in a condition of simplicity and poverty, devoting himself to the instruction of all ranks in his precepts of virtue and social order. His proselytes gradually increased, and he at length reckoned as many as 3000 disciples, of whom 72 were more particularly distinguished by their devotion to their master, and 10 were so well grounded in all sorts of knowledge that they were called, by way of excellence, 'the ten wise men.' In his visits to the different princes he endeavoured to prevail upon them to establish a wise and peaceful administration. His wisdom, his birth, his popularity, recommended him to the patronage of the kings, but his laudable designs were frequently thwarted by envy and interest. After many wanderings and disappointments, he became prime minister, with a recognized authority to carry his theories into practice in his native country Loo. At this time he was 55 years old. In three years he is said to have effected a thorough change in the moral condition of the kingdom. The happiness and prosperity created by the philosophic prime minister excited the jealousy of the neighbouring kings; the sovereign of Loo was soon induced to abandon his benefactor, and Confucius was obliged to flee to the northern parts of China. He was subsequently repulsed at three different courts, to which he applied for office in order that he might render the people happy; and, after sustaining many other sorrows, he withdrew to the kingdom of Chin, where he lived in great poverty. His doctrines, however, had taken root, and it was at this time of adversity that his disciples were most numerous. He went again to Loo, his native country, but vainly solicited to be re-employed in the government.

According to some authorities he enjoyed a few glimpses of royal favour in his latter days, being sought after by the rulers of several states, and employed in high offices, which matured his knowledge and experience: but it seems more certain that his rigid principles, and the firm uncompromising manner in which he carried them into practice, always made him many enemies. His zeal endangered his life more than once, but he regarded death with a stoical eye. At length, full of years, if not of honours, he retired from the world, in company with a few of his chosen disciples, to write or complete those works which became the sacred books of the Chinese, and which have survived twenty-two centuries. He died in his seventy-third year. His sepulcre was raised on the banks of the Soo river, and many of his disciples, repairing to the spot, deplored the loss of their great master. The envy and hatred of his contemporaries soon passed away. When peace was restored, and the empire amalgamated, his writings, which had largely contributed to that happy issue, were looked upon as of paramount authority in all matters; and to mutilate, or in any way to alter their sense, was held to be a crime deserving of condign punishment. Unfortunately, however, the obscurity of the language, and the difficult involved nature of the written character of the Chinese, rendered involuntary alterations and mistakes of the sense numerous and inevitable.

Though Confucius was left to end his life in obscurity, the greatest honours and privileges were heaped upon his descendants, who have existed through sixty-seven or sixty-eight generations, and may be called the only hereditary nobility in China. They flourish in the very district where their great ancestor was born; and in all the revolutions that have occurred their privileges have been respected. In the earlier part of the eighteenth century, under the great emperor Kang-hy, the total number of descendants amounted to eleven thousand males. In every city, down to those of the third rank, styled Hien, there is a temple, dedicated to Confucius. The mandarins, all the learned of the land, the emperor himself, are bound to do him service. This service consists in burning scented gums, frankincense, tapers of sandal-wood, &c., and in placing fruit, wine, flowers, and other agreeable objects before a plain tablet, on which is inscribed,—'O Confucius, our revered master, let thy spiritual part descend and be pleased with this our respect, which we now humbly offer to thee.' The ceremony is precisely the same as that which every man is enjoined to observe in the hall of ancestors to his parents, &c.

'It was the great object of Confucius,' says a recent writer, 'to regulate the manners of the people. He thought outward decorum the true emblem of excellence of heart: he therefore digested all the various ceremonies into one general code of rites, which was called Le-ke, or Ly-king, &c. In this work every ritual in all the relations of human life is strictly regulated, so that a true Chinese is a perfect automaton, put in motion by the regulations of the Ly-king. Some of the rites are most excellent: the duties towards parents, the respect due to superiors, the decorum in the behaviour of common life, &c., speak highly in favour of Confucius; but his substituting ceremony for simplicity and true politeness is unpardonable. The Ly-king contains many excellent maxims, and inculcates morality, but it has come to us in a mutilated state, with many interpolations.' (Gutzlaff, *Sketch of Chinese History, antient and modern.*)

In the writings of Confucius the duties of husbands towards their wives were slightly dwelt upon. On the other hand, the duties and implicit submission of children to their parents were extended to the utmost, and most rigidly inculcated. Upon this wide principle of filial obedience the whole of his system, moral and political, is founded. A family is the prototype of his nation; and, instead of the notions of independence and equality among men, he enforces the principles of dependence and subordination—as of children to parents, the younger to the elder. (Dr. Morrison.) By an easy fiction, the emperor stands as the father of all his subjects, and is thus entitled to their passive obedience; and, as Dr. Morrison observes, it is *probably* (he might say *certainly*) this feature of his doctrines which has made Confucius such a favourite with all the *governments* of China, whether of native or Tartar origin, for so many centuries. At the same time it should be observed that this fundamental doctrine has rendered the Chinese *people* slavish, deceitful, and pusillanimous; and has fostered the growth of a national character that cannot be redeemed by gentleness of deportment and orderliness of conduct.

Confucius was a teacher of morals, but not the founder of a religion. His doctrines constitute rather a system of philosophy in the department of morals and politics than any particular religious faith. (Davis.) Arnauld and other writers have broadly asserted that he did not recognise the existence of a God. (Bayle, *Philos. Dict.*, in art. 'Maldonat'). In his physics Confucius maintains, that 'out of nothing there cannot possibly be produced anything; that material bodies must have existed from all eternity; that the cause (*lee*, reason) or principle of things must have had a co-existence with the things themselves; that, therefore, this cause is also eternal, infinite, indestructible, without limits, omnipotent, and omnipresent: that the central point of influence (*strength*) whence this cause principally acts, is the blue firmament (*Tien*), whence its emanations spread over the whole universe; that it is, therefore, the supreme duty of the prince, in the name of his subjects, to present offerings to *Tien*, and particularly at the equinoxes; the one for obtaining a propitious seed-time, and the other a plentiful harvest.' He taught his disciples that the human body is composed of two principles,—the one light, invisible, and ascending; the other gross, palpable, and descending: that on the separation of these two principles the light and spiritual part ascends into the air, whilst the heavy and corporeal part sinks into the earth. The word *death* never enters into his philosophy; nor, on common occasions, is it employed by the Chinese. (Barrow.) When a person dies they say, 'he has returned to his family.' The body, it was difficult to deny, resolved itself into its primitive elements, and became a part of the universe; but, according to Confucius, the spirits of the good were permitted to visit their antient habitations on earth, or such ancestral halls or other places as might be appointed by their children and descendants, upon whom, while they received their homage, they (the dead) had the power of conferring benefactions. Hence arose the indispensable duty of performing sacred rites in the hall or temple of ancestors; and all such as neglected this duty would be punished, after death, by their spiritual part being deprived of the privilege of visiting the hall of ancestors, and of the supreme bliss arising from the homage bestowed by descendants. A belief in good and evil genii, and of tutelar spirits presiding over families, houses, towns, and other places, inevitably arose out of this system. It does not appear however that either Confucius or any of his followers attached the idea of a *personal being or form* to the Deity; nor have the true Confucians ever represented the *Great First Cause* under any image or personification whatsoever. The images and idols of China belong to other faiths. It was soon found that the notions of Confucius were too abstract and ideal for the mass of his countrymen; who, like the rest of mankind in nearly all ages and all countries, required something material to fix their attention and excite their devotion.

The moral doctrines of Confucius include that capital one, which, however neglected in practice, has obtained, in theory, the universal assent of mankind: he taught his disciples 'to treat others according to the treatment which they themselves would desire at their hands.' In his doctrines there is an evident leaning to predestination or fatalism, and to fortune-telling, or predicting events by the mystical lines of Fo-shee. With all his defects and omissions, Confucius was, however, a most wonderful man. His system, without making any pretension to a divine legation, still continues to prevail throughout the most extensive empire in the world. Some religions may have lasted as long, or longer, but we believe no philosophic code can claim anything like such a lengthened period of active practical existence. The Tibetan, the Budhist, and other religions, have divided and still divide influence with it, but have never overthrown its empire. The superstitious and the vulgar of all classes, from the emperor on the throne to the poor sailor on board the junk, may burn gilt paper and offer sacrifices to wooden idols, practise incantations, and offer up prayers to the 'invisible mother of heaven,' but at the same time they all revere the name of Confucius, and the more enlightened pretend to be wholly guided by his merely philosophical code. The body of his laws and instructions is still followed, not only by the Chinese, but by Coreans, Cochin-Chinese, and other people who, taken collectively, are estimated at 400,000,000 of souls.

The classical or sacred works written and compiled by Confucius and his disciples, are nine in number; that is to say, the 'Four Books' and the 'Five Canonical Books.' The first of the Four Books is the *Ta-heo*, or 'The School of Adults;' the second the *Choong-yoong*, or 'Infallible Medium;' the third the *Lun-yu*, consisting of the conversations and sayings of Confucius, recorded by his disciples, and which, according to Mr. Davis, is 'in all respects a complete Chinese *Boswell*;' and the fourth the *Meng-tse*, which contains the additions and commentary of *Meng-tse*, or Mencius, as he is called by Europeans, who lived about a century after Confucius. The Five Canonical Books, all said to be written or compiled by Confucius himself, are, the *Shy-king*, or Book of Sacred Songs; the *Shoo-king*, which is a history of the deliberations between the antient sovereigns of China; the *Ly-king*, or Book of Rites and Ceremonies, which is considered as the foundation of the present state of Chinese manners, and one of the causes of their uniform unchangeableness; and lastly, the *Chun-tsieu*, which is a history of the philosopher's own times, and of those which immediately preceded him. (J. F. Davis—*The Chinese; a General Description of China and its Inhabitants*, London, 1836; Gutzlaff—*Sketch of Chinese History, antient and modern; Travels of the Jesuit Missionaries*, Bell (of Antermony), Barrow, Staunton, &c.)

CONGE' D'ESLIRE, a term in Norman French, literally signifying 'leave to elect,' which is appropriated to the king's writ or license to a dean and chapter to elect a bishop, at the time of the vacancy of the see. The right of nominating to bishoprics was in most countries of Europe enjoyed by the temporal sovereigns, with little opposition from the ecclesiastical authorities, until the eleventh century, when a contest began between the popes and the monarchs of Europe, which, in the next century, ended in the latter being compelled to surrender this important privilege to the clergy. Father Paul (*Treatise of Benefices*, c. 24), says that between A. D. 1122 and A. D. 1145, it became a rule almost everywhere established, that bishops should be chosen by the chapter. In England, by the constitutions of Clarendon, A. D. 1164, the election was vested in the chapters, subject to the king's approbation of the object of their choice. The right of election was afterwards formally surrendered to the chapters by a charter of King John, by which however he reserved to himself, among other things, the right of granting a congé d'eslire, and of confirming the choice of the chapter. This grant of freedom of election was expressly recognised in Magna Charta, and also by a subsequent statute, 25 Ed. III., stat. 6, which was passed for the purpose of preventing the popes from interfering with the elections to dignities and benefices in England.

So the law stood until the passing of 25 Henry VIII., c. 20, which, though repealed in Edward the VI.th's reign, was afterwards revived, and by which episcopal elections are regulated at the present day. By this Act it is provided that upon every avoidance of an archbishopric or bishopric the king may grant to the dean and chapter a license under the great seal to proceed to the election of a successor, and with the license a letter missive containing the name of the person whom they are to elect. If the dean and chapter delay their election above twelve days after receiving the license, the king may, by letters patent, nominate any person whom he pleases to the vacant see; if they delay the election beyond twenty days, or elect any other person than the candidate recommended by the king, or do anything else in contravention of the Act, they incur the penalties of a præmunire. Bishoprics in Ireland are donative by letters patent, without a congé d'eslire. (*Irish Stat.*, 2 Eliz., c. 4.)

CONGER. [MURÆNIDÆ.]

CONGESTION, a preternatural accumulation of blood in the capillary vessels of the sanguiferous system, attended with disordered function of the organs in which such an accumulation takes place. It has been shown [ARTERY, CAPILLARY, CIRCULATION,] that the main functions of the sanguiferous system are performed by the ultimate divisions of the blood-vessels, called, from their hair-like minuteness, *capillaries*; the office of the main trunks and the larger branches of the blood-vessels being merely to convey to the capillaries the material acted upon by them in the various processes which they perform. In the natural and healthy state of an organ, the arterial capillaries in which the arterial trunks that supply it with arterial blood terminate, receive a certain quantity of blood; retain that blood a given time; and then transmit it with a given impetus into the venous capillaries, which in their turn convey it into the larger venous branches, and these to the heart with a given degree of velocity. Upon this transmission of the blood to and from the organs in a given quantity and a given time, depends the balance of the circulation; upon the due balance of the circulation depends the healthy condition of the organic processes; and upon the healthy condition of the organic processes depends the sound performance of the animal functions.

Of the mode in which the balance of the circulation is disturbed by the preternatural accumulation of blood in the capillary vessels, some conception may be formed by observing the phenomena that take place when a mechanical or chemical irritant is applied to a transparent part of the animal body; and when such a part is brought under the field of the microscope, so that the circulation in the minute vessels can be distinctly seen. In this case, the first phenomenon observable is a quickened circulation in the part, and the consequent determination to it of a greater quantity of blood; next, after a time, the blood-vessels are seen to dilate and to become turgid with blood; and in the third place, the flow of blood through these distended vessels is manifestly retarded; and ultimately, if the irritating cause continue to operate with a certain degree of intensity, the circulation is wholly stopped. The quickened circulation, the first phenomenon that takes place, is occasioned by the action of the contractile power inherent in the coats of the capillary vessels, excited in an inordinate degree by the application of the unusual stimulus. The dilatation of the capillary vessels, the subsequent event, arises from a diminution of the vital power of the coats of the vessels, from the over-excitement produced by the irritating cause

The blood-vessels in this state are commonly said to have lost their tone; to be debilitated or weakened. The consequences of this loss of vital power in the living tissues that form the walls of the blood-vessels, are the engorgement of the vessels, the impeded, retarded, or abolished circulation of blood through them, and the disordered or suspended function of the part affected.

From the preceding statement, a distinct conception may be formed of that morbid condition of the blood-vessels, to the designation of which the term congestion is commonly applied. How greatly such a condition of the blood-vessels must disturb their natural functions, and consequently how powerful an agent it must be in the production of disease, it is also easy to conceive. But pathologists have hitherto made but slight progress in determining with precision the nature of the morbid changes which take place, either in the blood-vessels themselves, or in the tissues in which, as a consequence of this affection, an alteration of structure is sometimes ultimately superinduced.

From an observation of the phenomena connected with the state of congestion, it is usually distinguished into passive and active. When there is merely an accumulation of blood in the distended and debilitated capillaries, without any other manifest morbid phenomenon, the state is called simple congestion; and this state of congestion is commonly said to be passive. But when to this accumulation of blood there are superadded certain phenomena which accompany and which characterize another morbid state, namely, inflammation, the congestion is termed active. In active congestion, the blood-vessels themselves are in a state of excitement; the preternatural quantity of blood they contain is determined to them by their own inordinate activity; they are in a condition not of diminished but of exalted vital energy. In passive congestion, on the contrary, the coats of the vessels are destitute of their natural tonic, vital resistance; yield readily to the current of blood which is determined to them, or unable to pass on the current they receive, the blood accumulates in them and distends them. Active congestion, according to this account, however, can be distinguished by no certain and even no appreciable character from inflammation, a state which is always supposed to be different from congestion. It is certain that the state of congestion has a peculiar tendency to pass into the different state of inflammation, and it is this very tendency that renders congestion so dangerous and fatal a malady. But in what the two states differ, we are at present wholly ignorant. When the link that connects these two states with each other shall be supplied, a clear and bright light will be shed over the nature of some of the most important diseases at present involved in profound darkness. The labours of pathologists, conducted as they now are, with a precision and skill never before exemplified, should be sustained and animated by the prospect of the inestimable practical advantages which must result from the success of their investigations.

The tissue of the body in which the state of congestion is most apt to occur, is the cellular, and more especially in the lax and little cohesive condition in which this tissue forms the parenchyma of the different internal organs, as the brain, the lungs, the liver, the spleen, the kidneys, and so on. A congested state of their blood-vessels is also peculiarly apt to occur in the mucous membranes, and more especially in the mucous membranes of the bronchi and air vesicles of the stomach and the alimentary canal, and of the ovaria and uterus. But besides these, other and less yielding structures, as the serous and fibrous membranes, the skin, and even the muscles, may be affected with congestion, after the operation of causes which have exhausted the vital energies of the system in general, or which have diminished the vital cohesion of these structures in particular.

Congestion, when present to any considerable extent, and when continuing for any length of time, disorders the function of the organ in which it takes place. The signs of this disordered function are signs from which it is inferred that congestion is present. If, for example, the blood-vessels of the brain be in a state of congestion, the activity and energy of the cerebral functions will be diminished, indicated by dulness, heaviness, forgetfulness, inaptitude for mental labour, giddiness, lethargy, and so on: and if the congestion be in great intensity, it may produce all the symptoms of coma and even of apoplexy. [Coma and Apoplexy.] If the blood-vessels of the liver be in a state of congestion, the secretion of bile will be disordered; altered in quality, diminished in quantity, or entirely suppressed. If the blood-vessels of the mucous membrane of the air passages be in a state of congestion, it will occasion uneasiness in the chest, difficulty of breathing, cough, &c.

Congested states of these and other organs are exceedingly apt to occur in the progress of other diseases, more especially in the different types of fever, the character of which they modify, and the severity and danger of which they always greatly increase. There are fevers indeed, and those of the very worst kind, that is, the most intense and the least under the control of any known remedies, in which a high degree of congestion of the blood-vessels of the brain, of the lungs, of the liver, or of the mucous membrane of the intestines, is among the very first appreciable morbid conditions of the system; but in general such a congested state of the blood-vessels is consequent upon preceding morbid conditions of the organs; conditions by which the vital energies of the blood-vessels have been exhausted.

The appearances presented by congested parts after death, vary with their structure and with the degree and duration of the affection. The capillary arteries and veins are turgid with blood; the blood they contain is of a darker colour than natural; hence the colour of the organ, the seat of the congestion, is darker in proportion to the intensity of the affection; it is also commonly more or less swollen, and the cohesion of its tissues is diminished, so that they are more readily torn than when in a healthy condition. In some organs, indeed, as in the liver and the spleen, when the congestion is in an extreme degree, the cohesion of the component tissues is so much lessened that the organs are broken down on the slightest pressure.

Anything may be the cause of congestion which diminishes the vital energy of the capillary vessels; or which changes, beyond a certain limit, the quantity and quality of the blood they contain. If the vital energy of the capillaries be diminished, they cannot maintain the tension necessary to prevent distension of their parietes, and a consequent preternatural accumulation of blood. If the quantity and quality of the blood they contain be altered, their natural stimulus may be so deficient as not to excite, or so excessive as to exhaust them.

There is no morbid state of the system over which human art has so little control as that of congestion when the affection is extensive and severe. When, however, it is seated only in a single organ, and is not very intense, there are remedies which have a powerful tendency to relieve it; but there is scarcely any disease of the body the treatment of which requires to be conducted with so much caution and discrimination. The adoption of a wrong course, or the too vigorous application of a well-chosen remedy, has, in this case, a more than ordinary tendency to turn the balance between life and death, on the side of death. If the congestion be what is termed active, general blood-letting is sometimes indispensable; on the other hand, there are many cases of passive congestion, in which the abstraction of blood from the system in the smallest quantity, would be certain to extinguish life. In cases in which general depletion would be pregnant with danger, local blood-letting is often safe, and when employed with cautious decision, is the most efficient of all remedies. Its effect is sometimes greatly promoted by external local derivatives, as blisters, and by internal remedies which tend at once to stimulate the heart's action and to equalize the circulation, such as what are termed the diffusible stimulants, and diaphoretics. Emetics and purgatives are also auxiliary remedies, in general safe, and often remarkably efficient.

CONGLETON, a market town and borough in the county of Cheshire. It is in the parish of Astbury, in the eastern extremity of the hundred of Northwich, on the Staffordshire border; 42 miles nearly due east from Chester, in a straight line, and 162 N.N.W. from London. It appears to be a place of great antiquity, and is supposed to have been a military station of the Romans. The present town is a mile in length, and contains many of the antient houses of Cheshire, which are constructed entirely of timber frame-work and plaster. It is beautifully situated in a deep and picturesque valley on the banks of the river Dane. At the west end are numerous detached mansions of the opulent manufacturers of the place, surrounded with shrubberies and ornamental gardens. In the antient part is the guildhall, a commodious brick building, with a piazza for those who attend the market. The general appearance of the town is neat and respectable, and it bears a character for remarkable healthiness. The Macclesfield canal, and the great road from Lichfield and Stafford to Manchester, pass through it. The population in 1831 was 9352, of whom 4474 were males, and 4878 females. At this time there were 27 families employed in agriculture, and 1644 families employed in the silk manufacture, which of late years has greatly increased. The silk-mills erected on the banks of the river are very extensive. Ormerod, in his history of Cheshire, speaks of twenty-eight in the year 1819, for ribands and other kinds of silk fabric (vol. iii. p. 20). The manufacture of Congleton is almost wholly confined to black silks. In thrown-silks it exceeds the manufacture of Macclesfield, though in fancy-silks, and in the whole amount of business, it is much inferior. It is observed in the 'Report on the Municipal Corporations' (1835), that no new works have been erected since 1825, and that the state of the manufacture is not such as to offer encouragement to any additional speculations. It is added that the silk goods are greatly exposed to depredations; detection being difficult in consequence of the smallness of the bulk in proportion to the value. There is no cotton manufactory within the boundary of the borough, but there are several immediately beyond it. There are also some tanneries and manufactures of leather. This town was formerly celebrated for tagged leather laces, called Congleton points. The borough of Congleton is co-extensive with the township of Congleton, which is one of several constituting the parish of Astbury. It is divided into three wards, with six aldermen and eighteen councillors. The living is a perpetual curacy subordinate to the rectory of Astbury; but though the chapelry extends over an area of 2500 acres, the stipend is only about 140*l.* a year. The dissenting chapels are numerously attended, including one of Catholics. The Methodists and Independents have schools each, with several hundred scholars. There is a free grammar-school, with sixty-eight scholars, who are taught Latin and Greek; also several Sunday-schools, an infant-school, and several endowed charities. The licensed public-houses are very numerous—there are 50, and 52 beer-shops within the space of 300 yards. (*Municipal Corp. Rep.*, p. 2657, part 4.) The market-day is on Saturday; and fairs are held on Thursday before Shrovetide, May 12, July 5, and November 22, for cattle and pedlars' wares. (*Boundary Report; Municipal Corp. Report; Population Report; Report on Charities;* Lysons' *Mag. Brit.;* Ormerod's *Cheshire.*)

CONGLOMERATE, the generic term for coarse sand or rounded fragments of stone, of various kinds, cemented into a mass. It is sometimes called pudding-stone. Conglomerates differ in their nature, and vary in the size of their component parts according to the process by which they have been brought into the form of conglomerate. The mechanical convulsions of the earth, great floods, and other agents, more or less powerful, having carried the primary materials into places favourable to the process, and rubbed off their sharp and angular parts, they are united into solid masses by a posterior formation. Along the base of the Maritime Alps the rivers, with few exceptions, are now forming conglomerate and sand. (Lyell's *Geology*). Near Nice the mud, pebbles, and portions of rock brought down by the torrents form beds of shingle; but the greater part are swept into the deep sea, where they form strata of inclined conglomerate, about 1000 feet in thickness and seven or eight miles in length. Volcanic eruptions also tend to the formation of conglomerate by uniting masses of rock together. Conglomerates, as already observed, to whatever causes owing, are characterized by being manifestly a congeries of fragments of rock, of various sizes, which have undergone the process of attrition, and consequently have been formed by fragments of various rocks that have been carried considerable distances. [BRECCIA.] Many of these conglomerates are sometimes so well compacted as to form a hard rock, capable of receiving a considerable degree of polish, as we observe in two colossal fragments of heads in the British Museum, the faces of which are tolerably smoothed by Egyptian art, while the broken parts exhibit a conglomerate consisting of irregular-sized rounded grains, and masses of quartz and other rocks.

CONGO. This name, in its most extensive application, as explained under the word ANGOLA, comprehends the whole of the region lying along the western coast of Africa, which is more correctly divided into the four kingdoms or districts of Loango, Congo Proper, Angola, and Benguela. In this large and loose sense it extends from Cape Lopez Gonsalvo, in lat. 0° 44′ S., to Cape Negro, in lat. 15° 40′ S. Congo, properly so called, however, at least according to its modern limits, (for it is said to have been more extensive formerly,) does not stretch to the north beyond the river Zaire (otherwise called the Congo), in about lat. 6° S., which separates it from Loango, nor to the south beyond the river Dando, in lat. 8° 20′ S., which separates it from Angola. It is believed to extend a considerable distance into the interior; but we have no distinct information respecting its limits in that direction, and they are probably not very definitely marked. The country immediately to the east of Congo appears to be that of the Giagas, a race of bushmen whose ferocity is much dwelt upon in the old accounts, and seems to be still the terror of their more peaceable neighbours.

The first European who reached Congo was the Portuguese navigator, Diogo Cam, who made his way thither from Elmina, in 1484. Diogo revisited the country in 1489, making his voyage on that occasion from Portugal. The following year another armament arrived from Portugal, under the command of Ruy de Souza. After this the king of Congo, and many of his subjects, made profession of Christianity, and the Portuguese formed considerable establishments in the country. It was in the course of the seventeenth century, however, that the most strenuous endeavours were made in the work of converting the natives. Ample accounts of the proceedings of the Portuguese missionaries, of the opposition and difficulties of various kinds they had to contend with, and of the wonderful success which, notwithstanding, is asserted to have crowned their persevering labours, are given in the Voyage of Michel Angelo di Gattina and Dionisio Carli di Piacenzo, two Capuchin friars, who set out to join the mission in Congo in 1666; and in that of Geronimo Merolla di Sorrento, another Capuchin father, who joined the same mission in 1682. There are French and English translations of both these voyages, which were originally published in Italian; and they are incorporated in Labat's 'Relation Historique de l'Ethiopie Occidentale,' 5 vols., 12mo. Paris, 1732; along with a translation, also from the Italian, of Father Cavazzi de Montecucculo's description of the kingdoms of Congo, Angola, and Matamba. A relation of the earlier attempts to christianize the people of Congo, beginning with the first introduction of Christianity into the country, may be found in an account of Congo and the neighbouring countries, first drawn up in Italian, in 1589, by Filippo Pigafetta, from the journals and verbal information of Duarte Lopez, a Portuguese captain, who had spent about ten years in Congo, and was eventually sent to Madrid and Rome, on a sort of embassy from the king, for priests, missionaries, and warlike assistance against his enemies. Pigafetta's book was early translated into English and Latin.

The earliest English account of Congo is that published by Purchas under the title of 'the Strange Adventures of Andrew Battel, of Leigh, in Essex, sent by the Portuguese prisoner to Angola, in which kingdom and the adjacent regions he lived eighteen years.' Battel, whose relation is very curious, was detained in this part of Africa from 1589 till 1607. An English navigator, of French descent, James Barbot the younger (so called to distinguish him from his father of the same name, also a writer of voyages), made a voyage to Congo in 1688, the journal of which was published along with the voyages of his uncle, John Barbot. There are translations or abstracts of all these early voyages in the 4th and 5th volumes of Prevost's 'Histoire Générale des Voyages.' Some of them are also in Hackluyt and Purchas; and most of them in Churchill, Harris, Osborne, Pinkerton, and the other English collections. In Labat's book, already mentioned, the accounts of several Portuguese voyagers are added to those of the missionaries. The country is also described, from personal acquaintance, in Olfert Dapper's 'Description of Africa,' first published in Dutch, at Amsterdam, in 1670, but of which there is a French translation, fol. Amst., 1686. The Abbé Proyart has collected the most important particulars mentioned in these voyages in his 'Histoire de Loango, Cacongo, et autres Royaumes d'Afrique,' 1776, of which there is an English translation in the 16th vol. of Pinkerton's collection, pp. 548—598.

According to the old accounts, the native division of Congo is into the six provinces of Bamba, Sogno (or Sonio), Sondi, Pango, Batta, and Penda. The Portuguese however appear to have divided the country into what they called the metropolitan province of San Salvador, the duchy of Bamba, the duchy of Sondi, the marquisate of Pemba, and the county (or earldom) of Sogno, thus omitting altogether Pango and Batta, or comprehending them under some of the other names. The Portuguese province of San Salvador is a part of the native province of Pemba, the marquisate of Pemba being the remainder. It is placed along a portion of the left bank of the river Congo, immediately to the north-east of Sogno, which occupies the angle formed by the river and the sea-coast. In this province is the capital, said to have been antiently called Banza, which appears however to be merely a name signifying a chief town, the residence of a king, or even of a subordinate ruler. The Portuguese having established a settlement here, gave the place the name of San Salvador. It is described as situated about 150 miles from the sea, and about a third of that distance from the river, in a hollow on the south-east side of a lofty mountain, having on the summit a plain of about ten miles in circuit, which is covered with towns and villages. The palace of the native sovereign and the Portuguese part of the town are each surrounded by an inclosure of about a mile in circumference; but the suburbs of the Portuguese town are described as also of considerable extent. The principal ornaments of San Salvador were, a cathedral and nine or ten other churches, all built of stone, although, with the exception of that of the Jesuits, roofed only with thatch. The religious establishment consisted of a bishop and chapter, a Jesuit college, a convent of capuchins, &c. It appears however that even before the end of the seventeenth century the ravages of war had almost ruined San Salvador, and the native sovereign had transferred his residence to another place, called Lemba, in the province of Bamba, and nearer the sea-coast.

For details as to the history, the religion, the customs, the arts, and the former general condition of the people of Congo, we must refer the reader to the missionary accounts, in which these matters are treated at great length. There is probably however a good deal of fiction in these accounts, the prevailing aim of which evidently is to exaggerate the importance of the country and its inhabitants. At all events, now that both the show of Christianity and the very thin sprinkling of civilization, of which this region of Africa may at one time have had to boast, have nearly disappeared, these old descriptions would certainly be found very inapplicable to the present state of Congo.

The most authentic information we possess respecting the modern state of Congo, is derived from the 'Narrative of an Expedition (sent out by the English government) to explore the river Zaire, usually called the Congo, in 1816, under the direction of Captain J. K. Tuckey, R. N.,' 4to., London, 1818. Captain Tuckey and his companions, of whom out of 56, the whole number, no fewer than 21 perished in this disastrous expedition, including Tuckey himself, and all the scientific persons whom he took along with him, made their way up the river to a point about 280 miles from its mouth; and in the course of their navigation they both saw and conversed with many of the natives, and made some excursions a short way into the interior of Congo. Their actual inspection of the country however was of course confined to the portion along the bank of the river; and the only record we have of the information they obtained, consists of the journals of Captain Tuckey and Professor Smith, the botanist attached to the expedition, hastily drawn up at the time, and which the writers had no opportunity of revising and extending at leisure. Their account therefore can scarcely be safely assumed as applicable to more than a very small part of the whole region comprehended under the name of Congo. It is, in fact, principally an account of the lower part of the great river up which the expedition sailed.

The Congo, even till of late years, was supposed by some persons to be the embouchure of the Niger; but long before this point was settled, the soundest geographers were of a different opinion, although Captain Tuckey's expedition was undertaken with the view of ascertaining the matter; and in the official account of the voyage, the identity of the two rivers is elaborately contended for by a writer, who declares that 'the hypothesis which makes the Niger to pour its waters into the gulf of Benin is entitled to very little attention.' The Congo is not properly called the Zaire, it seems, as Diogo Cam was led to suppose, that being merely a word signifying any great river, but the Moienzi Enzaddi, which means the river that swallows up all other rivers. The old accounts represent the velocity with which it rushes into the sea to be so great, that it preserves its stream unaffected by the salt water for twenty leagues or more. This description Captain Tuckey found reason to believe considerably exaggerated. It had been usually stated that the Congo was always full of water; but when he entered it, in the beginning of July, he found it from eight to eleven feet lower than the point which from the marks on the rocky banks it appeared to have reached at other seasons. The tide also was very perceptible at 140 miles up the river. The velocity of the current at the mouth of the river was found nowhere to exceed 4½ or 5 knots an hour, and in many places it was not more than 2½. The accounts of some preceding navigators make it flow at the rate of six or seven knots; and so it very possibly may do, when the channel is more full of water. The depth however in the middle of the stream here was very great, no bottom having been found with a line of 160 fathoms; so that when the river is at high flood the mass of water which it pours forth must be immense. Its breadth for some distance from the sea is not less than five or six miles; it is then divided by a number of islands into several streams: at the distance of 140 miles from the mouth the Narrows commence, and continue for about 40 miles, during which it forces its way between two opposite barriers of steep rocks, not more than from 300 to 500 yards asunder. Many ledges of rocks stretch across this part of the river, the most formidable of which however, called the Great Yellala, or Cataract, has only a fall of about 30 feet in 300 yards, and would be more appropriately designated by the term Rapid. Above the Narrows, which terminate at a place called Inga, the river expands to the breadth of two, three, and even four miles. Tuckey ascended it for about 100 miles beyond this point, and he was assured by the natives that after this there was no impediment to its continued navigation for a great distance. Its direction, according to their account, continued to be nearly in a straight line towards the north-east; and Tuckey appears to have felt convinced that it must have its source in some vast lake or chain of lakes several degrees to the north of the equator. Much surprise was experienced at finding that it did not receive the water of any other stream in the whole distance along which the survey extended; and both Captain Tuckey and Professor Smith were inclined to believe that it must receive accessions of water by some under ground communication. The old delineations of the river, it is to be observed, also represent it as without any tributaries in this part of its course; but they make numerous rivers to flow into it higher up. The torrents that pour down in the rainy season however through the ravines between the hills on both sides of it, probably bring it a considerable supply. In the lower part of its course the Congo spreads out into extensive swamps, which are covered with mangrove and palm trees, as are also the islets by which it is here interrupted; above the swampy region, hills, none of which much exceed 2000 feet, rise all the way that the survey extended at a short distance from the channel, or the rocks between which it is confined. Up to the great cataract of Yellala these hills are stony and nearly barren, and the rocks at the Narrows are composed of masses of micaceous slate; but beyond this point the rocks are of limestone, and the country is described as fertile and beautiful. Even below this however, between the hills and the water, vegetation is in many parts very luxuriant, and numerous villages are to be seen both in the hollows and even on the flat summits of the mountains. The old maps make five or six smaller rivers fall into the sea between the Congo and the Dando.

With regard to the products of Congo, the information acquired by this expedition accords sufficiently with the accounts of the Portuguese missionaries. Although so many of the members of the expedition were cut off by a fever, which appears to have been brought on by fatigue and exposure to the night air, and to have been of a contagious character, the climate of Congo is described as neither disagreeable nor in ordinary circumstances unhealthy. The range of the thermometer in a period of a month, from about the middle of July to the middle of August, was never below 60° during the night, nor above 80° during the day; the common noon-day heat was 76°. Among the vegetable products (for many of which the natives must have been indebted to the Portuguese) are manioc or cassava, yams, maize, sweet potatoes, pumpkins, millet, calavanses, cabbages, spinach, pepper, capsicum, the sugar-cane, and tobacco. Of fruits they have the banana, the papaw, the orange, the lime, and the pine-apple, which last Captain Tuckey found growing in the open places at the extreme point to which he penetrated. If, as is supposed, the pine-apple be indigenous only in the New World, the plants must have been carried thither by the natives, for certainly no European settlements had ever been formed so far from the sea-coast. Their only prepared beverage is a wine made from the juice of the palm-tree, which was found by the members of the expedition to be both an agreeable and a wholesome drink. Of domestic animals there are goats, hogs, fowls, ducks, and pigeons, as well as a few hairy sheep. There were also some horned cattle, to which however little attention seemed to be paid; no beasts of burthen were seen. Of wild animals, the country abounds with elephants, leopards, lions, buffaloes, large monkeys, antelopes, wild hogs, &c. Guinea fowl and red-legged partridges are described as abundant, large, and fine, and wild pigeons, of three or four species, as very plentiful. Bees are in great numbers; the flea and the bug were the only insects that were found troublesome. The lower part of the river abounds in different species of fish, which form an important part of the subsistence of the people; it also, especially above the Narrows, swarms with hippopotami and crocodiles.

The native sovereign of Congo, Captain Tuckey was informed, was called Lindy, or Blindy N'Congo, and resided at a place called Banza Congo, six days' journey southward from the river. This is, in all probability, the San Salvador of the Portuguese, who were affirmed by the natives to have soldiers and white women there. Under the king are the Chenoos. 'The Chenooships,' says Captain Tuckey, 'improperly named kingdoms by Europeans, are hereditary fiefs, passing in the female line, that is, on the decease of the Chenoo the succession, instead of passing to his son, goes to his brother, or uterine uncle or cousin.' In other words, to secure the certainty of the blood royal, the successor must descend from the same female ancestor with the deceased chief, and must be the nearest male descended, either immediately or through a line of females, from that common female ancestor. Of the inferior officers, the chief is the Mafook, or collector of the customs, who is generally qualified to act as an interpreter to the European visitors of the coast. These functionaries also often amass considerable wealth by giving their services as agents to the slave traders, Portuguese and piratical, who still resort to Congo. A place called Embomma, on the north bank of the river, and about fifty miles from its mouth, appears to be the great slave mart. It may be observed that Captain Tuckey represents the dominions of Congo as comprehending a small territory to the north of the river included within a line drawn from below Malembo, a town on the sea coast about fifty miles north from the mouth of the river, to Banza N'Inga at the termination of the Narrows.

The natives of Congo, although they have thus an established government, and have arrived at the agricultural state, cultivating regularly two crops of Indian corn in the year, must be considered as sunk in the same barbarism with the other nations of the west coast of Africa. Rights of property are well understood among them, and are carried so far that a fowl or a pig will sometimes have three or four proprietors. But their houses are mere huts constructed of a few posts stuck in the ground and interwoven with reeds, and they go naked, with the exception of a small apron, generally of grass-matting, tied round their loins. They seem to be a timid and unwarlike race, and both their indolence and their sensuality are extreme. Their women are their drudges in all kinds of laborious work, and, not excepting the sisters, daughters, and wives of the highest personages, are eagerly offered by them for a trifle to a white man of any grade. Their sense of the whites being a race of beings altogether distinct from themselves seems to be complete. They scarcely appear to have gained a step towards civilization by their intercourse with the Portuguese. Even the Christianity introduced among them by their European conquerors has, as in such circumstances might be expected, retained very little resemblance to what is commonly understood by that name. Captain Tuckey was visited, when near the coast, by a Christian priest, who had been taught to write his own name and that of Saint Antonio, and could even read the Romish litany in Latin, but who boasted that he had a wife and five concubines, and stoutly maintained that this kind of polygamy was not at all prohibited in the New Testament. Both this man and the other Christians, as they called themselves, who came along with him, were tattooed all over like the rest of the natives, and had the two upper front teeth filed away, in deference to the prevalent notion of beauty in Congo.

It is a curious circumstance that the language of Congo, which is merely a dialect of that of Angola, Benguela, and the other neighbouring districts, appears to be also radically the same with that spoken by the natives of the east coast of Africa, which is separated by thirty degrees of longitude from the coast of Congo. This fact was first noticed by the late Mr. Marsden (the author of the 'History of Sumatra,'), and has been confirmed by the lists of Congo words collected by Captain Tuckey.

Since the publication of Captain Tuckey's Voyage, an account of a visit to Congo and the neighbouring countries, by M. Douville, has appeared in the transactions of the French Geographical Society. This voyage, unfortunately for those who profess to be geographers and have given credit to it, turns out to be the fiction of an ignorant and unprincipled adventurer. Douville afterwards published a separate book, with plates. The plates on the face of them are good for nothing.

CONGREGATION most commonly signifies an assembly of persons for the purpose of public worship and religious edification. It denotes more particularly a number of ecclesiastics constituting a legislative and executive body; and in this acceptation it is applied chiefly to certain Boards of administration consisting of cardinals and of prelates, or aspirants to the cardinalship in Rome. These congregations serve as a check on the papal authority: for though their proceedings are usually sanctioned by the pope, he cannot, without alleging the weightiest reasons, put a veto on them. The whole number of these congregations is twenty-one, that is, fifteen for spiritual and six for temporal purposes. Congregation is also used to designate a company, society or fraternity of monks forming a subdivision of an order, as the congregation of the Oratory, or of Cluny among the Benedictines. The congregation of the Lord' was an appellation assumed by the Scotch Presbyterian Reformers, who called the church of England the congregation of Satan. They appeared first in 1557, under the earl of Argyle, and were subsequently led by John Knox.

Congregationalists are those who compose the congregations which assume an independence not only of the ecclesiastical control of the established hierarchy, but of all authority extraneous to the constituency of the congregation itself. They may therefore in general be said to be identical with the Independents. They are said by some to have appeared first in 1616, under the conduct of Mr. Jacob, (Evans's '*View*.') But they are generally considered to be of the same origin as the Brownists, who appeared in 1600. [Brownists.] The real founding of the sect is attributed to Mr. Robinson, in 1640, and the following passage from his 'Apology,' c. 5., p. 22, is adduced as their leading maxim. 'Cœtum quemlibet particularem esse totam, integram et perfectam ecclesiam, ex suis partibus constantem immediatè et independenter sub ipso Christo.' It is said that they adopted the name of congregational brethren, and congregational churches, to avoid the odium of sedition and anarchy which was charged upon them as the Puritan regicides of Charles I. Cromwell made use of them as a political check on the Presbyterian party. (See 'Declaration of the Faith and Order owned and practised by the Congregational Churches in England,' 1658.) In the six New England States of North America, which were colonized by the English Puritans, the Congregationalists are very numerous; and in several other parts of the union their numbers are much larger than those of other sects. Their creed and the rules of their democratic government are given fully in their 'Platforms of Discipline.' They believe in 'The Trinity; Predestination; Total Depravity; Particular Redemption; Effectual Grace and Final Perseverance;' and maintain that 'Every congregation of visible saints, furnished with a pastor, is under no other ecclesiastical jurisdiction whatever.' (Mosheim, vol. v., p. 398; Neal's *Hist. Puritans*, vol. ii., p. 107; vol. iii., p. 547; vol. iv., p. 187; Burnet's *Hist. Own Times*, vol. i., p. 16; Adam's *Dict. of Religion; Reasons against the Indepen. Gov. of Congregations*.)

CONGRESS, AMERICAN. [United States of N. America.]

CONGREVE, WILLIAM, was the second son of Richard Congreve of Congreve in Staffordshire, and born at Bardsa, near Leeds, in Yorkshire. His father, who held a commission in the army, took him over to Ireland at an early age, and placed him first at the Great School at Kilkenny, and afterwards under the direction of Dr. St. George Ashe, in the University of Dublin. After the revolution in 1688 he returned to England, and was entered as a student in the Temple. His first play, written at the age of nineteen, was the 'Old Bachelor,' which was produced with great applause at Drury-Lane in 1693; and Dryden is said to have remarked that he had never seen such a first play. The next year he produced 'The Double-Dealer,' and in 1695, joining with Betterton, they commenced their campaign at the new house in Lincoln's Inn Fields with a new comedy written by Congreve, called 'Love for Love.' In 1697 he produced his tragedy of 'The Mourning Bride,' and two years afterwards the comedy of 'The Way of the World.' The indifferent success of this last play disgusted him with the theatre, and he determined to write no more for the stage. Through the friendship of his patron the Earl of Halifax, he was first made one of the commissioners for licensing hackney-coaches, then presented with a place in the Pipe Office, and after that with one in the Customs, worth 600*l.* per annum. On the 14th of November, 1714, he was appointed commissioner of wine licences, and on the 17th of December, in the same year, nominated secretary of Jamaica. The last twenty years of his life were spent in retirement, and towards its close he was much afflicted with the gout and with blindness. Being overturned in his chariot on a journey to Bath, he received, it is supposed, some internal injury, and, gradually declining in health, died on the 19th of January, 1729, at his house in Surrey Street in the Strand, London, aged 57, and was buried on the 26th of January, in Westminster Abbey. Mr. Congreve was also the author of a romance called 'The Incognita, or Love and Duty reconciled,' written at the age of seventeen; 'The Judgment of Paris,' a masque; 'Semele,' an opera, and several poems. His merit as an *original* writer Johnson pronounces to be of the highest kind, as he 'borrowed neither the models of plot, nor the manner of his dialogue.' Of his plays, he remarks, that his characters are commonly fictitious and artificial, with very little of nature, and not much of life. His scenes exhibit not much of humour or passion; his personages are a kind of intellectual gladiators—every sentence is to ward or strike; the contest of smartness is never intermitted; his wit is a meteor, playing to and fro with alternate coruscations. 'His comedies, therefore,' observes the critic, 'have in some degree the operation of tragedies—they surprise rather than divert, and raise admiration oftener than merriment.' His only tragedy, 'The Mourning Bride,' although very successful, is a piece of unrelieved bombast. 'Love for Love' is the only play of Congreve's which has still possession of the stage, and even that is rarely acted, as its wit cannot atone for the exceeding grossness of much of the dialogue.

CO'NI, or more generally **CU'NEO,** a province and town of the Sardinian states in the south-west part of Piedmont, near the foot of the Maritime Alps, which divide it from the county of Nice and from France. The province of Cuneo is bounded on the north by the province of Saluzzo, east by that of Mondovi, south by that of Nizza, and west by the French department of Basses Alpes. It is a country of valleys, which slope down towards the great valley of the Po, and in which the Grana and the Macra, affluents of the Upper Po, the Stura and its affluents, and several of the affluents of the Tanaro have their source. The valleys, which are naturally fertile, are improved by the excellent system of irrigation. The principal products are corn, wine, hemp, hay, and silk. The south and west borders of the province lie among the Alps, the lower slopes of which are covered with chestnut trees, and the upper parts afford summer pasture. The length of the province west to east from the sources of the Stura to the borders of the province of Mondovi near Chiusa, is about forty miles, and its greatest breadth from north to south from Fossano to the Col di Tenda, is about thirty miles. The population is reckoned at 143,000. (Serristori, *Saggio Statistico.*) The province contains several considerable towns: 1. Cuneo, the capital, and a bishop's see, has a royal college, and 18,000 inhabitants, and is the residence of the intendente and of the military governor. It was formerly a place of great strength, and sustained several sieges; but its fortifications were razed in 1801. A navigable canal runs from Cuneo to Carmagnola, uniting the Stura with the Po. The high road from Nizza to Turin by the Col di Tenda passes through Cuneo. 2. Fossano, with 12,500 inhabitants, and a bishop's see, situated in a fine plain near the Stura, has a royal college, and a college for boarders, kept by the Fathers Somaschi. 3. Demonte, in the valley of the Upper Stura, on the road leading to the Col de l'Argentiere, has 6400 inhabitants, and a grammar-school kept by the Scolopj. The mineral baths of Vinadio, a few miles above Demonte, have considerable reputation. 4. Dronero, in the valley of the Macra, has 6700 inhabitants, and a college. 5. Caraglio, 5800 inhabitants, and a college. 6. Busca, on the road from Cuneo to Saluzzo, 8000 inhabitants, and a college likewise 7. Boves, 7700 inhabitants, and a grammar-school. 8 Chiusa, 5500 inhabitants, and a grammar-school. 9. Centallo, on the road from Cuneo to Turin by Savigliano, has 4400 inhabitants. 10. Limone, at the foot of the Col di Tenda, has 3400 inhabitants, many of whom are employed with their mules in carrying goods and passengers over the mountain. There are besides in the province of Cuneo several other small towns, of between 2000 and 3000 inhabitants. (*Calendario Generale dei Regj Stati*, Torino, 1824.) These valleys were in antient times inhabited by the Vagienni, a tribe of the Ligures. The Roman colony of Pedona is believed to have stood where Borgo San Dalmazzo now is, a few miles south of Cuneo. Augusta Vagiennorum stood farther north, near Fossano. All traces of those colonies became lost in the middle ages, and it is believed that they were destroyed by the Saracens, who from their stronghold of Frassineto near Nizza infested and devastated these valleys in the tenth century of our æra. (Jacopo Durandi, *Delle Antiche Città di Pedona, Caburro, Germanicia, ed Augusta de' Vagienni.*)

CONIA. [Cirrhipeda.]

CONIC SECTIONS, the curves formed by the intersection of a circular cone and a plane, the former being either oblique or right.

Though the name of conic sections still remains, yet the interest which attaches to these curves, and the method of treating them, has no longer any reference to the accident from which they derive their name. The Greek geometers, in pure speculation, occupied themselves with the different methods in which a cone may be cut, simply because the conical surface (with the cylindrical and spherical) came within the restrictive definitions under which they had placed geometry. [Geometry.] The works of Apollonius and Archimedes are the first in which these sections were treated; and their history is nothing but that of the addition of a few remarkable properties, till the discovery that the path of a projected body in an unresisting space is a parabola, and that of a planet round the sun, an ellipse. [Galileo, Kepler.] Since that time we might as well attempt to write the history of mathematics and physics as that of conic sections in their results and consequences: and from that time we have nothing to say of them merely as *conic sections.*

Some sections of a cone are considered in elementary geometry, for a plane may meet a cone in a point, or in a single straight line, or in two intersecting straight lines, or in a circle. But the curves which are peculiarly conic sections, are the oval made by a plane which cuts the cone entirely on one side of the vertex, called the Ellipse: the indefinitely extended modification of this when the plane becomes parallel to any one slant side of the cone, called the Parabola: and the curve which is partly on one side, and partly on the other of the vertex, formed by a plane which cuts both surfaces of the cone, called the Hyperbola. To these names we refer for the specific properties of the sections.

Algebraically considered, the *conic sections* are the *curves of the second degree,* meaning the curves belonging to such equations between co-ordinates are of the second degree. Thus x and y being co-ordinates, oblique or rectangular, the general equation

$$ax^2 + bxy + cx^2 + dy + ex + f = 0,$$

may, by properly assuming a, b, c, &c. be made the equation of every possible section of a cone by the plane in which the co-ordinates are measured. As very many elementary works do not fully discuss the conditions under which the preceding equation represents the different sections, we subjoin the following from the 'Camb. Phil. Trans.', vol. v. p. 89. In the following list θ means the angle made by the co-ordinates. [The notation has reference to the table in **Surfaces of the Second Degree**.]

$$\text{Let } V_1 = a + c - b\cos\theta \qquad V_2 = 4ac - b^2;$$

$$W' = \frac{cd^2 + ae^2 - bde}{b^2 - 4ac} + f,$$

and in the case where V_2 and $cd^2 + ae^2 - bde$, are both $= 0$, let

$$W'' = \frac{4af - d^2}{4a} = \frac{4cf - e^2}{4c}.$$

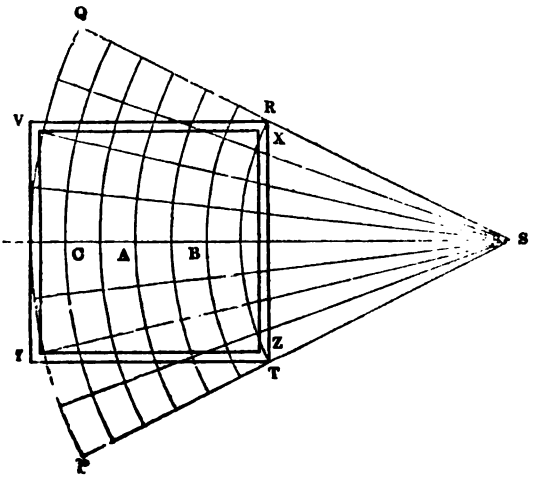
In the following table, p means either sign, + or −, but in the same line, n means the other sign; a dotted line means that the sign of the expression at the head of the column need not be considered. The word line by itself means straight line.

W'	V_2	W''	V_1	Name of the Section.
p	+		p	Impossible.
p	+		n	Ellipse.
....	−		....	Hyperbola.
0	0		....	Parabola.
0	+		....	Point.
0	−		....	Intersecting lines.
$0 \div 0$	0	p	p	Impossible.
$0 \div 0$	0	p	n	Parallel lines.
$0 \div 0$	0	0	....	Line.
$0 \div 0$	0	∞	....	Line.

Thus if W' and V_1 both have the same sign, and V_2 be positive, the equation cannot be satisfied at all; but if W' and V_1 be of different signs, and if V_2 be positive, the equation is that of an ellipse. We may add that $V_1 = 0$, indicates an equilateral hyperbola. [**Hyperbola.**]

The general properties of the sections are numerous and interesting, but we shall only mention one, because it is the most convenient as a general definition of the curves, combining them at once with each other, in a manner to which algebra is easily applied. If a point move in such a way that its distance from a given point (called the *focus*) always is the same fraction of its perpendicular distance from a given right line (called the *directrix*), then the curve traced out is an ellipse, parabola, or hyperbola, according as the given fraction is less than, equal to, or greater than, unity. We are convinced that no method of deducing the properties of these curves can be very successfully applied in the case of beginners, unless it involve the foci in the definition. The properties of these points do not readily show themselves either in the deduction from the cone, or from the general algebraic equation.

CONICAL PROJECTION. A method of describing a representation of a part of sphere upon a plane. A sphere cannot be unrolled into a plane, as can every cone or portion of a cone. If a cone be described which touches a sphere in a small circle, and if the several points of the sphere be then projected upon the cone by lines drawn through the centre, the parts adjacent to the small circle of contact will be projected into figures very nearly similar to the originals. If the degrees of latitude, which are very nearly equal, be made actually equal, no injurious effect will be produced on the map. Suppose, for instance, it is required to draw the map of a country contained between two given longitude circles, and two given parallels of latitude.



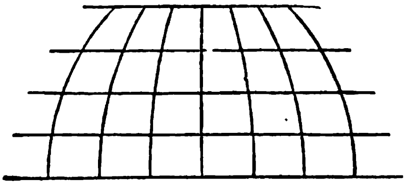
Take any radius for the sphere, and let S A be the radius × cotangent of the middle latitude of the map. From A set off A B, A C, &c., equal to the arc of one degree (or whatever the distance may be between the parallels which it is desired to draw) on the great circle of the sphere chosen. Let L° be half the total longitude contained between the extremities of the map, and take the angles A S P and A S O, equal to L° × the sine of the middle latitude. Divide the angle Q S P into as many parts as there are degrees (or other required intervals of longitude lines) in L: then Q R T P is the map required, and V X Y Z such a portion as is usually exhibited on a sheet of paper.

If instead of the tangent cone, it be required to project upon the cone formed by the revolution of the chord which joins the two extreme points of the map on the sphere, let l and l' be the least and greatest latitudes, and let

$$SR = \text{radius} \times \cos l' \div \sin \tfrac{1}{2}(l + l')$$
$$SQ = \text{radius} \times \cos l \div \sin \tfrac{1}{2}(l + l')$$

the rest is as before.

There are two modifications of this principle which it will be convenient here to notice; the projection used by Flamsteed, and that adopted by the French government in their recent maps. In Flamsteed's projection the degrees of latitude are equal, and the parallels of latitude are perpendicular to the middle longitude circle, which is a vertical right line. But the degrees of longitude are made in every parallel to bear the same proportion to the degree of latitude as on the globe: so that the meridians are, in fact, curves, the ordinates of which are as the cosines of the abscissæ.



In the French government maps, the same plan is adopted, with this exception, that the parallels of latitude are the circles of the conical projection, and the degrees of latitude are all equal (the oblateness of the earth may be allowed for, if thought necessary); the degrees of longitude are then set off on the parallels of latitude in the same proportion as in Flamsteed's projection.

CONI'FERÆ, a natural order of Gymnospermous exogens, consisting of resinous, mostly evergreen, hard-leaved trees or shrubs, inhabiting all those parts of the world in which arborescent plants can exist. Under this name are collected the various races of fir trees, pines, cedars, junipers, cypresses, and the like, which, however dissimilar they may at first sight appear, correspond not only in their universally terebintaceous sap, but in the following points of organization:—They all branch from numerous buds, proceeding from the side of a main stem. Their wood consists of tubes of nearly equal diameter, among which are here and there fistular cavities which receive the resin that exudes from the wood. The sides of the woody tubes are marked by circular disks, which, when highly magnified, appear as if consisting of a smaller internal and a large external circle; the nature and use of these disks is unknown. The following cut represents highly-magnified sections of a piece of deal; A shows the nearly equal size of the woody tubes when viewed transversely. B is a perpendicular section with the disks seen on the sides of the tubes.

The leaves are articulated with the stem, and very often are linear, veinless, and sharp-pointed; but in some cases, as Salisburia adiantifolia, *fig.* 1, and Podocarpus asplenii-folia, *fig.* 2, the leaves become broad, and then they are filled with veins, which are all of the same size, and branch by repeatedly forking; a mode of veining known only in

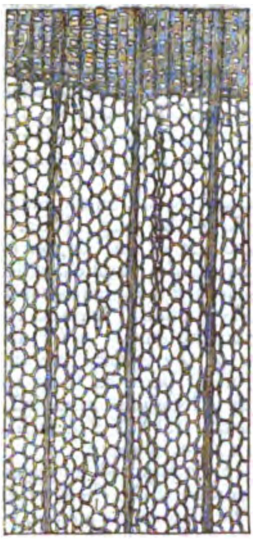


***Fig.* 1.**

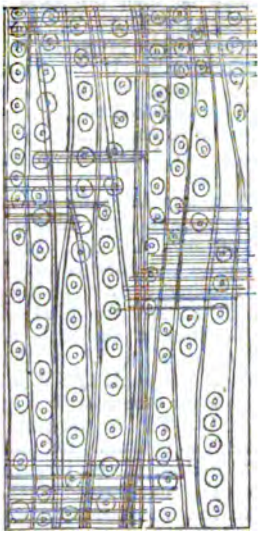


***Fig.* 2.**

[Salisburia adiantifolia.] [Podocarpus aspleniifolia.]

these plants and in ferns. The flowers are collected in little scaly cones; males in one cone, and females in another. The females have no pericarpial covering, but consist of naked ovules, to which fertilization is communicated directly from the pollen, without the interposition of a style or stigma. When the fruit is ripe it consists of a certain number of scales collected into a cone, and inclosing the naked seeds in their axils. Sometimes such scales are thin as in the larch, or hard and long as in the pine, or even succulent as in the juniper, whose berries, as they are named, are small cones with succulent consolidated scales.

Coniferæ are among the most useful of all plants, firstly, for their resinous secretions, such as pitch, turpentines of different kinds, Canada balsam, and similar substances; secondly, for their timber, which under the names of deal, fir, pine, red cedar, Sandarach wood, &c., is most extensively used in building; and thirdly, because of the screen which their compact, evergreen leaves oppose against cold, in barren, bleak situations, where few other trees will grow. [ABIES, PINUS, CUPRESSUS, THUJA, JUNIPERUS, ARAUCARIA, &c.]

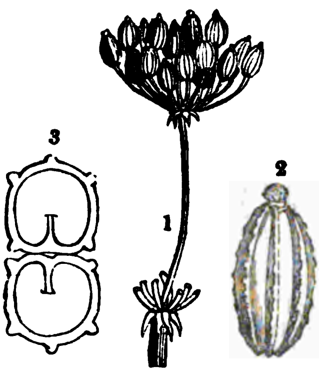
CONILIRA. [ISOPODA.]

CONILITES. [ORTHOCERATA.]

CONIPORA. [POLYPIARIA MEMBRANACEA.]

CONIROSTRES (Zoology), the third family of Cuvier's Passeres, comprising those genera which have a strong bill, more or less conical, and without notches. Cuvier says that they live more or less exclusively upon seeds, in proportion as their bill is more or less thick. The *Conirostres* form one of the five tribes of the order *Insessores* of Mr. Vigors. [BIRDS, vol. iv., p. 431.]

CONI'UM MACULA'TUM, or HEMLOCK, is a wild umbelliferous plant, possessing highly narcotic and dangerous qualities, but used medicinally as a remedy against nervous affections It has a white fusiform biennial root; an erect, branched, bright green, spotted stem, from five to ten feet high, on which are planted so many smooth, finely cut, large, fern-like leaves. When very healthy and growing in a spot where it is neither injured by storms nor disfigured by dust, the hemlock is one of the most noble of all wild plants. Its little greenish white flowers, arranged in umbels after the manner of its order, have a minute involucre of several leaves at the base; and the partial umbels have also three or four short oval leaflets on one side. The fruit is globular, each half having five projecting angles which are slightly crenelled, without either vittæ or appendages or projections between them. It grows in wild places, sometimes by the sides of ditches in meadows, but more frequently in light upland pastures, flowering in June and July. It is almost the only wild umbelliferous plant whose fruit is destitute of vittæ, and consequently not aromatic.



[Fruit of Conium maculatum.]

1. A partial umbel loaded with fruit, natural size. 2. The back view of a fruit, much magnified. 3. A transverse section of the same, showing the ridges, the absence of vittæ, and the involute albumen.

It is necessary to pay the greatest attention to the botanical characters of Conium maculatum, in order that the genuine one may be collected. Sometimes plants resembling it are collected, which are almost or entirely inert when employed as a medicine, or plants possessed of greater potency are used in its stead, from which fatal results have followed. It is a 'well-known cirumstance that the greatest discrepancy prevails among medical men as to the activity of hemlock, not merely as a remedy but also as a poison.' This discrepancy admits of satisfactory explanation on several grounds. The activity of the plant—even supposing the proper one to be collected—depends greatly upon its place of growth, the kind of season, the time when collected, and the means employed to dry it or form it into an extract, on the temperature and dryness of the place where it is preserved, and on the length of time it has been kept. In the south of Europe it is much more energetic than in the north, owing to the greater intensity of light: even in the southern provinces of France it is more powerful than in the northern. The wild plant, growing in well-exposed situations, is always to be preferred to a cultivated one; the kind of season markedly influences its power, which is greatest in a dry sunny season, and least in a wet gloomy one. The leaves during the first year of growth possess little potency; nor do they possess much during the early period of the second, till the flower-stem is developed, and the flowers are about to expand. If this period, which is the fittest time for collecting the leaves, is allowed to pass, it is better to wait two months longer and collect the fruits instead, as they become the recipient of the active principle. The leaves should be dried quickly, but not by the application of a high temperature; they should never be powdered till the time when it is intended to use them, but preserved meanwhile in a cool dry place. If an extract be formed which requires much care in the preparation, it can rarely be kept beyond twelve months. A fresh supply of leaves, fruits, or extract, should consequently be procured every year, and the former thrown away, as the action of time or heat volatilizes the active principle (Conia), and renders the residue nearly inert. When these precautions are attended to, hemlock is a medicine of great power, and unquestionable value.

The fresh leaves are dark green, shining; odour strong, stupifying, unpleasant, resembling that of mice, or the urinous odour of fresh Spanish flies; when dried the colour is lighter, a greyish green; the taste is disagreeably saline, nauseously bitter, and at last somewhat acrid. The expressed juice is green.

The active principle of hemlock appears to be an alkaloid termed *conia*, which, unlike most vegetable alkaloids previously known, is not fixed and crystalline, but volatile and oleaginous. It has been obtained both from the leaves, and fully developed but still green fruits. Its activity is increased by union with acids, both mineral and vegetable; a circumstance which shows the impropriety of giving vinegar as an antidote in cases of poisoning by hemlock, when any of the substances is yet present in the stomach. Conia is sparingly soluble in water, to which it imparts its odour and taste. It also combines with about a fourth of its weight of water to form a hydrate of conia. When exposed to the air it quickly contracts a dark brown colour, and is slowly resolved into a resinous matter, with the disengagement of ammonia. This change takes place more promptly under the co-operation of heat; but even at common temperatures it is so apt to ensue, that unless the alkaloid be kept very carefully excluded from the air, discolouration will take place in a few hours. Though conia exists in the plant in combination with some acid, which may render it less alterable, yet its proneness to decomposition is so great, that either by time or the application of a considerable degree of heat, it may be entirely dissipated; which accounts for the inertness of old leaves, and of most extracts which have not been prepared with the greatest care. Geiger says that the dried leaves do not contain conia; a statement which, if correct, leads to the conclusion that conia, though the most powerful, is not the only efficient agent in hemlock.

Conia appears, from the experiments of Geiger and Christison, to be a deadly poison to all animals. It acts with the most extraordinary rapidity; but if it fail to kill, its injurious action passes quickly away, and perfect recovery follows. It acts through every texture of the body where absorption is readily carried on. It acts as a local irritant; but its ultimate and fatal energy is chiefly exerted on the spinal chord, to which its influence is conveyed by entering the blood and producing on the inner membrane of the blood-vessels a peculiar nervous impression, which is instantly conveyed by sympathy along the nerves to the organ remotely and ultimately affected. 'It exhausts the nervous energy of the spinal chord, producing general muscular paralysis and asphyxia from relaxation.' The heart however is exempt from this general paralysis, contracting vigorously for a long time after all motion and respiration and other signs of life are extinct. It is therefore extremely probable, as suggested by Dr. Christison, that where a dose is not so large as to produce immediate death, the carrying on of artificial respiration and administering vital stimulants, might save the life of the patient, especially as the action of the poison is so transient, and incapable of producing a permanently injurious impression.

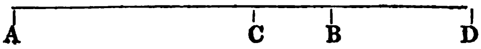
In what way hemlock proves useful as a remedial agent in many diseases is by no means clear, unless it be by allaying irritability in the diseased parts, and giving an opportunity to the vital powers to recover their healthful action. That it lessens irritability in many diseased organs is certain, from the effects of the administration of even a few doses, especially in many cases of scrophulous affections, and above all from allaying the irritation of the lungs during the formation of tubercles, and indeed during all the subsequent stages of consumption. Even when inhaled along with the vapour of warm water the same good effect is said to follow, but this is rather doubtful. Its beneficial influence over external ulcers is however open to observation; and John Hunter remarked, that under the combined action of conium and cinchona-bark, many obstinate buboes, which resisted every other mode of treatment, soon took on a healing process. Many irritable or painful ulcers are soothed and improved by a hemlock poultice. Rheumatic pains, and those attending nodes, are most effectually allayed by conium and ipecacuan. From the very decided sedative action of conia on the spinal chord, Dr. Gordon has suggested that it will prove a useful remedy in tetanus, and other spasmodic diseases. The catalogue of diseases in which it has been found useful might be greatly extended, but enough has been advanced to prove its value, and consequently the propriety and necessity of attending to the above-mentioned rules to obtain it in an efficient state. When the fresh leaves cannot be obtained, owing to the season of the year, the extract may be used. Dr. Christison states, that from an alcoholic extract he obtained the greatest quantity of conia: he was therefore disposed to consider this the most powerful form of preparation. But a carefully prepared watery extract which has subsequently been submitted to trial by him, was found to be, in equal doses, as powerful as the alcoholic.

Dr. Christison is of opinion that the Conium maculatum of the present day is not the plant which furnished the poison employed to dispatch Phocion and Socrates.

For many important particulars in this article we are indebted to Dr. Christison's 'Memoir on the Poisonous Properties of Hemlock and its Alcaloid, Conia.' (*Trans. of Royal Society of Edin.*, vol. xiii.)

CONJEVERAM, so called from a highly venerated pagoda built there, and dedicated to Vishnu Conjee, is a populous and flourishing town, in the district of Chingleput, in the Carnatic, in 12° 49′ N. lat., and 79° 41′ E. long. The town, which stands in a valley, is built in a straggling manner, being more than five miles long: the houses, many of which are handsome, are separated by extensive gardens and plantations of cocoa-nut trees. The town is surrounded by a hedge of the Agave Americana, a plant formerly much used in India as a defence against the incursions of bands of horsemen, who were accustomed to commit depredations upon defenceless places. The valley in which the town is placed is watered by the small river Wegawutty. Besides the pagoda above mentioned, there is a very large and lofty temple, dedicated to Siva, the view from which is very magnificent. Considerable manufactures of cotton goods, chiefly red handkerchiefs and turbans, are carried on in the town, where the weavers set up their looms under the shade of the trees. Conjeveram is celebrated in the antient history of the country, and is well known to Europeans as having been the frequent seat of military operations during the Carnatic wars: the town is forty-eight miles S.W. from Madras. (Heyne's *Historical and Statistical Tracts on India.*)

CONJUGATE. This word is used in several branches of mathematics in a sense which (with one exception, and that might easily be abolished) may be described as follows: two points, lines, &c., are called conjugate, when they are considered together in any property in such a manner that they may be interchanged without altering the way of enuntiating the property. Thus if A C be to C B as A D to D B, C and D are conjugate points with regard to this property.



If we write D where C now is, and C for D, the property is still expressed in exactly the same way. We have other instances in conjugate diameters, conjugate hyperbolas [Ellipse, Hyperbola], conjugate foci. [Lens, Mirror.]

The instance of exeption is the conjugate point of a curve, meaning a single point lying by itself, whose co-ordinates satisfy the equation of the curve, without its actually being on any continuous branch of the curve. [Curves, Theory of.] It would be better to call this point *conjunct* than use a term which destroys the generality of language. But the best term, in our opinion, would be *evanescent oval*. [See the article already cited.]

CONJUGATION of a verb is a term in Grammar denoting the addition of suffixes or prefixes to the crude, or elementary form of a verb, for the purpose of denoting respectively, person, number, time, state, mood, and what is generally understood by voice. In the English language, prefixes are commonly used for these purposes, and these prefixes are not printed in connexion with the verb, though the voice presents them in one mass. Thus *I shall have heard*, as pronounced, is not less one word than the Latin *audi-v-er-o*. In this example therefore, *I, shall, have*, are virtually prefixes, and the letter *d*, a contraction from *ed*, is a suffix attached to the simple verb or crude form *hear*. In the ancient languages, such as Greek, Latin, and Sanscrit, suffixes are commonly but not exclusively preferred.

The suffixes which denote the *persons* are the personal pronouns more or less corrupted. Thus in Latin, *egomet* is the full form of the pronoun which signifies *I:* but as three syllables would be too long for a term in such frequent use, and this inconvenience in the present instance would be aggravated by an appearance of egotism, the word was shorn of its exterior letters, and at the utmost the three middle letters, *ome*, were attached to the verb. We see them in the Greek form *tupt-ome-s* or *tupt-ome-n*, 'we strike.' In the Latin, the vowels were corrupted, so that instead of *ome*, either *umu* or *imu* occur, as in *s-umu-s*, 'we are;' *poss-umu-s*, 'we are able;' *scrib-imu-s*, 'we write.' The old German has nearly the same suffix in *war-ume-s*, 'we were;' *bir-ume-s*, 'we be.' Again the three letters, *ome*, deprived of the last vowel, became *om*, as Greek *tupt-om-ai*, 'I strike myself;' *um*, as Latin, *s-um*, 'I am;' *poss-um*, 'I am able;' or *on*, as Greek, *e-tupt-on*, 'I was striking.' But the first vowel might disappear instead of the last. Thus *me* is the form which appears in the Greek *es-me-n*, or *es-me-s*, 'we are;' *mi* is used in *es-mi*, *e-mi*, *ei-mi*, 'I am;' *di-do-mi*, 'I give,' &c. Sometimes the *m* is all that appears, as *scribeba-m*, 'I was writing.' In Greek, this final *m*, by a principle constantly observed in that language, becomes an *n*, as *e-n*, 'I was;' *etetuphei-n*, 'I had struck.' Another form of the suffix is *o*, instead of *om*, which is common both in the Greek and Latin, as Greek, *tupt-o*, 'I strike;' Latin, *scrib-o*, 'I write.' Finally, all trace of the pronoun at times disappears, and the defect ceases to mislead because the other persons have their characteristic terminations. Thus the Greek tenses, *etupsa*, 'I struck;' *tetupha*, 'I have struck;' and *etetuphea*, 'I had struck,' contain no remnant of the pronoun. In the English language there are some slight traces of the personal suffixes, which existed in full perfection in some of the older forms of the Teutonic languages. The word *am* has a remnant of the first person suffix in its final *m*.

The second person in the Greek and Latin languages, was *su* or *tu*, in German, *du*, and in English, 'thou.' Accordingly we find a sibilant attached to the verb to denote the second person, as in the Greek, *es-si*, 'thou art;' *ois-tha*, 'thou knowest;' *tupt-es-ai*, 'thou strikest thyself;' in the Latin, *scrib-is*, 'thou writest,' and in the English termination *est* in *knowest*, *strikest*. But as the Latin form has a *t* instead of an *s*, *tu* not *su*, so the *t* occasionally appears as in Greek, *tupt-ete*, 'you strike;' Latin, *scribiti-s*, 'you write;' and in the English, '*art*,' 'thou art.'

The third person is an indefinite term; and the suffix which denotes it is derived from *to*, signifying *this*, which is the full form of the Greek article, and again appears, on the one hand in Latin, in the derivatives, *tam*, *talis*, *tantus*, *tot*, *tum*, and on the other in the English, *the*, *this*, *to-day*. It is therefore as general as the English article *the*, and may denote indifferently, the *man*, *the woman*, *the thing*, in other words, *he*, *she*, *it*. It appears as a suffix in the Greek, *es-ti*, 'he is' (Sanscrit, *as-ti*); *tupt-et-ai*, 'he strikes himself;' in the Latin, *es-t*, 'he is,' *scrib-it*, 'he writes;' and in the obsolete form of the English language, *walk-eth*, now corrupted into '*walks*.'

Suffix of *number*. If a sign be employed to denote plurality, the absence of that sign will be a sufficient indication of the singular. Now the suffixes of plurality in English are *s* and *en*, as in *dogs*, *oxen*. The same are employed in Greek and Latin, as, first person, Gr., *tupt-ome-s* or *tupt-ome-n*, Lat., *scrib-imu-s;* second person, Lat., *scribiti-s*. The Greek has dropped the *s*, as in *tuptete*, a corruption probably of *tupteti-s*, just as the Latin imperative *scribite*, must be looked upon as reduced from *scribitis*. In the third person the mark of plurality appears to have been prefixed to the pronoun suffix, as in the Greek, *pha-n-ti*, 'they say;' *tupt-on-ti*, 'they strike;' Lat., *scrib-un-t*, 'they write.'

Time or tense (Fr. *temps*) divides itself into past, present, and future, where again the idea of present time will not require any peculiar distinction, if the ideas of past and future have their proper symbols. The past time appears to have had for its characteristic, either the prefix, *e*, or the suffix, *sa*, *ha*, or *a*. The former appears in the Greek, *e-tupt-on*, 'I was striking;' *e-tup-sa*, 'I struck;' *e-tetuphea*, 'I had struck.' The second appears in two of the Greek forms just enumerated, and in the Latin, *scribeb-a-m*, 'I was writing;' *er-a-m*, 'I was.' A very distinct example of a future suffix appears in those European languages which are derived from the Latin. Thus in the French, *écrir-ai*, we have really two distinct words, the infinitive, *écrire*, and *ai*, the present tense of *avoir*, forming altogether, *écrir-ai*, 'I have to write,' *i.e.*, 'I shall write.' This origin of the French future is placed beyond a doubt by a comparison with the Spanish and Italian.

By the term *state*, which stands fourth in the series of suffixes which have been included in the definition of conjugation, it was intended to denote the notions of perfect and imperfect action. Here again one suffix is sufficient, and the notion of completeness is variously marked:—1st. By a doubling of the verb upon itself. The purest example of this is presented in the Gothic, as *laia*, 'I laugh;' *lailô*, 'I laughed;' *stauta*, 'I strike;' *staistaut*, 'I struck.' The Greek have perfects formed upon this principle in *te-tupha*, *ge-grapha;* the Latin in *te-tul-i*, *de-d-i*, *spo-pond-i*, (for the less easily pronounced *spo-spond-i*.) And in our own language there is strong reason for believing that such is the origin of *did*, the perfect of *do*. Out of the same principle grows the formation of the perfect by a long vowel, *vēni* being probably a contraction from *vĕ-vĕn-i*. 2nd. By affixing the letter *s*, which is probably a corruption of the verb *es*, to be; a supposition strengthened by the fact, that the past perfect *scrips-eram*, and the future perfect *scrips-ero*, are undoubtedly formed by the addition of *eram* and *ero* from that verb. The same would also be found on investigation to be the case in the Greek *etetuph-ea*, 'I had struck;' and lastly, in our own language the same verb is used for this purpose in such phrases as '*I am recovered*.' 3rd. By the letter *v*, which may possibly be a remnant of the auxiliary verb *habe*, 'have,' in accordance with the practice of nearly all the languages of modern Europe. Examples of this suffix are abundant in Latin, as *ama-vi*, 'I loved.'

The suffixes of the *moods* could not be placed in a distinct point of view without a detailed investigation. It may be sufficient to point out that *to* is distinctly observable as a suffix in those parts of the so-called Latin imperative, which strictly deserve that title; for the forms which do not contain the syllable in question, are at the same time devoid of the notion to command. That the suffixes of the potential, subjunctive, and optative moods, in the Greek and Latin, were originally distinct words, and perhaps verbs, like our own *may*, *can*, &c., is probable from general principles, and is confirmed by the appearance of the separate particles *ken*, *ke*, *an*, in the Greek language, which are used in connexion both with the indicative and other moods.

The last suffix for consideration, is that which denotes the *voice*. The Greek grammarians acknowledge a middle or reflective voice; but the Latin language in fact possesses the same, as for instance in *accingo-r*, 'I gird myself for the contest;' *nito-r*, 'I support myself;' *lavo-r*, 'I wash myself,' 'I bathe.' And in both languages the middle voice is the parent of the passive. This may be illustrated by such phrases as the French *les bas se vendent ici*, 'stockings sell themselves here,' *i.e.*, 'are sold;' the Italian *si dice*, 'it is said,' strictly *it says itself*. Now the suffix of the Latin passive appears in the various forms *ur*, as *monet-ur*, *er* as *moneri-er*, *r* as *moneo-r;* but the attentive Latin student is ever ready to suspect when he meets with an *r*, that an older form of the word contained an *s;* and in fact we find an *s* in the form *moner-is*, where moreover the first part *moner* is another example of the corruption in question, for it supplies the place of *mones*. If then *s* is the original consonant of this suffix, we are forthwith directed to the reflective pronoun *se;* nor ought we to be stopped by the fact that this pronoun in Latin is confined to the third person. In the Russian and other Sclavonic languages, the connexion of which with the Teutonic languages and with those of Greece and Rome is indisputable, the reflective pronoun, containing in fact the very same root as *se*, is applicable alike to all the persons: and indeed there was nothing in the nature of things to limit the Latin pronoun as to *person*, when it is confessedly unlimited as to *gender* and *number*.

The division of verbs into several conjugations depends upon the last vowel or consonant of the verb in its simple or crude state. Thus in the Latin language all verbs ending in *a* are said to be of the first conjugation, all that end in *e* of the second, those in a *consonant* or *u* of the third, and those in *i* of the fourth or last; for it accidentally happens that the Latin language possesses no verbs in *o*, except the fragmentary forms *gnovi*, *gnotus*, *potus*, *ægrotus*, which appear to imply the existence of stems in *o*, viz., *gno* (in English, 'know'), *po* (compare the Greek *pe-po-ka*), *ægro*. The Greek language is not without a class of verbs having *o* for the final letter, as *doulo*, enslave, &c. The division of verbs into conjugations is founded upon the fact that the union of the final letters in the crude form of the verb with the initial letters in the suffixes leads to changes dependent upon these letters.

CONJUNCTION and OPPOSITION (Astronomy). Two heavenly bodies are said to be in conjunction with respect to a third, when they have either the same longitude (measured on the ecliptic of the third) or the same right ascension (measured on its equator). But as it is the second position which is usually meant by conjunction, the first is called the ecliptic conjunction. Thus in every eclipse of the sun, there is a conjunction of the sun and moon, both equatorial and ecliptic, not however at the same moment, unless the eclipse be perfectly central. There is also a conjunction at every new moon.

Opposition (equatorial or ecliptic) is when the bodies are exactly of opposite right ascensions or opposite longitudes, that is, when their longitudes or right ascensions differ by 180°. Thus there is always an opposition of sun and moon at every full moon, and both oppositions are at the same moment in the middle of a central eclipse.

The conjunction of a planet with the sun prevents its being observed, as it is then always in the brightest part of the heavens: it is nevertheless an important element in the theory of the planets. But at the opposition (an equally important point in theory) the planet is always in the darkest part of the heavens. Both therefore in theory and practice, comparisons of observations and theory near the opposition are desirable: and accordingly astronomical ephemerides usually give very close computations for these periods.

Apparent conjunction and opposition take place when the right ascensions are the same, or opposite to the spectator or the earth's surface: *true* conjunction, &c., refers to a spectator supposed to be at the earth's centre. [APPARENT.]

CONJUNCTIONS. Under this term grammarians commonly include several classes of words which have little similarity of meaning, and which, in their etymological origin, may be verbs, substantives, adjectives, or prepositions. The old definition of a conjunction, that it was a word which connected sentences together, will certainly not apply in all cases, if at least the word 'and' is to be included. It is true, as Horne Tooke observes, that "the sentence 'You and I and Peter rode to London' may be resolved into three: 'you rode,' 'I rode,' 'Peter rode.' But try some other instances: 'two and two are four;' 'AB, BC, and CA form a triangle;' 'John and Jane are a handsome couple.'—Does AB form a triangle?—Is John a couple?—Are two four?" (*Diversions of Purley*, Taylor's edition, i., p. 210.)

On the etymological origin of conjunctions, which is a distinct question from their use, some remarks will presently be made; in reference to their employment in the construction of a simple or compound sentence they may perhaps be divided into the following classes: 1. Conjunctions which unite either individual words, or phrases, or sentences, without, in the last case, implying any subordination of one sentence to the other. Such are the words: *and, or, nor;* or the double forms: *both—and—, either—or—, whether—or—, neither—nor—*. With respect to this class it may be useful to point out the great advantage which the Greek and more particularly the Latin language possessed in the variety of their forms for *and:* as *και, τε* in the former, *et, que, atque* or *ac* in the latter. This superiority over modern languages, simple as it is in itself, gave to the longest Latin sentence a perspicuity of arrangement, which in a great measure superseded the necessity for a cumbersome punctuation. (*Journal of Education*, vol. iv., p. 135.) 2. Conjunctions, which in themselves simply meaning *this*, being prefixed to a secondary sentence or phrase, direct the attention to that secondary phrase as a unit, and thus prepare it for subjection to some preceding word. This usage of the pronoun is as nearly as possible equivalent to the use of the bracket or vinculum in algebra, which connects the separate elements of any compound or polynomial term, and subjects it as a new unit to the algebraical operation, the sign of which is attached to the vinculum. Horne Tooke, in his remarks upon the so-called conjunction *that*, furnishes many examples: as, 'I wish you to believe that I would not willingly hurt a fly,' which is resolved by him into 'I would not willingly hurt a fly; I wish you to believe *that*.' A mathematician would have expressed it by 'I wish you to believe [I would not willingly hurt a fly],' where the words within the brackets must be considered as a compound accusative or object after the verb *believe*. The Latin *ut* and *quod* in their origin are merely neuters of the relative, and the original meaning of the relative, it must be recollected, was *this*. [ARTICLE.] Hence they too are used in the same way as the English *that;* for example: *suadeo ut abeas*, 'I recommend *this*, you should go away;' *lætatur quod redieris*, 'he rejoices at *this*, you have returned.' Other examples may be found in the use of the Greek *ὁτι*, which is again the neuter of a relative, as: *λεγω ὁτι τεθνηκε*, 'I say *this;* he is dead.' In Greek there is sometimes a double accusative after the verb, one of which simply denotes the object of the verb, and the other points to the condition or state of the object, as explained by the words that follow it: thus, *ὁρω σε ὁτι κακως πασχεις*, literally, 'I see you *this*, (that) you are suffering.' This employment of the pronoun is more particularly to be noticed after prepositions. Thus, in the Latin language, if a simple noun be the object of a preposition, all that is required is to put that noun in a certain case, as *post cœnam*, 'after dinner;' but if a verb with its accessories is to be subject to a preposition, it is common to interpose the vinculum *quam*, 'this,' as, *postquam cum fratre suo cœnaverat*, 'after he had supped with his brother.' Even in English we might say: 'after that he had,' &c. Examples of this usage are abundant in the forms *antequam, præterquam, extra quam, præter quod, prout;* and the word *this* is sometimes doubly expressed, as in *pro eo ut, ad-eo ut, propter-ea quod, ex eo quod, præter quam quod*. The German idiom agrees precisely with the Latin, as may be seen in *nach-dem, in-dem*, &c., as opposed to the employment of the simple prepositions *nach, in*, &c. The French, too, have their *pendant-que*, &c., *puis-que*. &c., and the English their *besides that*, &c., *now that*, &c., and the old phrase *being that*, &c. 3. The pronoun in the several languages thus employed as a vinculum is frequently attached as an enclitic to the preceding word, and grammarians, not observing the distinction between the governing word and the pronoun, have often given the name of conjunction to the compound, as *postquam* in Latin, *διοτι* in Greek, *puisque* in French, *nachdem* in German. 4. The vinculum, however, is not essential in those forms, and is therefore frequently omitted; but in case of this omission the governing word must immediately precede the phrase which is dependent upon it. This governing word, which expresses the nature of the connexion between the subordinate and the superior sentence, is also called a conjunction, but here the term is used in a different sense. The words which signify *this*, of which we previously spoke, found their claims to the title of a conjunction upon the fact that they unite the several elements which follow into a whole. When the governing particle is so called, it is because it binds the one sentence to the other. 5. There is a class of words which correlate with conjunctions: such as *so* in connection with *as* or *that, yet* with *although, therefore* with *since* or *because*. These words are often called adverbs, but as they too serve to connect sentences, they deserve like the rest the name of conjunctions. They bear, in fact, the same relation to the other conjunctions that the so-called antecedent does to the relative.

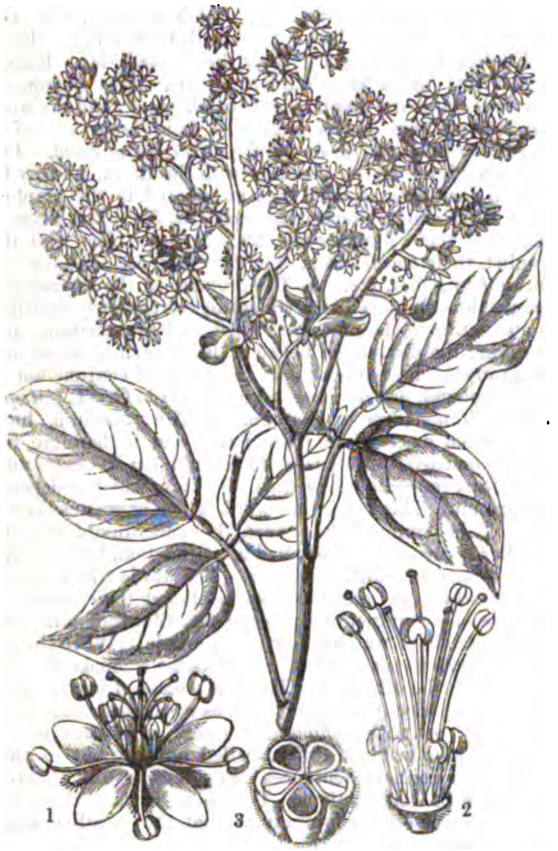
We have already said that conjunctions belong in their origin to all the leading parts of speech. Examples of verbs so employed are seen in the English *if*, formerly written *gif*, i. e. *give*. (Horne Tooke as before, p. 103, &c.) The Latin *licet*, 'although,' is evidently a verb signifying 'it is allowed.' So too *vel*, 'or,' appears to be an derivative of *volo*, 'choose;' and *si*, as well as the Greek *ει*, 'if,' have much resemblance to the imperative moods of the verb 'to be.' The English *while* and the Latin *dum* of the same meaning are substantives signifying 'time.' 'Either' and 'whether' are of course pronominal adjectives, and 'or' is a corruption from 'other,' as is evident from the German equivalent *oder*. And a similar analogy seems to lead to the derivation of the Latin *aut—aut*, from *alterum—alterum*. Conjunctions of a participial and prepositional character have occurred in the examples already quoted; but the relative form appears to be specially fertile in the production of this class of words, as, in the Latin, *quam, quando, quamquam, quamvis, ubi, unde, ut, quia, quod;* and the English *when, how, as, where*. In fact the relative itself has the power of a conjunction, as explained under the second head. [ARTICLE.]

Many of the conjunctions defy all attempts at analysis and certainly Horne Tooke, notwithstanding the acuteness and truth of his general views, has occasionally erred in the details of derivation.

CONN, LOCH, a large lake, 3½ miles from Ballina, in the county of Mayo in Ireland; it is 11 miles in length, with a coast of 53 miles and a surface of 14,000 acres. It is situated 27 feet above the level of the sea at Killala Bay, in which it discharges its water through the river Moy. The water power which could be procured from Loch Conn is estimated at equal to half the power of all the steam-engines in Glasgow. Loch Conn is a double lake; its southern half is called Loch Cullin.

CONNAMARA. [GALWAY.]

CONNARA'CEÆ, tropical trees or shrubs, with pinnated alternate leaves having no stipules, polypetalous flowers having ten unequal hypogynous stamens, and a fruit consisting of one or more one-seeded follicles. Their seeds are remarkable for having the embryo at the end most distant from the hilum. The species are much alike in habit, not numerous, and possess no known properties that deserve to be mentioned.



[Connarus Asiaticus.]
An expanded flower, much magnified. 2. Its stamens and styles. 3. A section across the ovary.

CONNAUGHT, a province of Ireland, containing the counties of Galway, Mayo, Roscommon, Leitrim, and Sligo. It lies between 52° 52′ and 54° 25′ N. lat., and between 7° 33′ and 10° 15′ W. long. The latitude is about that of Yorkshire and Lincolnshire; but from its proximity to the ocean, the climate is much more moist and variable. It is bounded on the north and west by the Atlantic Ocean; on the east by the river Shannon and the counties of Cavan, Fermanagh, and Donegal; and on the south by the county of Clare. Clare was at one time a part of this province, to which it would appear naturally to belong; but it is now annexed to Munster. The greatest length of Connaught, from Scariff on the borders of Clare on the south, to Mullaghmore Head on those of Donegal on the north, is 85 Irish, or 108 English miles; and its greatest breadth, from the boundary of Leitrim on the N.E. to Slyne Head on the S.W., 93 Irish, or 118 English miles. It is estimated to contain 3,660,451 statute acres; but this calculation probably falls much short of the actual amount, which cannot be ascertained till the completion of the Ordnance Survey of Ireland, now in progress.

The mountain-ranges are distributed round the coast. From their inland declivities the province has a comparatively level surface to the Shannon. This river thus becomes the main drain of the intermediate country. Its chief feeders in Connaught are the Suck and the Gara; the latter discharges the waters of Loch Gara and Loch Key, and the former, a large river, is navigable from its confluence with the Shannon to Balliferan, a distance of about 20 miles. The streams which flow to the ocean are much more numerous, but the body of water brought down by them is not so great. They take their rise chiefly in lakes, which are distributed through the mountain districts of Galway and Mayo. Of these, Lochs Corrib, Mask, and Carra discharge their united waters southward by Galway; and Loch Conn, Loch Anow, and Loch Gilly, northwards by Ballina, Ballasadera, and Sligo respectively. The rivers which flow westward from the lakes of Connamara and Erris are short and rapid in their course, and comparatively inconsiderable in the quantity of water; so that, with reference to its rivers, the province may be divided generally into three districts: that of the Shannon, that of the basin of Loch Corrib, and that of the basin of Loch Conn. The neighbourhood of Ballihannis in Mayo, about the centre of the province, forms the summit level from which these principal slopes diverge; and lines drawn from this point to Scariff on the south-east, Sligo on the north-east, and Westport on the west, will be found to mark pretty nearly the boundaries of each.

The limestone field of Connaught is very nearly co-extensive with the low district between the Shannon and the western elevations. The mountain-groups that inclose this plain present towards the inland field successive elevations of sandstone, clay-slate, granite, and quartz, corresponding pretty nearly with the development of the same strata on the opposite side of the island. The limestone field is very much encumbered with bog, which in Ireland is almost always found to rest on limestone gravel. An immense tract of ground in Galway, Roscommon, and Mayo, is thus rendered of little or no value; for the borders only of these bogs (some of them of twice the extent of the bog of Allan) are available for purposes of turbary. The remainder of the province is more mountainous than any other district of equal extent in Ireland; so that Connaught, in produce and population, is far behind the other provinces. An estimate may be formed of the condition of Connaught, as to religious and other instruction, by referring to TUAM. Its history, antiquities, and local description will be found under the heads of its separate counties.

Connaught was formerly a kingdom of the Irish Pentarchy. Its kings were of the race of O'Connor. It enjoyed a comparative independence until the year 1590, when it was made shire-ground under the 11th Eliz. c. 39, and divided into six counties, viz., those above enumerated and Clare, which had formerly been part of Munster. In 1602 Clare was re-annexed to the latter province, yet so late as 1792 remained on the Connaught circuit. In the various rebellions down to the end of the seventeenth century, Connaught was the refuge of the fugitive and dispossessed Irish. The Irish language is still very prevalent; and the condition of the poorer classes to this day attests the miserable circumstances which brought the population together. Employment is here more difficult to be obtained than in any of the other provinces. The average of wages is 7*d.* per day, and the average of employment for labourers is only 125 days in the year. Multitudes of the peasantry, especially from the counties of Mayo, Leitrim, and Sligo, annually emigrate in search of employment: a great part of every harvest of England and Lowland Scotland is reaped by these wanderers.

Numerous projects have been formed for the improvement of this province and the development of its great resources. It has been proposed to run a railroad from Dublin to Blackrod Bay on the western coast through the county of Mayo; and to Roundstone Bay in Connamara through the county of Galway; also to Sligo through the county of Roscommon, all by way of Athlone. Canals have also been proposed, as an extension of the Royal Canal to Loch Conn and Killala, and an extension of the Grand Canal from Ballinasloe to Loughrea. It is at present in contemplation to connect the lakes of Galway and Mayo, so as to form a line of navigation from Galway to Killala, through Lochs Corrib, Mask, Carra, Castlebar, Cullin, Conn, and the river Moy to Ballina, a distance of eighty miles, through a district susceptible of immense improvement. To con nect these lakes it would require a series of cuts only seventeen miles in length, the remainder of the navigation already existing in detached lakes and parts of rivers. The line of navigation would pass through a country abounding in limestone, marble, compact granite, sandstone flags, marl, and brick and potters' clay, with an inexhaustible supply of turf fuel, all which are at present valueless from not being accessible.

The produce of Connaught which comes to market consists chiefly in black cattle, which are sold in immense quantities at the fair of Ballinasloe. There is a pretty brisk export of grain from Sligo and Ballina, but, generally speaking, the resources of the province remain quite undeveloped

The progress of population has been rapid, as will be seen from the annexed table. Still it falls far short of that of the island at large. In the number of houses and inhabitants to a square mile, Connaught bears to the other provinces a proportion of little more than 2 to 3.

POPULATION OF CONNAUGHT. *No Return under Act of* 1812.

Date.	How ascertained.	No. of Houses.	No. of Families.	Families chiefly employed in agriculture.	Families chiefly employed in trade, manufacture, and handicrafts.	All other families not comprised in the preceding classes.	Males.	Females.	Total.
1792	Estimated by Dr. Beaufort .	95,821	..	..	..	..	..	..	*478,000
1821	Under Act 55 Geo. III., c. 120	197,408	211,637	..	..	..	553,948	556,281	1,110,229
1831	Under Act 1 Will. IV., c. 39	224,638	239,387	184,528	23,613	31,246	660,498	683,416	1,340,914

CONNECTICUT, one of the United States of North America, is bounded on the south by Long Island Sound, which separates it from Long Island; by Rhode Island on the east; by Massachusetts on the north, and by the State of New York on the west. It has a sea coast of about ninety-five miles along the Sound, which is indented by several good harbours, of which New London, New Haven, Bridgeport, and Norwich, are the chief. The form of Connecticut is nearly that of a parallelogram, which is about eighty-five miles long from east to west, with a mean width of sixty miles from north to south. The area is about 5000 square miles, or about one-eighth less than that of Yorkshire.

Hartford, the capital, near the centre of the state, on the left bank of the Connecticut river, is in 41° 46′ N. lat., and 72° 45′ W. long. The surface of the country is generally uneven, but there are no lofty mountains. The principal ranges of high ground run from north to south in the direction of the Housatonick and the Connecticut, the two principal rivers of the state. The Lyme range on the east side of Connecticut river separates the lower basin of the Connecticut from the Thames. A range of high land of moderate elevation, called the Middleton Mountains, runs from Hartford on the Connecticut, past Middletown, to New Haven. The Housatonick mountains run along the western margin of the state, on the west side of the Housatonick river.

The Housatonick rises in Berkshire county, Massachusetts, in a fine plain 1000 feet above the sea, and running a general southern course through a picturesque valley, enters the Sound at Milford Point, after a course of about 120 miles.

The CONNECTICUT, which is a considerable river, rises in Lower Canada, about 45° 20′ N. lat., and its sources are supposed to interlock with those of the Androscoggin, Kennebeck, Chaudiere, and St. Francis. Its general course is S. by W. and then S.W. to the point where it breaks through one of the Appalachian ranges, and receiving the Passamsick, descends over the Barnet falls from the high valley in which it hitherto flows, into a lower basin. From the junction of the Passamsick it continues, as it did before, to form the boundary between New Hampshire and Vermont, and after a course of about 140 miles, it is deflected for a short distance to the S.E. by some high land. Resuming its general southern course, it enters Massachusetts. Below the confluence of Miller's river (which joins it on the right bank in Massachusetts about twelve miles south of the boundary between New Hampshire and Massachusetts), the river again abruptly bends to the west a few miles above Greenfield. It makes several other bends in Massachusetts, which state it leaves about five miles below Springfield. Its general southern course continues to Middletown in Connecticut, where it is deflected to the S.E. by some high land, and continuing this direction it enters the Sound. The whole course of the river is probably not less than 400 miles. The Connecticut is in many respects a very remarkable river. Its general course, as already described, is nearly due S.; though it receives numerous streams, they are comparatively of small importance. The river basin above the junction of the Passamsick, is about thirty miles wide below this point it widens to about forty; the whole surface of the basin is calculated at about 9300 square miles. The river generally flows in a deep and often narrow valley, bordered by high lands, which, where they recede from the river, leave fine alluvial plains. One of these alluvial plains stretches uninterruptedly for forty miles from a little above Middletown, in Connecticut, to South Hadley, in Massachusetts. The sources of the Connecticut lie in a region with a mean elevation of at least 1200 feet above the sea, and four degrees north of the outlet of the river in Long Island Sound. These circumstances cause a considerable contrast in the climate of the different parts of the Connecticut basin, and, combined with the circumstance of the narrowness of the river valley, help to account for the dreadful inundations to which the alluvial tracts on the river are exposed. In September, 1828, the river rose at Hartford twenty-four feet above low-water mark, and did immense damage. The river is navigable for vessels drawing ten feet water to Middletown, which is at the head of tidewater, and thirty-six miles from the Sound; vessels drawing seven feet and a half ascend to Hartford, fifteen miles above Middletown. Though this river is much obstructed by rapids, falls, and shoals, it has been made navigable for boats of considerable size to the Fifteen Mile Falls in New Hampshire, a total distance of 250 miles.

The only canal in the state that is yet completed, is the Enfield canal, five miles and a half long, which was made to avoid the falls of the Connecticut. The Farmington canal, which is to connect Northampton in Massachusetts, with New Haven in Connecticut, will be seventy-eight miles long, when completed.

The soil of Connecticut is only of a medium quality, except in the river valleys, some of which contain rich alluvia Agriculture is generally in a good state, and the pastures on the low lands are particularly fine. The minerals are iron, copper, lead, cobalt, plumbago, and coal.

The state is divided into eight counties, subdivided into 120 townships: the population is 297,675. Hartford, on the Connecticut, near the centre of the state, has a population of near 10,000. Newhaven, which stands on a bay on Long Island Sound, has a considerable trade, and a population of about 10,700. The legislature meet alternately at Hartford and Newhaven. Middletown, on the Connecticut, has manufactures of cotton, woollen, and arms, and a population of about 6900. New London, at the mouth of the Thames, with a population of about 4400, has some vessels engaged in the whale fishery. Norwich, with a population of about 5200, is a manufacturing town.

Yale college, in Connecticut, which is an old foundation, has a president and fourteen professors and tutors, with a library and a large collection of minerals. There is also a law and medical school connected with the college. Washington College, at Hartford, was founded in 1826. Hartford also contains a very well regulated asylum for the deaf and dumb. The Wesleyans have a university at Middletown. The State of Connecticut possesses large resources for education. The interest of the school-fund,

* Exclusive of the town of Galway, not calculated.

which amounts to 2,000,000 dollars, is appropriated to the support of elementary schools.

The legislative body is composed of a senate, consisting of twelve members, and a house of representatives, consisting of 208 members. The present constitution was adopted in 1818, up to which time the state was governed by the colonial charter granted by Charles II. in 1662. Connecticut sends six members to the House of Representatives at Washington, and two senators to the Senate.

CONNELL, SIR JOHN, was admitted an advocate of the College of Justice in the year 1788, and soon afterwards married the daughter of President Campbell. In March, 1796, he was made sheriff of Renfrewshire, and on Mr. Robertson's elevation to the bench he was elected procurator to the church of Scotland, May, 1806. In the end of the year 1815 he published the first edition of his 'Treatise on Tithes,' and in July following was advanced to be judge of the admiralty in Scotland. In May, 1818, he published his 'Treatise on Parishes,' and had afterwards the honour of knighthood. In July, 1830, the high court of admiralty and his office of judge-admiral were abolished by act of parliament. He died suddenly the following year.

CONNOR, a bishop's see in the archdiocese of Armagh, in Ireland; the chapter consists of dean, chantor, chancellor, treasurer, archdeacon, and four prebendaries. This diocese is very nearly co-extensive with the county of Antrim. It extends in length from N. to S. 57 miles, and in breadth from E. to W. 30¼ miles. It contains 72 parishes, constituting 47 benefices: of these parishes, three and a part of a fourth are in the county of Derry, and a part of one is in Down. In 1792 the numbers were—76 parishes, 40 benefices, and 43 churches of the Establishment. In 1834 the numbers were—churches of the Establishment, 51; Roman Catholic ditto, 45; Presbyterian ditto, 96; and other houses of Protestant and Dissenting worship, 41. In the latter year the gross population of the diocese was 361,618; of whom there were 66,888 members of the Established Church; 95,545 Roman Catholics; 193,261 Presbyterians; and 5924 other Protestant Dissenters; being the proportion of one member of the Established Church, and three Presbyterians and Dissenters, or four Protestants of whatever denomination, to 1⅜ Roman Catholics; or as 2¾ to 1 nearly, from which it appears that Connor is the most Protestant diocese in Ireland. There were at the same time in this diosese, 562 schools, educating 32,938 young persons, being in the proportion of $9\frac{11}{100}$ per cent. of the entire population under daily instruction, in which respect Connor stands tenth among the 32 dioceses of Ireland. Of these schools, 86 were in connexion with the Board of National Education, being in the proportion of one to six and a half.

Connor, from which the diocese takes its name, is an inconsiderable village situated on the Glenwhippy river, in the barony and county of Antrim. It was a place of some note in 1315, at the time of the invasion of Edward Bruce, by whom it was taken, after the defeat of the English under Richard, Earl of Ulster, before its walls. It is supposed to have gone to decay after the irruption of the expelled Irish in 1333. There are now no traces of an episcopal seat; a large Presbyterian meeting-house is the chief object in the village.

The bishopric of Connor was founded by Aengus, the son of Nissa, usually known as Saint Macnish, who died A. D. 514. He was the disciple of Olcan, who was the disciple of Patrick. Of his successors little is known until the time of Malachy O'Morgair, who was advanced to this see A. D. 1124 Prior to this time the diocese had fallen into a very barbarous state.

Its inhabitants are represented by Bernard of Clarevalle, who has written the life of Malachy in Latin, as being 'Christians in name, but Pagans in practice; caring neither for the rites of marriage nor of baptism; paying neither tithe nor first fruits; in fine, little better than beasts of the field.' Yet, such was Malachy's success in reclaiming them, that on his translation to the see of Armagh, in 1134, he is said to have left this diocese, which he had found sunk in iniquity, engaged in the practice of all the virtues. At this time the diocese was known indifferently as Connor and Dalnaruigh, or Dalaradia. Shortly after we find Reginald, bishop of Connor, subscribing witness to a charter of John De Courcy, the conqueror of Ulster. In the beginning of the fifteenth century the diocese appears to have relapsed into a barbarous condition: numbers of the people were without baptism; and one family, the clan Gillmore, of which Hugh Mac Adam Mac Gillmore was the chief, being in a state of civil and ecclesiastical outlawry, committed many atrocious sacrileges. Mac Gillmore himself is said to have destroyed no less than forty religious houses. He was at length put to death, 1407, by a party of the clan Savage, in the Franciscan Church at Carrickfergus, where he had taken sanctuary. Soon after, in 1442, one John, being bishop of this diocese, prevailed on Pope Eugene IV., contrary to the wishes both of the Irish primate and the court of England, to unite the sees of Down and Connor, which have so continued ever since. By the 3rd and 4th William IV., c. 37, sec. 121, the united bishopric of Down and Connor becomes augmented by the diocese of Dromore.

(Ware's *Bishops*; Beaufort's *Memoir of a Map of Ireland*; *Reports of Commissioners*.)

CONODYCTIUM. [POLYPIARIA MEMBRANACEA.]

CONOELIX, CONŒLIX, or CONOHELIX, a genus of turbinated shells, established by Mr. Swainson for a group which, in his opinion, 'form a beautifully defined link connecting the *Cones* with the Volutes, strictly so termed'—with the following generic character. 'Shell coniform. Spire very short. Outer lip simple. Columella or pillar plaited. Aperture linear, narrow, longer than the spire. Generic type, Conœlix lineatus.' (Swainson.)

The animal, which is doubtless a gastropod, is not known

Geographical Distribution.—Mr. Swainson (*Zoological Illustrations*) figures three species, and mentions that several specimens are in the Banksian collection from the Pelew islands. To one of these species in that collection, Taheite, usually called Otaheite, is given as a locality. Mr. Cuming brought home another species, *C. Virgo*, which Mr. Swainson considers as representing *Conus Virgo*, from the reefs at the island of Rietea. It was in shallow water. Mr. Swainson says, in the work above quoted, that Mr. Humphrey informed him that he had at different times seen five or six other species besides those figured by Mr. Swainson, all of small size. Example. *Conoelix lineatus*. 'Shell smooth, whitish, with transverse capillary fulvous lines. Spire depressed, the apex prominent. Pillar six-plaited. Inhabits the South Seas?' (Swainson.) The figures, which are of the natural size, are copied from the accurate drawing in the *Zoological Illustrations*. All the other known species are comparatively small.

[Conoelix lineatus.]

De Blainville divides the genus *Mitra* into five sections, and makes his fifth consist of 'Imbricaria, Schum., and Conœlix, Sow.,' meaning Sowerby; but the genus is Swainson's, and is generally adopted.

CONOID (like a cone), a term sometimes applied, but in this country only, to the surface generated by the revolution of a conic section about its axis. [SPHEROID, HYPERBOLOID, PARABOLOID.]

CONON (Κόνων), an Athenian general, was the son of Timotheus. The first time he is mentioned in history is B.C. 413, in the eighteenth year of the Peloponnesian war, when he had the command at Naupactus on the Corinthian gulf. (Thucyd. vii. 31.) Conon was the chief of the ten generals who were appointed to the command of the Athenian fleet, when Alcibiades and Thrasybulus were removed from office, and, though at first beaten in a sea-fight by Callicratidas [CALLICRATIDAS] the Lacedæmonian general, he afterwards gained a signal victory at Arginusæ. Lysander being appointed a second time to the command of the Spartan fleet, engaged with Conon at Ægospotami, and defeated him, B.C. 405. Immediately dispatching to Athens the sacred ship Paralus with the news of the defeat, Conon himself fled to Salamis in Cyprus, where the friendship of the king, Evagoras, sheltered him from the obloquy or punishment which he would have encountered at home.

Isocrates has given us a pleasant picture of the intimacy which subsisted between the Athenian general and the

Prince of Salamis during Conon's residence in Cyprus. Here for a time he kept aloof from action, watching attentively the progress of affairs: the negotiations, which he soon commenced with the Persian satrap Pharnabazus, terminated in a speedy union of the Persian and Athenian forces with those of Evagoras, with the view of stopping the progress of the Lacedæmonians. Evagoras, Conon, and Pharnabazus together, raised a powerful fleet, in the command of which Pharnabazus was materially assisted by the experience of Conon. Falling in with the enemy's fleet near Cnidos, they gained a complete victory, B.C. 394: the galley of the Spartan general, Peisander, being driven on shore, most of his crew escaped; but Peisander disdained to save himself by flight, and was killed on board his ship. The consequences of this victory were of great importance to the interests of Athens; and Isocrates (*Philip.* §§ 94, 95) represents Conon as having completely destroyed the Lacedæmonian empire. Of the Grecian islands, some surrendered at once, and others showed a readiness to renew their old alliance. This was a juncture too favourable to be lost sight of, and accordingly Conon and Pharnabazus hastened to follow up their success by an invasion of the Thracian Chersonese. Town after town submitted to them, and the people abandoned their lands. Sestos and Abydos still held out, but the approach of winter at last put an end to the attempt at reducing them, and the satrap and Athenian admiral began to prepare for the operations of the ensuing spring, at the commencement of which they proceeded without delay to the coast of Laconia, and ravaged the country in various parts, B.C. 393. Conon seized the opportunity, which the flush of their present success afforded, for obtaining from Pharnabazus many important favours for his country. The satrap allowed him the use of his fleet for recovering the payment of tribute from the islands, and not only gave a large sum of money towards the rebuilding of the long walls at Athens, which had been demolished by the Spartans at the close of the Peloponnesian war, but sent men to assist in the work. At this time Conon appears to have returned to Athens, amidst the joy and congratulations of his countrymen: his portrait, which with that of Evagoras was placed beside the statue of Zeus Soter, was a slight memorial of their gratitude.

At the time when Antalcidas was sent on an embassy from Sparta to conclude a peace with the Persian king, Conon, the Athenian ambassador, was one of those who refused to give their assent to such terms as were proposed for their acceptance. The result was that he was imprisoned by the Persian minister Teribazus, on pretence of his adopting measures detrimental to the great king. What became of him afterwards we have no certain information. Nepos says, that according to some he was brought up before the king himself and put to death; while others affirm that he escaped from confinement. Xenophon, who relates his imprisonment, says nothing of his death. Lysias (*On the Property of Aristophanes*, §§ 635-646) gives an account of Conon's property, which was of considerable amount in Cyprus, and states that it was disposed of after his death; and Mitford (chap. xxv. § 6) has conjectured with good reason, that he escaped to Cyprus out of the hands of Teribazus, and died there. The words of Lysias (§ 640) certainly imply that he died a natural death, and was not murdered. He appears to have died about B.C. 388. (Clinton, *Fast. Hel.*) He had a wife in Cyprus at the time of his death. (Isocrates and Lysias, as cited above; Xenophon, *Hellenica*, i. 4-7; iv. 3-8; Diodorus Siculus, xiii. 48, 77, 78; xiv. 39, 79, 83, 84, 85, 86; Nepos, *Life of Conon;* Plutarch, *Life of Lysander*, and of *Artaxerxes*.)

CONON, of Alexandria, a friend of Archimedes, mentioned in his writings as having a great knowledge of geometry. He was the proposer of the spiral which bears the name of Archimedes. [SPIRAL OF ARCHIMEDES.]

CONOVULA. [MELAMPUS.]

CONRAD I., count of Franconia, was elected king of Germany A.D. 911, on the death of young Ludovic IV., the son of Arnulf, and the last of the Carlovingian dynasty in Germany. He was chiefly engaged during his reign in making his authority respected by the turbulent dukes or great vassals, his electors; among whom Henry, duke of Saxony and Thuringia, was the most powerful and most troublesome. The Huns too attacked Germany, and pushed their depredations as far as Bavaria. Conrad went to oppose them, and received a mortal wound in battle, A.D. 919. In his last moments he exhibited a wise policy. Knowing the ambition and power of Duke Henry, he recommended to his brother Eberhard and his other relatives the propriety of renouncing their own views, and of electing the Saxon duke; a measure which he looked upon as necessary to the salvation of Germany. His advice prevailed, and Henry, called the Fowler, was elected after his death by the title of Henry I. Conrad was never crowned emperor or king of Italy, the Italians having chosen a separate king, Berengarius, marquis of Friuli.

CONRAD II., called the Salic, duke of Franconia, was elected king of Germany after the death of Henry II., A.D. 1024. He annexed the vast dominions of Burgundy to the German confederation, forced the king of Poland to do homage for Silesia, and ceded the duchy of Schleswig to Canute, king of Denmark, as a fief, on the same condition. The great feudal nobles of Italy were at variance among themselves and with the towns. They had acknowledged the princes of the House of Saxony for their kings, and Conrad their successor crossed the Alps to enforce a like submission. He was crowned king of Italy at Monza by Heribert, archbishop of Milan, in 1026, after which he convoked a general diet of Lombardy in the plain of Roncaglia, near the Po, not far from Piacenza. In this diet he regulated the feudal legislation of Italy, the jurisdiction of the great feudatories, the successions, &c. He then proceeded to Rome, where he was crowned by Pope John XIX. as emperor and king of the Romans, with the titles of Cæsar and Augustus, A.D. 1027. Gisela, Conrad's wife, was crowned empress at the same time. Two kings, Rudolf III. of Burgundy and Canute of Denmark, were present at the ceremony. On Conrad's return to Germany, he was obliged to repress the insubordination of the great vassals.

Rudolf of Burgundy having died in 1033, the crown of that kingdom devolved upon Henry, Conrad's son, and Rudolf's nephew by his mother; but it was not without a war that Conrad secured his son's inheritance. About 1035 there was a general rising in Lombardy of the vassals, or sub-feudatories, against the great lords, secular and clerical, and especially against the archbishop of Milan. A battle was fought between Milan and Lodi, in which the archbishop was defeated, and the bishop of Asti was killed. In 1036 Conrad came down into Italy with an army to quell the disturbances; he deposed Heribert and imprisoned him, but the people of Milan rose in favour of their archbishop, and resisted all the forces of the emperor. During the two years that Conrad passed in Italy he visited Rome and Monte Casino, deposed Pandolfo, prince of Capua, and gave the principality to his brother. A pestilence having spread among the imperial troops in 1038, Conrad returned into Germany, and in the following year died at Utrecht. He was succeeded by his son, Henry III.

CONRAD III., of the House of Hohenstauffen, Duke of Franconia, and nephew of Henry V., was elected king of Germany in 1138, after the death of Lotharius II., who had succeeded Henry. Conrad had already been proclaimed king of Italy during the life of his uncle. Henry the Proud, of the House of Welf, Duke of Saxony and of Bavaria, who had married Lotharius's daughter, and whose sway extended from the Baltic to the Alps, had also pretensions to the imperial crown. Conrad, assembling a diet at Würzburg, stripped Henry both of Bavaria, which he bestowed on Leopold V., margrave of Austria, and of Saxony, which he bestowed on Albert the Boar, who was descended from the antient dukes of that province. A civil war was the result: Henry the Proud preserved Saxony, but dying in the midst of the war, his rights descended to his infant son Henry, afterwards styled the Lion. Welf, brother of Henry the Proud, expelled Leopold from Bavaria. A battle was fought at Winsberg in Suabia, between Welf and Conrad, which was lost by the former, and is memorable as having given rise to the distinctive names of Guelphs and Guibelines, which became the rallying words of two opposite parties that desolated Germany and Italy for centuries. At the battle of Winsberg, the war cry of the Saxons and Bavarians was that of their leader 'Welf;' and that of the imperial troops was 'Waiblingen,' a town of Würtemberg, the patrimonial seat of the Hohenstauffen family. The two names were originally applied to the respective adherents of the Saxon duke and of the emperor; but that of Welf soon became extended to all the rebels or disaffected to the imperial authority. The Italians, adopting the distinction long after, named Guelphs all the opponents, and Guibelines the supporters, of the imperial authority in Italy. Owing to the constant jealousy between the church and the empire, the popes and their adherents were generally found on the side of the Guelphs. For the moment however peace was made in Germany: Henry the Lion was acknowledged Duke of Saxony, and gave up Bavaria to the margrave of Austria. Albert the Boar was indemnified for the loss of Saxony by the erection of Brandenburg into an independent margravate, which his own successes over the Sclavonic tribes bordering on the Baltic soon raised to an equal rank with Saxony, Bavaria, Suabia, and the other great provinces of the empire. Having thus given peace to Germany, Conrad was induced by the preaching of St. Bernard to assume the cross. He set out with a numerous host for the East, by the way of Constantinople. In conjunction with Louis VII. of France, he penetrated into Syria, and besieged Damascus and Ascalon, but without success. Conrad having lost most of his followers, returned disappointed to Germany, which he found again distracted by the intrigues of Welf. He defeated Welf, and died in 1152, as he was preparing to set out for Italy to receive the imperial crown from the hands of the pope. He was succeeded by his nephew, Frederic of Hohenstauffen, Duke of Suabia, surnamed by the Italians 'Barbarossa.'

CONRAD IV., son of Frederic II. emperor of Germany, and king of Italy and of Sicily, was elected king of the Romans in his father's life time; but at the death of Frederic, A.D. 1250, he found a competitor for the crown of Germany in the person of William of Holland, who was supported by all the influence of Innocent IV. The pope excommunicated Conrad, as the son of the excommunicated Frederic, and released all his subjects of Germany and Italy from their allegiance. This was an epoch of the greatest animosity in Italy between the Guelphs and the Guibelines. The popes were bent on the destruction of the house of Hohenstauffen, the great leaders of the Guibelines, and who had stoutly resisted the universal temporal sovereignty which was assumed by the see of Rome. Naples, Capua, and other towns of Apulia and Sicily, revolted against Conrad, but Manfred, the natural son of Frederic, who had been left regent of the kingdom in the absence of his brother, brought back most of them to their allegiance, and laid siege to Naples.

In 1251 Conrad, on arriving in Italy, was well received by the Guibeline party, which was strong in Lombardy, especially at Verona, Pavia, Cremona, Piacenza, Tortona, Pistoia, and Pisa. In 1252 Conrad passed into Apulia, and on receiving the oath of allegiance from many of the barons, he asked the pope for the investiture of the kingdom of Sicily and Apulia; but the pope maintained that all Conrad's rights were forfeited through the rebellion of his father against the authority of the church. Conrad, strengthening his army with the Saracen colonists who had been removed from Sicily by his father and settled in Apulia, at Lucera, and in the neighbourhood, took Naples after an obstinate defence, and razed the walls of that town. Meantime the pope was offering the crown of Sicily, first to Richard of Cornwall, afterwards to Edmund III., son of Henry Crookback, of England, and, lastly, to Charles count of Anjou, who accepted it. In 1254, while Conrad was preparing to return to Germany to oppose William of Holland, he was taken ill at Lavello, in Apulia, and died soon after. The Guelphs spread a report that Manfred had poisoned him in order to possess himself of the crown of Sicily and Apulia, as they had already accused him of having hastened the death of his father Frederic; but these reports are deserving of little notice. [MANFRED.] Conrad left one only son, called also Conrad, who, on account of his tender age, was styled by the Italians Conradino, or little Conrad. Berthold of Hohenburg was left tutor of the young prince, who was brought up in Germany, and Manfred remained regent of the kingdom of Sicily and Apulia in the name of his nephew. For the Guibeline version of all those transactions, see Raumer's *Geschichte der Hohenstauffen*, and for the Guelph part, the numerous Italian writers, and Sismondi's *Histoire des Républiques Italiennes*.

CONRADIN, CONRADI'NO, son of Conrad IV. and of Elizabeth of Bavaria, was an infant when his father died in 1254. He was acknowledged as duke of Suabia, but his father's splendid inheritance of Sicily and Apulia passed into the hands first of Manfred and afterwards of Charles of Anjou, by the battle of La Grandella, A.D. 1265, in which Manfred was killed.

In the autumn of 1267 Conradin, when only 16 years of age, set out for Italy at the head of a few thousand men. At Verona he was well received by the great Guibeline leaders of N. Italy. He entered Rome without opposition, the pope being then at Viterbo, and thence took the road of the Abruzzi. He met his opponent, Charles, at Tagliacozzo, near the lake of Celano, on the 23rd of August, 1268. The battle was long contested; the Germans had at first the advantage, and, elated with success, were pursuing the French, when Charles, who had been lying in wait, came up with his reserve and completely routed them. Conradin escaped from the field of battle with his cousin Frederic Duke of Austria and others, and descending from the mountains reached the village of Astura, on the sea coast near the Pomptine marshes, expecting to find some means of reaching the fleet of his allies the Pisans, which was in the neighbourhood. But John Frangipani, Lord of Astura, seized upon him and delivered him up to Charles for a sum of money. He was taken to Naples, tried, and, notwithstanding the protest of a celebrated jurist, Guido da Luzzano, and others, he was condemned and beheaded in the market-place on the 29th October, 1268, together with Frederic of Austria and several of their followers. The story of the glove, said to have been thrown down by Conradin from the scaffold, to be delivered to Peter of Arragon, the husband of Constance, daughter of Manfred, does not seem sufficiently authenticated. A chapel was raised on the place of the execution. The chapel no longer exists; but in the vestry of the new church of Santa Croce al Mercato, built opposite to it, is a small column of porphyry, which once stood on the very spot of the scaffold, with a Latin distich commemorative of the event. (Valéry, *Voyages en Italie.*) Conradin's mother hastened from Germany to ransom her son. Coming too late, she used the money in founding the great convent Del Carmine, where the remains of Conradin and Frederic of Austria were deposited behind the great altar.

CONSALVI, E'RCOLE, CARDINAL, born at Rome in June, 1757, studied for the church, but applied himself likewise to belles lettres, music, and the arts. He became a monsignore, or prelate attached to the papal court, and was made, by Pius VI., Uditor di Ruota, or member of the highest civil court of the Roman State. When Cardinal Chiaramonti became pope he made Consalvi, whom he knew and appreciated, a cardinal deacon, with the title of Santa Maria ad Martyres, in August 1800, and appointed him at the same time his secretary of state or first minister.

In 1801 Consalvi repaired to Paris, and concluded the concordat with the first consul, Bonaparte. His pleasing manners and liberal opinions procured him marked attention during his stay in the French capital. In 1806, when Bonaparte began to quarrel with the pope, he insisted upon Consalvi being removed from his office, under the pretence that he was ill affected towards him, which meant in reality that he defended the interests and rights of his own sovereign. Consalvi himself urged the pope to accept his resignation for the sake of peace. Pius at last unwillingly received it, and appointed Cardinal Casoni his successor. Consalvi remained at Rome during the following years until the abdication of the pope in 1809. After that event he was exiled from Rome with the other cardinals, but some time afterwards he was allowed to join the Pope at Fontainebleau. On the release of the pope, and his return to Rome in 1814, Cardinal Consalvi was reinstated in his office of secretary of state, and continued the presiding minister of the court of Rome till the death of Pius, 20th August, 1823. Consalvi did not long survive his master and friend, to whom he had been faithfully attached through all the vicissitudes of a long and stormy pontificate, and between whom and him there was a sympathy of mind and a mutual confidence. [PIUS VII.] Cardinal Consalvi died at Rome in 1824. He was buried in the church of S. Marcello, where a monument was raised to him by the sculptor Rinaldi. An excellent full-length likeness of him by Sir Thomas Lawrence is in the king's collection of paintings.

Consalvi's administration of the papal state forms an epoch in the history of modern Rome. He abolished numerous abuses and old customs which were no longer in accordance with the state of society. He was favourable to rational change. By the Motu Proprio of 1816 all feudal taxes, monopolies, and exclusive rights were suppressed. Torture, and the punishment of the corda or estrapade, the use of which had long disgraced the most frequented street of Rome, were likewise abolished, as well as the punishment of death for the indefinite and undefinable offence of heresy. A new civil code, a commercial code, and a penal code were ordered to be framed. The maintenance of the registry of mortgages, introduced by the French, a better system of police, having in its service a respectable body of carabineers or gendarmes, instead of the old worthless sbirri, and the establishment of workhouses for the poor in the principal towns; all these are the results of Consalvi's administration. He also took strong measures to extirpate the banditti from the Campagna, and in one instance, July, 1819, he ordered the town of Sonnino, one of their notorious haunts, to be razed to the ground. New concordats were entered into with France, Naples, Bavaria, and other German states. (*Compendio Istorico sù Pio VII.*, Milano, 1824; *Biografia degl' Italiani viventi*, art. 'Consalvi;' and Tournon, *Etudes Statistiques sur Rome.*)

CONSANGUINITY, or KINDRED, in law, is the relation subsisting between persons who are of the same blood, or, in other terms, who are descended from the same stock or common ancestor. Consanguinity, in this sense, is either *lineal* or *collateral*. The former subsists between persons who are related to each other in the direct ascending line, as from son to father, grandfather, great grandfather, &c.; or in the descending line from great grandfather to grandfather, father, and son. Collateral kindred are those who, though they have the same blood, derived from a common ancestor, and are therefore *consanguinei*, do not descend one from the other. Thus brothers have the same blood and are descended from a common ancestor, but they are related to each other collaterally, and the children and descendants of each of them are all collateral kinsmen to each other. The Canon Law and the Civil Law have adopted different methods of computing the degrees of collateral consanguinity According to the former, which has been followed by the law of England, we begin at the common ancestor and reckon downwards to the persons whose degree of consanguinity we desire to ascertain, counting each generation as a degree; and the degree of consanguinity in which they stand to each other is the degree in which both of them, or the more remote of them, stands to the common ancestor. Thus (to use the example given by Sir William Blackstone), Titius and his brother are related in the first degree; for from the father to each of them is counted only one; but Titius and his nephew are related in the second degree, for the nephew is two degrees removed from the common ancestor; viz., his own grandfather, the father of Titius. On the other hand, in this supposed case, the civilians would place Titius and his nephew in the third degree of consanguinity, for they count all the degrees from one given person upwards to the common ancestor, and downwards from that common ancestor, whose degree of relationship to the first person it is the object to establish. Thus they would count from Titius's nephew to his grandfather two degrees, and one more from the grandfather to Titius. By the law of England, all persons related to each other by consanguinity or affinity, nearer than the fourth degree of the civil law, are prohibited from marrying, excepting in the ascending or descending line (in which the case is hardly possible by the course of nature); and by stat. 5 and 6 William IV., c. 54, sec. 2, it is enacted, 'that all marriages celebrated after the date of that Act between persons within the prohibited degrees of affinity or consanguinity, shall be absolutely null and void to all intents and purposes whatsoever.' Under the statute of distributions, 22 and 23 Car. II., c. 10, in making the distribution of an intestate's personal estate among the next of kin, the computation of degrees of kindred is according to the Civil Law. (*Novell.*, 118, and INTESTACY; Blackstone's *Essay on Collateral Consanguinity*, and Blackstone's *Commentaries*, vol. ii., p. 202.)

The question of consanguinity is the question of relation between two given persons, as explained above. If one of these persons is called $\boxed{A}$, all his lineal ancestors will be found in (*a*) in the ascending line above him, and all his lineal descendants in the descending line below him. His collateral relations will be found in the parallel lines (*b*), (*c*), (*d*), &c. The Roman numerals denote the respective degrees of consanguinity in the Canon, and the Arabic those in the Civil Law. Thus, III. in the ascending line is A's great grandfather, and III. in the descending line his great grandson. In the ascending and descending lines the computation of the civil and canon laws, as already explained, is the same: in both laws the great grandfather and great grandson are respectively in the third degree from A. No. III. in line (*b*) is A's great uncle, who, according to the mode of reckoning already explained, is in the third degree of consanguinity to A by the canon law; and in the fourth, as denoted by the Arabic numeral 4, placed under III., by the civil or Roman law.

The following are the names for consanguinity in the Roman law. In line (*a*) ascending from A: 1, pater, mater; 2, avus, avia; 3, proavus, proavia; 4, abavus, abavia; 5, atavus, atavia; 6, tritavus, tritavia: all above 6 are included in the general name 'majores.' In line (*a*) descending from A:—1, filius, filia; 2, nepos, neptis; 3, pronepos, proneptis; 4, abnepos, abneptis; 5, atnepos, atneptis; 6, trinepos, trineptis: all below 6 are included in the general name of 'posteri' or 'posteriores.'

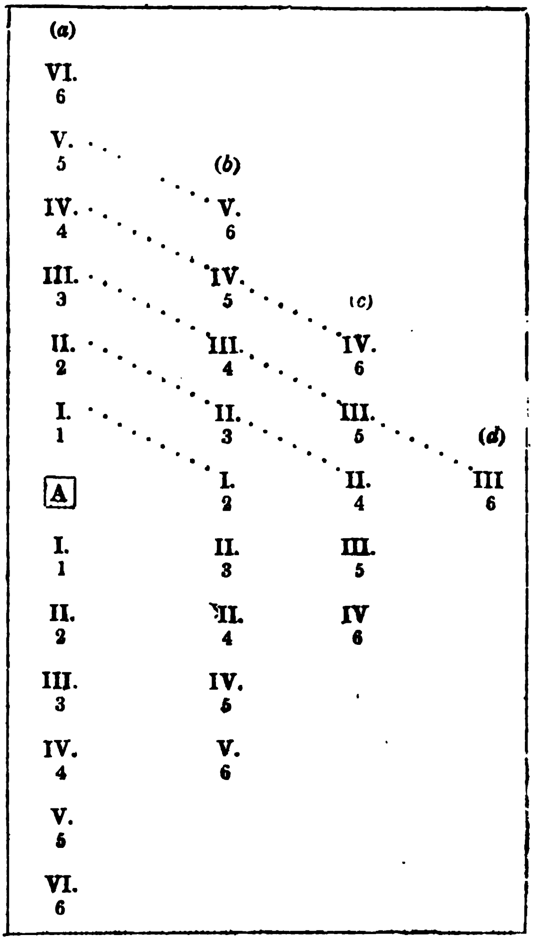
In line (*b*), beginning with 2 and ascending:—2, frater, soror; 3, patruus, amita (uncle and aunt on the father's side); avunculus, matertera (do. on the mother's); 4, patruus magnus, amita magna, avunculus magnus, matertera magna; 5, propatruus, proamita, proavunculus, promatertera; 6, abpatruus, abamita, abavunculus, abmatertera.

In line (*b*), beginning with 3 and descending, the names are, 3, fratris, sororis, filius et filia, and so on.

In (*c*), beginning with 4 and ascending:—4, consobrinus, consobrina, which are the general terms, but properly signify those born of two sisters (quasi consororini); sons born of two brothers are properly called fratres patrueles· daughters, sorores patrueles. 5, propior or prior sobrino, propior sobrina, the sons and daughters of the patruus magnus, amita magna, &c. (See Tacit. *Annal.*, xii., 64.)

Some of the Latin writers used 'nepos' to express a brother's or sister's son.

It is unnecessary to go farther. (*Institut.* iii. tit. 6, *De Grad. Cognationum.*)



CONSCRIPTION is the name given to the mode of recruiting the French army. Under the old monarchy the army was recruited chiefly by voluntary enlistment, and the soldiers were taken mostly from the peasantry, by whom the change from the condition of a daily labourer to that o a soldier was considered as an improvement. The officers were appointed from among the higher or educated classes. When the revolution commenced, the old army was broken up, the whole nation was called to arms, and volunteers were found in abundance. But as the soldiers were bound by no permanent obligation, a system of requisition was enforced, by which every district was bound to furnish a certain number of men for the regular army. But even this proved insufficient, and the Executive Directory found itself in want of soldiers to supply the numerous armies on the frontiers. In 1798 General Jourdan presented to the Council of Five Hundred a project of a law for a new mode of recruiting, under the name of conscription. This project was approved by the legislature, and passed into a law 5th of September, 1798. After setting down as a principle that every Frenchman is bound to defend his country when in danger, the law went on to say, that independently of danger to the country, every Frenchman from the age of twenty to twenty-five is liable to be called out to serve in the regular army. Every year lists were made in every department of the young men of the age above stated, divided into five classes, the first being those between twenty and twenty-one years; the second from twenty-one to twenty-two; and so forth. The number of men required for that year being made known by the Government, and voted by the legislature, a distribution was made among the departments and districts of the quota which each was to furnish. The number required was then taken by lot from the first or junior class, and when that was exhausted, from the second, and so on. This operation was repeated every year. The first levy by conscription in 1799 was 200,000 men. Bonaparte, when First Consul, found the system already established, and he applied himself strenuously to render it more effective, and carry it to the utmost extent. At the beginning of 1802 a levy was made of 120,000 conscripts, 60,000 of whom were to fill up vacancies in the army on the peace establishment, and the other 60,000 to form a reserve in case of war. In April, 1803, 120,000 more conscripts were levied out of the conscription lists for the years XI. and XII. In October of the same year, 60,000 more were levied out of the lists of the year XIII. By an arrêté 19 Vendemiaire, year xii. (12 October, 1803), severe penalties were enacted against refractory conscripts, that is, those who had not joined their regiments. Eleven depôts in various citadels were marked out for them, where they were to be kept under arrest, and work at the fortifications. They were also condemned to a fine, payable by their relations. In January, 1804, 60,000 men of the list of the year XIV. were levied. On this occasion, Bonaparte said to the Council of State that the law of the conscription was the dread and desolation of families, but that it formed the security of the state. (Thibaudeau, tome v. p. 319.) In 1805, just before the war of Austerlitz, a Senatus Consultum ordered a levy of 80,000 men. Till then the levies had been voted by the legislative body, but henceforth a Senatus Consultum was deemed sufficient.

In December, 1806, a levy was ordered of 80,000 men; in 1808, 80,000, besides 80,000 more of the conscription lists of 1810, to be called out in 1809. This was on account of the Spanish war, which the senate said was 'politic, just, and necessary.' Instead of men of twenty years complete, according to the original law, the young men now taken were not nineteen. In 1809, a new Senatus Consultum 18th April, ordered a levy of 40,000; and on the 5th October, another of 36,000. In 1810 there was a levy of 120,000 of the lists of 1811, besides 40,000 conscripts of the maritime departments for the service of the navy. In 1811 the levy was 120,000 conscripts, besides those levied in Tuscany, the Roman states, Holland, and the Hanseatic towns recently annexed to the empire. As the levies increased, the repugnance of young men to the service became greater, and the severity of the government against refractory conscripts increased in proportion. A reward of twenty-five francs was given for seizing one. When there was a considerable number of refractory conscripts in a department, a moveable column was formed to hunt after them, and the soldiers were quartered in the houses of the relations of the fugitives, who were obliged to board them.

The disasters of the Russian campaign occasioned new expedients for raising men besides the regular conscription. Half a million of men was voted by the senate towards the end of 1812, consisting of 150,000 conscripts of 1813, 150,000 of 1814, 100,000 out of the lists of 1809, 1810, 1811, and 1812, who had not been included in the former levies, and 100,000 men of the first ban of the National Guard, who were formed into regiments of the line.

In November, 1813, another Senatus Consultum placed at the disposal of the emperor 350,000 more conscripts of the lists of 1813-14, who had not been included in the previous levies; and by a decree, 17th December of the same year, 180,000 men, taken chiefly from the National Guards, were ordered for the defence of the towns, as the allies threatened the French territory. And yet, notwithstanding these enormous calls, Napoleon, in 1814, had hardly 150,000 regular troops to oppose to the allies.

Besides the above conscriptions of the French empire, the kingdom of Italy furnished the following numbers:—in 1805, 6000; January, 1807, 9000; October, 1807, 10,000; 1808, 12,000; 1810, 11,000; January, 1811, 15,000; November, 1811, 15,000; 1812, 15,000; February, 1813, 15,000; October, 1813, 15,000.

Few soldiers, unless disabled by infirmities or wounds, ever got their discharge under Napoleon. The time of service was unlimited. By the present law of France, the harshness of the conscription, the principle of which, though not the name, is retained, has been greatly mitigated, and the soldier is entitled to his discharge after five years' service. Greater facility is allowed for procuring substitutes, which Napoleon admitted in principle, and even defended in the Council of State, as necessary 'in the present state of society, which was very different from that of Sparta or Rome;' but he afterwards surrounded it with so many difficulties, that substitutes became extremely scarce and expensive. Exemptions are also granted to the single sons of poor parents, and upon other humane considerations, as well as in cases of delicate health of young men applying to the learned professions, &c.; all which considerations were entirely overlooked in the sweeping conscriptions of the empire. A system somewhat similar to the conscription exists in Prussia and other German states. [PRUSSIA.]

CONSECRATION (consecratio), the act of sanctifying or making holy, consists in the solemn appropriation or dedication of anything to the service of the Deity. In modern times the consecration of men is usually called *ordination*, except in the case of kings and bishops, when the performance of the rites of sanctification is still named consecration. When applied to temples, churches, and altars, it is generally termed *dedication*. It is sufficient to advert to the religious antiquities of India, Egypt, Judæa, Chaldæa, Greece, Rome, and of the Celtic Druids in Britain and Europe in general, to show the antiquity of consecration. At the commencement of the Mosaic dispensation all the first-born of man and beast were consecrated to the Lord. (*Exodus* xiii., 2, 12, 15.) Subsequently the whole tribe of Levi was thus consecrated instead of the first-born (*Numbers* iii., 12, 45; viii., 16, 18); and Aaron and his sons, who were Levites, were more especially consecrated to the priest's office. (*Exodus* xl., 13.) The dedication or consecration of the tabernacle and altar is described in the book of *Numbers* ch. vii. Of the dedication of the first or Solomon's Temple, a description is given in 1 *Kings* viii., 5; and of the second temple in *Ezra* vi., 16. Under the Jewish theocracy not only men and beasts were consecrated to the Lord, but houses, fields, and the walls of Jerusalem (*Leviticus* xxvii.; *Nehemiah* xii., 27.) At the commencement of the fourth century, when Christianity, under Constantine, became the established religion of the Roman state, and Christian temples began to vie in magnificence with those of the Pagan deities, they were consecrated with great pomp; for instance, the church of Jerusalem, built by Constantine over the supposed site of the Holy Sepulchre, when the ceremony was performed by a full synod of all the bishops of the east. (Euseb. *Ecc. Hist.*, l. 10, c. 45. Gratian, *Concordantia Discordantium*, part 3.)

The following are the principal parts of the rite of consecrating a church according to the Roman Catholic pontifical. Previous to the ceremony three crosses are painted on each wall of the church, and over each cross is placed a lighted candle. The bishop, in his pontifical vestments, proceeds to the church door, attended by his clergy reciting the seven penitential psalms; and after a solemn procession round the external walls, which are copiously sprinkled, in the name of the Trinity, with a kind of brush dipped in consecrated water, the bishop knocks loudly at the door with his pastoral staff, repeating from the 23rd Psalm, 'Attollite portas, et introibit Rex Gloriæ;' to which a deacon, who is within the church, replies, 'Quis est iste Rex Gloriæ?' The bishop responds, 'Dominus fortis et potens, Dominus potens in prælio,' &c.; then signing the door with the figure of the cross, he exclaims, 'Ecce crucis signum! fugiant phantasmata cuncta.' On the admission of the bishop and clergy the *Veni Creator* is chanted, and ashes are strewn on the floor in the form of a cross, in which the bishop, with his staff, traces some alphabetical characters. After several prayers the altar is consecrated by sprinkling it with a mixture of water, wine, salt, and ashes, in the name of Jesus Christ; the solemnity closes by depositing in the altar a vessel containing relics and incense, with a parchment inscribed with the name of the bishop and the date of the consecration. The church, on this occasion, is richly decorated, and the altar is illumined with a profusion of large tapers. (Broughton's *Hist. Dic.*, vol. i., p. 311.) Churches are not recognised as such by the law of England until they are consecrated by a bishop. The form used by the Church of England is given at length in Bishop Gibson's 'Codex juris Ecclesiastici Anglicani,' pp. 1459-1463: see also Bishop Wilkins's 'Concilia Magnæ Britanniæ,' vol. iv. p. 668, and Burn's 'Eccles. Law, Churches,' sec. 2. The present form has been used since 1712; and in 1799 it was adopted, with some slight modification, by the episcopal church in America. One of the principal charges on which Archbishop Laud was arraigned before the Commons was, that he endeavoured to revive the Roman Catholic ceremonies in the consecration of churches and altars, with all their costly furniture. Still the Protestant form of consecration, as well as the Catholic, is an imposing ceremony; and the 21 stat. Henry VIII., c. 13, states as the reason for allowing a bishop six chaplains, that this number is requisite for the consecrating of churches. The village feasts which are still celebrated in many parts of England commence on the anniversary day of the consecration of the parish church, and are said to have been substituted by Pope Gregory the Great for similar festivities appertaining to the Druidical religion. (Bingham, b. 8, c. 9). Consecration is generally understood to change not the nature of the thing consecrated, but merely the *use* of it; and in this opinion the Catholics appear to acquiesce, with regard to numerous objects which they usually consecrate; as church bells, candles, water, oil, crosses, pictures, &c. But with respect to the consecration of the eucharistic bread and wine, they maintain that a complete change is effected in the thing consecrated,—the body and the blood of Jesus Christ, by the change of the bread into his body, and of the wine into his blood, being believed to be really present by virtue of the words of consecration. This is what is termed transubstantiation. (Brunet, *Parallèle des Religions*, 4to., 1792, tome iii., p. 310; *Exposition de la doctrine de l'Eglise Catholique, par* Bossuet.)

The consecration of animals was very common in antient Egypt, where birds, beasts, and reptiles were privileged, as in modern India, to live unmolested, and even to receive adoration. Athenæus and Ælian speak of sacred fishes, adorned with necklaces; so the sacred crocodile in Egypt was decorated with ear-rings. (Herodotus, ii. 69.) Consecration is a name given to the apotheosis of the Roman emperors, and coins and medals commemorating these events have the inscription CONSECRATIO. See an account of these funeral honors in the article APOTHEOSIS, and the medal with the legend CONSECRATIO in the article AURELIUS.

CONSERVATOR OF THE STAPLE, in the law of Scotland, an officer in the nature of a foreign consul, resident at Campvere, in the Netherlands. By the Act 1503, c. 81, passed, as the preamble states, for the welfare of merchandize, and to provide remedy for the exorbitant expense of pleas in foreign courts, the conservator of Scotland was vested with a jurisdiction to do justice between merchant and merchant in the parts beyond sea, such merchants being the king's lieges, and the conservator exercising his jurisdiction by advice of at the least four merchants, his assessors; and it was further provided by the Act, that no Scotch merchant sue another before any other judge beyond sea, nor do in the contrary of the statute, under the penalty set down therein. By subsequent Acts he was empowered to put the usury laws and other like laws in execution among the same merchants; so that the conservator might be regarded as a commercial judge, with a civil and criminal jurisdiction over native Scotsmen beyond the realm.

From the chapter immediately following that first above cited, wherein the conservator is required to come yearly home, or send a procurator for him, to answer all matters laid to his charge, we might suppose that appeal lay from him only to the king and council. But since the erection of the Court of Session, in 1532, he has been regarded as an inferior judge, and his court as an inferior court, which it is accordingly considered by Erskine in his 'Institutes,' b. i., tit. 4, sec. 32. In the case of Hoy *v.* Tenant, June 27, 1760, the Court of Session went still farther, and held itself as the *forum originis* of all Scotsmen, to have a cumulative jurisdiction with the conservator.

CONSERVATORS OF THE PEACE, before the comparatively modern institution of justices of the peace, were officers who by the common law of England were appointed for the preservation of the public peace. These conservators, whose powers were far inferior to those of modern justices of the peace, consisting almost entirely of the authority to take sureties for the peace and for good behaviour, were of several kinds. In the first place, certain high functionaries were general conservators by virtue of their offices. Thus the king, the lord chancellor or lord keeper, the judges of the court of King's Bench, and the master of the rolls, were intrusted by the common law with the general conservancy of the peace throughout the realm, as incidental to their several offices. Other officers again were conservators only in special places; thus the judges of the common pleas and barons of the exchequer were conservators of the peace only within the precincts of their several courts. In like manner, judges of assize and gaol-delivery within the places limited by their commissions; coroners and sheriffs within their several counties; the steward of the Marshalsea within the verge of the king's household; and constables and tithingmen within their hundreds or tithings, were all conservators of the peace at common law; and all the officers above enumerated retain their authority at the present day. But besides these official conservators there were others who were expressly intrusted with the charge of the peace, either by prescription, election, or tenure. Thus it is said that the owner of a manor might have prescribed that he and his ancestors, whose estate he had, were entitled to be conservators of the peace within such manor. So also as sheriffs were formerly elected, and as coroners still are elected, by the freeholders of the county, certain persons were, before the reign of Edward III., elected conservators of the peace in different counties. There were also instances in which lands were granted by the king to hold of him by knight's service, and also by discharging the duties of conservation of the peace within the county where the lands lie. Besides these, there were conservators of the peace appointed by letters patent from the crown, in cases of emergency, to defend particular districts, where breaches of the peace were apprehended in consequence of foreign invasion or intestine tumult. All the different kinds of conservators of the peace above noticed, excepting those who have the duty cast upon them as incidental to other offices, were entirely superseded upon the establishment of the system of justices of the peace, in the early part of the reign of Edward III. [JUSTICES OF THE PEACE.] (See also full details upon this subject in Lambard's *Eirenarcha*, book i., cap. 3.)

CONSERVATORY. The names given to the garden buildings employed for preserving plants in an artificial climate, are applied with so little precision, that it is almost a matter of indifference which to select for the purpose of explaining the principles that ought to be observed in the construction and management of such houses. We shall therefore reserve for the article GREEN-HOUSE what we have to say upon that head, and briefly dismiss the others as their names occur. In illustration of this remark we may observe that the term conservatory, which, as its meaning shows, was originally intended for buildings in which plants were preserved during winter, has come to be used, firstly for glass-houses in which plants are cultivated by growing them in the open border, and subsequently for all such glazed buildings whatsoever. A conservatory, properly so called, is a brick building heated by artificial means, having its whole southern part closed by large glazed sashes, which may be opened or shut at pleasure. Its floor is generally of stone, and a part of it is occupied by a stage on which plants in pots can be placed. One of these buildings, but in a ruinous state, may be seen in the physic garden at Chelsea; others are not uncommon in gardens that were laid out forty or fifty years ago, but they are fast falling into neglect and disuse—in our opinion undeservedly. Such a conservatory was intended to preserve during the winter orange-trees, myrtles, American aloes and similar plants, which during the summer will flourish in the open air, but which require in winter to be protected against the inclemency, or, to speak more exactly, against the cold and wet of the English climate. Such plants are torpid during winter; their rest begins with that of our trees, and it is easy to prevent a renewal of their growth at too early a time; to preserve them against too much wet and from severe cold, especially in the spring, is all that is requisite for them, and these objects the old conservatory answered perfectly well. It had moreover the advantages of being spacious without being excessively costly; of being easily heated, and of requiring the smallest possible amount of labour for the plants preserved in it. Persons however, gradually forgetting the original object of a conservatory, added to it numerous species requiring a very different treatment in winter from those it was contrived for; and what was far worse, they attempted by humidity and high temperature to keep the plants in a growing state all the winter. The necessary consequence of this was, that those plants which formerly succeeded in the conservatory became unhealthy, the new comers disappointed the expectations of their cultivators, and the building itself fell into discredit. The reason of this is sufficiently obvious. Plants when in a growing state require an abundant supply of light: a conservatory is particularly ill calculated, on account of its solid roof and sides, for the admission of light, and consequently a conservatory is not suitable for plants in a growing state; but plants when torpid, as in their winter season, require a very moderate supply of light, and this a conservatory is sufficiently calculated to admit.

A house of this kind is best suited for gardens of considerable extent, where a large number of plants is required during the summer for the ornament of the flower garden and shrubbery. Under such circumstances we strongly recommend the erection of conservatories as the cheapest, the most efficient, and the most ornamental mode of preserving in a healthy state during winter not only oranges, myrtles, and similar plants, but in general all the species which are natives of countries that, without experiencing severe frost, are cold enough during winter to suspend the vital energies of vegetation. It will be perfectly within the gardener's power to keep the earth in which conservatory plants grow sufficiently damp during winter to enable them to accumulate by the return of spring an abundant supply of new sap; and this is all that he need be particularly reminded of, if he understands his business scientifically; if he does not, advice to him would be only a waste of words. [Green-House.]

CONSISTORY is the court christian, or spiritual court, formerly held in the nave of the cathedral church, or in some chapel aisle or portico belonging to it, in which the bishop presided, and had some of his clergy for assessors and assistants. But this court is now held by the bishop's chancellor or commissary, and by archdeacons or their officials, either in the cathedral church or other convenient place in the diocese, for the hearing and determining of matters of ecclesiastical cognizance happening within that diocese. (Burn's *Ecclesiastical Law*, tit. *Consistory*.)

By stat. 24 Henry VIII., c. 12, an appeal lies from this court to the court of the archbishop of the province.

CONSOLS, a term familiarly used to denote a considerable portion of the public debt of this kingdom, more correctly known as the three per cent. consolidated annuities. This portion of the debt originated under an Act 25 Geo. II., whereby various perpetual and lottery annuities then outstanding, and which from the time of their creation had respectively borne an interest of 3 per cent., were brought under one head in the public accounts. Various additions have from time to time been made to the amount of these annuities; and, on the other hand, some diminution has been effected by the operation of the sinking-fund and the application of surplus revenue. The capital outstanding and unredeemed under this head, on the 5th of January, 1836, amounted to 356,768,258*l.* 4*s.* 6*d.*, and the annual interest or annuity to 10,703,047*l.* 14*s.* 11*d.*

CONSONANCE, in Music, a term which has, we think, often been explained with too strict a regard to its etymological meaning. That it signifies *one sound heard with another* is undeniable, but the two sounds must, in our opinion, be concords. [Concord.] *Consonance* and *dissonance* are words which, in music, ought to be considered as synonyms of *concord* and *discord*.

CONSONANT. [Alphabet, p. 379.]

CONSPIRACY. Every conspiracy to do an unlawful act which is injurious to individuals or to the public, is a misdemeanor at the common law of England. Many frauds affecting individuals, which cannot be made the subject of prosecution as such, become indictable when they are effected by the co-operation of several confederates. Thus where several persons agree by indirect means to impoverish a third person, as by circulating calumnies injurious to his character or credit, the offence is punishable as a conspiracy, though the concerted acts alone, when committed by individuals, could only have formed the subject of a civil action by the injured party. Another instance of this is, the case of a conspiracy among journeymen or servants to raise the price of wages, by refusing to work under a certain price. Any individual may fix what price he pleases upon his labour, and may lawfully refuse to work under that price; but if he conspires with others to do the same thing, he may be indicted for a conspiracy at common law. In former times, persons convicted of conspiracy at the suit of the king (the nature of which offence is very doubtful), were liable to receive what was called *villanous* judgment, by which they were rendered incapable of acting as jurors or witnesses, their lands and goods were forfeited for life, and their bodies committed to prison. This judgment was never however inflicted upon persons convicted of conspiracies of a less aggravated kind at the suit of the party; and in modern times, the villanous judgment having become obsolete by long disuse, the punishment of conspiracy has been by fine, imprisonment, and sureties for good behaviour, at the discretion of the court. (Russell on *Crimes and Misdemeanors*, vol. ii.)

CONSTABLE. This word is supposed by Ducange, Spelman, Cowell, and other legal etymologists, to be corrupted from *comes stabuli*, which was another name for the *tribunus stabuli* or *prepositus equorum*, a kind of master of the horse, frequently mentioned as an officer of state in the middle ages. (See Ducange's *Glossary*, ad vocem *Comes Stabuli*.) Sir Edward Coke, Selden, and several other writers, insist upon another etymology—from two Saxon words, *koning*, a king, and *stapel* or *stabel*, a stay or support—*quasi columen regis*. Both these derivations are equally remote from the description of the office of our modern constable; but the former appears to be far the more probable; and, in accordance with it, the Constable of France was an important officer of the highest rank in that country, who had the chief command of the army, and had judicial cognizance of military offences; and whose duty it was to regulate all matters of chivalry, such as tilts, tournaments, and feats of arms. This office was suppressed in France by an edict in the year 1607; it was revived by Napoleon, and constituted one of the six grand dignities under the French empire; and was finally abolished upon the restoration of the Bourbon dynasty in 1814.

Immediately after the Norman conquest, we find in England an officer of the crown called the Lord High Constable, whose duties, powers, and jurisdiction were in most respects strictly analogous to those of the Constable of France. The office was one of great dignity and power, both in war and peace, the constable having the command of the army and the regulation of all military affairs. He was the supreme judge of the court of chivalry, in which character his encroachments upon other courts were so heavy a grievance in early times, that the stat. 13 Rich. II. c. 2 was passed to restrict his jurisdiction to 'contracts and deeds of arms and things which touch war, and which cannot be discussed or determined by the common law.' The office, for several centuries after the Conquest, passed by inheritance in the line of the Bohuns, Earls of Hereford and Essex, and afterwards in the line of their heirs-general, the Staffords, Dukes of Buckingham, in right of certain manors held by them by the feudal service of being constables of England. The fees of the office were extremely burdensome to the crown; and the possession by a subject of the hereditary right to command the militia of the realm, independently of any royal appointment, was an unusual and frequently a dangerous power; and on this account Henry VIII., in the early part of his reign (1514), consulted the judges respecting the means of abolishing the tenure. He was advised by them, that as the individuals holding the manors were only compellable to exercise the office *ad voluntatem regis*, he had the power of discharging the feudal service altogether; and acting upon this opinion, the king abolished the office, by disclaiming to have the services any longer executed. (See Dyer's *Reports*, p. 285 b.) The effect of this was, that Edward Stanley, the last duke of Buckingham in that line, the hereditary high constable of England at the time of this resolution, held the manors after this period discharged of the service of being constable. All doubt which might have been suggested respecting the legal extinction of the office by this means, was removed eight years afterwards by the attainder of the Duke of Buckingham for high treason, upon which even the manors in question were forfeited to the crown. Since that time, the office of high constable has never been granted to any subject, excepting *pro hâc vice*, upon great and solemn occasions, such as the king's coronation or trials of peers.

'Out of this high office,' says Lambard, in his 'Duties of Constables,' 'the lower constableship was first drawn and fetched, and is (as it were) a verie finger of that hand; for the statute of Winchester, which was made in the time of Edward I., and by which the lower constables of hundreds and franchises were first ordained, doth, amongst other things, appoint that, for the better keeping of the peace, two constables in every hundred and franchise should make the view of armour.' He then concludes, in justification of his etymology of the term, that 'the name of a constable in a hundred or franchise doth mean that he is an officer that supporteth the king's majesty in the maintenance of his peace.' This derivation of the office of a common constable seems very improbable, especially as it is the better opinion that these officers were known to the common law before the statute of Winchester. (See Hawkins's *Pleas of the Crown*, book ii. cap. 10.) An ancient judicial authority, chief justice Fineux, in the reign of Henry VII., gives a more reasonable account of the matter. He says that when the superintendence of the peace of a county was found too great a task for the sheriff, hundreds were formed, and a conservator of the peace under the sheriff appointed in each, who was called a constable. This was the high constable, or constable of the hundred. In process of time, as population increased and towns grew into existence, it was found expedient to make a further subdivision for the preservation of the peace; and accordingly, conservators were appointed for manors, vills, and tithings, who were then called petty constables. (See *Year Book*, 12 Henry VII. pl. 18.)

Following this account of their origin, which is confirmed by many of the minute incidents of the two offices, constables, in the usual acceptation of the term at the present day, are of two kinds; constables of hundreds, who are still called high constables, and constables of vills or tithings, who are called either petty constables or tithingmen. Both high and petty constables were formerly chosen by the jury at a court leet, and were sworn in and admitted there by the lord or his steward; but at the present day the high constables are usually chosen by the magistrates at the quarter-sessions. The petty constables are still often chosen by the homage at the court-leet; but by the stat. 13 and 14 Car. II. c. 12, s. 15, it is enacted, that if any constable shall die or go out of the parish, any two justices shall make and swear a new constable, until the lord of the manor shall hold a court, or until the next quarter-sessions, who shall approve of them or appoint others. By virtue of this statute, and by reason of the disuse of courts-leet in modern times, the duty of nominating and swearing the constables is now generally discharged by the justices of the peace.

By the Metropolitan Police Act, 10 Geo. IV. c. 44, the police force are appointed by direction of the Secretary of State, and sworn in as constables by the commissioners; and in boroughs affected by the provisions of the Municipal Reform Act (5 and 6 Will. IV. c. 76), constables are now appointed by the Watch Committee under the authority of the 76th section of that statute. The office of constable at common law is a yearly appointment; and if any officer has served longer than a year, the justices at quarter-sessions will, upon his application, discharge him, and appoint another officer in his stead.

Besides these general constables, two or more justices of the peace, upon information that disturbances exist or are apprehended, are authorized by the stat. 1 and 2 Will. IV. c. 41, to appoint special constables; and by the 83rd section of the Municipal Reform Act, magistrates in boroughs are authorized to swear in as many inhabitants as they think fit to act as special constables when called upon.

In general, all the permanent inhabitants within a district, borough, parish, or place, are liable to serve as constables; but they must be persons of good character and of competent ability; and the lord or steward of the manor at the leet, or the justices, may exercise a discretion as to the appointment of proper persons. It is obligatory upon a constable who has been legally appointed to serve the office, unless he can show some lawful exemption; and if he refuses to serve, he may be fined or punished by indictment. The following persons are exempt from serving the office; namely, members of the colleges of physicians and surgeons in London, apothecaries in London, or within seven miles thereof, who are free of the Apothecaries' Company, and also those in the country who have served seven years' apprenticeship (see stat. 6 and 7 Will. III. c. 4); practising barristers, attorneys, dissenting ministers following no trade or other employment for their livelihood except that of a schoolmaster, and publicans.

The Metropolitan Police Act and the Municipal Reform Act contain provisions that the constables to be appointed under those statutes respectively 'shall have all such powers and privileges, and be liable to all such duties and responsibilities as any constable has within his constablewick by virtue of the common law of this realm.' In consequence of these provisions, it becomes of great practical importance to ascertain with precision the common-law incidents of the office of constable.

1. By the common law, constables are said to have been conservators of the peace; and in consequence of this character probably every constable has undoubted authority to arrest all persons who commit an affray, assault, or breach of the peace *in his presence*, and keep them in safe custody until they can be brought before a magistrate. It is said also by antient authorities that by virtue of his power as a conservator of the peace, he may himself, on view of a breach of the peace, take surety of the peace by *bond*, though he cannot do so by recognizance, being incompetent to administer an oath. But as his duty is to preserve the peace, and not to punish for the breach of it, it is doubtful whether he can arrest by his own authority and without a warrant, upon the information or charge of a third person, for an affray committed in his absence. (See the case of 'Timothy *v* Simpson,' 1 Crompton, Meeson, and Roscoe's *Reports*, p. 760.) By sect. 9 of the Metropolis Police Act, and by sect. 79 of the Municipal Corporation Reform Act, constables appointed under those acts are expressly authorized, in charges of petty misdemeanor in the night time, to take bail by recognizance for the appearance of the offender before a magistrate within a limited time.

2. A constable having reasonable cause to suspect that a felony has been committed, may arrest and detain the supposed offender until he can be brought before a magistrate to have his conduct investigated; and he will be justified in so doing even though it should afterwards appear that in fact no felony was committed. In this case there is a distinction between the authority of a constable and that of a private person; the former may arrest if he can show a reasonable ground of suspicion that a felony has been committed; but a private person, in order to justify himself for causing the imprisonment of another, must prove, in addition to the reasonable suspicion of the individual, that a felony has actually been committed. A constable is bound to arrest any person whom he sees committing a felony, or any person whom another positively charges with having committed a felony; but generally speaking, he has no authority to arrest for a misdemeanour, either upon his own reasonable suspicion or the charge of another person, without a magistrate's warrant. With respect to the authority of a constable to arrest for felony or breach of the peace, Mr. Justice Buller is reported to have said, that 'if a peace-officer, of his own head, takes a person into custody on suspicion, he must prove that such a crime was committed; but if he receives a person into custody on a charge preferred by another of felony or breach of the peace, then he is to be considered as a mere conduit; and if no felony or breach of the peace was committed, the person who preferred the charge alone is answerable.' Lord Ellenborough, in the case of Hobbs *v*. Branscomb, (3 Campbell's *Reports*, 420,) said that 'this rule appeared to be reasonable.'

3. Constables were authorized by the common law to arrest such 'strange persons as do walk abroad in the night-season.' (See Lambard's *Constable*, p. 12.) This authority, which was perhaps sufficiently definite in times when the curfew was in practice and when watch and ward were kept, is at the present day of so vague a nature, that a

peace-officer could scarcely act under it without imminent danger of an action in every particular instance. It is however obviously essential to the efficiency of any system of police, that constables should be armed with some general authority of this nature, especially in towns. By the 7th section of the Metropolis Police Act, it is provided that 'any man belonging to the police force appointed under that act, may apprehend all loose, idle, and disorderly persons whom he shall find disturbing the public peace, or whom he shall have just cause to suspect of any evil designs, and all persons whom he shall find between sunset and the hour of eight in the forenoon lying in any highway, yard, or other place, or loitering therein, and not giving a satisfactory account of themselves, and deliver them to the constable in attendance at the nearest watch-house, to be secured until they can be brought before a magistrate.' The Municipal Reform Act contains a similar but less comprehensive provision, authorizing 'any constable appointed under that act, while on duty, to apprehend all idle and disorderly persons within the borough whom he shall find disturbing the public peace, or whom he shall have just cause to suspect of intention to commit a felony.' Besides these specific authorities, however, which apply only to the metropolitan police district and the boroughs affected by the Municipal Reform Act, there is no doubt that in general a constable, by virtue of his common-law authority, may stop any person carrying by night a bundle or goods under circumstances of reasonable suspicion; and if upon examining him his suspicions are not removed, he may detain him in his custody. A constable has also a general authority to apprehend for offences against the Vagrant Act, 4 and 5 George IV., c. 83, or against the Larceny Act, or the Malicious Injuries Act, 7 and 8 George IV., c. 29 and 30.

4. In the execution of a warrant a constable acts no longer as a conservator of the peace, but as a ministerial officer to the magistrate who signs it. He is the proper officer to a justice of the peace, and is bound by law to execute his warrants, and may be indicted for disobeying them. It is his duty to execute the warrant of a magistrate as soon as it comes to his hands; and where he arrests or distrains or does any other act, though it is not absolutely necessary by law that he should show his warrant, he ought always to give notice of it, and he will be wise to produce it in all cases where it is demanded; but as the warrant constitutes his justification, he is not required to part with it out of his possession. If the constable has a legal warrant to arrest for felony, or even breach of the peace, he may break open doors after having demanded admittance and given notice of his warrant; and if, after such notice, he is resisted and killed, it will be murder. If a warrant be directed to a constable by his name of office merely, he is *authorized* by the Stat. 5 George IV., c. 18, to execute it out of his own constablewick, provided it be within the jurisdiction of the magistrate who signs it; but he is not *bound* to do so, and may in all cases make his election whether he will go beyond his own precincts or not.

5. The law has made several provisions for the indemnity and protection of constables in the proper discharge of their duty. Thus by the Stat. 7 Jac. I., c. 5, if an action be brought against a constable for any thing done by virtue of his office, he may plead the general issue and give the special matter in evidence; and if he recovers, he is entitled to double costs. Formerly if a magistrate granted a warrant in a matter over which he had no jurisdiction, the officer who executed it was liable to an action of trespass for so doing; but by the Stat. 24 George II., c. 44, s. 6, it is enacted, that 'no action shall be brought against any constable for anything done in obedience to the warrant of a justice of the peace, until he has neglected or refused to show his warrant on being demanded so to do. And if after he has shown his warrant, any action is brought against the constable alone, without joining the justice who signed the warrant, the defendant, on producing the warrant at the trial, shall be entitled to a verdict, notwithstanding the defect of the justice's jurisdiction; and if the action be brought against the constable jointly with the justice, the constable is to be entitled to a verdict on proof of the warrant.' By the 8th sect. of the same statute, all actions against constables for anything done in the execution of their office must be brought within six months. For the further protection of constables, the Stat. 9 George IV., c. 31, sect. 25, enacts that persons convicted of assaults upon peace-officers in the due execution of their duty may be imprisoned with hard labour for two years, and be fined or required to find sureties for keeping the peace.

For the guidance of the metropolitan police force, the commissioners deliver to each of the men printed directions, which contain an accurate and perspicuous summary of the laws relating to the duties, liabilities, and indemnities of constables. In those boroughs which have adopted a new system of police under the Municipal Reform Act, similar codes of instruction have been issued to the constables. (For fuller information upon the whole of this subject, see Viner's *Abridgement*, Bacon's *Abridgement*, and Burn's *Justice*, title 'Constable.')

CONSTABLE, LORD HIGH, OF SCOTLAND. In the twelfth century we find

Hugh de Morvill, of the family of the De Morvilles, barons of Burgh, co. Cumberland, contemporary with one Edward, Conestabulus; himself constable of Scotland, and the possessor of vast estates in Teviotdale, Lauderdale, Lothian, Clydesdale, and Cuninghame. He died anno 1162, when his son,

Richard de Morvill succeeded him in his possessions and high office. On his death, anno 1189, he was succeeded by his son,

William de Morvill, who died, anno 1196, without issue.

Helen, his eldest sister, being married to Roland, lord of Galloway, the latter became constable in her right, and lord of Cuninghame; and on his death, anno 1200, the office passed to their son and heir,

Alan, lord of Galloway[*]. He died, anno 1234, leaving only female issue; of whom was

Helen, his eldest daughter, who being the wife of Roger de Quincy, earl of Winchester, the latter became constable in her right. He died, anno 1264, leaving, by the said Helen, daughters only; of whom

Margaret, married to William de Ferrariis, earl of Derby, was the eldest. It is said that William de Ferrars, of Groby, their son, was some time constable. But the countess retained the office, and then resigned it into the king's hands, in favour of

Sir Alexander Comyn, earl of Buchan, lord justiciar of Scotland, the husband of Elizabeth, her immediate younger sister; and on his death the office fell to his son and heir,

John Comyn, earl of Buchan, who was forfeited in the year 1308 for his adherence to the Baliol interest.

Sir Gilbert de Hay, of Errol, was then made constable of Scotland during pleasure; and in 1311 the office was bestowed on

David de Strathbogie, earl of Athol, in like manner during pleasure; but he being soon afterwards outlawed for espousing the cause of Baliol,

Sir Gilbert de Hay, before mentioned, got the office in fee and heritage in the year 1314; since which time the constable's staff, then put into his hands by Bruce, has remained in the Errol family.

The office and jurisdiction of the lord high constable of Scotland differ from those of the like officer in England. No formal distribution of the powers of the lord justiciar of Scotland, such as took place at the breaking up of the aula regis of England, was ever made in the former kingdom; nor when in the course of years this happened, did the once large powers of the justiciar pass to the like officers in the one country as in the other. On the new modelling of the judicial polity of England by King Edward I., the constable and mareschal were set over a court of chivalry, with jurisdiction in matters of honour and arms. But in these, the constable of Scotland never had jurisdiction. His jurisdiction was of the nature of that in England, vested by 33 Henry VIII. c. 12, in the lord steward of the king's household, or (in his absence) of the treasurer, comptroller, and steward of the marshalsea; for according to the Leges Malc. II., he judged jointly with the mareschal in all transgressions committed within certain limits of the king's court. But even this jurisdiction seems to have been exercised in fact by the lord justiciar; the constable only protesting against the interference with his powers. In the reign of King Charles I. a commission was issued to inquire into the nature and extent of the constable's jurisdiction; and they reported that it extended to all slaughters and riots committed within four miles of the king's person, or of the parliament or privy council. No alteration was made at the Union; and by the act 20 Geo. II. c. 43—which swept away so many other heritable jurisdictions—the office and jurisdiction of the lord high constable of Scotland were expressly reserved.

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[*] He is mentioned in the charter granted at Runnymede by King John of England. Selden calls him 'Alan de Leweia [which is an evident error for Galweia], constabular. Scotiæ,' Selden, 'Eng. Epin.' c. 10.

CONSTANCE. [CONSTANZ.]

CONSTANCE, COUNCIL OF, was assembled in 1414 at the request of the emperor Sigismund, chiefly to put an end to the great schism, during which John XXIII., Gregory XII., and Benedict XIII., each claimed the rank and office of sovereign pontiff. The Council deposed all three, and elected Ottone, cardinal Colonna, as legitimate pope, by the name of Martin V. It was on this occasion that a canon or decree was passed, asserting the supremacy of a general council over the pope. Gregory and John XXIII. submitted to this decision, the latter after much demurring; but Benedict continued the schism in Spain to the time of his death. The Council was also engaged in the trial of John Huss, who was summoned and appeared before it, and was arrested by order of the Council, notwithstanding a safeguard from the emperor. His doctrines were condemned as heretical, and as he would not retract he was publicly degraded from his priestly office, and then consigned to the civil magistrates, who by order of the emperor had him burnt. For the peculiar doctrines of Huss, some of which concerned doctrine, and others discipline, see HUSS. The Council condemned likewise the doctrines of Wycliffe, most of which were identical with those of Huss. Jerome of Prague, a disciple of Huss, having been brought before the Council, first retracted his obnoxious doctrines, but being still kept in prison, as his retractation was not considered to be sincere, he demanded a public audience, at which he declared that he had recanted only through a temporary weakness, and that he persisted in his master's doctrines; upon which he was also condemned to the stake, to which he went with the greatest serenity. Poggio Bracciolini, who was present at the tragical scene, bears full evidence, in his letter to Aretino, to the firmness of the victim; and so does Æneas Sylvius, afterwards Pope Pius II., in his 'Historia Bohemica.'

The Council had promised to occupy itself with a reform of church discipline, which was much wanted in that age; but it did little in that way, having been abruptly dissolved by the new pope, Martin V., in April, 1418. The Council of Constance is one of the most noted in the history of the church, and was one of the most numerous ever assembled. Lenfant has given a full and instructive account of all its proceedings, session after session. (*Histoire du Concile de Constance.* 2 vols., 4to., Amsterdam, 1727.)

CONSTANS, son of Constantine, had for his portion at his father's death, Italy, Africa, and Illyricum. His elder brother Constantine, being envious of his share, attacked him, was defeated, and killed near Aquileia, A.D. 340; after which Constans took possession of his brother's dominions, and became emperor of the whole west. Magnentius, commander of the troops in Gaul, having revolted against him, and drawn a great part of Gaul into his party, Constans, who happened to be in that province at the time, was obliged to take flight towards Spain, when he was pursued and overtaken at the foot of the Pyrenees by some emissaries of Magnentius, and killed, A.D. 350. He is represented by the historians as indolent and rapacious; Zosimus accuses him also of cruelty and other crimes, but Zosimus wrote under the influence of party feeling. The character however of all the three sons of Constantine is open to much censure. Constans protected the Christian faith, as established by the Council of Nicæa, against the Arians and Donatists, and he also shut up many heathen temples. After his death Magnentius took possession of Italy and of Rome, and styled himself Augustus, until he was overthrown by Constantius. [CONSTANTIUS.]

CONSTANT, a quantity which remains the same throughout a problem. Thus in the question, required that point of a circle which is at a given distance from a given straight line, the radius of the circle is a constant. If the problem require the use of twenty different points of the circle, the radius is the same for all.

A constant may be determinate, or it may be indeterminate or arbitrary. Thus the proportion between the circumference and diameter of a circle is a determinate constant, being 355 to 113 very nearly; but in the problem, required the relation which exists between the abscissa and ordinate of a circle, the radius of that circle is an arbitrary constant.

The term constant is frequently applied to any remarkable or very necessary number which enters a question, as follows. By the *constant* of aberration is meant that one constant by the determination of which the aberration is obtained from its known laws at any given time; in this case it is the maximum aberration, or about 20½″. [ABERRATION.] Thus we have the constant of nutation, the constant of friction, &c.

Nothing is more common in mathematical works than the term *variation of constants*, which appears a contradiction. But its meaning is as follows: a quantity which upon one supposition would remain constant, becomes variable by the introduction of another supposition. Thus, taking into account the earth's attraction only, the longitude of the moon's node is constant; but by the attraction of the sun and planets, its place is slowly changed. In this case one of the constants is said to vary.

CONSTANTIA, a farm situated about eight miles to the west of Cape Town at the Cape of Good Hope, which received its name in compliment to the wife of the Dutch governor of the colony, Vander Stel, by whom it was formed. This farm owes all its celebrity to the Constantia wine which it produces, and which is universally esteemed for its high flavour and luscious quality. The vineyard is of small dimensions, and the wine which it yields, both white and red, does not exceed from 8000 to 12,000 gallons annually, varying between these quantities according to the season. It has not hitherto been found possible to produce wine of equal quality upon any other spot within the colony

CONSTANTINE, POPE, a native of Syria, succeeded Sisinnius in 708. He visited Constantinople and Nicomedia, where he was received with great honour by the Emperor Justinian the younger. After his return to Rome he defended the worship of the images against John, patriarch of Constantinople, and against Philippicus, who had usurped the empire. Felix, archbishop of Ravenna, who had at first refused to acknowledge Constantine, and had been exiled in consequence, made his submission to him, and was reinstated in his see. Constantine died in 714, and was succeeded by Gregory II.

CONSTANTINOPLE (Stambool), literally, 'the city of Constantin,' in Roumeli or European Turkey, the capital of the Ottoman empire, is situated in 41° 0′ N. lat. and 28° 45′ of E. long., on the sea of Marmora (Propontis), and at the west end of the narrow channel of the Bosporus, which connects the sea of Marmora with the Black Sea (the Euxine). The ground on which it stands is fitted by nature for the site of a great commercial city, the connecting link between Europe and Asia. A gently-sloping promontory, secured by narrow seas, stretches out in a triangular form towards the Asiatic continent, from which its extreme point is separated by so narrow a strait (the Bosporus), that in a quarter of an hour a boat can row from one continent to the other. Indeed, Scutari, on the Asiatic coast, immediately opposite, is always considered as a suburb of the European capital. Just before the Bosphorus enters the sea of Marmora, it makes a deep elbow or inlet on the European shore, flowing between the triangle of Constantinople proper and its European suburbs of Galata and Pera, and forming the magnificent port of the Golden Horn. The triangle which, allowing for many vacant spaces within the walls, is entirely covered by Constantinople, is thus washed on one side (the northern) by the deep waters of the port, and on the other (the south-east) by the sea of Marmora. The base of the triangle, or the ground immediately beyond the walls, which attaches it to the European continent, is an open elevated flat, with some slight inequalities. The area of the triangle is occupied by gentle hills, which are highest towards the land side and the suburb of Eyoub, and gradually decline to the Seraglio point, the apex of the triangle, shelving off on each side to the sea of Marmora and the port. As Rome was built on seven hills, so the Roman founders of Constantinople called these the 'Seven Hills,' though, if the principal chain only were counted, there would be less; and if the minor hills or spaces were included, there would be more than seven. The ridge of the first hill, departing from the acute part of the triangle, is covered by the main building of the Seraglio, or vast palace of the Sultan, behind which, a little on the reverse of the hill, the dome of Santa Sophia shows itself. The second hill is crowned by the bold and lofty dome of the Osmanieh Mosque. The still loftier mosque of Solyman the Magnificent towers on the third hill; whilst an antient aqueduct, the arches of which are of a considerable span, and which is generally attributed to the Emperor Valens, unites the summits of the third and fourth hills. On a fifth point, the most elevated of the little chain within the triangle, there is a slender lofty tower, built in 1828, in which a guard is constantly kept to watch the breaking out of fires, which are very frequent and destructive in a city where all the private habitations are built almost entirely of wood. The situation of Constantinople upon hills is the main cause, not only of its picturesque beautiful appearance, but of its salubrity and comparative cleanliness. It receives all the breezes from the Bosporus, the sea of Marmora, and the adjoining plains of Thrace; and the dirt that might otherwise accumulate descends the hills' sides to the port or the open sea, in both of which it is carried off by a strong current. This natural local advantage is improved by the number of fountains and the abundance of running water which is always carrying off parts of the dirt, and by the heavy rains, which, when they fall, thoroughly cleanse the sides of the hills. The lower edge of the city that touches the port, and the suburb of Galata (the Wapping of the Turkish capital), on the opposite side of the port, may be called filthy places, but the term cannot be correctly applied to Constantinople as a whole, although from various other causes the interior of the city is far from being so beautiful and imposing as its external aspect.

The form of the triangle is somewhat irregular, the side on the sea of Marmora, from the old state prison called the Seven Towers to the Seraglio point, being considerably the longest; we have no exact admeasurement, but its length cannot be much short of five English miles. On this side the old walls and towers are in a very ruinous state, and on the side towards the port they have almost entirely disappeared. But on the land side Constantinople presents a double line of strong and lofty stone walls (the work of Theodosius II.), which might be easily put in a complete state of repair, and which, in their more dilapidated parts, present such magnificent and picturesque specimens of mural ruins as probably no other city can boast of. The length of this latter line of wall, from the head of the port to the sea of Marmora, is about four English miles. The walls are flanked at short intervals by towers, which are mostly rectangular. There are many Greek inscriptions inserted in their face; nor have the Turks been at the trouble to remove the numerous Greek crosses that are carved on the towers and over the gateways. Besides the double walls, which are almost entire, and still retain their antient battlements, the outer ditch was faced with a wall which made a third rampart, but this is in part destroyed, and seems never to have been defended by towers. Bondalmonte, a Florentine, whose plan bears the date of 1422, sets down one hundred and eighty towers, of which not more than one hundred and twenty are now standing. The intervals between the walls are in many places choked up with earth and masses of the ramparts which have fallen under the shocks of war or earthquakes. The great ditch, which is about twenty-eight or thirty feet broad, is partly cultivated and converted into kitchen gardens.

There are six gates on this side:—1. Egro-Kapoussi (the Oblique Gate); 2. Edrene-Kapoussi (the Gate of Adrianople); 3. Top-Kapoussi (the Cannon Gate), through which the conqueror Mahomet II. made his public entry on the capture of Constantinople; 4. Selivri-Kapoussi (the Gate of Selivria); 5. Yeni-Kapoussi (the New Gate); 6. The Gate of the Seven Towers. The 'Golden Gate,' so celebrated by the Byzantine writers, has been sought for in vain, though a gate now wholly blocked up, with two mean pillars supporting a low arch, is sometimes shown to travellers for it. Near to the Top-Kapoussi, where Palæologus, the last of the Christian emperors, fell, is the breach through which the Turkish besiegers poured into the city: the wide rent, which has never been repaired, is now full of trees and shrubs. A waste, a stillness, and a solitude, difficult to conceive near so great a capital, reign immediately beyond these walls, which are so lofty, that from the road which passes under them the eye can scarcely catch a glimpse of the mosques and minarets of the city. This melancholy aspect is heightened by several cemeteries, with dark cypresses and white marble tombs, that lie outside of the walls.

The size of the triangle on which Constantinople stands has been greatly exaggerated. Tournefort, in general a correct observer, makes the circuit of the triangle twenty-three miles (*Voyage du Levant*, let. xii.), but the length of the three sides does not in reality much exceed thirteen miles. Gyllius (*De Topog. Const.*, l. i., ch. 4), makes the whole circuit rather less than thirteen miles, thus agreeing pretty closely with Chalcondylas, who estimates it at one hundred and eleven stadia. (*Melet. Geog.*, Art. 'Opakh.') The treble walls and ditches on the land side, the extensive gardens of the Seraglio, and other palaces, the large court yards of the royal mosques, the Hippodrome and other vacant squares, materially diminish the extent of ground covered with houses.

With the exception of the land walls, and the church of Santa Sophia, there does not remain much of the Byzantine architecture; the greater part of the antiquities which were seen by Gyllius, by Spon, and other old travellers, have disappeared. The fact is, the Turks, instead of digging in the quarry, have knocked down the Grecian buildings to use the materials in their own public edifices, such as mosques, minarets, and fountains, and to cut them up into tomb-stones.

There is a vast subterranean edifice, the roof of which is supported by an immense number of columns, each column being oddly formed of three separate pillars placed one on the top of the other. The Turks call it the palace of the 'thousand and one pillars;' not that this is the precise number, but because it is a favourite number with all eastern nations. Though the earth has in part filled it up, it is still of great depth. It was originally one of the immense cisterns or reservoirs made by the Greek emperors, and always kept full of water by them, in case of a siege, though they have long been destroyed, or suffered to go to ruin, by the improvident Mussulmans. This particular one is dry, and a number of silk-twisters have taken possession of it, and ply their trade at the bottom in almost total darkness. There is another which still exists as a cistern, though it is hardly known except to a few Turks, whose houses are situated immediately above it, and who call it the 'Subterranean Palace.' It may be described as a subterranean lake, extending under several streets, having an arched roof that covers and conceals it, supported on 336 marble pillars.

The Turks retain the translated name (they call it the At-Meidan or horse-course) of the famed Hippodrome, but all the antient splendour of the place has disappeared. It is now not a circus, but an oblong open space, about 300 paces long by 150 wide It is partly flanked on one side by the mosque of Sultan Achmet, and partly on the other by the high dead walls of a building which was once an hospital, but in 1828 a receptacle of a few wild beasts kept by the sultan. At the upper end of the Hippodrome there is a granite obelisk of rather mean proportions, and partly covered with hieroglyphics which are not of the best workmanship; it is called after Theodosius, though it is probable that emperor only removed it from another part of the city where it was erected by Constantine, and set it up here, after it had been thrown down by an earthquake. Near this obelisk is the fragment of the wreathed column of bronze, which has been the subject of many discussions. Whether it supported three serpents' heads, which Mahomet II. struck off at a blow with his battle-axe—whether it was brought from the oracular shrine of Delphi or not, we will not attempt to determine, but we can safely assert that it is now a poor mutilated thing, with one end stuck in the ground, above which it does not rise more than seven feet, with the other end open, and the hollow almost filled up with dirt and stones which the Turks have thrown into it. The marble pyramid of Constantine Porphyrogennetus, the Colossus Structilis of the old topographers, does not at present fairly stand on the At-meidan, though it is near it and visible from it: it has long been stripped of the plates of gilded bronze that once covered it; the shaft is held together by rude iron hoops, and blackened by the many conflagrations that have raged round it. It is now an unsightly object, about 90 feet in height, and 33 in circumference.

Many of the mosques erected by the Turks are distinguished by grandeur and beauty. There are fourteen chief or imperial mosques, nearly all lofty, and magnificent in their general dimensions, and built from base to dome of excellent enduring materials, chiefly of white marble, slightly tinged with grey. Some of these have two, some four, and one (that of Sultan Achmet) has even six of those light, thin, lofty, arrowy, and most graceful towers called minarets. Besides the imperial mosques, there are 60 others, varying in size and beauty, but all considerable edifices; and then 200 and more small mosques or messelgids, which are only distinguished as places of worship by having little minarets, often made of wood, contiguous to them. The mosque which has been most talked of, because it was antiently a Christian temple, and was supposed (we think erroneously) to have suggested to the Turks the grand dome or cupola which predominates in all the great mosques they built themselves, is that of Santa Sophia. Several of the imperial mosques, however, in situation, boldness, and beauty, far excel Santa Sophia, which, externally, is rendered hideous by the clumsy buttresses that have been built against it, at different periods, to keep it from falling. If the Turks really copied the dome from it, they have improved on the original, which is comparatively low and heavy, whilst most of their cupolas are lofty, light, and elegant. This is particularly the case with the mosque of the Sultan Achmet, which flanks the Hippodrome, and which may be deemed altogether the grandest edifice in Constantinople. The colleges and hospitals, which are generally attached to or near the great mosques, offer no striking architectural features; but some of the detached chapels or sepulchres (*turbés*), where sultans, viziers, and great personages repose, are handsome. The spacious barracks erected by the reigning Sultan Mahmoud for the accommodation of his *Nizam-djedid*, or troops disciplined in the European manner, may be reckoned among the public ornaments of the city and suburbs.

The public baths, of which there are said to be upwards of 120 within the walls, with their very low and small and flat domes, do not contribute to the beauty of the city externally, though within many of them are exceedingly handsome and spacious. The public fountains are remarkable and numerous: some of them, with their pure white marble facades, elaborate arabesque ornaments and Chinese roofs, are most beautiful objects. All this water, the daily consumption of which is immense, is supplied by *Bendts* or artificial lakes in or about the forest of Belgrade, at the distance of ten or twelve miles from the city: it is conveyed to Constantinople, as also to the suburbs of St. Dimitri, Pera, Galata, &c. by means of narrow subterranean aqueducts, and *souterazi*, or hollow hydraulic pyramids, which latter are placed at certain irregular distances, and so contrived as to overcome the inequalities of surface presented by the country that intervenes between the bendts and the city. Within the walls the lofty aqueduct of Valens still performs its duty, carrying the fluid across a deep hollow.

With the exception of one very long street, which traverses the city nearly from the high walls of the seraglio to the gate of Adrianople, the streets are narrow, winding, and uncommonly dull and deserted. The *gazeboo* or *shah-nishins* (projecting windows) are latticed and closed like the windows of convents; and many of the houses have no windows at all towards the street, but only a low, narrow, dingy door. All the life and activity of the interior of the city is concentrated in the bazaars or bezestines. These are long wide corridors, communicating with each other mostly in an irregular and striking manner; their side walls are built of stone, and they are covered in with stone arches or successions of domes, through which a subdued light is admitted. The dealers are separated by nations or religions and by trades. [BAZAAR.] Towards the evening the coffee-houses, which are excessively numerous, though chiefly of mean appearance and dimensions, are much thronged by Turks, Armenians, Greeks, and Jews, all smoking and indulging in tiny cups of coffee, which is generally drunk by the poorer classes, not only without milk, but without sugar.

The communication between the city and the opposite suburbs of Galata, Pera, and Tophana, is kept up by means of *caïks*, or light fast wherries, the constant passing and repassing of which give the port an animated appearance in the day-time. The imperial dock-yard, the arsenal, the artillery barrack, are all on that side of the water, and the elevated plateau of Pera is the residence of the foreign ambassadors to the Porte, the drogomans, Frank merchants, &c. An active communication is also kept up by the same means with Scutari, where caravans and travellers are constantly arriving from Ismmid (Nicæa), Brusa (Prusa), Angora (Ancyra), and other places in the interior of Asia Minor

The port of the Golden Horn is safe, capacious, and beautiful; but it has one serious drawback, which affects Constantinople as a commercial emporium. During the summer, the Etesian or north wind blows unremittingly from the Black Sea down the Bosporus, the sea of Marmora, and Straits of the Dardanelles, thus retarding the approach of all sailing vessels from the Mediterranean and Ægean to the capital. Vessels undertaking the voyage upwards at that season are often detained two or even three months at Tenedos, on the coast of Troy, near the mouth of the Dardanelles, where whole fleets of wind-bound ships, laden with goods for the capital or the Black Sea, are frequently at anchor. This serious obstacle can only be overcome by steam-vessels, which are now well known and on the increase in the Sultan's dominions. The first that ever appeared in those narrow seas was a large English boat, purchased by the Turkish government in 1828. The Sultan has bought two others since then, and there are two or three belonging to companies of merchants that trade from Smyrna and the Greek Islands. In no part of the world can the usefulness of such vessels be more felt.

As a manufacturing town, Constantinople scarcely deserves mention; pipes and pipe-sticks, muslin handkerchiefs painted and embroidered, costly saddlery, and horse-trappings, are the principal articles produced. The foreign trade, however, is very considerable. In the articles of exports it is made the depôt of raw silks and opium, which are now not allowed to be shipped at any other port. It imports manufactures, colonial and other goods, not only for its own large population, but for a considerable portion of both European and Asiatic Turkey. The impoverishment of the people and the insecurity of property render nugatory many wise regulations, and prevent the growth of commerce, which might be tenfold what it actually is. The Turks have never loaded trade with heavy duties or jealous prohibitions; their code extends immunities and high consideration to merchants; but unfortunately these immunities are not enjoyed by the consumers, or by any class, and the cultivator of the soil is the helpless victim of the extortion and tyranny of the government officers. [TURKEY, COMMERCE OF.]

We have no census or official data, but the population contained within the walls of Constantinople is probably about 500,000. It is usual, in the country, to speak of 'the million of Stambool,' and to add the population of Pera, Galata, St. Dimitri, Scutari, and the numerous villages on the Bosporus; but we question whether all these would carry the number higher than 700,000 or 800,000, comprising Turks, Greeks, Armenians, Jews, and Franks.

A city stood here in remote antiquity; but if (as there are good grounds for believing) the extent of Byzantium is marked by the present walls of the Seraglio, it was a small one. [BYZANTIUM.] The present enlarged city was founded in A.D. 328 by the Emperor Constantine, who gave it his name, enriched it with treasures of art taken from all parts of the Roman world, and soon made it the rival of Rome itself. It was taken from the degenerate Greeks in 1204 by 'the blind old Dandolo,' the Venetians, and the French, who attacked it on the side of the port. After remaining fifty-seven years in the hands of the Franks, it was retaken by the Greeks in 1261 under the Emperor Michael Palæologus. It was conquered by the Turks in 1453.

CONSTANTI'NUS, FLA'VIUS VALE'RIUS, called the Great, the son of Constantius Chlorus, was born in 274. He was brought up at the court of Diocletian, and served early with the armies in various expeditions. Being in Britain at the time of his father's death, he was proclaimed emperor by the soldiers, but he prudently referred his nomination to Galerius, who acknowledged him only as Cæsar, and governor of the provinces which had long been administered by his father. Constantine passing over into Gaul to oppose the Franks who had entered that province, defeated them as well as the Alemanni, and behaved with great inhumanity to the prisoners; he gave up their chieftains to the wild beasts as a public spectacle. (Eutropius, x.) Meanwhile Maxentius, the son of Maximianus, caused a revolt at Rome while Galerius was absent in the East, and Maximianus himself having come to Rome, resumed the title of emperor, and took Maxentius as his colleague. Severus, whom Galerius ordered to put down this insurrection, was betrayed by his troops, taken prisoner, and put to death by Maximianus. The latter however fearing the vengeance of Galerius, thought of strengthening himself by an alliance with Constantine, whom he went to meet in Gaul, and gave him his daughter Fausta in marriage. From that time Constantine was acknowledged as Emperor by the West. Soon after Maximianus having quarrelled with his son Maxentius, left Rome for Pannonia, where he met Galerius and Diocletian, who had left his retirement of Salona for the purpose of appointing Licinius a new Cæsar, in the room of Severus. There were then in the empire no less than six emperors and Cæsars, namely, Maximianus, Maxentius, Galerius, Constantine, Maximinus and Licinius. Galerius soon after acknowledged both Constantine and Maximinus, as emperors and Augusti equal to himself. Maxentius continuing to maintain himself at Rome, Maximianus visited his son-in-law Constantine, whom he attempted to dispossess of his authority by exciting his soldiers to revolt, but he was defeated and taken at Massilia by Constantine, who treated him with great indulgence, and allowed him to remain in his palace. Maximianus having next attempted to murder him in his bed, was seized and put to death. In the year 311 Galerius published an edict to stop the persecution against the Christians; this document bears the name of three emperors, Galerius, Constantine, and Licinius: Maximinus, who was in Asia, is not mentioned in it. Galerius soon after dying at Sardica in Dacia, Licinius took possession of his dominions as far as the Hellespont, and Maximinus had the whole of Asia. Maxentius continued to govern Italy, and was making warlike preparations against the other emperors, when Constantine moved with an army from Gaul to attack him, A.D. 312. He took Susa, defeated several bodies of troops sent against him by Maxentius, entered Mediolanum (Milan), and then attacked Verona, where Pompeianus, a general of Maxentius, had stationed himself. After an obstinate fight, Pompeianus was defeated and killed, and Constantine marched upon Rome, where he defeated Maxentius in person, a few miles from the capital, on the right bank of the Tiber, near the present Ponte Milvio, where Maxentius had constructed a bridge of boats. In recrossing the bridge in his flight, Maxentius was drowned, with many of the fugitives. Constantine entered Rome on the 29th of October, and was acknowledged emperor by the senate, who ordered the Triumphal Arch which still exists to be raised to him as the liberator of Rome. He is said to have behaved with moderation after his victory, having put to death only a few of the worst ministers of Maxentius, who is represented as a cruel tyrant both by Heathen and Christian historians.

It was on this occasion that Constantine adopted a new ensign for his army, which was called Labarum or Laborum; it had the figure of a cross, with the Greek letter P above it, and the Greek words ἐν τούτῳ νίκα, 'conquer in this.' Eusebius, who gives a description of it, asserts with other Christian historians, that it was assumed in consequence of a vision which Constantine had before his battle with Maxentius. Gregorius Nazianzenus says, that the name of Laborum was used as indicating that by the assistance of this new sign all 'labours' and tribulations of the empire should cease. Zosimus, Aurelius Victor, and Eutropius, say nothing of it. Much has been written on this subject. (See Gretser, *De Cruce*; and *Dissertation sur la Vision de Constantin*, par J. B. Devoisier, Bishop of Nantes.)

In the year 313, Licinius came to Rome, when both he and Constantine were named consuls, and he married Constantia, the sister of Constantine. The old emperor Diocletian died in July of that year at Salona.

A war having broken out in the East between Licinius and Maximinus, the latter was defeated, and died of poison at Tarsus: all his family were put to death by Licinius. The whole empire was now divided between Constantine, who ruled over the west, including Italy and Africa; and Licinius, who had the eastern provinces, with Egypt.

Constantine now openly favoured the Christian communion, and discountenanced and ridiculed the practices of the old religion of Rome. He exempted the Christian clergy from personal taxes and from civil duties, and granted donations and privileges to the churches. He ordered a council of the bishops of the west to assemble at Arles to settle the schism of the Donatists, and went himself to Arles; but while there he received news of the hostile intentions of Licinius, which made him march in haste at the head of an army into Illyricum. The two armies met near Sirmium in Pannonia, and again in the plains of Thrace, after which Licinius sued for and obtained peace, by giving up to Constantine Illyricum, Macedonia and Greece. On visiting these new provinces, Constantine promulgated several laws, by which he abolished the punishment of the cross, ordered that the children of destitute parents should be maintained at the public expense, and allowed the emancipation of slaves to be effected in the Christian churches in presence of the clergy without any interference of the civil magistrate. By another law, promulgated at Sardica in December, 316, he gave to the vicars or governors of the provinces full power to try persons of every rank accused of oppressions and robbery, without any appeal to Rome, by which he put a check on the overbearing insolence of the rich towards the poor. In the year 318, Crispus, son of Constantine by his first wife, obtained the consulship with the younger Licinius, the son of Licinius. Constantine spent several years in visiting the provinces of the empire, and promulgating new laws, which were conceived for the most part in a humane and liberal spirit: he abolished the punishment of flagellation formerly inflicted on defaulters in the payment of taxes, introduced a better discipline into the prisons, repealed the old laws against celibacy, and forbade concubinage, which was then allowed by the Roman laws. He also prohibited nocturnal assemblies, and certain obscene rites of Paganism; but he did not attempt to forbid the exercise of the old religion.

By an edict of March, 321, he ordered the observance of the Sunday, and abstinence from work on that day. In the year 322 he defeated the Sarmatians and the Getæ or Goths, and repulsed them beyond the Danube. On returning to Thessalonica, where he was constructing a harbour, the Goths appeared again, and invaded Mæsia and Thrace. Constantine again attacked them, and pursued them into the territories of Licinius. This was made the pretence of a new war between the two emperors, in which Licinius being defeated near Chalcedon, by sea and by land, escaped to Nicomedia, and there surrendered to Constantine, who, at the intercession of his sister Constantia, promised him his life, and sent him to Thessalonica, where however he was soon after put to death, A. D. 324. Licinius has been spoken very unfavourably of by most historians. Constantine, being now master of the whole empire, extended to the east his laws in favor of the Christian religion. He forbade consulting the haruspices and the oracles, ordered the churches of the Christians which had been demolished under Maximinus and Licinius to be rebuilt, and the property of the church to be restored, and more especially the burial grounds of the Martyrs; and reinstated in their rank and right all those who had been prosecuted or exiled for religion's sake. In writing to the Metropolitans he styled them 'well-beloved brethren.' He published a Latin edict, which was turned into Greek by Eusebius, addressed to all the subjects of the empire, in which he exhorted them to renounce their old superstitions, and to adore only one God, the Saviour of the Christians. In 325 he assembled the first universal council of Nicæa, which he attended in person. [Arius.] On the 25th July of that year, being the anniversary of his accession to the empire, he gave a great entertainment to all the fathers of the council, to whom he gave considerable gifts and sums to distribute to the poor. From Nicomedia, where he resided for some time, he issued an edict inviting all the subjects of the empire to address their complaints to him in person against any abuse of authority of the governors and magistrates. By another edict he abolished the fights of gladiators, and ordered that the convicts, who were formerly compelled to fight against them or against the wild beasts, should be employed in working the mines. These facts show a great alteration in Constantine's mind from the time when he himself gave up the Frankish prisoners to the wild beasts in the amphitheatre.

In the year 326 he repaired to Milan, and then to Rome. being consul, for the seventh time, with his son Constantius; he remained at Rome but a short time, and left it in disgust, never to return to it. According to Zosimus and Libanius the Romans were dissatisfied with him for having forsaken the old religion, and expressed their discontent by biting satires. By the end of the year we find Constantine at Sirmium, in Pannonia. In this same year is recorded the tragical death of Crispus, the eldest son of Constantine, by a former wife or concubine, a young man who had been educated by Lactantius, who has been praised by Eusebius, and who had given proof of his courage and abilities on many occasions. He was falsely accused by his step-mother, Fausta, of having endeavoured to seduce her, some say of having aspired to the sovereign power, and upon either of these charges his father had him beheaded: at the same time he put to death young Licinius, his sister's son, the motive for which is not ascertained. But it was soon after discovered, some say through Helena, the mother of Constantine, that the young prince was innocent, and that Fausta herself had been repeatedly guilty of adultery, upon which she also was put to death with several of her accomplices. Constantine's suspicious temper added to the number of the victims.

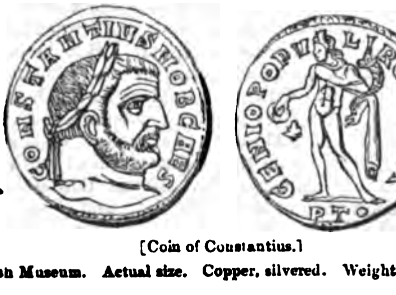
About the year 328 Constantine began to build his new capital, which was called by his name, and the spot was judiciously chosen. It was a Christian city, chiefly inhabited by Christians, and no Heathen temples were built in it. In May, 330, the new town was solemnly dedicated to the Virgin Mary. Meantime the emperor was repeatedly engaged against the Goths and other barbarians on the banks of the Danube. In the year 328 he recalled several Arian bishops, Eusebius of Nicomedia among others, who had been exiled by the council of Nicæa. This change is said to have happened at the suggestion of Constantia, who was herself in the Arian communion, and retained to the last much influence over her brother Constantine. Athanasius having opposed the re-admission of the Arians into the church communion, this led to a long controversy between him and the emperor, which lasted till the death of the latter. [Athanasius.] Constantine was fond of religious polemics, and himself wrote on the Arian and Donatist controversy. The remaining years of Constantine's life were chiefly spent in embellishing his new capital and attracting inhabitants, especially Christians, to it; the rich by privileges, the working men by daily distributions of corn and oil. He made a division of the empire, to take effect after his death, among his three sons, whom he had named Cæsars, giving to Constantine, the eldest, the Gauls, Spain, and Britain; to Constans, Illyricum, Italy, and Africa; and the east to Constantius. To Dalmatius, one of his nephews, he gave Macedonia and Achaia, and the other, Annibalienus, he made king of Pontus and Cappadocia. He likewise divided the authority of the præfect of the prætorium among four præfects, of the East, of Macedonia and Dacia, of the Gauls, and of Italy. These four great governments were subdivided into provinces, administered by vicars or propræfects. He took away from the præfects all military power, constituting them merely as civil and political officers. He is charged by Zosimus, who is strongly biassed against Constantine, with having effected another change which proved fatal to the empire, namely, the removal of the military stations on the frontiers, and the placing of the soldiers in garrison in the towns of the interior; but perhaps this was only on some particular points, where the barbarians had encroached and were likely to cut off the old border stations. We find that he gave lands in Thrace and other provinces south of the Danube to the Sarmatians, who had been driven from their country by the Goths. Constantine probably thought of making one race of barbarians a rampart to the empire against the other. In the year 337, when preparing to march against the Persians, who had commenced hostilities, he fell ill at Nicomedia, and died, in his sixty-fourth year. He is said to have received baptism on his death-bed from an Arian bishop; for although long converted to Christianity he was still only a catechumen, as was frequently the case with converts in that age. His body was transferred to Constantinople, where it was buried, after a sumptuous funeral. The senate of Rome placed him among the gods, and the Christians of the East reckoned him among the saints: his festival is still celebrated by the Greek, Coptic, and Russian churches, on the 21st of May.

The character of Constantine has been the object of various and contradictory judgments, according to the religious and political spirit of the various writers. Eusebius, Nazarius, and other Christian contemporaries, grateful for the protection afforded by the emperor to the Christian religion, may be considered his panegyrists, while Zosimus and other Heathen writers, animated by an opposite feeling, were his enemies. The brief summing up of Eutropius is perhaps nearest the truth. 'In the first part of his reign he was equal to the best princes, in the latter to middling ones. He had many great qualities; he was fond of military glory, and was successful. He was also favourable to civil arts and liberal studies; fond of being loved and praised, and liberal to most of his friends. He made many laws; some good and equitable, others superfluous, and some harsh and severe.' He has been blamed for dividing the empire, but that had been done already by Diocletian; in fact it was too large and straggling to remain in the possession of a single dynasty. By founding another capital in the east he probably did not accelerate the fall of the west, while at the same time he established a second empire, which lasted for more than a thousand years after his death. (Eusebius, *Life of Constantine;* Zosimus; Aurelius Victor; Eutropius, and other numerous writers, a list of whom is given by J. Vogt; *Historia Litteraria Constantini Magni*, 1720.)

[Coin of Constantine the Great.]

British Museum. Actual size. Gold. Weight, 70 grains.

CONSTA'NTIUS I., called **CHLORUS**, on account of his habitual paleness, son of Eutropius, of a distinguished Illyrian family, and of Claudia, niece of the Emperor Claudius II., was born about A.D. 250. He served with distinction under Aurelian, Probus, and Diocletian. In the year 291, Maximianus, the colleague of Diocletian, named him Cæsar and his colleague, while Diocletian chose on his side Galerius: the administration of the empire was divided among the four. Constantius had for his share the Gauls, Spain, and Britain. Both the new Cæsars were obliged to repudiate their wives. Constantius, whose first wife was Helena, the mother of Constantine, married Theodora, daughter of Maximianus; Galerius married Valeria, daughter of Diocletian. Constantius carried on war against the Franks, who began to be troublesome on the Lower Rhine, and took a vast number of them prisoners. He restored the town of Augustodunum (Autun), which had been devastated by Tetricus, one of the thirty tyrants. He then repaired to Britain, with Asclepiodotus, one of his lieutenants, who defeated Allectus (A.D. 300) the successor of Carausius in the usurped dominion of the island. Britain was thus restored to the empire after a revolt of ten years. On his return to Gaul, Constantius went against the Alemanni, whom he defeated with great slaughter near Vindonissa in Helvetia, some say near Langres, and drove them beyond the Rhine. About this time he founded the town of Constantia (Constanz). In the year 304 the two emperors, with the two Cæsars, came to Rome, where they enjoyed the honour of a triumph. In the following year Diocletian and Maximianus abdicated, and appointed Constantius and Galerius their successors, who in their turn appointed two new Cæsars as their colleagues, namely Severus and Maximinus Daia, or Daza. Constantius continued to administer his old government of Gaul, Spain, and Britain. His administration, which was equitable and humane, is greatly praised by the historians, both Christian and heathen. He put a stop to the persecutions against the Christians, and employed many of them about his person. The last campaign of Constantius was against the Caledonians, some say against the Picts, whom he defeated. He died soon after at Eboracum (York) in the arms of his son Constantine, whom he appointed his successor A.D. 306. By his second wife Theodora, Constantius left several children, Dalmatius, Julius Constantius, who was the father of Constantius Gallus and of Julian the Apostate, and Constantia, afterwards married to Licinius.



[Coin of Constantius.]

British Museum. Actual size. Copper, silvered. Weight 116 grains

CONSTA'NTIUS II., FLAVIUS JULIUS, son of Constantine the Great, was left, by his father's will, emperor of the east. The troops, however, in order to secure the empire to the three sons of Constantine, killed Julius Constantius, half-brother of the late emperor, Dalmatius and Annibalienus, his nephews, and other of his relatives, with several patricians and ministers. This massacre was allowed by Constantius, and some say was ordered by him; only two nephews of Constantine escaped, Gallus and Julianus, afterwards emperor. Constantius was repeatedly engaged in war against the Persians and the Armenians, but with little success on his part. Ammianus Marcellinus, in speaking of these wars, says that the Romans were successful when led by the emperor's lieutenants, but were generally losers when led by the emperor in person. After the death of Constans, A.D. 350, Constantius marched with a large force against Magnentius to revenge his brother's death, and at the same time to take possession of his dominions. A desperate battle was fought, A.D. 351, near Mursa, on the banks of the Drave, and at last the cavalry of Constantius gained the victory. Magnentius escaped into Italy, but Constantius was too much weakened by his victory to follow him until the next year, when he entered Italy, defeated Magnentius again, and obliged him to escape into Gaul. In the year after, 353, Constantius again defeated Magnentius in Gaul. The usurper, finding himself forsaken by his soldiers, killed himself, and his brother Decentius, whom he had made Cæsar, followed his example. Constantius now became master of the west as well as of the east, and thus reunited the whole empire under his dominion. He had appointed his cousin Gallus Cæsar and governor of the east, when he set out to oppose Magnentius. In the same year, 353, Constantius assembled a council at Arles, which was composed of Arian bishops. The emperor favoured that sect, and persecuted the orthodox or Nicæans, and exiled many of their bishops, among others Liberius, bishop of Rome. In the year 354, Constantius, having received repeated complaints of the cruelties and oppressions committed by Gallus in the east, sent for him and caused him to be beheaded in Dalmatia. Several conspiracies were also discovered or invented by the courtiers of Constantius, and numerous persons tortured and put to death. Meantime the Franks and the Alemanni had passed the Rhine, and destroyed Colonia (Cologne) and other towns; the Quadi and the Sarmatians were ravaging Pannonia, and the Persians attacked the eastern provinces. It was in this emergency that Constantius, being at Milan in November, 355, proclaimed his cousin Julian Cæsar, gave him his sister Helena in marriage, and sent him as commander to the Gauls. In the following year Constantius issued laws forbidding under pain of death any sacrifice to idols, and condemning to death all magicians, astrologers, and soothsayers. In 357 the emperor repaired to Rome for the first time, and was received with great pomp by the senate, and public festivals and games were celebrated in his honour. He caused the obelisk which Constantine had removed from Heliopolis to Alexandria, to be carried to Rome, where it was raised in the Circus Maximus: it was new called the Lateran Obelisk. Constantius having returned to the east, defeated the Sarmatians, while Julian conquered the Germans on the Rhine. He then marched against the Persians, but was unsuccessful. In the mean time Julian had been proclaimed emperor by the soldiers at Paris. Constantius was making preparations to attack him, when he was taken ill at Tarsus, and died, A.D. 361. On his death-bed he named Julian his successor. Constantius, though not a good prince, had yet some valuable qualities. He was cautious and discriminating in the appointment of his great officers; he took care of the soldiers; he bestowed office generally on the most deserving; was fond of science and application, was temperate, sober, slept little, and his habits were regular. But he was suspicious, and cruel in consequence of his suspicions. He oppressed the people with taxes, and spent much money in pomp, parade, and useless building. (Ammianus, b. xiv.)

CONSTANZ, also Costnitz, the capital of the Baden Circle of the Lake, is on the left or southern bank of that part of the lake of this name, where the Rhine begins to form the Untersee; in 47° 36′ N. lat., and 9° 10′ E. long. It is fortified in the old style, with a high wall flanked by towers and a broad ditch, besides bastions on the western side and the side of the lake. Kreuzlingen, one of its suburbs, separated from it by a ditch, is defended by two bastions; and Petershausen, which lies on the other side of the strait that connects the Bodensee and Untersee, is united to Constanz by a covered wooden bridge, on which there are grinding and sawing mills. In this last suburb is the castle of Petershausen, a fortress the works of which have been converted into pleasure grounds. There is a third suburb, called Paradise, in which Huss the reformer, and Jerome of Prague, his brother-reformer, were burnt, and which may now be termed the nursery grounds and orchard of Constanz. The most remarkable buildings in the town are the cathedral, which contains a magnificent high altar, some fine mosaic pavements, &c., and the church of St. Stephen; the antient Minorite or Dominican monastery, now a cotton factory, with the tower in which John Huss was confined; the Kaufhaus or mart, once a Carthusian monastery, built in 1388, which contains the hall where the council sat (1414-18), which deposed three popes, and condemned Huss and Jerome of Prague to the stake; the old Dominican monastery on the island of Genf, in which are the tomb and epitaph of Emanuel Chrysoloras, who died here in 1415, &c. Constanz is the seat of various official departments, and has a lyceum, gymnasium, hospital, and Dominican nunnery for the education of young females. It contains about 930 houses and 5600 inhabitants, a sad decrease since the fifteenth and sixteenth centuries, when the population was from 25,000 to 30,000. Indeed it is now a lonely deserted place, and the grass is growing in the streets. The chief occupations are trade, fisheries and navigation, the cultivation of vineyards and gardens, brewing, and some few manufactures. Constanz is one of the oldest towns in Germany, and previously to the fourth century bore the name of Gannodorum. [CONSTANTIUS I.] It was formerly a free imperial town, but fell under the ban of the empire in 1548, and in 1549 was annexed to Austria, which ceded it to Baden in 1810.

CONSTANZ, or **CONSTANCE**, a large lake, called also the Bodensee (from the antient castle of Bodmann) or the lake of Costnitz, forms part of the south-west boundary of Germany on the Swiss side, and is the common property of the several states on its banks, namely, Austria, Bavaria, Würtemberg, Baden, and Switzerland. It lies between 47° 28′ and 47° 48′ N. lat., and 9° 2′ and 9° 44′ E. long. It is 1283 feet above the level of the sea: its greatest length, from Bregenz to Bodmann, is about forty-five miles; its greatest breadth, between Rorshach and Friedrichshafen, is about thirteen miles, and its average depth is 320 feet, the greatest being 964. The entire lake occupies an area (exclusive of the islands) of about 199 square miles, of which about twenty-two belong to the Zellersee. It is divided into the Upper and Lower Lakes, of which the Upper, which is by far the most considerable, extends from Bregenz to Constanz. The Lower Lake is subdivided into Lake Zell or Zellersee, which is about sixty feet deep, contains the fertile island of Reichenau, belonging to Baden, and into what is properly called the Lower Lake (Untersee), through which the Rhine flows. The northernmost bight, which contains the island of Meinau, also belonging to Baden, and the island of Lindau, is called Lake Bodmer, or the Ueberlingersee. The Rhine enters the lake at Rheineck, and leaves it at Stein. Above fifty larger and smaller streams, such as the Bregenz, Schuszach, &c., empty themselves into Lake Constanz. It was frozen over in 1477, 1572, 1695, and 1830. It has on several occasions been subject to sudden risings of the waters. In 1549, according to Dr. Stein, it rose four or five times in one hour to the height of an ell, or upwards of two feet above its ordinary level; in 1770 it rose in one hour from twenty to twenty-four feet above the ordinary level. There is a considerable traffic on the lake in corn, timber, cattle, wine, fruit, &c., but it is rather dangerous, from being subject to sudden squalls; the navigation is besides impeded by the fall of the Rhine at Schaffhausen It contains seventy-three kinds of aquatic and marsh fowl, twenty of shell-fish, and twenty-six of fish, particularly salmon-trout, pikes, carp, and salmon; the latter however is not the true salmon, but the *Salmo murena.* The wine, called lake-wine, grown along the lake, is rough, but becomes excellent when old. The Lake of Constanz and its environs present the most varied and picturesque scenery in Germany. It is mentioned by antient writers under the name of Lacus Brigantinus; Pliny expressly assigns it to Rhætia; others reckon it part of Vindilicia. It bore other names, such as Rheni Lacus, Suevicus L., in addition to Brigantinus L., from the Brigantii who dwelt on its banks. Tiberius built a fleet on it in order to attack the Vindilici. (Strabo, vii. 292.)

CONSTELLATION (a putting together of stars), the name of one of those groups of stars into which the whole heavens are divided, and to each of which is imagined to belong the figure of a man, an animal, or some other object, natural or artificial.

The history of the constellations is a matter of mythological antiquity, the most curious features of which are connected with the twelve signs or constellations of the ZODIAC, or the sun's apparent yearly track. It is sufficient for us here to say, that it is certain we derive our constellations for the most part from the Greeks, and that it is nearly as certain that they derived them from the East, though it is highly probable that they altered the legends to suit their own mythology, and in some instances even the figures. Their firmament, if it confined itself to recording the vast and striking events of their mythic system, as in Argo or Hercules, might bear an external presumption of originality, which it wants altogether while so prominent a constellation as the Great Bear represents nothing but the unimportant and irrelevant story of Callisto. But while we are just in possession of sufficient knowledge to deny the original formation of the constellations to the Greeks, and perhaps even to the Egyptians, we have not enough to say in what nation they were first constructed.

The method of figuring the constellations, though in many instances it gives groups which are striking to the naked eye, is one of the worst which could have been invented for the modern purposes of astronomy. A dragon winding round three-quarters of the globe, and a man extending his arms and legs between half a dozen other figures, cannot connect their included stars in any manner which will lead to useful combinations. So that in our modern catalogues, though λ Draconis and *z* Draconis are said to be in the same constellation, the connection is purely one of names, and suggests no ideas of relative position. There are even instances in which stars bearing the name of one constellation are situated in another.

We shall proceed to describe the methods by which the stars in a constellation are distinguished, and the plan we have adopted in the present work. The letters of Bayer are generally adopted for all the stars in his maps. The stars were ranged by him in order of brilliancy, as they appeared to the naked eye about A.D. 1600. The Greek letters were first used, and afterwards the Italic small letters. Thus α is the most brilliant star in a constellation according to Bayer, while *p*, *q*, &c. are comparatively faint. Other astronomers have since carried on the lettering of Bayer, and we have latterly (in this work) distinguished the letters added since Bayer's time by parentheses in all those constellations which were partly lettered by Bayer and partly by others. But in all cases the extent of Bayer's letters may be ascertained by reference to the article headed by his name. The letters had been adopted, however, previously to Bayer. [PICCOLOMINI.]

The next step in the arrangement was that of Flamsteed, who retained the old method of describing stars by their situation in the figure of the constellation (as in the leg, in the head, &c.), but placed the stars of each constellation in order of right ascension, or in the order in which they come on the meridian. Succeeding astronomers described each star by the number which it stood from the beginning in the constellation, and called it Flamsteed's number. Thus 7 Draconis means that star of Draco which comes on the meridian the seventh of all the stars observed by Flamsteed in that constellation. Mr. Baily, in his new edition of the British Catalogue, has introduced new stars from Flamsteed's papers, but has allowed them to stand without disturbing the established numbering, and they are easily identified by the general numbering of the new catalogue. Thus, there is a star in Capricornus between 12 Capr. and 13 Capr., which may be described as 2786 of Mr. Baily's edition, that is, the 2786th from the equinox of 1690 of *all* the stars observed by Flamsteed, both of those which are in the British Catalogue of A.D. 1725 and those which have been since drawn from Flamsteed's papers.

The numbering of Piazzi is on a different and inferior principle. The whole heavens being divided into twenty-four hours of right ascension, the stars are numbered in their respective hours of right ascension. For instance, (303) Can. Maj. is, according to Piazzi, a star in Canis Major, not the 303rd of that constellation, but the 303rd of the hour of right ascension in which it fell in the year 1800, counting the first star of the catalogue which passed after the sidereal clock had marked the hour as 1, the second star as 2, &c., and affixing to each the name of the constellation in which it is. If the equinox were fixed, this method would be a good first correction of the vagaries of the constellations; but as it is, some stars which were in one hour of right ascension when Piazzi formed his catalogue are now in another, such as 12 Cancri, 15 Argus, &c., which were in 1830 on the borders of the 7-8 hour of right ascension.

In most other catalogues, such as those of Bradley, Lacaille, Mayer, Fallows, &c., the stars are usually numbered in their order from the beginning of the catalogue, the order being that of right ascension.

The Astronomical Society's Catalogue (published in 1827) is the basis of the enumeration of stars contained in this work. It professes to be a reduction to the year 1830 of all the stars of the following description which were observed by Flamsteed, Bradley, Lacaille, Mayer, Piazzi, and Zach; to which a few of Fallows' additions to Lacaille are joined. The whole list contains—

1. All the stars to the *fifth* magnitude inclusive, wheresoever situated.
2. All the stars to the *sixth* magnitude inclusive, situated within 30° of the equator.
3. All the stars to the *seventh* magnitude inclusive, situated within 10° of the ecliptic.

Bayer's letters and Flamsteed's numbers are both given where they exist. Where these are not found, *Piazzi's* numbers are given in *parentheses*, ( ), and where these are not found, *Bradley's* numbers in *brackets*, [ ]. Failing all these, we see Zach's numbers (with Z annexed) or Lacaille's (with C), or Fallow's (with Fa.) All Mayer's stars (some excepted, which have not been found again) are in Piazzi. The number in the catalogue itself (reckoning from the beginning) is in a separate column. The magnitudes are from Mr. Baily's Flamsteed so far as they go, and where that fails, from the catalogue.

The recognised makers of constellations are Aratus, Ptolemy, Bayer, Hevelius, and Lacaille. But Tycho Brahé, Lemonnier, and Poczobut have each added one constellation in the following list, and Halley two. The names without any letter are all in Aratus. (Remember, however, that Libra is only the *claws* of the Scorpion, both in Aratus and Ptolemy.) [LIBRA.] Three additional ones in Ptolemy's Catalogue are denoted by P.; Bayer's by B.; Hevelius's by H.; Lacaille's by L.; Tycho Brahé's by T.; Halley's by Ha; Lemonnier's by Le.; and Poczobut's by Po.

Andromeda.
Antlia Pneumatica, L.
Apparatus Sculptoris, L.
Apus[*], B.
Aquarius.
Aquila.
Ara.
Argo.
Aries.
Auriga.
Bootes.
Cælum Scalptoris, L.
Camelopardalis, H.
Cancer.
Canes Venatici, H.
Canis Major.
Canis Minor, P.
Capricornus.
Cassiopeia.
Centaurus.
Cepheus.
Cetus.
Chamæleon, B.
Circinus, L.
Clypeus Sobieski, H.
Columba, Ha.
Coma Berenices, T.
Corona Australis, P.
Corona Borealis.
Corvus.
Crux, Ha., or by Royer, from Halley's observations.
Cygnus.
Delphinus.
Dorado, B.
Draco.
Equuleus, P.
Equuleus Pictoris, L.
Eridanus.
Fornax, L.
Gemini.
Grus, B.
Hercules.
Horologium, L.
Hydra.
Hydra et Crater[†].
Hydrus, B.
Indus, B.
Lacerta, H.
Leo.
Leo Minor, H.
Lepus.
Libra.
Lupus.
Lynx, H.
Lyra.
Microscopium, L.
Monoceros, H.
Musca[‡], B.
Norma, L.
Octans, L.
Ophiuchus.
Orion.
Pavo, B.
Pegasus.
Perseus.
Phenix, B.
Pisces.
Piscis Australis.
Piscis Volans, B.
Pixis Nautica, L.
Reticulus, L.
Sagitta[§].
Sagittarius.
Scorpius.
Serpens.
Sextans, H.
Solitarius, Le.
Taurus.
Taurus Poniatowski, Po.
Telescopium, L.
Triangula[‖].
Triangulum Australe, B.
Tucan, B.
Ursa Major.
Ursa Minor.
Virgo.
Vulpecula (et Anser), H.

There are many other constellations formed by different individuals; but these are not now generally admitted. Such are the Antinous of Tycho Brahé; the Mons Mænalus and Cerberus of Hevelius; the Oak of Charles II. and the Cor Caroli of Halley; the Table Mountain and the Nubecula Major and Minor of Lacaille (the latter being not clusters of distinct stars, but large nebulæ); the Reindeer of Lemonnier; the Reaper of Lalande; the Honours of Frederic, the Sceptre of Brandenburgh, Herschel's Telescope, the Balloon, the Mural Quadrant, the Cat, and the Log Line of Bode; and George's Harp of Hell. Many others, we believe, have been proposed, but there would be little use in reviving their names. In fact, half a century ago, no astronomer seemed comfortable in his position till he had ornamented some little cluster of stars of his own picking with a name of his own making.

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[*] The Avis Indica of Bayer. [Correct *Apis* Indica in BAYER.]

[†] Crater is a separate constellation in Ptolemy. The neighbouring stars on the body of Hydra were considered by Flamsteed as part of this constellation.

[‡] This is the Apis of Bayer, called Musca by Lacaille: there is however a constellation Musca, formed by Bode, we believe, and situated close to Aries the stars of which are usually considered as belonging to Aries.

[§] A part of Aquila in Aratus.

[‖] Only one in Aratus and Ptolemy. Another added by Hevelius.

In the large maps of the stars, published by the Society for the Diffusion of Useful Knowledge, the constellations are figured precisely as described by Ptolemy, and the additional ones are not drawn, which will therefore render them useful to the readers of Greek astronomical works.

CONSTIPATION, an undue retention or an imperfect evacuation of the fæces. The alimentary canal, considered physiologically, may be divided into two portions; one appropriated to the conversion of the aliment into nutriment, and the other appropriated, among other functions, to the separation and discharge of the refuse matter of the aliment. The first constitutes the apparatus of digestion, and the second that of fæcation. Independently of the organs appropriated to the performance of the preparatory operations of prehension, mastication, insalivation, and deglutition, the apparatus proper to digestion consists of the stomach, the duodenum or the second stomach, the jejunum, and the ileum, the three latter portions of the alimentary canal forming the small intestines. It is in these great digestive chambers that the processes of chymification and chylification are performed; processes by which the multifarious substances taken as food are converted into an homogeneous substance analogous in its composition to the blood. The requisite changes on the food are effected partly by secretions formed by the walls of the digestive chambers themselves, and partly by secretions elaborated by distinct organs and conveyed into the digestive chambers by separate tubes. These auxiliary organs are the pancreas and the liver, the fluids secreted by which perform a most important part in the function of digestion. The chyle, the ultimate result of the action of these digestive fluids, is absorbed, as it is formed, by a set of vessels termed the lacteals, spread out upon the walls more especially of the jejunum and ileum, upon the surface of which they take their origin by open mouths.

But a considerable portion of the substances taken as food is incapable of being converted into chyle: this is separated from the chyle partly in the duodenum, and still more perfectly in the jejunum and ileum, as it flows over the walls of these extended chambers. Moreover, a considerable portion of the digestive fluids themselves does not enter into the composition of the chyle, but is separated from it and mixed with the refuse matter of the food. Again, the whole extent of the alimentary canal, from its commencement to its termination, is lined with a membrane which secretes a peculiar fluid, termed mucus. This fluid, which defends the delicate and sensitive vessels that are crowded on every point of the digestive chambers, and which maintains those chambers in a state of suppleness and moisture, is constantly formed, removed, and renewed. That portion of it which has served its office, and which has become effete, is mixed with the refuse matter of the aliment and of the digestive fluids. All these substances mixed together in a common mass are transmitted to the second portion of the alimentary canal, which consists of the large intestines; namely, the cæcum, the colon, and the rectum, by the operation of which the second part of the digestive function, that termed fæcation, is performed. This function consists of two processes; first, of that by which the common mass of excrementitious substances is brought into a state fit for its discharge from the body; and secondly, of that by which a force is generated adequate to effect its discharge. The chief agent by which these substances are brought into a state fit for their discharge is the bile. [BILE.] The agent by which their actual discharge is effected is the muscular coat of the intestines, which is excited to contraction, and thereby to the generation of the force requisite to the accomplishment of the object, by the stimulus of the bile.

It is obvious, then, that the matters to be discharged from the alimentary canal do not consist, as is vulgarly supposed, merely of the refuse portion of the food; this constitutes only a small part of those matters; an essential part of it consists of the refuse matter of secretions which have performed most important offices in the economy.

There is manifest in the performance of certain functions of the body a tendency to periodicity. The most remarkable of these are the return, at regular periods, of the necessity for sleep, of the appetite for food, and of the command to remove from the body the excrementitious matters prepared in the alimentary canal. Whatever may have first led to the formation of these habits, and however they may be varied by circumstances which operate at an early period of life, they cannot, after having been once formed, be materially and frequently interrupted, without danger to the health. The interruption of one of these habits by the retention of the fæces beyond a determinate period, namely, the period of twenty-four hours, constitutes the disease termed constipation, a disease often disregarded, generally considered of little importance, always productive of mischief, and very frequently terminating in a fatal result.

The slighter degrees of constipation, when, as is sometimes the case, they are attended with no appreciable disturbance of any function, can scarcely be considered as morbid; but, in general, a retention of the fæces beyond the period of twenty-four hours, is attended with manifest disorder. This disorder is commonly increased in proportion as the retention is protracted beyond that determinate period, and in proportion to the frequency with which such retention recurs. The amount of the disorder thus induced is however a good deal influenced by constitutional peculiarity; for there are individuals whose fæcal evacuations are not more frequent than once a week, or once a fortnight, or even once in three weeks. Such an habitual retention of the fæces, in the few cases in which it occurs, generally happens in females who lead a sedentary life, and who take little food and less exercise.

It may be sometimes difficult to connect any distinct disorder with this torpid action of the apparatus of fæcation; yet the health of the persons in whom it occurs is seldom sound, and never robust. Even in the still more extraordinary cases of constipation (and the details of many such cases are recorded in the annals of medicine), in which persons have gone five, six, seven weeks, and even, as is stated, as many months without a single fæcal evacuation, no manifest, at least no decided, injury to the health appeared to result for some time; but sooner or later, in almost every case, the enormously distended intestines became suddenly inflamed, and death followed with great rapidity. Two remarkable instances of this are on record, which it may be instructive to relate. A young female who never had more than one evacuation every two months during a period of five years, and who enjoyed good health during all that time, at length went on for the space of seven months without passing a single fæcal evacuation. Notwithstanding this extraordinary retention of the fæces, her health did not appear materially to suffer, until at last inflammation suddenly came on, which rapidly terminated life. Mr. G——, a medical officer in the French service had always been costive from birth. He ate largely, but seldom passed a stool oftener than once in one or two months, and his abdomen assumed a large size. At the age of 42 his constipation was unusually prolonged to three or four months. In 1806, after medicines had been taken to procure a stool, which had not been passed for upwards of four months, abundant evacuations continued for nine days, and contained the stones of raisins taken a twelvemonth before; but the constipation returned. In 1809 the enlarged abdomen became painful, vomiting supervened, and he died at the age of 54, having seldom through life passed more than four, five, or six stools in the year.

These are the extreme cases of constipation; and they show the ordinary result that takes place when the unnatural distension of the intestine is brought on in the most gradual manner, and when the organ seems to be habitually accustomed to it; that is, when its extreme torpor seems to be, in the strictest sense in which such a term can be employed, constitutional. Of course when such a state of torpor comes on, in a system not habituated to it from an early period of life, the danger is increased a hundred-fold.

The immediate effects of constipation, when this disease occurs in its usual degree, in ordinary habits, is the production of some one or more of those painful states, the signs of which are generally grouped together under the common name of dyspepsia. There is disordered appetite, which is either deficient, capricious, or voracious; a dry, coated, or clammy tongue; thirst, or some disagreeable taste in the mouth; dulness, heaviness, confusion, giddiness, or pain in the head; physical and mental torpor; dry and hot skin; and last, though not least, an irritable temper, and a capricious or a desponding mind.

The remote effects of constipation are far more numerous and serious than is commonly understood. It is impossible to enter into a full detail of them in this place. But among the most obvious may be mentioned, the origin of various diseases of the skin. Between the internal covering of the body, a principal part of which consists of the membrane which lines the inner surface of the alimentary canal, and the external covering of the body, or the skin, as there is a close relation in structure, so there is a most intimate sympathy. Pimples, blotches, eruptions, unsightly and painful, of various forms and names, have their origin in an irritation excited and maintained in the alimentary canal by fæcal retention. When the fæcal matters are retained beyond a certain period they undergo chemical changes, by which their nature, originally irritating and noxious, becomes far more acrid than in a healthy state, and in extreme cases almost poisonous to the system. There is abundant evidence that these acrid and poisonous matters are absorbed from the surface of the intestines, and carried into the blood, which they corrupt, and to which they give irritating properties. The taint thus communicated to the blood is manifest in the vitiated nature of all the excretions eliminated from it and expelled from the body, and in the corrupted condition of many of the secretions formed from it, and retained in the system; but more especially in the exhalation from the lungs and bronchi, constituting a fetid breath, and in the perspiration from the skin, forming a fetid atmosphere around the body. It is observed by Dr. Copland, that in almost every instance in which the fæces are retained four, six, eight, or ten days, the breath is loaded with an offensive vapour, or the perspiration is abundant and disagreeable, or the urine is copious and unusually loaded; and that it is thus manifest that the disorder is connected with a rapid absorption from the alimentary canal, and with an augmented evacuation by the other excretory surfaces and organs. Now, as one of the principal emunctories by which the blood endeavours to get rid of the acrid matter with which it is loaded is the skin, so the skin is one of the first organs to suffer from the irritating matter brought to it to be discharged. Hence the dirty, dull, doughy, dusky, sallow colour of the skin, giving rise to a more than sufficient variety of bad complexions, so strikingly in contrast with the fresh and bright and glowing colour of the skin where pure blood, in natural quantity and with natural velocity, circulates through it. Hence the irritating and painful eruptions which constitute a large portion of the long catalogue of cutaneous diseases that disfigure the body; and hence the numerous, and even dangerous, cutaneous diseases to which children especially are subject, in consequence of the irritation excited in their acutely sensible alimentary canal, by improper articles of diet, taken in improper quantities.

Moreover, headache and giddiness existing as severe and permanent affections, and the distinct diseases called colic [Colic], chorea [Chorea], epilepsy, chlorosis, hysteria, hæmorrhoids, and many others, have their most frequent origin in an habitual and protracted retention of the fæces.

The usual termination of constipation when severe, frequent, and obstinate, is, as has been stated, in inflammation of the intestines, which commonly assumes the form either of ilius [Ilius] or enteritis [Enteritis], and which rapidly proves fatal.

There is, without doubt, a greater tendency to constipation in some temperaments than in others; in the melancholic, for example, than in the sanguineous, and in certain individual peculiarities of constitution. But this tendency would appear to be capable of being superinduced by the habitual use of certain kinds of indigestible food; such as imperfectly fermented bread, heavy pastry, as dumplings, &c.; indigestible vegetables, as cucumbers, melons, &c. The tendency thus superinduced may be greatly increased by the use of astringent and stimulating beverages, sedentary habits, long indulgence in sleep, &c. The immediate causes of constipation are, 1. an impaired or torpid action of the liver, in consequence of which there is either a deficient or a vitiated secretion of bile. It has been stated that one portion of the bile [Bile] mixes as an essential constituent with the chyle, by which the nutritive part of the food is assimilated to the constitution of the blood; the other portion of the bile consists of excrementitious matter, principally of a resinous nature. It is this resinous portion of the bile that constitutes the proper stimulus to the colon and rectum, whose office it is, by the contraction of the fibres which form their muscular coat, to remove the fæcal matters from the body. A certain change in the quantity or quality of the bile must therefore necessarily diminish the action of these organs, by depriving them of the stimulus on which their action mainly depends. 2. Torpor of the muscular coat of the alimentary canal itself, and more especially of that portion of it which constitutes the large intestines. 3. The production and accumulation of flatus in these organs, by which their thin parieties are distended, and even a mechanical obstacle is afforded to the passage of the fæces.

The treatment of constipation should always have in view two objects:—1. the immediate removal of the impacted fæces; and 2. the change of the pathological condition of the system in general, or of the alimentary canal in particular, on which the fæcal retention depends.

The choice of the particular remedies adopted for the immediate removal of the retained fæces is often a matter of the last importance. The coats of the intestines are already in a state of preternatual distension; they have lost in a great degree their vital power; they have a peculiar tendency to lapse, from the operation of slight causes, into the state of inflammation. All purgative medicines are irritants, and the most active are powerful irritants. If the purgative employed be of a highly acrid nature, it may excite inflammation in the intestines, by the very stimulus by which it removes the retention of the fæces; but if it irritate the intestines, without overcoming the obstruction, it will be still more likely to induce ilius or enteritis. Only the milder purgatives should therefore be employed; and in general the more protracted the retention, the less irritating should be the purgative selected to remove it. The various preparations of aloes, senna, and castor oil, combined with a narcotic, as hyoscyamus, to lessen the irritation sometimes excited even by these gentle aperients, are the safest remedies; and fortunately, when judiciously combined, alternated, and repeated, they are generally effectual. In the slighter and more ordinary cases of constipation, from three to five grains of the blue pill, with from five to ten grains of the compound gamboge, or aloetic pills, taken at bed-time, followed by a draught in the morning, consisting of equal quantities (about an ounce) of the compound infusions of senna and gentian, or about the same quantity of the compound decoction of aloes, and these doses repeated about twice a week, are all the medicines required. The remedies most appropriate for the removal of habitual and protracted constipation can be discovered only by the detection of the exact pathological condition on which the retention depends. This should be investigated with the utmost care; and when ascertained, the particular medicines, and the form of exhibiting them best adapted to the case, will be sufficiently obvious. But medicines alone, though the most judiciously chosen, and producing the best effects, will accomplish but little. The general management must co-operate with the medical treatment. There must be the strictest attention to regimen, including under this term all the known means of putting and keeping the body in general, and the disordered organ in particular, in a state of the most perfect health and vigour; namely, diet, exercise physical and mental, pure air, retirement to rest at regular and early hours, with a moderate, and only a moderate, quantity of sleep, &c. (Copland's *Dictionary of Practical Medicine*, and Southwood Smith's *Philosophy of Health.*)

CONSTITUTION, a term often used by persons at the present day without any precise notion of what it means. Such a definition of a constitution, if it were offered as one, might be defended as equally good with many other definitions or descriptions which are involved in the terms used whenever a constitution is spoken of.

The constitutions which are most frequently mentioned are the English constitution, the constitution of the several states composing the North American union, the federal constitution, by which these same states are bound together, and various constitutions of the European continent, which have hardly been permanent enough to be submitted to an accurate investigation.

The *vague* notion of a constitution is that of certain fundamental rules or laws by which the general form of administration in a given country is regulated, and in opposition to which no other fundamental rules or laws, or any rules or laws, can or ought to be made.

The *exact* notion of a constitution cannot be obtained without first obtaining a notion of sovereign power. The sovereign power in any state is that power from which all laws properly so called proceed; it is that power which commands and can enforce obedience. Such a power, being sovereign or supreme, is subject to no other power, and cannot therefore be bound by any rules laid down, either by those who have at any previous time enjoyed the sovereign power in the same community, or by any maxims or rules of conduct practised or recommended by its predecessors in power, whether those rules or maxims be merely a matter of long usage or solemnly recorded in any written instrument. The sovereign power for the time is supreme, and can make what laws it pleases without doing any illegal act, and, strictly speaking, also, without doing any unconstitutional act. For this word constitution, taken in its strongest sense, can never mean more than a law made or a usage sanctioned by some one or more possessed of sovereign power, which law or usage has for many generations been observed by all those who have successively held the sovereign power in the same country. To modify or destroy such a rule or law might be unwise, as being an act in opposition to that which many successive generations had found to be a wise and useful law; it might be dangerous as being opposed to that to which the prejudices of many generations had given their sanction; and it might lead to resistance on the part of the governed, if either their own interest or their passions were strong enough to lead them to risk a contest with the sovereign power. If (as would generally be admitted) the assembled parliament of Great Britain and Ireland possess the sovereign power, there is no act which they could do which would be illegal, as every body must admit: and further, there is no possible act which they could do which would be unconstitutional, for such act would be no more than repealing some law or usage having the force of law which the mass of the nation regarded with more than usual veneration, or enacting something at variance with such law or usage. For example, if the next assembled parliament should abolish the trial by jury in all cases, except criminal matters, or where the crown is the prosecutor, such an act might be called by some illegal, unconstitutional, and unwise. But it would not be called illegal by any person who had fully examined into the meaning of the word law; it would not be called unconstitutional by any man who, having called it illegal, wished to be consistent with himself: it could only properly be called wise or unwise by those who had reflected sufficiently on the nature of the institution and its operations to know whether such a modification would do more good or harm.

The words constitution and unconstitutional appear to be only strictly applicable to such a case as the following; where the sovereign power being invested in one, or two, or five hundred, or all the males of an independent political community who are above a certain age, or in any other number in such a community, lays down certain rules to regulate the conduct of those to whom the sovereign power intrusts the legislative functions. Such are the Constitutions of the several states composing the North American Union, and such is the Constitution of the Federation of these several states. In these several states the people, in the mass, and as a general rule, are the sovereign. The people assembled by their delegates, named for that especial purpose, have framed the existing Constitutions; and they change the same Constitutions in the same way whenever the majority of the people, that is, when the sovereign, chooses to make such change.

These Constitutions lay down certain rules, according to which the legislative, executive, and judicial functionaries must be chosen; they fix limits to their several powers, both with respect to one another, and with respect to the individuals who compose the sovereign. 'They do ordain and declare the future form of government. For example, the Constitution of Virginia of 1776, declares 'that all ministers of the Gospel of every denomination shall be incapable of being elected members of either House of Assembly, or of the Privy Council.' The same rule, we believe, forms a part of the recently amended Constitution of the same state. If the Virginia legislature were to pass an act to enable clergymen to become members of the House of Assembly or of the Privy Council, such an act would be unconstitutional, and no one would be bound to obey it. The judiciary, if such a matter came before it, would, in the discharge of its duty, declare it unconstitutional, and such so-called law could have no further effect than if any unauthorized body of men had made the rule.

A constitution then is nothing more than an act of the sovereign power, by which it delegates a part of its authority to certain persons, or to a body, to be chosen in a way prescribed by Act of Constitution, which at the same time fixes in a general way the powers of the body to which a part of the sovereign power is thus delegated. And the sovereign power changes this Constitution whenever it pleases, and in doing so acts neither constitutionally nor unconstitutionally, but simply exercises its sovereign power. No body can act unconstitutionally but a body which has received authority from a higher power, and acts contrary to the terms which fix that authority. Wherever then there is a sovereign power, consisting either of one, as the Autocrat of Russia, of three members, king, lords, and commons, as in England (provided these three members do possess the complete sovereign power), or of all the males born of American citizens and of a given age, as in most of the United States of North America—such sovereign power cannot act unconstitutionally. For to act unconstitutionally would be to act against a rule imposed by some superior authority, which would be a contradiction.

The policy of having a constitution in a state where the sovereign power is in the hands of the community, may be defended on general grounds of convenience. When the community have settled that certain fundamental maxims are right, it is a saving of time and trouble to exclude the discussion of all such matters from the functions of those to whom they have by the constitution intrusted legislative power. Such fundamental rules also present a barrier to any sudden and violent assumption of undue authority either by the legislative or executive, and oblige them, as we see in the actual workings of constitutions, to obtain their object by other means, which, if not less dangerous in the end, are more slow in their operation, and thus can be detected and are exposed to be defeated by similar means put in action by the opposing party. There are disadvantages also in such an arrangement. Constitutional rules when once fixed are not easily changed; and the legislative body when once established, though theoretically, and in fact too, under the sovereign controul, often finds means to elude the vigilance and defeat the wishes of the body to which it owes its existence, and from which it derives its power. One of the great means by which these ends are effected is the interpretation of the written instrument or constitution, which is the warrant for their powers. The practice of torturing the words of all written law, till in effect the law or rule is made to express the contrary of what seemed to be at first intended, appears to be deeply implanted in the English race, and in those of their descendants, who have established constitutional forms on the other side of the Atlantic. The value of all written instruments, whether called constitutions or not, seems considerably impaired by this peculiar aptitude to construe words which once seemed to have one plain meaning only, so that they shall mean any thing which the actual circumstances may require, or may seem to require.

It is beside our purpose to discuss the advantage of a Constitution in a community where the sovereign is one. Being supreme, the sovereign may change the Constitution when he pleases. It may be said that if the Constitution is good, and has been allowed to stand by several successive possessors of the sovereign power, it obtains an apparent prescriptive authority, which is the more binding on the sovereign, as the mass of the nation habitually regard the same Constitution as something which even the sovereign cannot touch with impunity. It would shock common prejudice if the actual sovereign were to violate that which has been sanctioned by his predecessors, and is recommended by an apparently higher antiquity than the power which, in the actual sovereign's hands, appears to be of more recent birth. The precise meaning of what is called the English Constitution must be got from the various writers who have made its origin and progress their study. In reading them it may not be amiss to bear in mind that the word Constitution, as used by them, has not the exact, but the vague meaning as explained above.

For the nature of a Federal Government, which necessarily implies the notion of a Constitution, see FEDERATION.

CONSTITUTIONS, APOSTOLICAL or CLEMENTINE, are a code of regulations, attributed by some ecclesiastical writers to the Apostles, and said to have been collected by Clemens Romanus. The collection consists of eight books, containing a great many precepts and rules concerning the discipline, doctrine, and ceremonies of the church.

Besides the gospels, epistles, and apocalypse, which now compose the volume of the 'New Testament,' there were, in the earliest ages of Christianity, numerous writings bearing the name of the Apostles and apostolical men, of which some are extant at the present time; and it is generally considered that two among the first in order of time are the eight books of Apostolical or Clementine canons, and the Constitutions which are the subject of the present article. That the latter once constituted a part of the New Testament is evident from the last of the apostolical canons, which states that 'The holy and venerable Bible consists of the Old Testament (of which the several constituent books are enumerated) and the New Testament, which consists of the gospels of Matthew, Mark, Luke, and John; 14 epistles of Paul; 2 of Peter; 3 of John; 1 of James; 1 of Jude; 2 of Clement, and the *Constitutions* for you that are bishops, published by me Clement in 8 books, which are not to be divulged to all, because of the mystical things contained in them; and the Acts of the Apostles.' (Labbei, *Collect. Concil.*, tom i.) One of the epistles of Clement and part of the other which is attributed to him, are included in the ALEXANDRINE MS. Epiphanius (A.D. 400) cites the Constitutions not only as the work of an honest Catholic Christian, but as the divine word and doctrine; yet in his catalogue of canonical books they are not included, and it is contended that the Constitutions now extant are not identical with those from which Epiphanius cited.

The authenticity and date of this work have been a subject of much learned contention; and though by far the greater number of critics have pronounced it to be a pseudonymous compilation, made in the third or fourth century, there have been some who support the opinion of its apostolical origin.

Those who wish to examine the state of the evidence will find in the following works, and in various others to which they refer, some useful assistance. Turrianus, who argues for the authenticity of the Constitutions, in his five books Adversus Magdeburgenses, adduces many passages from Tertullian, Ignatius, Justinus, and others, as instances of quotation from them. To this Revetus replies (Criticus Sacer, p. 115, et seq.), that since these fathers say nothing of the Constitutions by name, it is just as likely that the Constitutions are compiled from the fathers as that the fathers quoted from the Constitutions. Scultetus, another opponent of Turrian, gives, in replying to him, a full analysis of all the books of the Constitutions in his Medulla Patrum, l. ii., c. 5. Cottelerius (Apparatus Patrum Apostolicorum, tom i.) declares them to be apocryphal and pseudepigraphical, and the production neither of the Apostles nor of Clement. Tillemont expresses a similar opinion. Dallæus (in Pseudipigraphis Apostolicis, lib. iii.) dates them subsequent to the council of Nice, in A.D. 325. Le Clerc (Bibliotheca) assigns their origin to some Arian in the 4th century, in which he is followed by Robert Turner in 'A Discourse on the Pretended Constitutions,' which regards them as a compilation from numerous Constitutions, canons, travels, traditions, and liturgies, ascribed to the apostles. Bishop Pearson (On the Creed,) supposes them to have been compiled from others which were attributed to Clement, Ignatius, Hippolytus, and others; but altered and interpolated since the time of Epiphanius. Archbishops Wake and Usher, the former in 'Genuine Epistles of the Fathers,' p. 105; the latter in 'Dissert. ad Ignatium,' p. 2, consider them as apocryphal and pseudonymous; but Whiston, regardless of all such opinions, contends with great learning and warmth, in his 'Vindication of the Constitutions,' 8vo., 1715, that they are quite as authentic as the writings of the New Testament, were dictated by the Apostles and written from their mouths by Clement, and that they contain a good scheme of (Arian) faith, and form a valuable supplement to the New Testament. The Constitutions are given in the great collection of Councils by Labbe, tom. i.; in the several Bibliothecæ Patrum; in Cottelerii S.S. Patrum Opera Vera et Suppositicia. (See also Bishop Beveridge, *Codex Canonum Eccles. Primitivæ vindicatus et illustratus*; Gerhard, *Hist. Juris Eccles.*, num. 122; Hoffmanni, *Lexicon*; Lardner's *Credibility*, vol. iv., p. 320-354; Lenglet, *Tab. Chronol.*, tom. ii., p. 212; Jortin's *Remarks on Eccles. Hist.*, vol. i., p. 228.)

CONSTITUTIONS, ROMAN. The word constitutio (from constituere, *i.e.*, to set up, to establish), signifies any disposition or appointment; for example, in D. iv. 2, l. 9, § 3, a decree of the prætor is called constitutio. The decrees and decisions of Roman emperors are also called constitutiones; and, according to Gaius (i. 5), an imperial constitution is what the emperor declares by a decree, or an edict, or a letter. That modern signification of the term, which denotes the fundamental law of a state, was not in use among the Romans; yet Cicero (*de Republica*, i. 45) employs the word to express a similar notion.

During the republic the Roman law was made or developed by decrees of the people in the comitia (leges and plebiscita), by decrees of the senate, and by the edicts of various magistrates, as the prætors and ædiles. [ROMAN LAW.] After the great internal change and revolutions had taken place in the Roman state, and Augustus had united in himself the powers of all the branches of government, with the direction of the senate, and of the assemblies of the people, the imperial power was firmly established. The emperor not only had the right of issuing edicts, as the magistrates of the republic had done, but he could propose and make entirely new laws. Propositions of laws from the emperor to the senate were called orationes principum. Thus arose the imperial constitutions, with the supremacy of Augustus. But as the arbitrary acts of Sulla, Pompeius, and Julius Cæsar, were ratified and confirmed by the people, both in their lifetime and after their death, this may be considered as the beginning of the system of constitutions. As the institutions of the republic only gradually merged into the imperial autocracy, the voice of the people in the comitia and the decrees of the senate were still respected in form, though not in substance. But after A.D. 24, during the reign of Tiberius, the legislation of the people, and 200 years later, the decrees of the senate also, totally ceased. From that æra laws were made only by the emperors; and from the time of Constantine the Great, the constitutions were properly called leges novæ, or new laws.

The imperial constitutions occur under different denominations; as edicta (leges edictales), or decrees addressed to and binding on all Roman subjects; decreta or rescripta, which are decisions in particular cases, upon questions proposed to the emperor by public functionaries or private persons; these decisions also were universally binding. We find the terms epistolæ also used, when the decisions were answers to magistrates, and literæ when given in reply to private persons. Important single constitutions were often called, from the emperor who made them, 'lex Anastasiana.'

In course of time the number of these constitutions became so great, that to prevent confusion collections were made, and called codes. The first collections made by private persons were the codices Gregoriani and Hermogeniani, of which we know very little; it being even uncertain if they were two separate codes or only one. Yet it seems that the first collector was Gregorius, and that Hermogenes continued the work. Opinions vary also as to the time when these compilers lived. Their collections, which contained the constitutions from the time of Hadrian to Diocletian, are lost, and we have only some fragments, which were first edited by Jac. Sichardus (Basil, 1528, fol.), together with the Codex Theodosianus. The fragments are in Schulting's 'Jurisprud. Vet. Antejust.,' Lugd. Bat. 1712, and in the 'Jus Civile Antejust.,' Berol. 1815.

Another and more important collection was made under the reign of Theodosius II., by public authority. The emperor having nominated, in the year 435, a commission of sixteen persons, under the direction of Antiochus, for the purpose of collecting the constitutions from the time of Constantine the Great, three years afterwards (A.D. 438), the new code, called Codex Theodosianus, was confirmed by the emperor, and published in the eastern empire. It contains sixteen books, divided into titles, in which the separate constitutions are arranged, according to their subject-matter, in such a way that many of them are subdivided. Some additions, called novellæ, were afterwards made to the collection of Theodosius. The first five books were lost, but some parts of them have been recently discovered at Milan, by Clossius (Clossii 'Theodos. Codic. Genuin. Fragmenta,' Tüb. 1824); and at Turin, by Peyron, ('Codic. Theodos. Fragm. Ined.,' Tur., 1823-4.) The best edition of the Theodosian Code is that by Jac. Gothofredus, tom. vi., Lugd., 1665, who also wrote an excellent commentary on it, which was published, together with the text, by Ritter, Leipzig, 1736-54.

In the year 506, Alaric II. made an abridgement of the Theodosian Code, adding to it the excerpts from the codices Gregoriani and Hermogeniani, and of the works of the Roman lawyers Gaius and Paulus, for the use of the Romans then living in the empire of the Visigoths: the collection is called 'Breviarium Alaricianum.'

The last and most important collection of Roman constitutions was made by the order of Justinian. [Justinian's Legislation.]

CONSTRUCTION (geometry), all formation of lines, figures, &c., which is not absolutely implied in the hypothesis of the problem or theorem in question. Thus, in the proof of the theorem, 'the square on the hypothenuse of a right angled triangle is equal to the sum of the squares on the sides,' the formation of the right-angled triangle and of the squares is not technically considered as part of the construction, the latter term being only used to imply all the additional formation of figure necessary to the proof.

A question is frequently said to be solved by construction, when it is only meant that a geometrical method of solving it is adopted [Solution, Geometrical], as distinguished from an algebraical solution. An equation is also sometimes said to be constructed, in the sense inverse to that in which it is said to be solved; that is, when the roots are given, and the equation is required to be found. [Equations, Theory of.]

CONSUBSTANTIAL (Consubstantialis) is equivalent in expression to co-essential, and is the translation of the term ὁμοουσίος, homoousios, which, in the commencement of the fourth century, was the subject of so much zealous contention among the Trinitarian and Unitarian sects of Christians. The Arians and Eusebians, who asserted the second person of the Trinity, and the adherents of Macedonius, who asserted the third person, to be different and distinct in nature from the first, were strenuously opposed by the Athanasians, who, at the council of Nice (A. D. 325), adopted as the pass-word of their party the term ὁμοουσίος, consubstantial, or, as it is Englished in the Nicene creed, '*Of one substance* with the Father.' There were three conflicting denominations: those who held the three persons to be of the *same* substance, ὁμοουσίος; those who asserted them to be of a *similar* substance, ὁμοιουσίος; and those who contended that they were of a *different* substance, ἀνομοῖος. Between these parties the dispute was carried on during several years with great violence; and successive councils, composed of hundreds of bishops, continued to meet for the purpose of altering creeds and reciprocating anathemas. In modern times, the ἀνομοῖος doctrine has been advocated by Dr. Bury in his 'Naked Gospel,' a work which, though condemned and burnt by the University of Oxford, was approved and adopted by Locke, Clarke, and Whiston. The circumstantial particulars of the antient controversy may be found in the various histories of the councils of that period, and its modern revival in the numerous works on the Unitarian doctrines. See especially the article 'Arianisme,' in Plugnet's *Dict. des Hérésies.*

CONSUBSTANTIATION, or IMPANATION, is a term adopted by the Lutheran Church to designate its doctrine of the Eucharist, in contradistinction to the transubstantiation of the Church of Rome. Luther, after separating from the Catholic communion, still retained the doctrine of the real presence; but instead of teaching, as the Romanists do, that the priest's pronunciation of the words of consecration at once deprive the bread and wine on the altar of their natural qualities, and transform them into the real body and blood of Christ, he taught, that after the consecration of the bread and wine, they are mysteriously *accompanied* with the real body and blood. In short, in *transubstantiation*, the divine body and blood is present *without* the bread and wine; and in *consubstantiation* it is present *with* the bread and wine: the former effects a change of nature, the latter a change of circumstance.

The Lutheran doctrine of consubstantiation was first introduced into the church by John, surnamed Pungens Asinus, a doctor of Paris, at the end of the thirteenth century. His work on this subject, entitled 'Determinatio F. Joannis Parisiensis de modo existendi Corpus Christi in Sacramento Altaris,' was republished by Allix in 1686.

CONSUL (a word of the same family as *consulere*, to consult), was the title of the highest ordinary magistrate in the Roman republic. King Tarquinius Superbus having been expelled from Rome for his tyrannical conduct, by the joint efforts of the patricians and plebeians, B.C. 409, a republic was established. Instead of kings, two functionaries called consuls (consules, in Greek ὕπατοι) were appointed to administer the republic. The first consuls were Lucius Junius Brutus and Lucius Tarquinius Collatinus (or M. Horatius, according to Polybius, iii. 22). The consuls were annually elected in the Comitia Centuriata, and at first only chosen from the patricians.

As the consulship was established in the place of the kingly office, the consuls also were invested with the same power that the kings had. (Niebuhr's *History* and Gibbon's *History*, i. 3; Cicero, *De Leg.* iii. 3, who ascribes to them 'regiam potestatem.') The consulate was, with the exception of the dictatorship, the highest, and, before prætor, ædiles, and censors existed, the only superior administrative office in Rome. The consuls were at the head of the whole republic: the judiciary (jurisdictio), the military (imperium), and the executive powers were all united in them. Accordingly, we find them also called prætores, and judices, and imperatores. They presided in the senate, where they had an elevated seat, and the business in the comitia curiata and centuriata was conducted by them. The consuls created the quæstors of the public treasury, and thus had great influence in the administration of the treasury, the quæstors being dependent on them. They could also conclude peace and make alliances. They were the supreme judges in all suits and criminal trials.

The consuls possessed the same external insignia of honour as the kings, except the golden crown and the trabea (purple cloak), which latter they were only allowed to wear in a triumph. They had a sceptre of ivory, with an eagle at the end. In the assemblies of the people they sat on the sella curulis (an ornamented chair); and like the other senators they wore the toga prætexta. Twelve lictors, with the fasces and axes, as the symbol of the consuls' power over the lives of the citizens, preceded each of them at first; but P. Valerius, called Poplicola, a name which implies his respect, or affected respect, for popular rights, limited the power of the consuls, and curtailed the external symbols of their authority. In the city, the axes were taken from the fasces, and only one of the consuls was preceded by the twelve lictors. From their sentence appeals to the people were allowed. From this time they were deprived of their former power of condemning citizens to death in Rome, and the power of scourging them only remained. But while they were at the head of the army out of Rome, they retained the axes in the fasces and all their former rights. The consul who, according to the settlement of Valerius, was not preceded by the twelve lictors, had a public slave, called accensus, to precede him. The right to the twelve lictors and the supreme authority in matters of administration were enjoyed by the consuls alternately from month to month.

The patricians, after expelling the kings with the help of the plebeians, designed to transfer the royal power to themselves, which they accomplished by securing the election of both consuls out of their own body. The consuls therefore being invested with the supreme power, the struggle of the people with the patricians was at the same time a struggle against the consuls. Their power sustained a great shock by the institution of the tribunes of the plebs. Each of the tribunes, whose number at last amounted to ten, had the right of putting his veto on the measures of the consuls. In order to prevent arbitrary acts of the consuls, the tribune Terrentius, B.C. 461, made a proposition for a code or collection of laws, and in the year B.C. 452 ten men (decemviri) were named for this purpose, who were invested with full powers, and all other functionaries for the time were suspended. The consulate being re-established, the tribunes, B.C. 444, proposed that the people should choose consuls from the plebeians also, a proposal which gave rise to a long and violent contest. The consulship was again suspended, and tribunes of war (tribun militares) with consular power were appointed, to which office plebeians also were made eligible. At last, B.C. 366, the first plebeian was elected consul. (Liv. vi. 42 vii. i. 2. 21;

Afterwards both consuls were on several occasions plebeians.

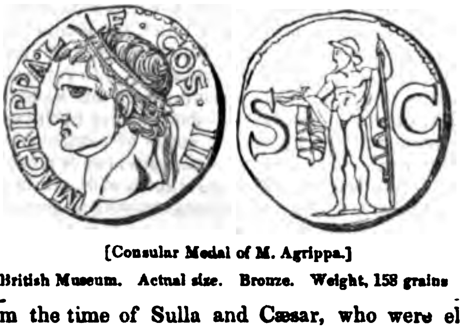
In the mean time the extension of the state made it impossible for the consuls to perform the increased duties of their office, and new functionaries were created. In B.C. 442, the censors, and B.C. 365, the prætors, were created, which latter had the judicial functions previously attached to the consulate. In relation to these new magistrates, the consul was called magistratus major, or superior magistrate.

Though the consular power was thus much diminished, it was still very great. All the officers of the state, except the tribunes, were under the consuls; they summoned the meetings of the senate, received all dispatches, and gave audiences to foreign ambassadors. In time of war they were commanders-in-chief, and the election of the military officers partly depended on them. In critical times the consular power was made unlimited by the decree of the senate, 'videant consules ne quid respublica detrimenti capiat' (they should take care that the republic sustained no harm). Under such circumstances they could require the strictest obedience from all the citizens; and they resumed their right to condemn to death without appeal.

The imperium or military command was granted to the consuls by the lex curiata [COMITIA], whereby a province (*provincia*) was assigned to them. The term *provincia* originally denoted the power given to discharge some public duty out of Rome, particularly the command of the army in conquered countries; and these countries themselves were called provinciæ (provinces). When a consul, after the expiration of his term of office, was appointed to govern a province, he was called pro-consul.

At first no particular age was a necessary qualification for the consulate. But by the lex Annalis, proposed by the tribune L. Villius, in the year B.C. 181, a certain age was required for each magistrate; and the consul must be forty-three years of age. But this law was not always observed; M. Valerius Corvus was elected consul in his twenty-third, and Scipio Africanus in his twenty-eighth year. No one could legally be re-elected till after an interval of ten years; but M. Valerius Corvus was re-elected six times, and Marius seven times.

The candidate for the consulate was required to be at Rome when the election took place in the comitia centuriata, a rule which was also sometimes not regarded. The elder of the two consuls first received the fasces, until the Emperor Augustus prescribed, by the law called lex Julia and Papia Poppæa, that he should take them first who had most children. The time of election varied at different periods of the Commonwealth; but they were always chosen some time before they entered on office, and were called designati. The time of entrance on office likewise varied; but about B.C. 154 it was fixed that they should always enter on their office on the 1st of January. The years were named after the consuls, and annual registers were kept for that purpose, which were called fasti consulares. When the consuls entered on their office, they went in a solemn procession to the capitol to sacrifice to Jupiter Capitolinus; and after this ceremony the senate held a solemn session. Within the five next days they were to take the oath to administer the republic according to the laws; and at the end of their term of office they took a similar oath. Those who had discharged the office of consul were called consulares, and enjoyed a kind of pre-eminence in rank over the other senators.


M AGRIPPA L F COS III
S C

[Consular Medal of M. Agrippa.]

British Museum. Actual size. Bronze. Weight, 158 grains

From the time of Sulla and Cæsar, who were elected perpetual dictators, the consulate gradually lost all its powers, and under the emperors it sunk to a mere shadow and a name. Yet consuls were still annually elected by the people, until the time of Tiberius, who ordered that they should be chosen by the senate. The number of the consuls was much augmented by the emperors; and several kinds of consuls were made, as consules ordinarii, after whom the years still were called; consules suffecti, elected by the emperors; and consules honorarii, who had title and rank, but no power. The last consul after whom the year was denominated, was Basilius, junior, in the year 1294 A.U.C. or 541 A.D., in the reign of the Emperor Justinianus.

CONSUL, an officer appointed by a government to reside in some foreign country, in order to give protection to such subjects of the government by whom he is appointed as may have commercial dealings in the country where the consul resides, and also to keep his employers informed concerning any matters relating to trade which may be of interest or advantage for them to know. To these duties are sometimes superadded others having objects more directly political, but into this part of a consul's duty it is not necessary to enter at present, as such functions are assigned to consuls not as such, but in the absence of an ambassador or other political agent. The duties of an English consul, as such, cannot perhaps be better described than by giving the substance of the general instructions with which he is furnished by the government on his appointment.

His first duty is to exhibit his commission, either directly, or through the English ambassador, to the authorities of the country to which he is accredited, and to obtain their sanction to his appointment: the document whereby this sanction is communicated, is called an exequatur; its issue must precede the commencement of his consular duties, and its possession secures to the consul 'the enjoyment of such privileges, immunities, and exemptions, as have been enjoyed by his predecessors, and as are usually granted to consuls in the country in which he is to reside.' It must be the particular study of the consul 'to become conversant with the laws and general principles which relate to the trade of Great Britain with foreign parts; to make himself acquainted with the language and with the municipal laws of the country wherein he resides, and especially with such laws as have any connexion with the trade between the two countries.' It is the consul's principal duty 'to protect and promote the lawful trade and trading interests of Great Britain by every fair and proper means;' but he is at the same time 'to caution all British subjects against carrying on an illicit commerce to the detriment of the revenue and in violation of the laws and regulations of England, or of the country in which he resides;' and he is to give to his own government notice of any attempt at such illicit trading. The consul is 'to give his best advice and assistance, whenever called upon, to his Majesty's trading subjects, quieting their differences, promoting peace, harmony, and good-will amongst them, and conciliating as much as possible the subjects of the two countries upon all points of difference which may fall under his cognizance.' Should any attempts be made to injure British subjects in person or in property, he is to uphold their rightful interests and the privileges secured to them by treaty. If, in such cases, redress cannot be obtained from the local administration, he must apply to the British minister at the court of the country in which he resides, and place the matter in his hands. The consul must transmit to the Secretary of State for Foreign Affairs, at the end of every year a return of the trade carried on at the different ports within his consulate, according to a form prescribed. He is also required to send quarterly an account of the market prices of agricultural produce in each week of the preceding three months, with the course of exchange, and any other remarks which he may consider necessary for properly explaining the state of the market for corn and grain. It is further his duty to keep his own government informed as to the appearance of any infectious disease at the place of his residence. The consul is required to afford relief to any distressed British seamen, or other British subjects thrown upon the coast, or reaching by chance any place within his district, and he is to endeavour to procure for such persons the means of returning to England. He is to furnish intelligence to the commanders of king's ships touching upon the coast where he is, and to obtain for them, when required, supplies of water and provisions, and he is to exert himself to recover all wrecks and stores belonging to king's ships when found at sea, and brought into the port where he resides.

In most cases consuls are subjects of the state by whom they are appointed, but this is by no means an invariable rule, and they are sometimes the subjects of the country in which they reside, or of some other country foreign to both. Persons are usually selected for filling the office from among the mercantile class, and it very commonly happens that they are engaged in commercial pursuits at the port where their official residence is fixed. In this respect the English government is chargeable with some inconsistency, for while, in many instances, British consuls are permitted to trade, in others they are expressly interdicted from so doing. It would be difficult to discover the application of any fixed principle in determining the places where either of these opposite rules has been adopted. We believe the interdiction to be of modern application, and that the desire of diminishing the public expense has since led, in many cases, to the relaxation of what was once intended to be made a general rule, it being necessary to give a higher salary whenever trading is not allowed. Many traders are willing to undertake the office at a low rate of direct remuneration for the sake of the commercial influence which it brings, and which is frequently of far greater value to them than any salary which the government would give. The policy of this kind of economy has been much questioned.

The number of consuls and vice-consuls appointed by the English government, and their distribution in the year 1835, were as under:—

	Consuls-General.	Consuls.	Vice-Consuls.		Unpaid Vice-Consuls.
Russia	1	5	1		5
Sweden	0	2	0		14
Norway	0	2	0		16
Denmark	0	1	1		6
Prussia	0	1	4		2
Hamburg	1	0	1	Germany.	7
Bremen	0	0	1		
Lubeck	0	0	1		
Cuxhaven	0	0	1		0
Holland	0	2	0		7
Belgium	0	2	0		3
France	0	11	1		29
Spain and Spanish Colonies	0	12	1		58
Portugal	1	3	5		19
Italy	0	8	3		24
Austria	1	1	3		2
Sicily	0	0	0		10
Greece	0	2	2		14
Turkey	1	2	8		6
Syria	1	2	2		1
Egypt	1	1	2		3
United States of America	0	9	1		16
Mexico	1	0	3		1
Guatemala	0	1	0		0
Columbia	0	5	1		2
Brazil	0	4	2		3
Monte Video	1	0	0		0
Buenos Ayres	0	1	0		0
Chili	1	2	1		0
Peru	1	1	1		1
Hayti	0	1	2		2
Sandwich Islands	0	1	0		6
	11	82	48		261

The salaries paid vary not only in the manner above stated, but likewise according to the particular circumstances attending the appointment, a residence in some countries being necessarily more expensive than in others.

The total amount paid in salaries to English consuls and vice-consuls in 1835 was 61,950*l.*; in 1825 the amount was 71,716*l.* In addition to their salaries, consuls are in the receipt of fees on signing various documents, but these fees are of small amount. In 1834 only 12,143*l.* was divided among the whole number in unequal proportions: the largest, at Rio de Janeiro, in that year was 980*l.*; while, in some cases, the sum did not exceed one or two pounds.

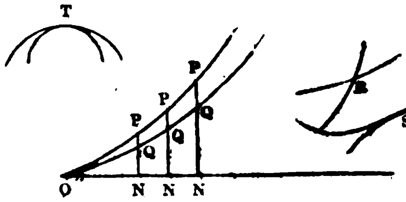
CONSUMPTION, PULMONARY. [PHTHISIS PULMONALIS.]

CONSUMPTION, MESENTERIC. [MARASMUS.]

CONSUMPTION, in political economy, is the end of production; the use, the expenditure, of articles produced. It is unnecessary here to enter upon any examination of the theories of *productive* and *unproductive* consumption, which have so largely occupied the attention of writers upon political economy. We have stated the general principle under the head ACCUMULATION. The natural relations between production and consumption appear very unlikely to be greatly disturbed in any condition of society in which there is freedom of labour and security of property. The most injudicious and extravagant consumption on the part of the few is, in its degree, a stimulus to a more strenuous production on the part of the many; and under these circumstances there is sure to be that excess of production over consumption which constitutes capital. The creation of capital shows that the production has been greater than the unproductive consumption. A judicious and well-regulated expenditure on the part of the few would doubtless afford a more certain encouragement to the industry of the producers, and the excess of production over consumption would, in the long run, be greater. Whatever injury the improvident consumption of individuals may cause to themselves, it is quite clear that the producing class of society will always repair the waste of the spending class; that in point of fact there will be an excess of production over consumption, wherever the course of industry is not impeded by bad laws, or by a wasteful consumption on the part of a government. Whenever a government engages in the ruinous consumption incidental to war, for example, a very powerful stimulus may indeed be given to particular branches of industry; but other branches of industry that would have been encouraged had their money remained in the pockets of the tax-payers, will proportionately be depressed. The compensating power of production that is called forth in all cases of private consumption must be deranged, or unequally and therefore imperfectly excited, by the consumption of the state.

CONTACT. (Geometry.) Two lines, one of which at least is curved, are said to be in contact when they have a common point, and recede from that point in such a way that the deflection of the one from the other will, if a sufficiently small departure be taken, become as small a fraction as we please of that departure; that is, if there be no limit to the smallness of the ratio which P Q may be made to bear to O N, as we approach the point O. The subject will be further discussed mathematically in TANGENT, CURVATURE, CURVES (THEORY OF),—SURFACES (THEORY OF); and we shall at present confine ourselves to pointing out the connexion between the preceding definition, which is refined and mathematical, and the obvious ocular phenomenon, by perception of which we immediately admit a marked difference of character between *contact*, as shown at S, and simple *intersection*, as shown at R.

All our perceptions of lines being ocular and physical in the first instance, there is a *minimum visibile*, or least visible distance, at which lines will run into each other. Now if P Q and O N always preserve such a ratio to each other that the *minima visibilia* of these lines arrive nearly together, P Q will not be lost to sight before O N, and the curves will continue distinct up to the very point of meeting. But if P Q diminish so rapidly as compared with O N, as to be lost to sight while O N is still visible as a length, the two curves will appear to coincide for a visible length, which forms the principal ocular feature of contact. But this *practical* contact is not admitted in geometry, a science of reason, in which no length is considered as invisible; so that contact is only said to exist where the ratio of P Q to O N diminishes—not merely very much—but without limit. Let O N and P Q be the fractions x and v of a linear unit. If then v diminish without limit when compared with x, but always retain a finite ratio to x^2, the contact is said to be *of the first order*; if v also diminish without limit when compared with x^2, but always retain a finite ratio to x^3, the contact is said to be of the second order, and so on. These different orders of contact exhibit nothing to the eye but a closer approach, the higher the order of contact; except in this, that contacts of an even order are always accompanied by the *intersecting* coincidence shown at S, while contacts of an odd order make the curves tangent to each other in the sense in which the word is used by Euclid.



CONTAGION, THE MATTER OF, a poison which, on entering the blood, produces a definite train of morbid phenomena, and which communicates to the blood the property of generating a similar poison, capable of producing precisely similar morbid phenomena. Considered as a morbific matter *sui generis*, contagion, then, is an agent which produces a disease of a definite nature, one of the distinctive characters of which is that in its progress a peculiar matter is secreted from the blood, which, when introduced into the blood of another individual, produces precisely the same disease. The term contagion is also in common use to denote the actual propagation of diseases of a specific nature from person to person. Such diseases, so propagated, are called contagious; and the matter by which they are propagated is called contagious matter or contagion.

The disease called small-pox exhibits a series of morbid phenomena peculiar to itself. These peculiar phenomena constitute it a distinct or generic disease. The pustules formed in its progress, the formation of which is one of the series of morbid phenomena distinctive of it, contain a peculiar secretion, a specific poison, which, on being introduced into the blood of a person previously in sound health, as by inoculation, produces in that person small-pox. This disease, then, presents all the characters of a contagious disease.

According to the etymological signification of the term, the propagation of disease from person to person by contagion depends on the actual contact of the body which receives with that which communicates the poison. But direct contact is not indispensable to the propagation of a contagious disease. There are contagious diseases which are absolutely incommunicable without direct contact; but there are others which are capable of communication both by contact and without it. A particle of the matter of small-pox, for example, placed in direct contact with the body, will produce small-pox; but the matter of small-pox is likewise capable of being dissolved or suspended in the air; and the air thus loaded with small-pox matter, on coming in contact with the body, is capable of producing small-pox. Hence contagious diseases are divided into two great classes; into those in which the contagious matter acts only by positive contact of person with person, and into those in which it acts both by positive contact and through the medium of the air. Contagion may therefore be said to be immediate or mediate, contactual or remote.

Contagion is carefully to be distinguished from infection. The distinction is clear and broad. From not regarding it, medical men have fallen into the grossest errors, both in their so-called facts and in their reasonings. It is of great importance, theoretically and practically, that this distinction should be understood; it is a subject in which, on many accounts, the public has a deep interest; and an attempt will be made to elucidate it under the article Infection. [INFECTION.]

CONTARINI, an illustrious family of Venice, which has given to the republic many senators, doges, and statesmen. The first doge of the name was Domenico Contarini, in the eleventh century; another, Andrea Contarini, was doge during the war of Chiozza. After the Genoese had taken that place, and were threatening the very existence of Venice, in 1380, Contarini, then eighty years of age, led the Venetian fleet against the enemy; and being assisted by Vettor Pisani and Carlo Zeno, he defeated the Genoese, retook Chiozza, and thus saved the republic. Ambrogio Contarini was sent, in 1473, by the republic, then at war with Mahomet II., as ambassador to Hussum Hassan Bey, sovereign or usurper of Persia, to contract an offensive alliance against the Ottomans. The coasts of Asia Minor and Syria being occupied by the Turks, Contarini was obliged to take his way through Poland and Tartary to Caffa in the Crimea, from whence he crossed the Euxine to the mouth of the Phasis, and thence proceeded through Mingrelia and Armenia to Persia. He met Hussum Hassan at Ispahan, accompanied him to Tabreez, and then returned homewards by Derbent and the Caspian Sea to Astrakhan, and thence to Moscow, where he was well received by the grand duke of Muscovy. He returned to Venice in 1477, and published the journal of his mission, which is curious, and written with much apparent regard to truth. 'Itinerario nell' Anno 1473, ad Usun Cassan Rè di Persia,' 4to., Venezia, 1524. Hussum Hassan attacked Mahomet, while the Venetian fleet was ravaging the coasts of Asia Minor; but the Persians were defeated by the Turks near Trebizond, and the alliance led to no other result than to effect a temporary diversion in favour of Venice. There have been also several men of learning of the family of Contarini, such as Cardinal Gaspare Contarini, in the sixteenth century, who was employed on several important missions, and wrote many philosophical and theological works; among others, 'De Immortalitate Animæ adversus Petrum Pomponacium,' 'De Libero Arbitrio et Prædestinatione,' and also a treatise, 'De Magistratibus et Republica Venetorum.' His works were collected and published together at Paris, folio, 1571. Vincenzo Contarini was professor at Padua at the beginning of the seventeenth century. He wrote several works on classical erudition; 'De re frumentaria,' 'De Militari Romanorum Stipendio,' and 'Variarum Lectionum Liber.'

CONTEMPT. A contempt in law is a disobedience of the rules, orders, or process of a court of justice, or a disturbance or interruption of its proceedings. Contempts by a contumacious resistance to the process of a court, such as the refusal of a sheriff to return a writ, are punishable by attachment; but contempts done in the presence of the court, which cause an obstruction to its proceedings in administering the law, may be punished or repressed in a summary manner by the commitment of the offender to prison or by fining him. The power of enforcing their process, and of vindicating their authority against open obstruction or defiance, is incident to the nature of all courts; and the means which the law intrusts to them for that purpose are attachment for contempts committed *out of* court, and commitment and fine for contempts done *in facie curiæ*. [ATTACHMENT.] (See Viner's *Abridgement*, tit. 'Contempts.')

CONTENT (contentus, contained), the quantity of space contained in any portion of space, measured by the number of times which some arbitrary unit is contained in the space. Thus, linear content is simply LENGTH; superficial content is AREA or surface; solid content (in which sense the word is principally used), also called volume, is the number of solid units contained in a space. These solid units are always cubes, described in the unit of length. Thus, when the inch or foot is employed in measuring lengths, the cubic inch or cubic foot is always employed as the measure of solid content.

The solid content of a parallelopiped (or figure like a box) is found by multiplying together the units in the lengths of its three dimensions. Thus, 3 feet of length, 2½ feet of breadth, and 4 feet of height, give 3 × 2½ × 4, or 30 cubic feet.

The solid content of any cylinder or prism is found by multiplying together the number of square units in the base and the number of linear units in the altitude; and one-third of a similar product is the content of a pyramid or a cone. The content of any irregular solid bounded by planes must be found by dividing it into pyramids.

Weight is thus connected with content accurately enough for common purposes. Multiply the number of cubic *feet* by 1000 times the specific gravity; the result is the number of ounces avoirdupois. Roughly, multiply the number of cubic feet by the specific gravity, and five-ninths of the result is the number of cwts. Thus, the specific gravity of brick being 2, a cube of bricks 20 feet long every way weighs $\frac{5}{9}$ of 20 × 20 × 20 × 2, or 8889 cwt.

To find the solid content of a sphere, take $\frac{377}{90}$ths of the rad. × rad. × rad. Thus, the radius of a sphere being 4 feet, the number of cubic feet contained is 4 × 4 × 4 × 377 ÷ 90, or 268·1.

CONTINENTAL SYSTEM, the phrase used by Bonaparte to designate his scheme for combining the strength of the Continent against Great Britain. It was in part developed in the Berlin decree, issued 21st November, 1806, which declared that the British islands were to be considered as in a state of blockade by all the Continent; forbade under severe penalties all correspondence or trade with England; ordered all letters to and from England to be detained and opened at the post-offices; denounced as contraband all articles of English manufacture, or the produce of the British colonies; and declared property of every kind belonging to British subjects, wherever found, to be lawful prize. From this time Bonaparte adopted it as the rule of his policy to compel all the continental powers who would remain at peace with him to comply with these commercial regulations, and in addition to seize and imprison all English subjects found within their dominions.

CONTINUED BASE, in Music, is the figured base of a score used throughout, and so called to distinguish it from the vocal base, as well as from the base staves assigned to particular instruments. The term is only to be found in very old music, and is now become obsolete.

CONTORTÆ. [Apocynaceæ.]

CONTRABAND, from the Italian *Contrabando*, against the proclamation, a term commonly used in commercial language to denote articles the importation or exportation of which is prohibited by law. Since the adoption of the warehousing system in this kingdom, the list of goods the importation of which is prohibited has been made exceedingly short; it comprises at this time (1836) only the following articles:—

Arms, ammunition, and utensils of war, by way of merchandize, except by license from his Majesty for the public stores only.

Books first printed in the United Kingdom, and reprinted in any other country and imported for sale.

Cattle, sheep, swine, lamb, mutton, beef or pork, fresh or corned, or slightly salted.

Clocks or watches, with any mark or stamp representing any legal British assay mark or stamp, or purporting to be of British make, or not having the name and abode of some foreign maker visible on the frame and the face, or not being complete.

Coin, counterfeit, or not of the established standard in weight and fineness.

Fish of foreign taking or curing, or in foreign vessels, except turbots, lobsters, stock-fish, live eels, anchovies, sturgeon, botargo, and caviare.

Malt.

Snuff-work, tobacco-stalks, and tobacco-stalk flour.

The list of articles contraband as regards exportation from the United Kingdom is still more limited, and is in fact included under three heads: viz.

Clocks and watches: the outward or inward case or dial-plate of any clock or watch without the movement complete, and with the clock or watchmaker's name engraved thereon.

Lace made of inferior metal, in whole or in part, to imitate gold or silver lace.

Tools, utensils, and machinery.

The schedule of prohibitions to importations was formerly much more extensive. As it stands at present, if we except those articles which are introduced for the protection of agriculture, warlike stores, and fish, the insertion of which last is intended for the encouragement of a branch of native industry, the list is calculated only for the prevention of fraud. The same might be said of the second list, if it did not contain the prohibition to export tools and machinery; this restriction has of late years been very much relaxed under the power given by Act of Parliament to the Board of Trade to license upon application the exportation of such tools and machines as in the opinion of the Board may without inconvenience be allowed to go out of the country; and at present the restriction is limited almost entirely to machinery required for the prosecution of the processes of spinning various kinds of yarn.

There are some other prohibitions by which trade in certain articles is restricted; but these refer to the manner in which the trade may be conducted, as the size of the ship, or the package, or the country from or to which the trading may take place, and these being only of the nature of regulations, the articles in question cannot be considered contraband. Of this nature are the prohibitions which extend to our colonies, and which have for their object the encouragement of the trade of the mother country. The list of articles prohibited by many foreign countries is much larger than that enforced in this country; though the system in the case of some of those countries has of late been somewhat relaxed. The tariff of Russia is however still principally filled by designating articles which are contraband.

Another sense in which the term contraband is applied refers to certain branches of trade carried on by neutrals during the continuance of war between other countries. It has always been held under these circumstances, that belligerents have a right to treat as contraband, and to capture and confiscate, all goods which can be considered munitions of war, under which description are comprehended everything that can be made directly and obviously available to a hostile purpose, such as arms, ammunition, and all kinds of naval stores, and all such other articles as are capable of being used with a like purpose, such as horses, and timber for building ships. Under some circumstances, provisions which it is attempted to convey to an enemy's port are contraband, as when a hostile armament is in preparation in that port. These restrictions rest upon principles which are reasonable in themselves, and have been generally recognised by neutrals; others which have at various times been enforced or attempted to be enforced have been contested, but a description of this branch of the subject belongs rather to the matter of International Law, than to a description of contraband trading.

CONTRACT. [Agreement.]

CONTR' ALTO; CONTRATENOR. [Alto.]

CONTRARY and CONTRADICTORY. Two propositions are contrary when the one denies every possible case of the other: they are contradictory, when one being universal, the other denies some only of the things asserted in the first. Thus the contrary proposition to 'every A is B' is 'no A is B,' and its contradictory is 'some As are not Bs.

Contrary propositions may be both false, but cannot be both true; as in 'all angles are equal,' and 'no angles are equal.' But of contradictory propositions one must be true and one must be false; either 'all angles are equal,' or 'some angles are not equal.' One of the most common fallacies of conversation and debate (and occasionally of written argument) is fixing the assertion of the contrary upon one who simply contradicts. And on the other hand, nothing is more common than to assume a contrary as proved upon grounds which establish only the contradictory.

The most easy way of establishing general propositions is, in many cases, the refutation of the contradictory; and here is another source of error, since the refutation of the contrary is frequently supposed to have the same effect.

CONULA'RIA. [Orthocerata.]

CONULI'NA. [Polypiaria Membranacea.]

CO'NULUS. [Echinodermata.]

CONUS (zoology), a genus of gasteropodous mollusks, founded by Linnæus; and though multitudinous in species, left untouched by modern zoologists, with the exception of De Montfort.

Animal elongated, very much compressed and involved, with a very distinct head, terminated by a proboscis capable of much extension; *mouth* with a tongue rather short, but projecting, and armed with two rows of sharp teeth; tentacula cylindrical, carrying the eyes near the summit; foot oval, elongated, wider before than it is behind, with a transverse anterior channel; *mantle* scanty, narrow, forming an elongated siphon in front.

Shell thick, solid, rolled up, as it were, in a conical form; epidermis membranous, sometimes very thick; spire of different degrees of elevation, sometimes almost flat; aperture long and very narrow, widening a little anteriorly; lips generally straight and parallel, the outer lip simple and sharp-edged, sometimes a little curved, the inner lip without any plaits on the columella, but with a few elevated striæ on its anterior termination. *Operculum* horny, very small, subspiral, with a terminal summit, placed obliquely on the back part of the foot, and, when compared with the length of the aperture, appearing like a rudiment.

Geographical Distribution.—Southern and tropical seas. The form becomes gradually less developed as the locality approaches the north. In the Mediterranean there are a few species, but none appear to have been detected in the northern seas.

Habits.—Carnivorous. Found on sandy mud at depths varying from near the surface of the sea to seventeen fathoms.

The species are very numerous. Lamarck records 181 recent; and several of these include varieties. Deshayes in his Tables gives the same number. To these must be added one new species described by Mr. G. B. Sowerby in his 'Genera,' four new species brought to this country by Lieutenant Belcher, R.N., and by the Blossom, described by Mr. Broderip and Mr. G. B. Sowerby (*Zool. Journal*, vols. iv. and v.), together with six new species and some varieties described by Mr. G. B. Sowerby, and thirteen new species and several varieties described by Mr. Broderip from Mr. Cuming's collection (*Zool. Proceedings*). The following observations of Mr. Broderip in his introduction to the descriptions may be of use to the student. After pointing out the difficulty of the task arising from the infinite varieties presented by the genus, and the very few points of form and structure in the shell that can be relied on as the foundation of specific character, the author thus continues: 'M. de Blainville, when noticing the numerous species already recorded, gives us a hint that many of them may be what Adanson calls "espèces de cabinet," and no one can examine an extensive collection of *cones*, particularly if it contain many individuals of each species, for the purpose of comparison, without being struck by the force of the observation. Colour, granulation, or smoothness, length or shortness of the spire, its plainness or coronation, will be found in many species the result of locality, food, or temperature.' M. Duclos, in reference to the numbers given by Lamarck, states, that he is convinced that there are many of the species which can only be regarded as varieties at most.

Many of these species and varieties are very beautiful, both in shape and colour, and the genus has always been highly valued by collectors. *Coni, gloria-maris, cedo-nulli, omaicus, aurisiacus, ammiralis,* and some others, have brought very large prices, and some of the finest specimens of these shells are now in this country.

Lamarck separates the genus into two divisions: the first comprising those species whose spire is coronated; and the second those whose spire is simple. By far the greater proportion of species belong to the latter division.

De Blainville thus divides the genus.

α.

Conical species with a projecting spire, which is not crowned with tubercles. (Example, *Conus generalis.*)

β.

(Genus Rhombus, De Montfort.)

Conical species with a coronated spire, which is either projecting or flattened. (Example, *C imperialis.*)

γ.

(Genus Cylinder, De Montfort.)

Species a little elongated, suboval; the spire projecting and pointed, but not coronated. (Example, *C. textile.*)

δ.

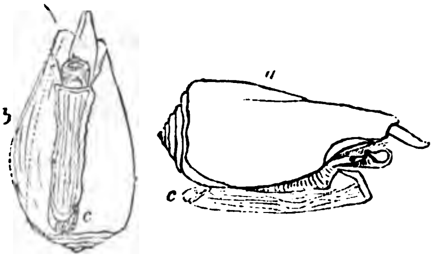
(Genus Rollus, De Montfort.)

Subcylindrical species, the spire apparent and coronated. (Example, *C. geographus.*)

ε.

(Genus Hermes, De Montfort.)

Elongated, cylindrical species with a projecting spire, and the aperture as in the genus *Terebellum*, that is, angular posteriorly. (Examples, *C. Nussatella* and *C. mitratus.*)



[Animal of Conus bandanus.]

a, seen in profile; *b*, view of under side; *c*, operculum.

Mr. G. B. Sowerby ('Genera of Recent and Fossil Shells') observes, that the *cones* are liable to be confounded with the *Pleurotomata*, and the young specimens of some *Strombi;* and those which are rather ventricose with young *Cypræœ;* but that they may be distinguished from the *Pleurotomata* by their short spire, their linear aperture, and their straight columella; from the young *Strombi*, by their being entirely destitute of varicose sutures, and by their never having any appearance of a notch near the lower extremity of the outer lip; the young *Strombi* moreover are seldom, if ever, so regularly conical; and from the young *Cypræœ* by the thickness of their shell, by the coronated or abrupt spire, and by their not being naturally polished in every part, which the *Cypræœ* always are, in consequence of the want of epidermis which covers the shell of the *cone*, while in the *Cypræœ* the large mantle comes in contact with the whole of the shell.

[Shell of Conus generalis.]

FOSSIL CONIDÆ.

Lamarck records nine fossil species. Deshayes in his Tables makes the number 49 (tertiary), one of which, *C Mediterraneus*, he gives as both living and fossil (tertiary) Mr. G. B. Sowerby ('Genera') says, 'Fossil cones are not unfrequent; but we believe that they occur only in the newer strata, or those above the chalk, such as the London clay and crag in England, the calcaire grossier in France, and the contemporaneous beds in other countries: there are a few seen in collections, filled with a coarse, dark-green arenaceous substance; these belong to the *Terrains calcareo-trappéens* of Brongniart. Doubtful casts are met with in the inferior oolite, according to Conybeare and Phillips.' The same author gives a figure of *C. dormitor*, a fossil from Barton, approaching very near to a *Pleurotoma*. Many species are found in the blue marls of the south of France. (M. Marcel de Serres.) M. de Basterot gives many from Bordeaux and Dax, &c., one of them, *C. deperditus* of Lamarck, as analogous to the existing species at Owhyhee. Among the fossil species from the western borders of the Red Sea, collected by Mr. James Burton, named by Mr. Gray and Mr. Frembley, and communicated to Mr. Lyell by Mr. Greenough, are twelve species all living; but neither *C. Mediterraneus* nor *C. deperditus* appears in the list.

CONVENT, from the Latin *conventus*, an assembly or meeting together. This word is used in a double sense, first, for any corporation or community of religious, whether monks or nuns; and secondly, for the house, abbey, monastery, or nunnery in which such monks or nuns dwell. Shakspeare uses it in the first senso, when he says of Wolsey—

> 'At last. with easy roads, he came to Leicester,
> Lodged in the abbey; where the reverend abbot
> With all his convent honourably received him.'
> Hen. VIII., act iv., sc. 2.

Addison uses it for the building:—'One seldom finds in Italy a spot of ground more agreeable than ordinary that is not covered with a convent.'

Furetiere, who wrote his dictionary in the time of Louis XIV., says there were no fewer than 14,000 convents formerly in France.

Convent, as related to the foreign military orders, meant the principal seat or head of the order. Furetiere says, 'La Commanderie de Boisy, près d'Orleans, est le Convent général de l'Ordre de St. Lazare.'

The earliest inhabitants of convents were termed Cænobites, from the Greek words κοινός and βίος, as living in community. They dwelt chiefly in Egypt. Fleury (*Hist. Eccles.*, 4to., Paris, 1720, tom. v., p. 14) dates their institution as early as the days of the Apostles; others, probably with more correctness, give them a later origin. St. Pachomius, abbot of Tabenna, on the banks of the Nile, who was born at the close of the third century, is believed to have been the first person who drew up a rule for the Cænobites. (Moreri, *Dict. Histor.*, tom. viii.)

CONVENTION, MILITARY, a treaty made between the commanders of two opposing armies concerning the terms on which a temporary cessation of hostilities shall take place between them. It is usually solicited by that general who has suffered a defeat, when his retreat is not secure and small chance is left of maintaining his position; and it is seldom refused by the victor, since, without incurring the unavoidable loss attending an action, his force becomes immediately disposable for other operations.

In 1757 the duke of Cumberland, when in danger of being surrounded, entered into a convention with the duke de Richelieu, through the medium of Denmark, by which, on consenting to disband all his auxiliaries, he was allowed to retire with the English troops across the Elbe. And in 1799, when the Anglo-Russian army failed in the attempt to deliver Holland from the French power, the duke of York made a treaty with General Brune by which the invading force was allowed to re-embark on condition that 8000 French and Dutch prisoners of war in England should be restored.

After the battle of Vimiero in 1808, the duke of Abrantes, having been defeated, and fearing a general rising in Lisbon against him, sent General Kellerman to the quarters of the British commander-in-chief, to request a cessation of arms, and propose a convention by which the French troops might be allowed to retire from Portugal. This being granted, it was finally arranged in the convention that they should not be considered as prisoners of war; and that, with their property, public and private, their guns, and cavalry horses, they should be transported to France: on the other hand, all the fortresses which had not capitulated were to be given up to the British, and a Russian fleet, then in the Tagus was to be detained in English ports till after the conclusion of a peace. This is the celebrated convention which was made at Lisbon, and is generally but improperly called 'of Cintra.' It excited much dissatisfaction both in Portugal and England, as the cupidity of the French induced them to appropriate to themselves property to which they had no claim. (Napier, vol. i.). By the appointment of a committee consisting of one individual of each of the three nations, all causes of complaint were, however, finally removed.

CONVERGENT, CONVERGENCY, DIVERGENT, DIVERGENCY. When a series of numbers proceeding without end, has terms which diminish in such a manner that no number whatsoever of them added together will be as great as a certain given number, the series is called convergent. But when such a number can be added together as will surpass any given number however great, the series is called divergent. Thus of the two following series—

$$1+\frac{1}{2}+\frac{1}{4}+\frac{1}{8}+, \&c., \quad \text{and } 1+\frac{1}{2}+\frac{1}{3}+\frac{1}{4}+\&c.,$$

the first is convergent, for no number of its terms, however great, will amount to 2: the second is divergent, and the sum of its terms may be made to exceed any number. By going a mile, then half a mile, then a quarter of a mile, &c., two miles could never be completed: but by going a mile, then half a mile, then one third of a mile, &c., a hundred million of miles, or any greater number, could be surpassed.

The subject of the convergency of series is one of fundamental importance in the whole of the mathematics; but it is seldom treated in works on algebra in the manner which its importance requires. Algebraical writers seem to have imagined that a series, however obtained, is safe and fit for use, whether convergent or divergent. If this be true, which, in a sense understood by writers on the higher part of the subject, we do not altogether deny, it is certainly not true to the beginner, without a great deal more of demonstration than is usually given. Considering the paucity of information which exists in our works on algebra, we shall state, rather more fully than usual, the results of investigation on the subject, together with the references to sources of information.

1. Series of increasing terms are certainly divergent.

2. Series of decreasing positive terms are divergent, unless the terms diminish without limit.

3. Of series of positive terms which diminish without limit, a test of convergency or divergency may frequently be given as follows. Let a, b, c, d, e, &c., be the terms of the series: form the new series

$$\frac{b}{a}, \frac{c}{b}, \frac{d}{c}, \frac{e}{d}, \frac{f}{e}, \&c. \quad \ldots\ldots \quad (A);$$

then if there ever arrive a term of the series (A), from and after which all the terms are not only less than unity, but tend towards a limit which is less than unity, the series is certainly convergent: but if the terms aforesaid become greater than unity, and continue so from and after a given term, the series is certainly divergent: and if the limit in the first case be not less than unity, but unity itself, the series may be either convergent or divergent, and each particular case must be examined by itself. Instances of both sorts can be given; and we know of no general rule for distinguishing between them, except the following, which includes all the cases we have seen, though we do not give it as a demonstrated test. Let the nth term of the series be N; and find a such that n^a N shall have a finite limit when n increases without limit. Then if a be greater than unity, the series is convergent; if equal to, or less than unity, it is divergent.

4. Series of the form $a + bx + cx^2 + dx^3 + ex^4 +$ &c., can always be made convergent by giving a sufficiently small value to x, except only in the case where the terms in the series (A) increase without limit from and after any term. If they do not increase without limit, let L be the limit; then the preceding series is convergent whenever Lx is less than unity, is referable to the preceding case when Lx is equal to unity, and divergent when Lx is greater than unity. But if $L = 0$, the preceding is always convergent.

5. Series whose terms are alternately positive and negative, are always convergent when the terms diminish without limit, and the error committed by taking any number of terms to stand for the whole value, is never so great as the first term thus rejected. For instance, if the answer to a question be $1-\frac{1}{2}+\frac{1}{3}-\frac{1}{4}+$ &c., then 1 is not wrong by $\frac{1}{2}$, $1-\frac{1}{2}$ is not wrong by $\frac{1}{3}$, $1-\frac{1}{2}+\frac{1}{3}$ is not wrong by $\frac{1}{4}$, and so on. The results are alternately too great and too small.

6. When such a series as the last has its terms not diminishing without limit, but towards a finite limit, the sum of any number of terms, increased by half the limit, is never wrong by so much as the first-rejected term differs from the limit.

7. When series produced by algebraical development have their terms alternately positive and negative, the error committed by stopping at any term is never so great as the first rejected term, even though the series become afterwards one of continually increasing terms. If then such a series have the first few terms rapidly diminishing, a close approximation may be made by means of them to the real value of the expanded function. For instance, in the series $1 - 2x + 2.3x^2 - 2.3.4x^3 + \ldots.$ (in which an attempt to calculate from the whole series would be utterly futile, since however small x may be, there must be terms of every degree of magnitude) when x is small, an approximation may be made to its value from the terms which decrease. Thus if $x = {\cdot}1$, in which case the series is

$$1 - {\cdot}2 + {\cdot}06 - {\cdot}024 + {\cdot}0120 - {\cdot}00720 + \&c.,$$

(and the first term which surpasses that preceding, is $2.3.\ \ldots.\ 11\,x^{10}$): the aggregate of the terms up to $2.3 \ldots. 9x^8$ inclusive, will not differ from the true value of the expression by so much as $2.3 \ldots. 10x^9$ or ${\cdot}0036288$. The proof of this curious proposition may be deduced from Lagrange's Theorem on the Limits of Taylor's Series. (*Lib. Usef. Knowl.*, Differential Calculus, page 73.)

Series which are functions of x, may be divided into—1. Those which are sometimes convergent, and sometimes divergent, such as the development of $(1+x)^n$; 2. those which are always convergent at last, but in which the appearance of divergency (increasing terms) may be continued as long as we please, such as the development of ε^x; 3. series which are always divergent, but to which a similar appearance of convergency can be given, such as $1 + 2x + 2.3x^2 + \ldots.$, and the like; 4. Series which are always convergent or always divergent, and never can be made to exhibit any symptom of approach to the other state, such as

$$x+\frac{1}{x}+\left(x^2+\frac{1}{x^2}\right)+\ldots \quad \text{and} \quad \frac{x}{1+x^2}+\frac{x^2}{1+x^4}+\ldots$$

The series which are always convergent, both in reality and appearance, and upon which, therefore, an arithmetical algebraist would reckon with most security, do, in fact, offer difficulties of a very peculiar character. They are the only ones in which the usual algebraical generalizations would lead to absolute error (so far as has yet appeared). On this subject generally, see Peacock's 'Algebra,' and Report on Analysis,' (*Rep. Brit. Assoc.*, vol. ii.); Cauchy, 'Cours d'Analyse;' Grunert, 'Supplemente zu Klugel's Wörterbuche der Reinen Mathematik,' in the article Convergenz der Reihen; 'Encyc. Metrop.,' article Calculus of Functions.'

CONVERSE, in logic and mathematics, means a proposition which is formed from another by interchanging the subject and predicate, thus: the converse of 'Every A is B' is 'Every B is A.' But care must be taken to put the proposition in its simplest logical form before conversion. Thus the converse of 'Every A has a B' is not 'Every B has an A.' For the proposition first stated is

$$\text{Every}\begin{bmatrix}\text{A}\\ \textit{subject}\end{bmatrix}\begin{bmatrix}\text{is}\\ \textit{copula}\end{bmatrix}\begin{bmatrix}\text{a thing which has a B}\\ \textit{predicate.}\end{bmatrix}$$

and the converse is 'Every thing which has a B is an A.'

Of the four forms to which all assertions can be reduced, namely (A) 'Every A is B'; (E) 'no A is B'; (I) 'some As are Bs'; (O) 'some As are not Bs', the logical converses (so called) are those in which the new subject appears with the same degree of generality of assertion as the old one. Thus the converse of 'Every A is B', is '*Every* B is A.' Consequently in the first and fourth forms, or the general affirmative and the particular negative, the logical converse is not necessarily true. Thus 'Every A is B,' does not give 'Every B is A' *necessarily*, but only 'some Bs are As'. The latter is called by writers on logic conversion *per accidens*, a term which, as Dr. Wallis has declined to explain it, we shall leave as we find it, adopting the phrase diminished or limited conversion, and calling the first kind simple conversion. The only other method of conversion which has a definite name is that in which the subject and predicate are made contradictory to the former ones, as when we convert the proposition, 'All equilateral triangles are equiangular triangles,' into 'All triangles not equiangular are triangles not equilateral.' This is called conversion by contra-position. Restricting ourselves to converses which are necessarily as true as the direct propositions, we have the following rules with respect to A, E, I, and O above.

E and I are simply convertible.

E and A are convertible by diminution.

A and O are convertible by contra-position.

Nothing is more apt to make a beginner believe that 'Every A is B' yields 'Every B is A,' than the study of geometry without close attention to the meaning of terms and the force of the parts of an assertion. For as a majority of the earlier propositions have their simple converses true, the student does not sufficiently reflect upon this being contingent and not necessary.

In mathematical propositions there is a species of conversion which has no name, consisting in the interchange of the predicate with a part only of the subject. Thus if P, Q, R, and S be four circumstances, of which the existence of any three makes the fourth also exist, we may observe this species of conversion in passing from the first to the second of the following propositions:—

Every (thing which gives P, Q, and R) is (a thing which gives S).

Every (thing which gives P, Q, and S) is (a thing which gives R).

Thus of the following set of circumstances: 1. That two figures be parallelograms; 2. That they be equiangular; 3. That the sides about equal angles be reciprocally proportional; 4. That the areas be equal: exhibit the possibility of this conversion. For (1) (2) and (3) give (4); (1) (2) and (4) give (3); (1) (3) and (4) give (2).

There is an important logical proposition which would save some theorems in Euclid, and give a much clearer view of some of the arguments. It is evidently most desirable, when a proposition is a purely verbal and logical consequence of another, that it should be known to be such, and its proof distinguished from those which do *not* merely develop implied propositions.

Suppose, for instance, that a certain thing must be either an A, a B, or a C, but cannot be two of them; and that each, A, B, and C, must be either a P, a Q, or an R, but cannot be two. Suppose also that each P, Q, or R, must either be A, B, or C. If then it can be proved that every A is P (and not Q or R), every B is Q, &c., and every C is R, &c. the simple converses necessarily follow; namely, that every P is A, every Q is B, and every R is C. These converses are usually proved in Euclid by a *reductio ad absurdum*. [ABSURDUM, REDUCTIO AD.] For instances see book i. prop. 19, 25.

The proof of the converse is generally in Euclid a *reductio ad absurdum*. The necessity for this undoubtedly arises from the restrictions of geometry. [EUCLID.] If it were permitted to turn a triangle round till it recovers its first plane again, and then to compare it with the original triangle, the indirect demonstrations of the first book would be avoided for the most part. It seems a fanciful distinction to allow a triangle to revolve in its own plane, as in book i., prop. 4, and to refuse to admit revolution about a line in the plane. The subject of converses is discussed by Aristotle, 'Analytic. Prior.,' i. cap. 2, &c. See the editions of the 'Organon,' by Pacius, 1597, &c.

CONVEX. [CONCAVE.]

CONVEYANCE (in Law) is a deed or instrument in writing which passes real or personal property. The only conveyances used in the earlier periods of English history seem to have been feoffments and grants, though cases were soon used to pass a limited interest. The possession of land, as well as property of a movable nature, passed by tradition or actual transfer. The possession of land was given symbolically, by the delivery of a twig, a turf, &c., the charter of feoffment being the evidence merely of the transaction, and not essential to its validity. Hence, in the charter of feoffment, the operative words, or those which expressed the gift or transfer of the property, were used in the past tense, *hath given*, &c.: these terms are still used by some practitioners, although the reason for them has long since passed away.

A grant was applied to the conveyance of incorporeal hereditaments which did not admit of actual delivery into possession. From this difference in their application, a diversity was supposed to exist in the innate qualities of the two modes of conveyance, the feoffment being used to convey the actual possession of land, and operating upon the possession without any regard to the estate or interest of the feoffor; the grant to transfer the right of the grantor to the grantee: the former is frequently defined as a tortious, the latter a rightful conveyance. This definition however does not appear to be correct, and the tortious operation of a feoffment has been controlled and even denied in several recent decisions, Sir James Mansfield (in Goodright *v.* Forrester, 1 Taunt. 613) observing, 'Our ancestors got into very odd notions on these subjects, and were induced by particular causes to make estates grow out of wrongful acts.'

Sir William Blackstone distinguishes conveyances as original or primary, which are those by means of which the benefit or estate is created, or first arises; and derivative or secondary, whereby the benefit or estate originally created is enlarged, restrained, transferred, or extinguished. This division however is of little practical importance. Conveyances operate either according to the rules of the common law, or under the statute of uses; and in the case of a lease and re-lease, in both modes: and this latter is the most usual modern mode of conveying land and hereditaments. Conveyances may be further divided into those made by matter of record and by deed. As examples of those by matter of record, we may mention private acts of parliament, and the king's grant; and, until those modes were abolished by the recent statute 3 and 4 Will. IV., c. 74, fine and recovery. Those by deed are by feoffment, grant, bargain, and sale, covenant to stand seised, lease, release or confirmation, exchange, surrender. Conveyances simply transferring personal property are called assignments.

By the statute 13 Eliz., c. 5, voluntary or fraudulent conveyances of real property are rendered void, as against the creditors of the party making the transfer; and the 27th Eliz., c. 4, extends similar, and in some instances more extensive, relief to subsequent purchasers of the same property, although they may have had notice of the prior conveyance. The bankrupt and insolvent laws also provide for the relief of creditors against certain conveyances of real and personal property in derogation of their claims, or made within a specified time previous to the bankruptcy or insolvency.

In the session of 1836 a bill was introduced into the House of Lords by Lord Lyndhurst to simplify the conveyance of real property, but it did not pass into a law. Its object was to abolish the use of the lease in conveyances by lease and release. In Ireland a somewhat similar but less effectual provision was made by the Irish statutes, 9 Geo. II., c. 3, sec. 6, made perpetual by the 1 Geo. III., c. 3, which enacted that the recital of the lease should in all cases be sufficient evidence of it.

In many of the states of North America a simple bargain and sale is the usual mode of conveying real property. In New York it is called a grant; and the conveyance by feoffment and livery of seisin, and also the statute of uses, are expressly abolished by the legislature.

Conveyances in Scotland are made according to the strict principles of the feudal law there established, which imparts to them the appearance of far greater specialty and quaintness than those used in modern English practice. (Bl. *Comm.*; Butl. *Co. Litt.*; Kent's *Comm.*)

CONVEYANCING is the business of preparing conveyances of real or personal property, of investigating the title of the vendors and purchasers of property, and of framing those multifarious deeds and contracts which govern and define the rights and liabilities of families and individuals. It is carried on by barristers, or members of the Inns of Court, who having kept twelve terms, obtain a certificate according to the provisions of the 9 Geo. IV., c. 49, and are called Certificated Conveyancers. The increased number of transactions in this branch of the law has rendered a division of labour, and a special course of study, necessary.

There are two opposite systems, by which the transfers and transactions of the owners of real property are capable of being carried on; and between the extreme points of which, in some portion or other of the intermediate ground, all existing systems must arrange themselves. In one of these systems, as in the present system of England, every transaction is accomplished and evidenced by means of instruments in writing, varying infinitely, and governed by a scientific and ascertained mode of construction. In the other, the effect is accomplished somewhat like the transfer of stock, by a comparatively mechanical operation, a process of book-keeping, of which the evidence is to be kept, not in private muniments, but in the ledger-books or registers of the State.

The respective objects of these systems are, in the one, to protect the rightful owner, in the other, the innocent purchaser. In the latter the State takes upon itself the duty of seeing to the title of the owner whom it admits to registration, and consequently takes upon itself the risk of being deceived; in the former, it leaves the parties to concert titles and transfers in secret and in silence, leaves them unrestrained and unchecked to transact with one another, but compensates this want of interference by the alternative of following the right, by its judicial machinery, against all parties, however ignorant, however innocent, who may have had the misfortune, at any time subsequent to a defective transaction, or wrongful succession, to become the owners or purchasers of the property; limiting that restoration or succession only by reference to certain durations of adverse possession. (Parke's *Lect.*)

In the time of the feudal law, and the period immediately succeeding, restraint was placed on every species of alienation; landed property was rarely the subject of barter. Every transfer of land took place in open court, that is, on the land itself *coram paribus* (before the pars or peers), who were the other tenants of the feudal lord, and who subscribed the instrument of investiture as witnesses (Sulliv. *Lect.*, p. 58); so that, in the words of Lord Mansfield, it was as notorious who was feudal tenant *de facto*, as who is now *de facto* incumbent of a living, or mayor of a corporation. Land was 'of a stubborn nature,' money portions were unknown, and personal property did not exist in sufficient quantities to be made the subject of settlement, and consequently conveyancing transactions were few and simple. But the devices of the ecclesiastics to evade the statutes of mortmain, the invention of uses and trusts, and subsequently the passing of the statutes of uses and wills, which enabled the possessor of land to provide for the contingencies which might occur in his family, and to mould his estate according to his whim or fancy, controlled only by the laws from time to time established to guard against the abuse of the privilege, the power of devising real estate, and the multifarious wants of a large and wealthy population, laid the foundation of the system of modern conveyancing. 'By means of this system,' says a late eminent professor, 'there is no device, arrangement, settlement, or disposition which imagination can conceive, or ingenuity construct, which the machinery of the law of England cannot carry into effect with certainty. There is no conceivable purpose to which property may not be applied or rendered instrumental, no event, or combination of events, which can possibly happen in a family, of whatever rank or number, which may not be provided for and met, by a family settlement framed by a master of his art.'

Modern conveyancing is conducted on principles which in general are well defined and accurately settled. Of this a remarkable proof was afforded by a statement in Mr. Parke's 'Contre-Projet to the Humphreysian Code,' p. 199, upon the authority of Mr. Preston, that of the cases which came before him (averaging thirty a week), three per cent. only went on to judicial litigation.

The great endeavour, from the earliest times, on the part of the owners of property, has been to be enabled to effect sales and dispositions with secrecy and dispatch, without incurring that publicity which it was the policy of the common law to enforce. Whether it be desirable, for the sake of mercantile credit, to favour secrecy, or promote publicity, in the sale and disposition of property, has been lately much discussed: a general registry has been proposed, and a bill for establishing it thrown out of the House of Commons. [REGISTRATION.]

CONVICTION. [JUSTICE OF THE PEACE.]

CONVOCATION, the assembly of the clergy in form of parliament under the authority of the king's writ, which takes place at the commencement of every new parliament. The tendency of the western states of modern Europe in political relations to become thrown into the form of which king, lords, and commons is no inapt type, is apparent in the ecclesiastical constitution of almost every country in which Christianity has been received and professed. The archbishop has had his suffragan bishops, and the bishops each his canons, who formed his council, in some of whom have been vested peculiar functions, as dean, archdeacon, and the like; while the great body of the clergy have had their meetings under the form of diocesan synods or provincial assemblies, in which they have been accustomed to discuss matters pertaining to the common interest and benefit of themselves or of the whole church. [BISHOP, CANON, CHURCH, CLERGY.]

These meetings, resembling as they do in some points the convocation of the English clergy in later times, might easily be supposed to be that assembly in its primordial state. But writers on this subject trace out the origin of the convocation in something more special than this. It is supposed that originally the clergy were thus called together by the king's authority for the purpose of assessing themselves in levies of taxes at a time when they contended for exemption from the general taxation of the country imposed by the authority of parliament. Like many other questions in our early constitutional history (we mean by 'early' when we ascend beyond the reign of King Edward the First), this is perhaps one of presumption and probability rather than of evidence and certainty. Such, however, the convocation is generally understood to have been in the reign of King Edward the First, rather than an assembly of ecclesiastics summoned to consult on things pertaining to the church, as the purity of its doctrine, the regularity of its ordinances, and the influence of its teachings and administrations.

When such an assembly was called together under the supreme authority of the state, it was natural that such subjects should be introduced, discussed, and in some instances determined by it; and even now, though the convocation may be said to exist rather in name than in reality, it seems to form the proper constitutional assembly in which to legislate on such subjects, whenever legislation upon them is needed.

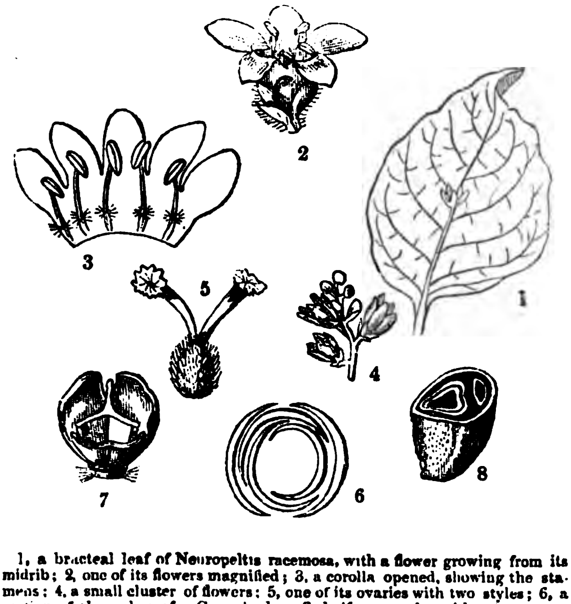
The crown, however, had always in its hands the power of controlling this assembly, possessing as it did the prerogative of proroguing and dissolving. But at the Reformation an act was passed (25 Henry VIII., c. 19,) which expressly deprived the convocation of the power of performing any act which could make such an assembly dangerous to the public. It was restricted by it from making any canon or ordinance which was opposed to the king's prerogative, or to the laws, customs, and statutes of the realm.

Again, in 1665, the clergy gave up the power of taxing themselves, consenting to fall within the scope of the statutes made in parliament for such purposes, like the laity when they received a right of voting with the laity in the election of knights of the shire.

But though virtually the convocation thus became almost a nullity, yet the practice has been continued, and continues to the present day, of summoning the clergy to meet in convocation whenever a new parliament is called; and the forms of election are gone through in the dioceses, and the meeting is held, usually in St. Paul's Church, when the form is gone through of electing a prolocutor or speaker. The king's writ is directed to the archbishops, commanding them to summon the bishops and the inferior clergy. The archbishop complies with this writ, summoning the bishops, and commanding them to summon the archdeacons and deans in their respective dioceses, and to command the chapters to elect one proctor each, and the great body of the clergy in each diocese two proctors, to represent them in the convocation. When assembled, they form two houses. In the upper house sit the bishops; in the lower, the other clergy, in all 143; viz., 22 deans, 53 archdeacons, 24 canons, and 44 proctors of the inferior clergy. It is the usual practice for the king to prorogue the meeting when it is about to proceed to any business.

CONVOLVULA'CEÆ, a natural order of monopetalous exogens, with bell-shaped flowers, opening or contracting beneath the influence of light, a plaited æstivation of the corolla, five stamens, and a fruit with two or three cells, in which one or two ovules stand erect. The embryo is crumpled up in the midst of very firm albumen. The common bind-weeds of the hedges, the Ipomœas and Convolvuli of the gardens, offer illustrations of the ordinary state of this order, the species of which have purgative roots, and in the case of scammony, yielded by Convolvulus Scammonia, and of jalap, produced by various species of Ipomœa, are of great medicinal importance. Occasionally the purgative principle is so much diffused among the fæcula of the root as to be almost inappreciable, as is the case in the Convolvulus Batatas, or sweet potato of America, which was the forerunner of the common potato, and gave it its name, and which is still cultivated in the south of Spain and France.

In most instances the stems of this natural order are twining, and in such cases it is immediately recognized; but occasionally they are erect and more spiny, and when that happens it is not so easy to know the order. If however attention is paid to the very imbricated state of the calyx, two of the sepals being quite exterior with respect to the other three, no real difficulty in identifying it need be experienced. For illustration we have taken a singular East Indian genus called Neuropeltis, in which the flowers grow from the midrib of the bracteal leaves: it would be superfluous to figure a bind-weed.



1, a bracteal leaf of Neuropeltis racemosa, with a flower growing from its midrib; 2, one of its flowers magnified; 3, a corolla opened, showing the stamens; 4, a small cluster of flowers; 5, one of its ovaries with two styles; 6, a section of the calyx of a Convolvulus; 7, half a capsule, with valves separating by their edge from the dissepiments; 8, a transverse section of a seed, showing a part of the embryo lying in the albumen.

CONVO'LVULUS, the genus of plants upon which the natural order Convolvulaceæ is founded, is known by its style being divided into two linear arms, and its ovary having only two cells, in each of which stand two erect ovules. Many of the species are exceedingly beautiful: even C. arvensis, the common bind-weed, would be prized as a lovely flower, if it were not so common, and such a troublesome plant to eradicate on account of its creeping roots. C. althæoides, italicus, and scammonia are the three prettiest of the hardy exotic species of the genus.

CONVO'LVULUS JALAPPA, and **C. SCAMMONIA**. The resins of the Convolvulaceæ, upon which these and other species depend for their activity as medicines, appear to be of two distinct kinds; the one soluble in proof spirit and insoluble in æther (found in jalap, turbith, and bind-weed), the other soluble both in alcohol and æther (found in scammony and C. soldanella). Jalap is chiefly shipped from Vera Cruz, and takes its name from the town of Xalapa, or Jalapa, in the interior. It is best when collected in March or April, before the young shoots have begun to be developed. The large root, which often weighs 50 pounds, is divided into portions, which are hung in nets over a fire, and dried in ten or twelve days. It occurs in commerce in irregular round or pear-shaped masses, which, when good, are dry, hard, with a brown shining fracture, resinous, not light, somewhat tough. It is often adulterated with portions of the root of white bryony, which however are white, or when old, gray, not heavy, very brittle, fracture not resinous, spongy, without smell, but with very bitter taste. Dried pears are also often substituted for it; but they may be detected by being laid open, when the core will be seen, containing the seeds. Analysed by Cadet de Gassicourt, 100 parts of the dry root yielded resin 10, gummy extractive 44, woody fibre 29, starch, albumen, salts of lime, and potass, &c. Its excellence depends upon the quantity of resin; a white jalap (from C. Mechoacanna) is sometimes met with, which contains only 2 per cent. of resin; its dose must be five or six times as great as that of the genuine jalap.

Jalap is ranged with the drastic purgatives, and where one of a resinous kind is desired, is that usually selected. Its action is generally certain, and when in combination with other substances, mild and speedy. It does not seem greatly to influence the nerves of the abdomen, but rather the vascular system of the pelvis and lymphatic system of the intestines. It is given in obstruction of the liver, vena porta, and diseases connected with these organs, such as hypochondriasis, melancholia, jaundice, dropsy, and intermittent fevers; but at the commencement of common fevers, along with calomel, it is of great utility; also in the inflammatory or turgescent stage of hydrocephalus, and in the treatment of worm cases.

Scammony is of the same nature as jalap, but being the inspissated juice obtained by making incisions into the living root, it consists of a much larger proportion of resin, without any woody fibre. It is therefore much more powerful, and the dose requires much less than that of jalap. Three kinds are met with: the best from Aleppo contains 60 per cent. of resin, with 35 per cent. of impurities; second sort from Smyrna, contains only 29 per cent. of resin and 58 of impurities; the third sort, from Antioch, is very bad. In France a so-called scammony, obtained from the Cynanchum monspeliacum, is very bad, and dangerous to employ. Scammony is used in nearly the same cases as jalap, and the smaller bulk of the dose renders it in many instances preferable: it often sits better on the stomach; no medicine surpasses it in clearing away the mucous accumulations in the bowels of children, which harbour, if they do not generate, worms. It should not, however, be too frequently repeated, as its power in this respect renders it a source of danger, by abrading the inner coat of the intestines of its necessary mucous covering, and thereby causing it to become inflamed. [CATHARTICS.]

CONVOY, in the military service, is a detachment of troops appointed to guard supplies of money, ammunition, provisions, &c., while being conveyed to a distant town, or to an army in the field, through a country in which such supplies might be carried off by the peasantry or by parties of the enemy.

In the navy, the name is applied to one or more ships of war which are ordered to protect a fleet of merchant-vessels on their voyage.

CONVULSIONS, irregular (anormal) and violent con tractions of muscular fibres with alternate relaxations. The muscles of the body are divided into two great classes, those which produce the motions necessary for the due exercise of the organic functions, and those which produce the motions necessary for the performance of one of the animal functions, namely locomotion. The first division comprehends the class of the involuntary, and the second that of the voluntary muscles. Contractility, the property of shortening itself on the application of a stimulus, is the proper function of the muscular fibre,; and by this property all vital motion of every kind which takes place in the living system is performed. [MUSCLE.]

The property of contractility is inherent in the muscle; but the manifestation of this property is wholly dependent on the nervous influence; for if the nervous influence be abstracted from a muscle, its fibres are incapable of contracting, whatever degree of stimulus be applied to them. When the muscular fibre is in a sound state, and is supplied with the nervous influence in proper quantity and of proper quality, the fibre contracts with a given degree of force on the application of a certain amount of stimulus. This degree of contraction constitutes its regular or normal action. Contraction, after it has continued a certain time, is succeeded by relaxation; relaxation, in its turn, yields after a given time to another contraction; this contraction to relaxation, and so on successively according to the order proper to muscular action when natural and sound. [MUSCLE.]

But when, on the application of a given stimulus, the muscular contraction is either more violent or more rapid, or longer continued than natural, that is, when it does not yield in proper time to the alternate state of relaxation, the muscular action is said to be convulsive, and the disease termed convulsion is induced. The state of convulsion is also produced when the muscular fibre is excited to inordinate action on the application of a stimulus not natural to it. The function ultimately deranged in convulsion is the muscular contractility; but the function proximately deranged is the nervous influence; the manifestation of disease is in the muscular, but its true and proper seat is in the nervous system.

Both divisions of the muscular system, the voluntary and the involuntary, are subject to this irregular and violent action. When the muscles of animal life, or those of voluntary motion, are thus affected, it constitutes the disease called convulsion in its true and proper sense; when the muscles of organic life, or those of involuntary motion, are thus affected, the disease is usually termed spasm. This distinction is not indeed invariably and universally observed by medical writers; but it would be very convenient if it were so. When the muscle is rigid and tense, and its contraction is persistent, not quickly alternating with relaxation, the contraction or spasm is called tonic; when the contractions rapidly alternate with relaxations, the convulsion or spasm is called clonic. In the first, the vital energy of the muscle is in excess; in the second it is deficient. When the convulsive or spasmodic action is of the clonic kind, but instead of being violent is slight, and when very slight contractions rapidly alternate with relaxations, it constitutes what is called *tremor*.

Convulsions differ, first, in kind, as dependent on an excess or a deficiency of vital energy; secondly, in degree; varying from the most powerful, violent, and persistent contractions, without perceptible relaxations, or with relaxations of very short duration, down to the feeblest contractions, with the most rapid alternate relaxations of the slightest tremor; thirdly, in their seat, affecting either the voluntary or the involuntary muscles, or both simultaneously or in succession; fourthly, in their cause, arising from a primary affection of the nervous system, or from irritation propagated to the nervous system from some other part (primary or secondary); fifthly, in their extent; affecting one part separately, or nearly the whole frame simultaneously (local or general); and sixthly, in their character (simple or specific): simple, when unattended with phenomena which give them a determinate type, that is, when the phenomena consist merely of convulsive or spasmodic action; specific, when the convulsive actions pursue a regular and determinate course, and when, moreover, some particular phenomenon is superadded to the series constituting a distinct form or type of disease. In this latter case the disease receives a generic name. The term epilepsy, for example, is given to the disease when the convulsions come on in a peculiar mode, and pursue a determinate course, and when there is present the superadded phenomenon of insensibility or sopor. On the other hand, in the affection called hysteria, the convulsions come on in a different mode, pursue a different course, and are attended with a different but still a determinate train of morbid phenomena. In these cases convulsions forming the species of disease, the series of determinate morbid phenomena constitute so many different genera under it.

Voluntary muscles are far more frequently the seat of convulsions, properly so called, than the involuntary muscles. The diaphragm, indeed, an involuntary muscle, next in importance to the heart, is often affected with a proper convulsive action, constituting the disease called singultus or hiccup; and the heart itself appears to be occasionally affected with a proper convulsive action, in some of the forms of palpitation, for example; but in general, when the organs of the organic life, as the bronchi, the stomach, the intestines, the urinary bladder, the uterus, &c., are attacked with an affection of this kind, it is much more closely allied, as has been stated, to the nature of spasm than of convulsion.

Of the voluntary muscles, whether those appropriated to locomotion, or those destined to act on foreign bodies under the command of the will, and also of certain muscles which, though not under the direct command of the will, still belong to the animal life, having a close relation either to sensation or emotion, there is not one which may not be the seat of convulsion, singly, or conjointly with many others.

The muscles of the eyelids, the muscles that move the ball of the eye, the muscular fibres of the iris, the muscles of the face, and more especially of the lips, the muscles of the tongue, the muscles of the pharynx, the muscles of the jaws, and particularly of the lower jaw, the muscles of the neck, the muscles of the chest, back, and abdomen, and the muscles of the upper and lower extremities, may be severally attacked singly or in combination, simultaneously or in succession, with every degree of convulsion, from the most violent tonic contractions to the slightest clonic tremors or twitching. The particular muscles affected, the particular combinations of the muscles affected, the particular order in which the muscular affections succeed each other, may be indicative of specific diseases of the nervous system or of diseases seated in particular parts of the nervous system. The study of these convulsive affections is therefore most important in a practical point of view, as indicating, at one time, the near approach or the actual existence of highly dangerous diseases, having their primary seat in the brain or in the spinal cord; and at another time pointing to no less formidable diseases of the brain and spinal cord excited by diseases of some distant organ.

When convulsions attack a single muscle, or a particular set of muscles, the convulsions are called partial or local; when they attack a great number of muscles simultaneously or in rapid succession, they are called general.

The accession of convulsions, whether local or general, is commonly, though not invariably, preceded by premonitory signs. An attention to such premonitory signs, when present, as they will almost always be found to be, if carefully looked for, is of the last importance; because it may lead to the adoption of means which may prevent the attack. Among the most common and decisive premonitory signs of an approaching attack of convulsions may be enumerated, flushing of the face, or the opposite state, an unusual pallidness of the countenance; giddiness; noise in the ears; spectra floating before the eyes; sudden and transient loss of sight or of hearing; unusual drowsiness, or the contrary state of sleeplessness and restlessness; a sensation of coldness creeping down the back or pervading the limbs; sickness or nausea at the stomach; palpitation of the heart; hurried irregular respiration; tendency to sigh; a sensation of faintness; torpor or despondency of mind, and an unusual irritability of temper. It is rare, that some one or more of these or of other analogous signs do not give warning of the approach of the paroxysm. The presence of such signs should therefore not only not be neglected, but, wherever there is a predisposition to the disease, should be carefully looked for, that measures appropriate to the particular nature of the case may be promptly taken to prevent an occurrence of the attack.

In the actual paroxysm, the features of the face are sometimes hideously distorted; the eyeballs are prominent, staring, vacant, wild, and are rolled in every direction; the teeth gnash; the mouth foams; the tongue protrudes; and the action of inspiration from the passage of the air through the clenched teeth, is attended with a hissing sound. So violent are the contractions, that occasionally the teeth and sometimes even the bones of the extremities are broken by the force. When the muscles of respiration are involved, and the respiratory function is much obstructed, the face becomes tumid, bloated, and of a dusky or purple colour; and sometimes even the entire surface of the body assumes a leaden hue, from the obstructed circulation through the lungs and the imperfect aëration of the blood. Such is the obstacle to the progress of the blood, that the blood-vessels sometimes give way, and the blood bursts from the nose, or is effused extensively beneath the skin, the effusion probably preventing irreparable mischief to the brain. At other times the face, instead of being red, is pallid and sunk, and then the pulse is feeble, small, and contracted; as in the former case it is full and strong, and attended with a violent beating of the carotids. The violent contractions of the muscles act upon the bladder and rectum, and expel their contents involuntarily and with force. In all the cases in which the current of the blood is much obstructed, the functions of the brain are proportionally impaired, the general sensibility is diminished, and there is sopor, or even coma; at other times consciousness is but little affected, and the violence of the contractions produces severe pain.

The duration of the paroxysm varies from a few minutes to as many hours. The moment the convulsions subside, the patient commonly falls into a long and profound sleep, from which he awakes suddenly, altogether unconscious of what has happened. The attack is generally succeeded by languor, lassitude, sickness, and a disordered state of the stomach

The paroxysm commonly returns at uncertain intervals, preceded by the premonitory symptoms just enumerated. But sometimes it proves fatal at the very first attack, by producing apoplexy or asphyxia; and not unfrequently it leaves behind it either paralysis or some definite and permanent form of convulsive disease, as epilepsy, chorea, and so on. The frequent recurrence of the fits invariably impairs, and sometimes wholly destroys, the mental faculties.

In some peculiarly nervous and irritable temperaments, instead of the languor and lassitude which ordinarily follow a severe convulsive paroxysm, the exhaustion is so extreme that the patient falls into a state of profound syncope or fainting, which continues for so long a period as justly to excite alarm; and sometimes the patient actually dies in this fainting fit, the brain never recovering its functions. At other times, when the animal life is completely suspended, and the action of the organic life appears to have ceased, but the latter is not wholly extinguished, though its functions are performed so feebly as to afford no indication of their existence; and consequently, to all outward appearance the patient is dead; yet he may be only in a state of lethargy or torpor, and may ultimately revive. It is in cases of this kind that there is a real danger of premature interment. Several cases are on record in which this event is stated to have actually happened, and the evidence on which the truth of some of these narratives rests it is difficult to resist. At all events it is quite certain, that several persons who had fallen into the state of syncope, after the exhaustion of convulsions, have narrowly escaped being buried alive; and such cases should make the medical attendant persevere in the most careful examination of every instance of apparent death, after a convulsive paroxysm, until he has observed the most unequivocal evidence that death is real.

The preceding account of a paroxysm of convulsion, is the description of it only as it exists in its severest form. In general even the tonic seizure is a much more mild attack; the convulsions being not violent; affecting only a few muscles at a time, and rather passing in succession from one set of muscles to another, than attacking a great number simultaneously. In general too the convulsions are unattended with the obstruction of respiration; are without the abolition of sensation; in short, are without the permanent and dangerous interruption of any function, organic or animal. And more especially when the paroxysm is of a clonic character, the muscles are not rigid, the contractions are not vehement and long-continued, the face is not swollen and livid, but rather pale and sunk, the features are little distorted, the pulse is feeble and rapid, and the extremities are cold.

Convulsions are frequently excited in the progress of other diseases, towards the termination of continued fevers, for example, in which they are almost always of bad, and sometimes of fatal omen; at the commencement of eruptive fevers, as small-pox, measles, scarlet fever, &c., when, though generally indicative of a severe form of disease, they are not so alarming as at the close of continued fever; in inflammatory affections of the brain; in hooping-cough; in cramp; in disordered states of the reproductive organs, and more especially of the uterus, and in long-continued suppression or imperfect performance of the catamenial function.

The causes of convulsions are exceedingly numerous and varied. There is, without doubt, a constitutional predisposition to such affections. They occur far more frequently in the nervous temperament than in any other. The distinctive character of the nervous temperament is muscular mobility combined with nervous irritability. The muscular fibre is relaxed, delicate, and weak; the nervous fibre is peculiarly sensitive, while it is proportionally without energy. Other powerful causes are, peculiar conformation of the body, namely, a feeble frame, with a largely-developed head; a relaxed and delicate fibre; a full and plethoric habit; a constitution often manifestly propagated from parent to child; all circumstances capable of producing over-excitement, or in any other mode of inducing debility, physical or mental; as an idle and luxurious mode of life; too much indulgence in sleep; neglect of regular and active exercise, and, as would appear, certain electrical conditions of the air, by which the nervous system is rendered more susceptible of impressions, and its vital energy is more rapidly exhausted.

The exciting causes are those which act either upon the animal or upon the organic portion of the nervous system. It has been stated that contractility, though a property inherent in the muscular fibre, can be excited only through the agency of a stimulus derived from the nervous system. All the muscles which are under the control of the will, or which depend on an act of volition for the exercise of their function, derive their nervous stimulus from a particular portion of the nervous system, namely, the spinal cord. Modern physiology has demonstrated that the nervous fibres which supply the stimulus necessary to voluntary muscular motion are different from the nervous fibres which communicate sensation. The first, the motive nerves, communicate with a particular portion of the spinal cord; the second, the sentient nerves, communicate with another portion of the spinal cord. Now, it is found that whatever disturbing influences act immediately upon the motive nerves, or upon that portion of the spinal cord with which the motive nerves are in direct communication, constitute most powerful exciting causes of convulsions. But there is so close a sympathy between the sentient and the motive portion of the spinal cord, and between the spinal cord and the brain, that any disturbing influence which acts powerfully on the one is rapidly communicated to the other. It is indeed seldom that it is possible to trace the seat of the irritating cause either to the motive or to the sensitive portion of the nervous system exclusively; that would imply an accuracy and completeness of knowledge which pathologists are at present far from possessing. All that the present state of knowledge almost ever admits of is to trace the seat of the irritating cause to some portion of the spinal cord or brain; and this, which is nearly all that can be done in any other case, is sufficient to connect the morbid condition of the organ with its disordered function. There are then morbid conditions of the spinal cord and brain which are clearly ascertained to be immediately connected with that disorder of their functions of which convulsions are the result.

Such are, 1. A disordered state of the circulation of the blood through these organs. One of the conditions the most essential to the due performance of the functions of the nervous system is, that the spinal cord and brain receive a certain supply of arterial blood. If the quantity of blood which flows to these organs be deficient, syncope will be induced, with a diminution or loss of muscular power: of this state convulsions, always of a clonic character, are a constant result. If the blood transmitted to the spinal cord and brain do not circulate through the blood-vessels with a certain impetus and velocity, but be retained either in the capillary arteries or veins, or in both, the state termed congestion [CONGESTION] will be induced, of which convulsions, also in general of a clonic character, are a constant result. If the blood sent to the spinal cord and brain be in preternatural quantity, and if it circulate with preternatural energy, the state of inflammation will be induced, of which convulsions, always of a tonic character, are a constant result. Whether, then, the balance of the circulation be disturbed by deficiency or excess in the quantity of the circulating blood, or deficiency or excess in the motion of it, it will prove alike an exciting cause of convulsions. 2. Precisely the same results are produced if there circulate through the blood-vessels blood vitiated in quality, blood too much venalized, or too much arterialized, or impregnated with poison. The characters of the convulsions induced by exciting causes of this class vary essentially according to the nature and extent of the vitiation of the blood and the kind of poison with which it may be imbued. 3. Extravasation of blood upon the surface or into the substance of the spinal cord and brain, by the rupture of the blood-vessels; or the effusion of the serous portion of the blood, occasioning direct pressure on the nervous matter. 4. Organic changes in the constitution of the nervous substance, as a preternatural softening or a preternatural hardening of it. 5. Morbid growths within the nervous substance, forming tumours of various natures and sizes. 6. Mechanical injury of the nervous substance, from the irritation occasioned by the deposition of bony matter on the investing membranes of the nervous substance, or from spiculæ of bone growing out from the inner table of the osseous cases that inclose it. 7. Mechanical violence directly applied to the nervous substance, as from a blow or fall, by which a shock, exhaustive of its vitality, may be communicated to it, or its substance injured or its circulation disturbed. Such are the more powerful exciting causes which act directly on the animal portion of the nervous system.

But convulsions may be equally induced by the action of an irritating cause on the organic portion of the nervous system. The irritation excited in the organic nerves is transmitted to the communicating branches of the spinal and cerebral nerves, and is by these communicating branches conveyed to the spinal cord or brain. It is in this manner that irritating substances in the stomach or in the intestines induce convulsions, as indigestible or acrid substances taken as food, or acrid matters generated or evolved during the digestive process, or retained by long-continued constipation [CONSTIPATION] in some part of the alimentary canal; or the accumulation of acid, or the presence of worms, &c. Many other noxious agents which act upon one or other of these nervous circles, or upon both conjointly, might be enumerated as the exciting causes of convulsions; but those which have been stated may suffice to indicate the kind of noxious agents which induce this affection, by disturbing the functions of the nervous system.

The treatment in every case of convulsion must be directed to the subduing of the paroxysm and to the prevention of its return. There are certain things proper to be done the instant a person is seized with a fit of convulsions, with a knowledge of which it is desirable that every one should be familiar. The patient should be immediately surrounded as completely as possible with fresh cool air. If he be seized in a small heated and crowded room, circumstances of themselves sufficient to produce a paroxysm in a person strongly predisposed to it, he should be removed into a spacious apartment, the windows of which should be thrown open, and every one whose assistance is not absolutely required should be excluded from the room. In the male, the neckcloth should be immediately untied, and the face, neck, and bosom freely exposed to the air; in the female, the stays should be unlaced, and every thing tight about the body should be removed. If the skin be cool and the face pallid and sunk, the patient should be placed in the horizontal posture; if the skin be hot and the face flushed, he should be sustained in the sitting or the erect posture, in order, in the former case, to favour the flow of blood to the spinal cord and brain; and in the latter, to retard it.

The remedies employed to put an end to the fit must of course depend on the nature of the exciting cause, and on the pathological condition of the nervous system. If the vascular action of the nervous system be highly excited; if the pulse be rapid, full, and strong; if the skin be hot, and the face flushed; if the eye be injected, wild, and glistening, means must be taken the very opposite to those which are proper when the circulation is depressed, the pulse rapid and feeble, the skin cool, the face pallid and sunk, and the eye dull, heavy, and expressionless. The experienced eye of the observing and discriminating practitioner will gather at a single glance, from the presence or absence of sopor, from the presence or absence of the signs, familiar to him, of active or passive congestion [CONGESTION], from the action of the carotid arteries, from the temperature of the skin, from the plethoric habit of the body, and from the character of the convulsions, almost all the information necessary to determine the first steps to be taken. Whether it be necessary to employ the lancet vigorously, opening a large orifice in the vein of both arms at once, or opening the jugular vein, or the temporal artery, or whether it be more desirable to have recourse to revulsive bleeding, by opening the veins of the feet, retaining the feet in warm water, or to employ topical depletion, by cupping behind the ears, at the nape of the neck, or between the shoulders; or whether the very opposite treatment be required, and life itself depend, as it sometimes does, on the administration of stimulants, restoratives, antispasmodics, opiates, he will be clearly taught by symptoms, which only perplex and confound the ignorant and the undiscerning. Not only the shortening of the paroxysm, but the preservation of life, will constantly depend on his perception of the right, among apparently opposite indications; on the promptness of his decision, and the energy of his action. There are few departments of medicine in which more care and skill are required to make the proper selection, and to adopt the most advantageous mode of exhibiting even the auxiliary remedies, namely, the application of cold and heat, the administration of purgative medicines; the application of counter-irritants, &c. If possible, a still higher demand will be made on professional knowledge and judgment, to detect the organs whose altered structure or diminished function are the cause of the disease, and to discriminate their exact pathological condition. Unless a sound conclusion be arrived at on these points, no rational course of treatment can be pursued, and it is more than probable that the very agents employed to cut short the paroxysm will increase the danger, and that the course adopted to prevent the return of the fit will facilitate and hasten its recurrence. It is impossible in this place to enter on a field of professional investigation so extensive and important; it is one on which the labours of modern pathologists have shed great light; and it is the duty of every medical practitioner diligently to study their works, that he may collect every scattered ray to guide him through a course in itself difficult and intricate, and in which, if he err, the consequence must always be mischievous and often fatal.

CONWY. [CAERNARVONSHIRE.]

COOCH BAHAR, a principality occupying the north-east extremity of the province of Bengal, and lying between 26° and 26° 30′ N. lat., and between 88° 52′ and 89° 52′ E. long. This principality, which once formed the western division of the antient kingdom of Camroop, has long been in a state of absolute dependence on the English government, to which an annual tribute is paid to the amount of half the revenue, and for the purpose of securing this tribute, the principality has been placed under the controul of the collector of the adjoining district, Rungpore. The extreme length of the principality from east to west is sixty miles, and its mean breadth about twenty-two miles, the total area being 1302 square miles.

The distinctive name, Cooch, has been given in order to mark the difference between this principality and the province of Bahar (described vol. iii., p. 276). This name, Cooch, is derived from that given to the majority of the inhabitants. The name of Cooch Bahar is displeasing to the chiefs of the country, who repudiate all connexion with the Cooch, and call themselves *Rajbangsies* (descendants of princes). Many of the Cooch tribes have relinquished the practices of their ancestors, which were characterized by various impurities, and have adopted the Brahminical faith; while others who inhabit the northern quarter of the principality, near to the frontier of Bootan, continue rude and barbarous in their habits. Their religion allows them to eat pork, mutton, venison, and poultry, but not beef; some of the more barbarous among the tribes not only eat beef, but frogs, cats, dogs, and snakes.

The southern parts of the principality are much improved by culture, and of considerable fertility; but in the north the country is low and marshy, and contains abundance of thick jungle. A considerable quantity of opium is produced, as well as indigo, and some cotton. Wheat is cultivated, and a little barley. Trade between the principality and the adjoining British territory is perfectly free, and the people have also commercial dealings with Asam and Bootan. Among the more indigent classes in the north, it is customary for the people to sell their children for slaves, although this traffic is much discountenanced by the English government.

The sovereign of this country is described in the Ayin Akbari as having been a powerful chief, at the head of an army of 1000 horse and 100,000 foot soldiers, and having Asam and the whole kingdom of Camroop under his sway, his territory being bounded on the east by the Bramahpootra river, on the south by Gorhaghaut, on the west by Tirhoot, and on the north by the Thibet mountains. This country was conquered by the Moguls about the year 1660, and subjected to an annual tribute of ten lacs of rupees. In 1772, when the East India Company had succeeded to the rights of the Mogul emperor, the rajah of Cooch Bahar applied to the collector of Rungpore for protection against the attacks of the Bootaners, by whom he had been reduced to great extremities. It was on this occasion that the rajah offered to pay an annual tribute to the English equal to one-half of his revenue, which offer being accepted, a British force was despatched to his assistance, and the Bootaners were made to retire precipitately. The tribute having fallen into arrear, and the internal affairs of the country being greatly disorganised, an English commissioner was appointed in 1789 to collect the revenues and controul the public expenditure, retaining the amount of the tribute, and paying over the surplus to the rajah. At this time the rajah was a minor, and when he attained his majority in 1801, the commissioner was withdrawn, but the right of superintendence was still retained in the hands of the collector of Rungpore. During the residence of the commissioner, the finances of the country were rescued from the state of disorder in which they were found, the tribute was regularly paid, and a considerable surplus accrued, which was invested for the benefit of the rajah in the English funds. No sooner however had the commissioner been withdrawn, than the old irregularities were again experienced, the tribute was obtained with great difficulty, and the rajah himself was kept in a state of poverty, while his ministers by a system of extortion and embezzlement were amassing fortunes. This state of affairs continued until 1813, when the tribute being withheld, and the country generally in a state of complete anarchy, a resident English commissioner was again appointed by the governor-general, the rajah was compelled to dismiss his ministers, and appoint others on the nomination of the English government, and a system of criminal jurisprudence was established, and administered through the agency of the British commissioner. The amount of annual tribute paid to the Bengal government is between 60,000 and 70,000 rupees. (*Ayin-i-Akbari*; Rennell's *Memoir of a Map of Hindustan*; Mill's *History of British India*.)

COOK, CAPTAIN JAMES, was the son of an agricultural labourer and farm-bailiff, resident at Marton, six miles from Stockton-upon-Tees, in Yorkshire, and was born October 27, 1728. At an early age he was apprenticed to an haberdasher at the fishing town of Staiths, near Whitby. Here his genius soon showed its true bent; and having procured a discharge from his master, he apprenticed himself to a firm engaged in the coal trade at Whitby, in whose service he continued, rising gradually, till he attained the situation of mate. Being in the Thames in 1755, when men were greatly sought after, he resolved to take his chance as a volunteer in the royal navy. He was soon distinguished as a skilful and trustworthy seaman: and such effectual interest, backed by the favourable testimony of Captain, afterwards Sir Hugh Palliser, was made in his behalf at the Admiralty by some Yorkshire gentlemen, that in May, 1759, he was appointed master, first of the Grampus sloop, afterwards of the Mercury, in which he was present at the siege and capture of Quebec, by Wolfe. He gave eminent proofs of skill and resolution, in taking soundings of the river opposite to the French fortified camp, preparatory to an attack thereon, a difficult and dangerous service, which he performed so well, that he was afterwards employed to lay down a chart of the river from Quebec to the sea. This chart was published, and for a long time was the only one in use. His success in these employments is the more remarkable, as he appears never to have been taught surveying, nor even accustomed to use the pencil.

In the same autumn he was promoted to be master of the Northumberland man-of-war, in which he served till 1762, when the ship returned to England. During the winter of 1759-60, which he passed at Halifax in Nova Scotia, he employed the leisure which the season gave him in beginning the study of mathematics, with a view to qualify himself for the higher departments of his profession. In 1763 he went out to survey the Newfoundland islands; and in 1764, on the appointment of Sir Hugh Palliser to be Governor, Cook was appointed Marine Surveyor of Newfoundland and Labrador. The fruit of his labours during the four years in which he held that office, was embodied in his valuable charts of those countries.

The credit which he acquired in the discharge of his functions at Newfoundland, was the cause of his selection, in 1767, as a fit person to conduct a voyage undertaken into the South Pacific Ocean, for astronomical and geographical purposes. On this occasion Mr. Cook was promoted to the rank of lieutenant. For an account of the origin and objects of this undertaking, and the course of the voyagers as far as Otaheite, we refer to the article BANKS, SIR JOSEPH. The transit of Venus having been satisfactorily observed on the third of June, Cook resumed his voyage July 13, 1769, and after cruising for a month among the other Society Islands, sailed southwards in quest of the unknown continent, *Terra Australis Incognita*, which was formerly supposed to exist somewhere, as a counterpoise to the great mass of land in the northern hemisphere. Lofty mountains were seen October 6, and it was supposed that the object of their search was found. The land however proved to be New Zealand, which had not been visited by Europeans since it was discovered by Tasman in 1642. Cook spent six months in sailing round it, and found it to consist of two large islands, divided by a narrow channel the warlike and savage temper of the natives hindered him from doing much to explore the interior. Sailing westward, he reached New Holland April 19, 1770, and ran down its eastern side from lat. 38° to its northern extremity at Torres Strait, lat. 10½°, where he took possession of the coast which he had explored in the name of Great Britain, and denominated it New South Wales. He then shaped his course towards New Guinea, and by passing between them proved what had been disputed, that New Holland and New Guinea were distinct islands. Of the various interesting adventures and narrow escapes which occurred to the navigators during their long sojourn among savage tribes and unknown seas, especially that difficult and tedious navigation of near 2000 miles along one of the most dangerous coasts in the world, we have no room to speak. Cook continued his voyage by Timor and the south coast of Java to Batavia (Oct. 9), where he was compelled to stay two months and a half to repair the ship, which had received most dangerous injuries among the coral reefs of New South Wales. The pestilential climate of Batavia proved very fatal to the ship's crew, already weakened by the hardships of their long voyage. Seven died at Batavia, and twenty-three more on the voyage to the Cape of Good Hope. June 12, 1771, the Endeavour anchored in the Downs.

Shortly after his return Cook was promoted to the rank of Commander. His journal and the papers of Mr. Banks were entrusted to Dr. Hawkesworth, who from these documents, and the materials of Captains Byron, Wallis, and Carteret, published an account of the several voyages of discovery undertaken during the reign of George III. into the Pacific, illustrated with plates and charts at the expense of government.

This voyage proved two things: first, that neither New Zealand nor New Holland were parts of the supposed southern continent; secondly, that no such continent could exist to the northward of 40° S. lat. It was now determined to send out a second expedition under Cook to explore the higher latitudes, and the Resolution, of 460 tons, and a smaller ship, the Adventure, Captain Furneaux—which parted company in the second year of the voyage—were commissioned for this purpose. Cook was instructed to circumnavigate the globe in high southern latitudes, prosecuting his discoveries as near the South Pole as possible, and making such traverses, from time to time, into every corner of the Pacific Ocean not before ex amined, as might finally and effectually resolve the much agitated question about the existence of a southern continent in any part of the southern hemisphere to which access could be had by the efforts of the boldest and most skilful navigator.

The two ships sailed from Plymouth, July 13, 1772, quitted the Cape of Good Hope Nov. 22, and traversed the Southern Ocean in high latitudes during near four months, between the limits of E. long. 20° and 170°, the extreme point to the southward being lat. 57° 15′. Having satisfied himself that no land of great extent could exist between these limits, Captain Cook made sail for New Zealand, which he reached March 26, 1773. After spending the winter months (our summer) among the Society Islands, he resumed his quest of the southern continent in November, proceeding eastward, principally between the 60th and 70th parallels of latitude, and from E. lon. 170° to W. lon. 106° 54′, where he reached his extreme southing, lat. 71°10 , where he was finally stopped by ice. Returning northwards, during the winter months he traversed the Pacific Ocean in the southern tropic, from Easter Island to the New Hebrides, and discovered another island, the largest in the Pacific except New Zealand, which he called New Caledonia. Thence he returned to New Zealand, to refresh the crew, and resumed his quest of a southern continent, November 10. Having sailed in different latitudes, between 43° and 56°, till the 27th, when he was in W. lon. 138° 56′, he gave up all hope of finding any more land in this ocean; and determined to steer direct for the western entrance of the straits of Magalhaens, with a view of coasting the south side of Tierra del Fuego, which at that time was very imperfectly known. December 29 he passed Cape Horn, and standing southward, discovered Sandwich Land, a desolate coast, the extreme point of which was named by him the Southern Thule, lat. 59° 13′, W. lon. about 22°, as being the most southern land which had been then discovered. Thence he ran to the eastward, nearly to the longitude of the Cape of Good Hope, and having thus encompassed the globe in a high latitude, and satisfied himself that no land of considerable magnitude could exist between the 50th and 70th parallels, he thought it inexpedient to prosecute his discoveries in those tempestuous seas with a worn ship and nearly exhausted provisions Accordingly he made sail for the Cape, which he reached March 22, 1774, having sailed no less than 20,000 leagues since he left it, without meeting even with so trifling an accident as the loss of a mast or yard. July 30 he anchored at Spithead.

He was immediately raised to the rank of Post Captain, and received a more substantial reward for his services in being appointed a Captain of Greenwich Hospital. Men of science were powerfully interested, not only by his geographical discoveries, but by his unprecedented success during this voyage in preserving the health of his ship's company, of whom he lost only four, and only one of these by any sickness. His method consisted chiefly in a strict attention to diet, and to keeping the ship clean, well-aired, and dry. Much however was found to depend upon the care and influence of the commanding officer; for the crew of the Adventure, fitted out with the same provisions, had suffered considerably even at an early period of the voyage. On the day of Cook's admission to the Royal Society, March 7, 1775, a paper of his was read, giving an account of the methods. April 18, he communicated a second paper, relative to the tides in the South Seas; both of these are printed in the Philosophical Transactions, vol. lxvi. For the former the Society gave him the Copley medal, which is bestowed for the best experimental paper of the year. Of this second voyage he published his own journal, illustrated by maps and engravings; a supplementary volume containing the astronomical observations was published at the expense of the Commissioners of Longitude. The style is unpretending, clear, and manly, and, considering the imperfection of his education, does credit to his sense and ability.

While Cook was exploring the Southern Ocean, the attention of government was also turned towards discoveries in the Arctic regions. [North-West Passage.] It was not thought fair, after so many years of labour and anxiety, to request him immediately to forego his honourable ease; but when he volunteered his services, they were gladly accepted. Two ships, the Resolution and Discovery, the latter commanded by Captain Clerke, who had sailed with Cook in both his former voyages, were fitted out with every thing that could promote the health and comfort of the crews and the scientific objects of the voyage. They sailed from Plymouth July 12, 1776. Cook's instructions were to the following effect:—he was to proceed by the Cape of Good Hope to the Pacific, and to revisit the chain of islands lying along the southern tropic, in which he was to endeavour to disseminate and naturalize a variety of useful animals, to be carried from England and the Cape. He was then to bend his course northwards, and on reaching the western coast of America, to proceed with as little delay as possible to the latitude of 65°, and then to use his best endeavours to return to the Atlantic by the high northern latitudes, between Asia and America, thus reversing the usual course of Arctic voyagers. He arrived at the Friendly Islands too late in the spring of 1777 to attempt anything in the Arctic Seas that year. In December he took a final leave of the Polynesian Archipelago, and January 18, 1778, came in sight of an unknown group, to which he gave the name of Sandwich Islands, about 20° N. lat. Making no long stay, he reached the coast of America March 7, being then in 44° 33′ N. lat. In Nootka Sound, lat. 49° 33′, he stopped a month to put the ships in perfect repair before encountering the dangers of the Polar Seas, and proceeded, April 26, keeping near the coast whenever the state of the weather permitted. Following this course to the extreme northern point of the Pacific, he there examined a deep bay, afterwards named Cook's Inlet, concerning which strong hopes were entertained that it might lead to the long-sought discovery. These proving unfounded, he ran to the southward, along the narrow peninsula which forms the western boundary of the Kamtchatkan Sea; and after touching at Oonalashka, made sail for Behring's Straits. There he determined the position of the most westerly point of America, lat. 65° 40′, long. 168° 15 W.; and ascertained it to be distant from the coast of Asia only thirteen leagues. August 18, he reached his extreme latitude, 70° 41′, where he was stopped by an impenetrable wall of ice. He continued to prosecute his search until August 29, when the daily increase of ice warned him to return. Before proceeding to the south, however, he spent some time in examining the sea and coasts in the neighbourhood of Behring's Strait, during which he had satisfactory proof of the correctness of that navigator, and made valuable additions to our geographical knowledge of that region.

Returning to winter at the Sandwich Islands, he discovered two which he had not before visited, Mowee and Owhyhee, the largest of the group. In sailing round the latter he spent ten weeks, from December 1 to February 13, 1779, without any serious disagreement with the natives, who, on the contrary, treated the English with the utmost respect. Speaking of the disappointment in not finding a northern passage, he uses the following words, which conclude his journal:—'To this disappointment we owed our having it in our power to revisit the Sandwich Islands, and to enrich our voyage with a discovery, which, though the last, seemed in many respects to be the most important that had hitherto been made by Europeans throughout the extent of the Pacific Ocean.' These pleasant anticipations were cut short by his tragical death. On the night of February 13, one of the Discovery's boats was stolen. Cook went ashore on the 14th to try to recover it; the natives became alarmed, blows were struck, and Cook was obliged to fire in self-defence. In retreating to the boats, four of the marines who attended him were killed, and Cook, who was the last person left on shore, was struck down from behind. He struggled vigorously; but the confusion of the boat's crews was such, that no assistance was given, and he was soon overpowered. His body having been left in the possession of the natives, his bones only were recovered, the flesh having probably been devoured. His remains were committed to the deep with military honours. Mr. Samwell, an eye-witness, has given the fullest account of this melancholy event, which he ascribed to no scheme of premeditated treachery, but to a sudden impulse, arising from the belief that the loss of the boat would be revenged by hostile measures. Captain Clerke succeeded to the chief command, and returned in the following summer to the Polar Sea; but he was unable to advance as far as in the former year: the voyage therefore failed in its chief object. The ships returned by China and the Cape to England, which they reached in October, 1780. An account of the voyage was published from Cook's Journal continued by Lieutenant King. Charts and plates were executed at the expense of government, and one-half of the profits of the work were bestowed upon Cook's widow and children, upon whom a pension was settled.

As a navigator, Cook's merits were of the first order. He was thoroughly acquainted both with the practical and scientific parts of his profession, and possessed the qualities which fit men for responsible situations—a mind inventive, and full of resources, sagacity, self-possession, and decision, and an intuitive readiness of perception in professional matters; so that his first opinion as to a course to be pursued, the nature of an opening, tides, currents, &c., was seldom found to be incorrect. His perseverance was unremitting, and needed no relaxation nor respite. He was a strict disciplinarian, but watchful and solicitous in an uncommon degree for the health and comfort of his crews; and to this constant care and to his moral influence, as much as to his judgment, we must attribute that remarkable exemption from disease which his men enjoyed, in his two last voyages, through every variety of climate. He may be said to have banished that horrible disease, scurvy, from our naval service; and it is observed by Mr. Samwell, that his success in this respect afforded him more satisfaction than the reputatoin which attended his discoveries. [Antiscorbutics, p. 119.] But that which we wish to point out in his character as most rare and truly estimable, was his scrupulous justice and humanity towards the rude tribes whom he visited. For their propensity to thieving he found a candid apology; and any offences committed against their persons or property by his own crew, he strictly punished; making it a rule to pay liberally, if required, for the slightest articles, even to grass, wood, and water. Nor did he give way to the gratifying of a natural curiosity, when by doing so he was likely to provoke a hostile collision. Once only he was betrayed into an unjust aggression, which ended in bloodshed; an act which he remembered with pain, and in his journal acknowledged to be an error, while explaining the motives which led to the commission of it. The same benevolence and steady principle which he displayed in public, he carried into the private relations of life. His constitution was robust, inured to fatigue, and patient of self-denial.

(See Kippis's *Life of Cook*, which is inserted, entire we believe, in the *Biographia Britannica;* the several voyages to the Pacific Ocean; Samwell's *Narrative of the Death of Captain Cook*, which is printed in the *Biographia.*)

COOKE, BENJAMIN, a highly-distinguished composer and organist, who during the latter half of the last century supported and advanced the science of music, both by his works and precepts. He was the son of Benjamin Cooke, a music-publisher in New-Street, Covent Garden, and before he had attained his ninth year became the pupil of the celebrated Dr. Pepusch, under whom he made such progress, that when only twelve years old he was found capable of doing the duty of organist at Westminster Abbey, as deputy of Mr. Robinson, son-in-law and successor to Dr. Croft. On the death of Pepusch in 1752, Cooke was chosen as conductor of the *Academy of Antient Music*, which office he held till the year 1789, when he relinquished it to Dr. Arnold. In 1757 he succeeded Bernard Gates as lay-clerk and master of the choristers at Westminster Abbey, and in 1762 was appointed organist of that venerable church. In 1777 the University of Cambridge conferred on him the degree of Doctor in Music. In 1782, after a severe contest, in which Dr. Burney was his chief opponent, he was elected organist of St. Martin-in-the-Fields. In 1784 he was nominated by George III. as one of the sub-directors of the famous Commemoration of Handel. He died in 1793, leaving two sons—Henry, still living, who formerly held a very respectable situation in the Post Office, and Robert, who followed his father's profession, and became organist of the Abbey on the decease of Dr. Arnold; but shortly after, in a fit of insanity, threw himself into the Thames, and was drowned, to the grief of his numerous friends, by whom he was much valued, both for his talents and moral qualities.

Dr. Cooke's compositions were chiefly for the Academy of Antient Music, the Church, and the Catch Club. For the first he made the important additions, so well known to connoisseurs, to Galliard's Morning Hymn. For the second he wrote a charming service and two lovely anthems. To the highly-distinguished Catch Club, he contributed his fine glees, 'In the merry month of May,' 'How sleep the brave,' 'Hark! the lark,' 'As now the shades of eve,' &c.; and obtained seven of the gold prize medals given by that elegant and useful society. He was the intimate friend of Sir John Hawkins, the musical historian—who profited much by the occasional hints of so learned a professor—and the master of some of the deservedly celebrated musicians of the last and present age, among whom it would be an act of injustice to Dr. Cooke not to name Parsons, Greatorex, Knyvett senior, Crosdill, Spofforth, Bartleman, Beale Walmisley, &c. (*Harmonicon*, vol. ix.)

COOKE, GEORGE FREDERICK, a popular actor, was born in the city of Westminster, April 17th, 1755. He was the son of an officer in the army, and his mother's maiden name was Renton. On the death of her husband she went to reside at Berwick upon Tweed, where George was educated. At the usual age he was articled to a printer; but having imbibed a strong passion for the stage, he appeared, after various essays in private, as a professed actor at Brentford, in the character of Dumont in the tragedy of 'Jane Shore.' In 1778 he made his debut in London, at the Haymarket theatre, for a benefit, but without attracting any particular attention. After a period of two-and-twenty years, during which he became the hero of the Dublin stage, he returned to London, and made his first appearance at Covent Garden theatre, Oct. 31, 1800, in the character of Richard III.: his success was decided; and for ten years he divided the favour of the town with Mr. John Kemble. In 1810 he sailed for America, and arrived at New York on the 16th of November, in which city, intemperance having been long undermining a wonderfully strong constitution, he expired on the 26th of September, 1812, aged 57 years and 5 months. His most popular characters were, in tragedy, Richard III., Iago, and Shylock; and in comedy, Kitely, Sir Archy Macsarcasm, and Sir Pertinax Macsycophant. Mr. Kean, in one of his visits to America, caused a monument to be erected over his grave. His memoirs were published by his friend Mr. Dunlop from a MS. journal kept by Mr. Cooke for many years, and other equally authentic documents, in 2 vols., 8vo., London, 1813.

COOLER. Various contrivances have been adopted by brewers and distillers for cooling their worts. This has been done by exposing the hot liquor in shallow wooden vessels to the air, and by the use of stirrers or fans to keep the liquor in motion, and thus expose fresh surfaces to the air.

The plan has also been adopted of passing spring-water, which in deep wells is usually about 52° even in summer time, through metal pipes placed in the liquor to be cooled.

Wine-coolers are made of porous earthenware, which being soaked in and saturated with water, by its gradual and copious evaporation occasions cold; and in Spain water-coolers, called alcarrazas, are made on the same principle. Coolers of this kind, made of porous clay, lightly baked, and rather thin, are also common in Egypt, where they are often represented on the antient monuments in a form very much resembling both those now used in Egypt, and such as we see in use at Cadiz and other places in the South of Spain. On the monuments of Egypt we sometimes observe a man fanning these earthen vessels with a palm-leaf, in order to promote the evaporation. The Arabs of Egypt are well acquainted with the practice of fanning their earthen vessels to quicken the evaporation. M. Costaz, when in Egypt, made the following experiment on the refrigerating power of these earthen vessels. The thermometer in the shade, but exposed to the air, marked 110°.75 Fahrenheit during the greater part of the day. At sunset the Nile water was 82°.6; an earthen vessel filled with this water was placed on the deck of the boat in which M. Costaz passed the night on the Nile. At day-break the temperature of the river was the same, but that of the water in the jar was only 61°.25, and more than half of the water was evaporated.

COOPER. [Shaftesbury, Earl of.]

COORDINATES mean lines, angles, &c. ranged in order. The notion from which the word arose was this, that when the positions of consecutive points on a curve are referred to given points or lines by means of lines (as in Abscissa) or angles, those lines or angles present a succession of *arranged* data, by which the several points of the curve may be treated *in order*. It was Descartes who first used coordinates in the second book of his geometry, and the words in which this now all-pervading method of expression was announced are as follows: 'Eligo rectam aliquam lineam, veluti A B, ut ad diversa ejus puncta referam omnia puncta hujus curvæ lineæ C E; deinde eligo etiam punctum aliquod in AB, veluti A, ad *ordiendum* ab eo calculum.' We do not find the word in Schooten, Beaune, or others of the immediate school of Des Cartes. De Witt calls the abscissa *crus patiens*, and the ordinate *crus efficiens*. Coordinates (so called) are used in the writings of John Bernoulli, but in Newton the phrase for them is 'lineæ ordinatim applicatæ:' in later times the use of the word has become universal. Coordinates either determine the position of a point in space, or in a plane which is understood to contain all the figure under consideration, as in the first six books of Euclid. They determine position either by straight lines only, or by a straight line and angles: in the latter case they are called *polar* coordinates.

1. Rectilinear coordinates in a plane. In the given plane draw two straight lines meeting in a point O (called the *origin*). From any point P draw parallels to the two lines just named: the parts intercepted between P and these lines (called *axes*) are the coordinates of the point. When the axes are at right angles, the coordinates are said to be *rectangular;* when at any other angle, *oblique.* [ABSCISSA.]

2. Rectilinear coordinates in space. Through any point O (the origin) draw three planes which intersect in right lines (the axes). Through any point P draw parallels to the axes: the parts intercepted between P and the coordinate planes (three in number) are the coordinates of P.

3. Polar coordinates in a plane. Choose any point O in the plane, and any right line O A passing through O. Then taking any point P, the distance O P (called the *radius vector*) and the angle P O A (which has no distinct name, but might be called the *vectorial* angle) are the polar coordinates of P.

4. Polar coordinates in space. Choose a plane (M), a point O, and a line O A, in the plane M. Take any point P above or below the plane, and let fall P B, a perpendicular on (M) meeting (M) in B. Then the radius vector O P, and the angles P O B and B O A are the polar coordinates of P. In astronomy, if O be the earth's centre, O A the line passing through the equinox, and (M) the plane of the ecliptic; then B O A is the longitude of P, and P O B its latitude. But if (M) be the plane of the equator, then B O A is the right ascension of P, and P O B its declination.

COORG, or **CADUGA**, a small principality which occupies the eastern part of the mountain range called the Western Ghauts, and extends from the Tamberacherry pass, on the south, in 11° 25′ N. lat. and 76° 20′ E. long., to the river Hennavutty, on the confines of Bedune, on the north, in 12° 42′ N. lat. The greatest length is about 70 miles, and the mean breadth about 22 miles. On the north it is bounded by Canara and Mysore, on the west and south by the province of Malabar, and on the east by Mysore. The country presents a succession of hills and valleys, placed at a medium elevation between the sultry plains and the tempestuous tops of the mountains; it enjoys a temperate climate, and has a fertile soil: in many parts it is well cultivated, but in others is overrun with jungle, which is the resort of wild elephants and many beasts of prey: some considerable forests also occur, and from these a good deal of sandal-wood is obtained. The Tungha and Bhadra, which after their junction are called the Toombuddra and the Cavery, have their sources in the Coorg country, which is so well watered and subject to so much rain, that rice is produced in sufficient abundance, not only for the inhabitants, whose principal food it forms, but also for exportation to Mysore: a considerable quantity of cardamom seeds are raised and exported. There is besides abundance of excellent pasturage, and great numbers of cattle are reared. The manufactures of the country are confined to a coarse kind of blanket, which forms part of the dress of the common people: the cotton cloths which they use are all imported. Periapatam, in 12° 22′ N. lat. and 76° 11′ E. long., was formerly the capital of the principality, but its proximity to the Mysore territory, the distance from Seringapatam being only 37 miles, occasioned it to be abandoned in favour of Mercara, which is now the residence of the rajah and the seat of his government. This town stands surrounded by an amphitheatre of hills, in 12° 26′ N. lat. and 75° 30′ E. long. The fort is a pentagon, with towers and bastions; within this is the rajah's palace, which is handsomely furnished in the European style.

The rajah of Coorg is mentioned by Ferishta as an independent prince in 1583. Many vain attempts were made by the Mysore rajah to subgugate the country, but a dispute about the succession having arisen between two brothers, Hyder Ali offered his mediation, and this being accepted, he by treacherous means obtained possession of the territory. One of the brothers he destroyed, together with his family, and the other he kept prisoner in the fort of Cuddoor, on the eastern frontier of Bednore. This rajah dying in 1779, Hyder put aside his son, whom he confined in Periapatam, and parcelled out the country into jaghires among several petty Mohammedan chiefs. After a confinement of eight years, the young rajah, Beer Rajindra, was released from his confinement by twelve of his subjects, chiefs of villages, who for that purpose repaired in disguise to the place of his confinement. His standard was immediately joined by all ranks of his people, and the invaders were with some difficulty driven out. This prince, Beer Rajindra, was a man of enlarged mind and noble disposition, and during his reign he succeeded in preserving order within his dominions, and in conciliating the affection of his subjects. At his death, in 1808, he left the succession to an infant daughter, to the exclusion of his brother, to whom of right it belonged according to antient usages; but the young ranny or princess having abdicated in favour of her uncle, with the sanction of the British government and to the satisfaction of the Coorg people, the country has since remained tranquil and prosperous. (Mill's *History of British India;* Buchanan's *Journey through Mysore, Canara, and Malabar;* Heyne's *Statistical Tracts on India.*)

COPAIBA or **COPAIVA**, an oleo-resin or turpentine (incorrectly termed a balsam, since it is destitute of benzoic acid), is procured not merely from the Copaifera officinalis (Willd.), a native of Venezuela, also naturalized in the Antilles, but from ten or twelve species, chiefly natives of Brazil. It varies in appearance and qualities according to the species from which it has been procured, and likewise according to the age of the tree and the time of the year. Incisions are made in the tree, from which flows a liquid differing little in consistence from thick sap. It is collected in calabashes, after which the incisions are closed with wax or clay. The incisions are repeated in general three times each season. The fluid is brighter or darker in colour, more or less rich in volatile oil, more acrid or more bitter, according to circumstances. It is mostly of a light yellow colour, clear and transparent, seldom turbid or cloudy; odour peculiar, volatile; taste oily, mild, slightly aromatic, at last acridly bitter. Specific gravity 0.966 to 0.997, according to its age. Exposed to heat in a platinum spoon, it is entirely consumed with a white smoke. In a state of purity, it consists of a volatile oil, in the proportion of 40 to 45 per cent., and 50 per cent. of an acid crystallizable resin. The oil may be separated by distillation, or by means of mixing equal parts of copaiba with alcohol of specific gravity 0.837, shaking them diligently, then mixing 100 parts of the copaiva which has been so treated with 37½ parts of a ley of caustic soda, to be again well shaken; after which 150 parts of water are to be thoroughly agitated with it, and the whole left to rest. The specific gravity of the oil thus obtained is 0.900. A slight difference exists between the oil thus procured and that by distillation. Both are used in medicine; indeed the oil is the active principle of copaiva, the resin being of very secondary importance. The oil is destitute of oxygen, and may be employed for the preservation of potassium.

Copaiva is frequently adulterated: the presence of any extraneous matters may be known by the manner in which the suspected portion conducts itself towards solvents and re-agents. Copaiva is occasionally mixed with castor-oil, almond, poppy, nut-oil, and the finer sorts of turpentines. All fixed oils (except castor-oil, the presence of which may be detected by sulphuric acid, but the accuracy of this test is called in question by Brandes) separate from it by being allowed to remain at rest. Good copaiva should be perfectly soluble in alcohol of the strength of 90 per cent. It is soluble in all known æthers, and in the volatile and fixed oils. Three parts of copaiva with one of caustic ammonia of specific gravity 0.950 form by agitation a clear soap. The simplest test of the purity of copaiva is to heat a small quantity in a watch-glass, when, if good, a hard brittle resin remains, which has considerable analogy with styracin. The crystals which form in this resin are six-sided prisms, and have the property of polarizing light.

A kind of copaiva is obtained in St. Domingo from the

Croton origanifolius (Lamarck); in Java and elsewhere the juice of the Canarium commune (Linn.) is found to possess similar properties.

Copaiva acts as a stimulant to the mucous surfaces, especially of the rectum and urino-genital passages: when the dose is small, it influences the kidneys and urethra; but if large, the rectum. It is chiefly used to lessen increased discharges from those organs, and if judiciously employed, generally effects this object; but if given prematurely or in too large a dose, it seldom fails to aggravate the complaints and occasion other serious symptoms. It has likewise been beneficially given in affections of the mucous membrane of the lungs, such as chronic bronchitis, which must be carefully distinguished from true phthisis pulmonalis or consumption, a disease in which it cannot fail to prove injurious.

Various means have been devised to conceal the disagreeable nauseous taste of copaiva without impairing its qualities. Calcined magnesia thickens it, and permits it being made into pills; an ætherial or alkaline solution will also retain the virtues, and lessen the repulsive taste.

COPAI'FERA OFFICINA'LIS, the plant from which balsam of copaiva is procured, is a tall handsome tree, with a fine head, found wild in the Spanish Main, and occasionally seen in Martinique, where it has been introduced. The leaves are pinnated, alternate, with lanceolate-ovate leaflets of a somewhat leathery texture and a shining surface, perfectly entire, and two or three inches long. The flowers grow in axillary panicles, densely collected towards the ends of the branchlets, white, and about eight in a cluster.

The tree, according to Jacquin, is common about the town of Tolu, thirty leagues from Carthagena, growing promiscuously with the species that yield balsam of Tolu, balsam of Peru, and similar secretions.

COPAL, a resin possessed of peculiar properties, the produce of the Rhus copallinum, a native of Mexico; it is in rounded masses, smooth and brittle, transparent or nearly so, without colour, or having a slight tinge of yellow: it has but little taste, and is nearly inodorous; it is insoluble in water, fusible, and inflammable. It differs from most other resins in its very sparing solubility in alcohol; and of the little that dissolves with the assistance of heat the greater part is deposited as the solution cools. It is dissolved by æther and some essential oils.

COPAL VARNISH, is the substance for preparing which this resin is most employed. It is probable that every manufacturer has his peculiar mode of proceeding: Tingry prepares the simple copal varnish by heating eight ounces of oil of turpentine in a matrass with the heat of a salt-water bath; as soon as this reaches its boiling point, he gradually throws in an ounce and a half of copal reduced to powder, keeping the vessel in a state of circular motion. This author further states that to obtain this varnish colourless, the rectified oil is to be exposed previously to the sun for some months in bottles, leaving an interval of some inches between the cork and the surface of the liquid; by this the oil undergoes some change, which renders it a better solvent of copal.

The varnish thus prepared is stated to be exceedingly durable and brilliant; it resists scratches, and is susceptible of a fine polish. Tingry particularly recommends it to be applied to philosophical instruments. There are several modifications of this varnish used for particular purposes, as with the addition of oil of lavender and oil of lavender and camphor, an account of which may be seen in the author above named.

COPENHAGEN, or KIOEBENHAVN, one of the six royal districts into which the Danish province of Seeland is divided, comprises the centre of the eastern portion of the island of Seeland and the islands of Amager (Amak) and Saltholm. It is bounded on the north, south, and west by other districts of Seeland, and on the east by the Sound and the Baltic. It contains an area of about 525 square miles, which are divided into three probsteien or provostships, each of which contains two harden or circles. Exclusive of the capital, the population is about 40,000; inclusive of it, the numbers are about 156,000; it has 78 parishes, 4 towns, besides the capital, and 197 villages. This circle is on the whole very fertile.

COPENHAGEN, the metropolis of the kingdom of Denmark, is situated partly on the eastern coast of the island of Seeland, and at the southern extremity of a gulf in that narrow channel of the Baltic called the Sound, which is here about 14 miles broad, and partly on the northern coast of the small island of Amager or Amak. It lies in 55° 42′ N. lat., and 12° 34′ E. long., is about 5 miles in circumference, 1⅞ in length, and 1¼ in breadth; and is divided into three principal districts—the Old Town or Aldstadt, the New Town or Friedrickstadt, and Christianshavn. These three quarters are surrounded by ramparts and ditches, and defended by 24 bastions, besides outworks, and towards the sea by a very strong citadel. Without these lines are the three suburbs of the North Bridge, East Bridge, and West Bridge. Altogether Copenhagen is one of the finest capitals in Europe. It is divided into 12 quarters, and contains 10 public squares, 5 market-places, 3 royal palaces, 9 parochial churches, a Roman Catholic chapel, 5 synagogues, 3 religious foundations, 13 hospitals, a foundling asylum, and 30 poorhouses. Its aspect, on emerging from the narrow entrance into the port, which is capable of containing 500 merchant vessels, besides the whole navy, is very grand and striking.

The Old Town, or what is called the City, is the most southern quarter. It is separated from the New Town by a canal and the 'Gothic Street,' and united to Christianshavn by a bridge; it is large and populous, has a fine appearance, and contains the spacious area called the New Market, which is embellished by the palace of Charlottenburg. Here also is the royal palace of Christianberg, built by Christian between 1732 and 1740. It was burnt down in 1795, but is now nearly restored, and is one of the finest buildings in Europe. It contains a magnificent palace-church, the royal galleries of paintings, natural history, &c., in a series of twelve saloons; the library, in which are 400,000 volumes, a valuable collection of engravings, and the marble sculptures and casts of Thorwaldsen. The other remarkable buildings in this quarter are Prince Frederick's palace; the palace of Charlottenburg, above mentioned, and now occupied by the Academy of Arts, a picture gallery, and a repository for the artillery, &c.; the bank, exchange, new town-hall, and Trinity church, on the top of whose singularly constructed round tower, which is 115 feet high, an observatory is erected; and the university with four colleges, which was founded in 1478 by Christian I. This university is attended on an average by 700 students, and has a library of 60,000 volumes, a collection of MSS. relative to northern and Icelandic history, a museum of northern antiquities, a botanical garden, a cabinet of natural history, a theatre of anatomy, &c.

The New Town, which is the most northern quarter of the city, and of which Frederickstadt is the finest portion, is laid out in broad streets, and contains the handsomest buildings in Copenhagen. Here is the antient royal palace of Rosenberg, in which are deposited the crown jewels, a beautiful collection of antiquities, and a cabinet of coins and medals; its ample gardens form a public promenade. Frederick's place, a noble octagonal space, is chiefly formed by the Amalienborg, a structure composed of four large palaces—those of the king, the prince royal, the king's brother, and the naval school; one of the sides is open, and is embellished with a beautiful equestrian statue of Frederick V

The third division of Copenhagen is Christianshavn, situated on the island of Amager, and united to the town by two bridges thrown across the narrow arm of the sea which separates Amager from Seeland; it forms an admirable harbour, which is the great naval station of Denmark, and is capable of containing above 500 ships. In this quarter, which presents regular well-built streets and handsome squares, is St. Saviour's church, the finest in Copenhagen, with its singular tower, 288 feet in height; the beautiful Frederick's church; and the warehouses of the Danish East India Company. In this direction are situated the two smaller islands of Old and New Holm, which contain the stores, dockyard, slips, and arsenals of the fleet, &c.

Copenhagen is the seat of a bishopric. It contains altogether 29 Protestant churches, a Roman Catholic chapel, 3 synagogues, 22 hospitals, (one of which accommodates above 2000 patients,) a naval hospital for 1000, and other benevolent institutions for human infirmities. The city possesses also a museum for northern antiquities, the Claasen library for mathematics, natural history, &c., containing above 34,000 volumes; a royal museum of the arts, cabinets of coins, mechanical objects, &c.; a naval and military cadet academy, 114 schools of various descriptions, a mechanics' institute, conservatory of music, &c. The principal learned societies are the Royal Academy, the Society for promoting Northern History and Languages, a Society of National Economy, Societies for Icelandic Literature and for Northern Antiquities, a Bible Society, &c.

The population in 1797 amounted to 85,161; in 1829 to 111,997, of whom 54,950 were males and 57,047 females; and at present it is about 116,000, including 2600 Jews. The chief source of employment is commerce and navigation, which is greatly promoted by the East India Company and various commercial associations. Though Denmark is rather an agricultural than a manufacturing country, there are a great number of manufactories in Copenhagen, which afford occupation to above 3000 persons; among them are 242 brandy distilleries, 50 breweries, 5 vinegar distilleries, 9 sugar refineries, 8 soap-boilers' works, 32 manufactories of tobacco, 21 of cloth, 23 of cotton goods, 18 of hats, 24 of gloves, 29 of linen and cordage, 3 of silk, 29 tanneries, 5 iron-founderies, &c. General trade has much declined, principally in consequence of Altona being a free port, which Copenhagen is not. The East and West India trades are however still pursued to much advantage.

Copenhagen is said to have been founded by Bishop Axel in 1168, when it was only a poor hamlet of fishermen; but as a town Copenhagen dates only from the thirteenth century, and as a city since 1443 only, when, having been much enlarged, it received municipal privileges, and became the royal residence. On the 27th of May, 1660, the peace of Copenhagen was concluded in the camp of Copenhagen, after the Swedes had in vain endeavoured to reduce it by a siege: on the 2nd of April, 1801, Lord Nelson gained here a great naval victory over the Danish fleet. It has frequently suffered much from conflagrations as well as from hostile bombardments, especially during that by Lord Cathcart, in 1807, when 308 houses were totally burnt, 2000 considerably injured, and 1106 inhabitants killed; but it has nearly recovered from these disasters.

The climate is damp and unhealthy; the water is of a bad quality; and the mortality is said to be greater than in any other town in Denmark. In the neighbourhood of Copenhagen are the king's summer palace of Fredericksberg, a splendid structure with delightful gardens, in the church attached to which the kings of Denmark are anointed: another royal palace, a fine specimen of the architecture of the middle ages, is at Roeskilde, a small town where the royal remains, particularly of the Oldenburg line, are deposited; and at Jaeger Preis is another royal residence, where many great men of the north are interred—among others, Bernstorf, the celebrated Danish statesman, and Tycho Brahé.

COPE'RNICUS, NICOLA'US. The real name was Copernik, or, according to others, Zepernic. We shall not discuss either this, or the somewhat more important question, whether he was born, as Junctinus asserts, at 38 minutes past four on the 19th of January, 1472, or, as Mœstlinus asserts, at 48 minutes past four in the afternoon, February 19, 1473. Morin adopts the date of the latter, but remarks that the horoscope was a most happy one for talent, as appears by the nativity given by the former.

The principal authorities for the life of Copernicus are the account of Gassendi, published with the life of Tycho Brahé [BRAHE', TYCHO]; the *Narratio*, &c. of RHETICUS, and an account prefixed to his Ephemeris for 1551. The latter two we have not seen, but Gassendi cites abundantly from them. Weidler also mentions Adamus, *Vit. Phil Germ.* There is nearly a literal translation of a large part of Gassendi's life in Martin's *Biographia Philosophica;* a sufficient abstract in Weidler, and a full account of the writings of Copernicus in Delambre's *Hist. de l'Art Mod.*, vol. i.

Copernicus was born at Thorn, in Prussia, a town on the Vistula, near the place where it crosses the Polish frontier. His family was not noble; but his uncle, Lucas Watzelrode, was bishop of Warmia (episcopus Warmiensis), whence it is frequently stated that Copernicus afterwards settled at a town of that name; whereas the cathedral was situated at Frauenburg, a town on the coast, near the mouth of the Vistula, and, as to social position, about 50 miles both from Königsberg and Danzig. Copernicus was educated first at home, and then at the university of Cracow, where he became doctor of medicine. He paid more than usual attention to mathematics, and afterwards to perspective and painting. A portrait of himself, painted by himself, passed into the possession of Tycho Brahé, (see his *Epistles*, p. 240,) who wrote an epigram on it, the point of which appears to be (the portrait being a half-length) that the whole earth would not contain the whole of the man who whirled the earth itself in ether. After the completion of his studies at Cracow, Copernicus went to Italy, and stayed some time at Bologna, under the instruction of Dominico Maria. His turn for unusual speculation began to appear in his having at this time the notion that the altitude of the pole was not always the same at the same place. He was certainly at Bologna in 1497, and by the year 1500 he had settled himself at Rome, as appears by astronomical observations which he is recorded as having made. At Rome he gave public instructions, and in some official capacity (magno applausu factus mathematum professor): he is said, while thus engaged, to have established a reputation hardly less than that of Regiomontanus. In a few years, but the date is not precisely stated, he returned to his native country, where (having taken orders, we suppose, in Italy) his uncle gave him a canonry in his diocesan church of Frauenburg. There, after some contests in defence of his rights, not very intelligibly described, he passed the rest of his days in a three-fold occupation—his ecclesiastical duties, his gratuitous medical practice among the poor, and astronomical researches. He went very little into the world; he considered all conversation as fruitless, except that of a serious and learned cast; so that he formed no intimacies except with grave and learned men, among whom are particularly recorded Gysius, bishop of Culm, and his pupil and follower, the celebrated Rheticus. A large mass of his epistles is said by Gassendi to have fallen into the hands of Broscius, professor at Cracow, but none have been published. He was all this time engaged as well in actual observation as in speculation. His instrumental means, however, were not superior to those of Ptolemy; and he perfectly well knew the necessity of improvement in this department. 'If' (said he to Rheticus, whose Latin has certainly been misprinted, but in a manner which leaves the meaning sufficiently clear,) 'I could determine the true places of the heavenly bodies within ten seconds of a degree, I should not glory less in this than in the rule which Pythagoras has left us.'

Copernicus was struck by the complexity of the Ptolemaic system, and searched all antient authors to find one of a more simple character. The earth stationary in the centre of the universe, the planets moving round it carried on enormous crystalline spheres, (for though many might use this as mere hypothesis, the refutation of Tycho Brahé from the nature of the orbits of comets shows that he considered the *material* spheres as one of the opinions of his day,) and finally the enormous sphere of the fixed stars, carried round once in every 24 hours, struck him with a feeling that such a system could not be that of nature.

He found in Martianus Capella and others proofs that an opinion had formerly prevailed to some extent that Mercury and Venus, at least, moved round the sun; that the Pythagoreans held the rotation of the earth; and that Philolaus had even imagined the earth to have an orbit round the sun. It is very doubtful to what point these several opinions were carried, or on what grounds they were supported: it is sufficient for our purpose here that Copernicus found such doctrines attributed to the sects and persons above mentioned, and took them into consideration, with a view to see how far phenomena could be made to follow from them with more simplicity than in the system of Ptolemy. At what time he finally adopted his own system is not very clear; his work was completely written in 1530, and from that time he did nothing except to add and alter. And since Copernicus says, in his epistle to Paul III., that he had been very long pressed by his friends to publish, the above date is not improbable. In the mean while his opinion was circulated even among the vulgar; and he was satirized on the stage at Elburg. His reasons had convinced Reinhold, Rheticus, Gysius, and others; and upon the representations made to him, Cardinal Schonberg was desirous of having the work printed, and wrote to Copernicus to that effect from Rome in 1536. But though backed by a cardinal, a bishop, and two of the most learned astronomers of the age, Copernicus was well aware of the odium which an attempt to disturb established opinions would excite; and it was not, it seems, till about 1541, that a tardy consent was extorted from him. The work was accordingly delivered to Gysius, and by him to Rheticus, who, thinking that it would be best printed at Nuremberg, entrusted it to Andrew Osiander, who superintended the printing, and wrote the remarkable preface, which is always attributed, and even by Delambre, to Copernicus himself. This is explicitly stated by Gassendi, and the reason assigned is the obvious one that Osiander (besides thinking it necessary to print the cardinal's request) was afraid of shocking public opinion, and thought it best to represent the scope of the work, not as actually affirming the motion of the earth, but as using such an hypothesis for the more simple and ready calculation of the heavenly motions.

He says, 'It is not necessary that hypotheses should be true or even probable; it is sufficient that they lead to results of calculation which agree with observations.' He points out the admitted defects, and admitted unlikelihood, of several points of the Ptolemaic system; requires that the new hypothesis should be admitted on the same footing as the antient ones, and ends thus—'Neither let any one, so far as hypotheses are concerned, expect anything certain from astronomy, since that science can afford nothing of the kind; lest, in case he should adopt for truth things feigned for another purpose, he should leave this study more foolish than he came.'

With such safeguards, headed by the urgent request of a cardinal, and dedicated, probably by permission, to the pope, the work was ushered into the world, of which it was the ultimate destiny to help largely in overthrowing submission to authority in matters of science, whether to the doctrines of the Greeks or to the reputed interpretation of the sacred writings. The title-page is as follows:—

NICOLAI CO-
PERNICI TORINENSIS
DE REVOLVTIONIBVS ORBI-
um cœlestium libri vi.

Habes in hoc opere iam recens nato & ædito, studiose lector, Motus stellarum, tam fixarum quàm erraticarum, cum ex ueteribus tum etiam ex recentibus obseruationibus restitutos: & nouis insuper ac admirabilibus hypothesibus ornatos. Habes etiam tabulas expeditissimas, ex quibus eosdem ad quoduis tempus quàm facilli me calculare poteris. Igitur eme, lege, fruere.

Ἀγεωμέτρητος ὀδεὶς ἐισίτω

Norimbergæ apud Ioh. Petreium.
Anno M. D. XLIII.

The taste of what we should now call the puff in the title-page is doubtless that of Osiander, to whom it is due that the great work of Copernicus contains an expression of recommendation to *buy* it in the title-page, being the only instance of the kind we know. The second edition, edited by Rheticus, was published at Basle, 1566, and is little esteemed; the third, edited by Muler, was printed at Amsterdam in 1617, and again in 1640, with notes: it is the most correct of the three. This same Muler, in his Tabulæ Frisicæ, Alcmaar, 1611, has reduced the hypotheses of Copernicus to the form of tables.

We now come to the description of the *Copernican* system, by which we mean, the system actually promulgated by Copernicus, and not the Keplerian, Galilean, Newtonian, Halleian, Laplacian, &c., system which bears the name. We have before remarked [Brahe', Tycho], that it is customary to call all existing notions on the system of the world, Copernican. This matters little, considered as a mere method of expression; but it becomes of consequence when, by means of it, a degree of lustre is thrown on the speculations of Copernicus, which, properly considered, they do not need, and, critically examined, they will not bear. We are accustomed to see Copernicus represented as a man so far in advance of his age, that in the main points of his system nothing has been added and nothing subtracted. The plates in our elementary works show, under the heading of 'the Copernican system,' planets, satellites, and comets, all with orbits such as the latest discoveries have assigned. We shall therefore exhibit the 'Copernican system' as far as we can in the words of its author (translated, of course), and at greater length than would have been necessary had no misconception prevailed. It will hardly be supposed that we intend an absolute depreciation of the merits of one of the most original talents that ever existed. Copernicus was a mathematician of the first order, a sincere lover of truth, a mind free from trammels to an extent which was then almost unknown, and which we should have deemed almost incredible had we not had the proof before us. It is no easy thing for us to conceive the state of a head furnished in youth with theories upon all things in heaven or earth, proved in as many words by the assertion that Aristotle said it.

The work 'De Revolutionibus,' &c., consists of an introductory dedication to Paul III., and six books. In the former Copernicus distinctly informs us that, being discontented with the complexity of the prevailing systems, he closely examined all the writings of the ancients, to see if he could find anything better. He found the testimony of Cicero and Plutarch, as to the opinions of Nicetas, Pythagoras, and Philolaus. He thereupon claims for himself the same licence, adverts to his hypothesis as purely fictitious, and says, 'Quamvis absurda opinio videbatur, tamen quia sciebam aliis ante me concessam libertatem, ut quoslibet fingerent circulos ad demonstrandum phenomena astrorum. Existimavi mihi quoque facile permitti, ut experirem, an posito terræ aliquo motu firmiores demonstrationes quàm illorum essent, inveniri in revolutione orbium cœlestium possent.' With regard to the word demonstration, it must be particularly remembered that at this period the term, as applied to astronomy, always meant a showing how the thing would happen if the supposition were true, not a proof of the supposition itself. Thus, in this sense, the supposition of a daily motion of the sun round the earth may be made to yield a perfect *demonstration* of the phenomena of day and night; and it would be legitimate to say that of two hypotheses, one false and one true, the false one might give *truer demonstrations* of the celestial motions than the other.

The first book contains the propositions—1. That the universe is spherical; which is proved by old reasons, such as that a sphere is the most perfect figure, &c. 2. That the earth is spherical; for which he gives the same reasons as are now given. 3. That the earth and sea make one globe. 4. That the motions of all the heavenly bodies must be either uniform and circular, or compounded of uniform and circular motions. Nothing but circular motion, he asserts, could reproduce phenomena periodically; and he maintains that a *simple* body must move circularly. 5. He examines the questions whether the earth can have an axical and an orbital motion, and satisfactorily shows that, supposing the distance of the fixed stars to be immense, there is no astronomical reason to the contrary. 6. He gives what he imagines to be a proof that the sphere of the fixed stars is immensely distant. It must be observed that he has no notion of a universe of stars unequally distributed throughout space. 7 and 8. He examines and argues against the reasons of the antients for placing the earth in the centre of the universe, by considerations which are as purely imaginary as those against which he was contending. He says that circular motion must be that of a whole, rectilinear motion that of a part separated from its whole; and from this assumption he deduces the falling of a body to the earth. That rectilinear and circular motion can exist together is, according to him, a thing of the same kind as the notion of a horse existing with that of an animal. He is throughout possessed by the opinion that there must be a *centrum mundi*, or fixed point in the middle of the universe, which, however, he considers to be the sun, not the earth. It is needless to say that the centrum mundi forms no part of the Newtonian system. 9. He contends for the possibility of the earth having several motions. 10. He establishes the order of the planets, remarks that it is impossible to explain the motion of Mercury and Venus upon the supposition of the earth being their centre, and observes that the motion of the other planets round the sun is perfectly possible, consistently with that of the earth, if the radii of their orbits be made large enough. He draws a diagram of the system in the manner now usual, and concludes with the following words, which must be considered as the first announcement of the system:—'Proinde non pudet nos fateri hoc totum, quod luna præcingit, ac centrum terræ per orbem illum magnum inter cæteras errantes stellas annuâ revolutione circa solem transire, et circa ipsum esse centrum mundi: quo etiam sole immobili permanente, quicquid de motu solis apparet, hoc potiùs in mobilitate terræ verificari, &c.' It must be observed that he lays down a sphere for the fixed stars so distinctly, that his commentator Muler finds it necessary to remind the reader that he does not *name* the spheres of the planets. But we shall presently see that he could not divest himself of the idea that the primitive motions of the planets were such as would be caused by their being fixed in immense crystal spheres which revolve round the sun.

Before proceeding further it will help us here to observe, that Copernicus does not in the smallest degree attempt to answer the mechanical objections to the earth's motion, which were urged with success against his system till the time of Galileo. The laws of motion, as then explained, and as admitted by Copernicus himself, were altogether insufficient to explain why, if the earth moved, a stone should fall directly under the point from which it is dropped. No explanation of such difficulties is given by Copernicus, nor can we find (nor did Delambre find) that they are even alluded to as an element of the question. If the mechanics of Copernicus had been true, the system of Copernicus would have been physically impossible. Now this is an essential element in the character of a discovery, which is materially altered if that which is advanced as true be advanced on false grounds. It is true that fire burns, and it is true that two and two make four; but it is false that two and two make four *because* fire burns. We give no credit to the Pythagoreans, if it be true, as asserted, that they placed the sun in the centre of the planets because they thought fire the most excellent of all things. We may consider the omission of Copernicus in two different lights. The first is, that he saw the mechanical difficulties, but was so struck by the simplicity of his astronomical system that he thought it more probable than the mechanics of his day, and suspected that future researches would produce laws of motion which should allow of the possibility of his system; and thinking thus, he judged it more wise not to enter upon the mechanical question, so as thereby to shock two sets of received opinions at once. This would do honour to his sagacity; but unfortunately, the single sentence above alluded to, the equestrian simile, prevents us from supposing that if he considered the subject mechanically at all, he was other than satisfied with his own conclusion, 'Cum ergo motus circularis sit universorum, partium vero etiam rectus, dicere possumus manere cum recto circularem, sicut cum *ægro* animal.' The word in italics must be a misprint for *equo*, as remarked by Muler. The latter distinctly points out that this is meant to explain the difficulty of a falling stone, and adds, 'Sententiæ hujus veritas dependet ex hypothesi Coperniciana;' that is, the truth of the proof depends upon that of the thing proved. He should have said (and possibly did mean), that upon the truth of this sentence the Copernican hypothesis depends, so far as it was proved by Copernicus himself. Our readers now must begin to have an idea how great an injustice has been done to those who found better reasons for the coexistence of rectilinear and circular motion, by the attachment of the name of Copernicus to the present cosmical system.

The second method by which we may suppose Copernicus to have reconciled difficulties, is the actual assertion made both by himself and Osiander, that the hypothesis of terrestrial motion was nothing *but* an hypothesis, valuable only so far as it explained phenomena, and not considered with reference to absolute truth or falsehood. It is usual to consider the expressions in question entirely as a concession to general opinion, and as intended either to avoid the Inquisition, or to induce those to look into the book who would otherwise have put it aside as anti-Mosaical and heretical. And though there may be some truth in this, we are on the whole inclined to suspect that the hypothetical hypothesis, as we may term it, really did bias the mind of Copernicus much more than has been supposed. We do not at all concede that the interference of ecclesiastical power was as likely in the case of the Prussian priest of 1540, as in that of the Italian layman of 1633. Nothing is more common than to view the middle ages as a whole, without noticing the ebbs and floods of power and opinion. The epoch contained between the last Lateran Council and that of Trent, in which the work of Copernicus was written, printed, and published, was sufficiently occupied by diocesan councils, both against Luther, and on the reformations in discipline of which the necessity began to be perceived. It appears to us far the most likely that the mind of Copernicus must have balanced between the two views we have described, and probably must have inclined different ways at different times

We now come to the brightest jewel in the crown of Copernicus, the method in which he explained, for the first time and with brilliant success, (so far as *demonstration* went, as before described,) the variation of the seasons, the precession of the equinoxes (book i. cap. 2, book iii., and book vi. cap. 35), and the stations and retrogradations of the planets. The latter point is fully made out, and in the manner now adopted, so far as the *qualities* of the phenomena are concerned: we shall presently see the method of rectifying the *quantities*. With regard to the variation of the seasons, Copernicus explains it rightly, from the continual parallelism of the earth's axis. But he cannot obtain this parallelism from his mechanics. He imagines that if the globe of the earth move round the sun, and also round its own axis, the axis of rotation must always preserve the same inclination to the line joining the centre of the earth and sun: just as when a ball fastened by a string is made to spin, and a conical motion is simultaneously given to the string and ball. It is most evident that he got this idea from the solid crystal spheres. If the earth's axis were fixed in an immense sphere, with which it turned round the sun, and if in the first instance the axis produced would pass through the axis of the sphere, the complete phenomenon of Copernicus would be produced. The earth's axis would then describe a cone yearly. To produce parallelism, Copernicus imagines what we may call an anticonical motion, namely, that the earth's axis is itself endued with such motion, independent of its motion in the sphere, as would, did it act alone, carry the axis round the same cone in a year, but the contrary way. The effect of the two motions is to destroy each other, and the axis remains parallel in all its positions. Then, by supposing the anticonical motion to be a little greater than the direct conical motion, by $50''$ in a year, he produces the phenomenon of the precession of the equinoxes. If we consider that even Newton himself, in tracing the effect of the forces which cause the precession, is thought to have misconceived his own laws of motion, it is not at this part of the mechanics of Copernicus that we need express surprise: and this explanation of the cause of the seasons and of the precession, together with that of the stations, &c. of the planets, must always place him among cosmical discoverers of the first order of sagacity.

All that we have hitherto described will explain the mean motions of the solar system, and the mean motions only. To account for all irregularities, Copernicus (hampered with the notion that all motions must be compounded of circular ones) is obliged to introduce a system of epicycles entirely resembling that of Ptolemy, and which will be most conveniently described under the head PTOLEMAIC SYSTEM. It will surprise many readers to hear that the greater part of the work of Copernicus is taken up with this description of this most essential branch of the real 'Copernican system.' But it must be added that the Copernican epicycles are more successful than the Ptolemaic. The latter were utterly unsufficient as a means of *demonstrating* the changes of distance of the planets and earth. The former, founded upon a basis which brought this point not very far from the truth at the outset, made a much nearer approximation to a correct representation of the inequalities. But as the epicyclic system is not now connected with the name of Copernicus, we need pursue this subject no further, satisfied that what we have done will have a tendency to put the reputation of that sagacious investigator in its proper place, and that no mean one, though lower than the one usually assigned to it.

Of the tables of Copernicus, his trigonometrical formulæ. &c., we shall have to speak in their proper places; they are more connected with the sciences they belong to than with his biography.

While Copernicus was in daily expectation of receiving a complete copy of his work from Rheticus, he was seized with hemorrhage, followed by paralysis. The book actually arrived May 23, 1543, and, as Gysius wrote to Rheticus, Copernicus saw it, and touched it, but was too near his end to do more. He died in a few hours after, and was buried in the cathedral to which he belonged.

We copy the following references to sources of information from the 'Bibliog. Astron.' of Lalande, p. 595: Adam, 'Vitæ Phil. Germ.;' Tycho Brahé, 'Orat. de Math.;' Jovius, 'Elog. Doct. Vir.;' Bullialdus, 'Proleg. Astr. Phil.;' Vossius, 'De Sci. Math.;' Crasso, 'Elog. d'Uom. Letter.;' Ghilini, 'Teatro,' tom. ii.; Freherus, tom. ii.; Blount, 'Cens. Cel. Auct.;' Paschius, 'De Invent. Nov. Ant.;' 'Actu Phil.,' part v., p. 884; Zernecke, 'Chronik von Thorn,' 2 ed., Berlin, 1727; 'Pantheon der Deutschen,' 1796; 'Berlin. Monatschrifft,' August, 1792, March, 1793; 'Preussiches Archiv.,' December, 1796; Wieland, 'Teutscher Merkur,' November, 1776. We may here notice that Ghilini asserts an epistle 'De Motu Octavæ Sphæræ' to have been printed; but as Gassendi had never seen it, and we can find no mention of it, we conclude no such epistle was published, though one with that name was certainly written.

COPING, the stone or brick covering of a wall, a term perhaps derived from the Italian *coprire*, to cover. Some think it is derived from the German *kopf*, or Dutch *kop*, the head. Coping-stones are placed on the tops of walls to protect them from the weather. Flat coping is called *parallel coping*, and is used upon inclined surfaces, as on the gables and parapets of houses, and also on the tops of garden and other walls. *Feather-edged* coping has one edge thinner than the other. *Saddle-back* coping is thicker in the middle than at the edges. Coping-stones should project over the walls which they cover, and should have a groove or *throating* underneath the projected part to throw off the water. The coping of Gothic battlements and the walls of churches, castles, and dwellings in the Gothic style of architecture, have a deep throating in the form of a bold cavetto in front, and are sometimes decorated with mouldings. [BATTLEMENT.] York stone is much used for parallel coping, and also Portland, but the latter is more expensive and not so durable. Bath stone coping is often used for Gothic works, but it is not calculated to withstand long the constant action of the weather.

COPLEY, JOHN SINGLETON, was born at Boston, in the United States, July 3, 1737. His father, who was of English extraction, resided in Ireland until his removal to America, which took place so immediately before his son was born, that Ireland has claimed him as a native. He was educated in America; and without the aid of instructors, simply by studying from nature in the groups around him and the neighbouring woods, he taught himself to paint. In 1760 he sent a picture of a 'Boy and Tame Squirrel' to the exhibition of the Royal Academy, which was universally admired. By the year 1767 he was in the receipt of a considerable income as a portrait painter, and was well known both by his works and by name to his brother painters on this side of the Atlantic. In 1774 he indulged a long-felt wish to visit Italy, which he reached by way of London. In the following year he returned to London, and established himself in George Street, Hanover Square. In 1777 he was elected an associate of the Royal Academy; and in 1783 he became a member. He died in 1815. One of his children, now Lord Lyndhurst, possesses some of his father's best paintings.

The best known of Copley's works is the 'Death of Lord Chatham,' which includes some valuable portraits. It was engraved by Bartolozzi on a plate of an unusual size, and the engraving was extensively sold. The painter sent an impression to General Washington, and another to John Adams. He painted many historical subjects, some sacred, and not a few illustrating the history of England, particularly the period of the Revolution. Perhaps the most spirited design from his pencil is the death of Major Pierson, a young officer who died in the defence of St. Helier's, in Jersey against the French, at the moment when his troops gained a victory over an enemy of superior numbers. There is a dryness and stiffness of manner in Copley's paintings generally, which is less observable in this picture. It is among those in the possession of Lord Lyndhurst. (A. Cunningham.)

COPPER is one of the metals with which the Greeks were acquainted, under the name of χαλκός (chalcus): it was used by them, alloyed with tin, for cutting and warlike instruments, before iron was known, or at any rate before it was common.

The word copper is said to be derived from the Island of *Cyprus*.

Copper has a red colour, and is capable of receiving a good polish; when warmed or rubbed it emits a disagreeable smell, and it imparts a nauseous taste: all its preparations are poisonous. Its density varies according to circumstances; Berzelius states that he found the specific gravity of fused copper to be 8·83, the same when drawn into a cylinder of two lines in thickness 8·946, and when laminated 8·958. Copper is malleable both when hot and when cold, and it may be reduced to very thin leaves; it is also very ductile, and may be drawn into fine wire. After iron and platinum it is the most tenacious metal: a wire $\frac{78}{1000}$ of an inch in diameter supports a weight of 302 pounds without breaking; it is extremely sonorous, and is a good conductor of heat and electricity. It melts at a temperature intermediate as to the fusing points of silver and gold, or, according to Professor Daniell, at a temperature equal to about 1196° Fahr. In pure dry air it does not readily tarnish or oxidize; but if the air be moist, by long exposure it is first oxidized and then converted into green carbonate.

This metal is one of those which occurs in the greatest number of places and in the largest quantity. It is found, though not in large proportion compared with the whole quantity actually obtained, in a metallic state, and is either amorphous, crystallized in cubes, octahedrons, or dendritic. Its ores are too numerous to admit of a detailed account, and as a mere catalogue would convey but little information, we shall only mention some of the more important. It occurs combined with sulphur, forming black sulphuret of copper, or vitreous copper ore; but principally with sulphur and iron, forming a double sulphuret, commonly called copper pyrites or yellow copper ore: this constitutes nearly the whole of the ore raised in Cornwall. It is found also combined with oxygen, forming the red, or suboxide of copper, or ruby copper ore, and less frequently it occurs as black oxide. It occurs also in the state of combination with some acids, as blue and green carbonate of copper, phosphate, sulphate, and silicate of copper.

Copper pyrites occurs in the north of Europe, in England, especially in Cornwall, Devonshire, and Anglesey, and in many parts of Asia and Africa, and the American continents.

We shall now give a brief statement of the mode of treating this ore, from an account given by J. H. Vivian, Esq., M. P., and published in the 21st vol. of the 'Annals of Philosophy.'

The ores are conveyed from Cornwall and Devonshire to Wales, to be smelted, on account of the supply of fuel in South Wales. By this arrangement the vessels not only carry the smaller quantity of material to the greater, but load back with coal for the use of the engines of the mines.

The principal smelting works are situated on the navigable rivers of Swansea and Neath. The furnaces in which the operations are conducted, are reverberating and of the usual construction; they are of different uses for different purposes. Thus the calcining furnaces or calciners are from seventeen to nineteen feet long, and fourteen to sixteen wide, and the melting furnaces are from eleven to eleven and a half feet long, and seven and a half to eight feet wide; the form of the calciner is hexagonal; the melting furnaces are oval flattened at one end

The processes are eight in number, and the first is:

The calcination of the ore.—The charge of ore usually put into the calciner weighs about three to three and a half tons; it is distributed equally over the brick bottom of the furnace. The process continues twelve hours, and towards the end of it the heat is as great as the ore will bear without fusion. To prevent this, it is frequently stirred during the operation. When this process is over, the charge is drawn out through holes in the bottom of the calciner, and if it has been well conducted the ore is black and powdery. During the calcination the arsenic is expelled and the sulphur is got rid of in the state both of sulphurous and sulphuric acid, and the copper and iron are both oxidized.

Melting of the calcined ore.—The furnace is charged through an aperture placed on the top of it. When the charge is spread over the bottom of the furnace, the door is put up and well luted. Some slags from the fusion of what is called the waste metal are added, not only on account of the copper they contain, but to assist in the fusion of the ore.

In this operation, unlike the first, the object is to melt the charge, and when this has taken place, the door of the furnace is taken down, and the liquid mass is well *rabbled*, or stirred, to allow the metallic sulphuret to separate from the earthy matter. When the latter flows on the former, it is skimmed off, and this being done, fresh charges of calcined ore are added till the metal collected at the bottom of the furnace is as high as the furnace will admit without flowing out at the door; the tapping-hole is then opened, in the side of the furnace, through which the metal flows into a pit of water. It thus becomes granulated, and collects in a pan, which is raised by a crane.

In this process a great proportion of the earthy matter and iron of the ore is got rid of. The granulated metal generally contains about one-third of copper, or is about four times as rich as the average ore; it now consists chiefly of copper, iron, and sulphur. When the ores are refractory they are rendered more fusible by the addition of fluor spar. In this state it is called *coarse metal.*

The slags obtained in this operation are broken up to examine whether they contain any copper, and if so, they are returned to the smelter to be remelted.

Calcination of the coarse metal.—This operation is conducted precisely in the same manner as the calcination of the ore; the charge is nearly of the same weight; it remains twenty-four hours in the furnace; the great object is to oxidize the iron; the heat during the first six hours should be moderate, and afterwards increased to the end of the operation. This is the *calcined coarse metal*

Melting of the calcined coarse metal.—This is performed in furnaces similar to the melting furnace. To the calcined metal are added some slags from the last operations in the works which contain some oxide of copper, as likewise pieces of furnace bottom impregnated with metal.

In this operation the oxide of copper in the slags becomes reduced by a portion of the sulphur which combines with the oxygen, and passes off as sulphurous acid gas, while the metal thus reduced enters into combination with the sulphuret; sometimes a little uncalcined ore is added to assist the operation, which it does by the sulphur that it contains.

The metal, after the slag is skimmed off, is either tapped into water or into sand beds, according to the mode of treatment to which it is to be subjected in subsequent operations. In the granulated state it is called fine metal; in the solid form, blue metal, from the colour of its surface. The former method is practised when the metal is to be brought forward by calcination; it then contains about sixty per cent. of copper, and it is called fine metal.

Calcination of the fine metal is performed in the same manner as the calcination of the coarse metal.

Melting of the calcined fine metal.—This is effected in the same manner as the melting of the coarse metal; the resulting product contains eighty to ninety per cent. of copper, and is called coarse copper.

Roasting.—This is chiefly an oxidizing process. The furnaces in which it is performed are called roasters, and are of the same kind as the melting furnaces. The pigs of coarse copper obtained by the last process are put into the furnace and exposed to the action of the air at a high temperature, which is gradually raised to the melting point; by this process the expulsion of volatile matter is completed, and the metals are oxidized; each charge is from twenty-five to thirty hundred weight. The metal is fused towards the end of the operation, which is continued for twelve or twenty-four hours, according to the state of forwardness when filled into the furnace, and is tapped into sand beds. The pigs are then covered with black blisters, in which state the copper is known by the name of blistered copper. In the interior of the pigs the metal has a porous honeycombed appearance, occasioned by the gas liberated during the ebullition which takes place in the sand beds on tapping. It is in this state fit for the refinery, the copper being freed nearly from all the sulphur, iron, and other substances with which it was combined.

Refining or Toughening.—The refining furnace is similar in construction to the melting furnaces, and differs only in the arrangement of the bottom, which is made of sand, and laid with an inclination to the front door instead of to one side, as is the case in those furnaces in which the metal is flowed out. The refined copper is taken out in ladles from a pool formed in the bottom near the front door. The pigs from the roasters are filled into the furnace through a large door in the side. The heat at first is moderate, so as to complete the roasting or oxidizing process, in case the copper should not be quite fine. After the charge is run down, if there is a good heat on the furnace, the front door is taken down, and the slags skimmed off. An assay is then taken out by the refiner with a small ladle, and broken in the vice; and from the general appearance of the metal in and out of the furnace, the state of the fire, &c., he judges whether the toughening process may be proceeded with, and can form some opinion as to the quantity of poles and charcoal requisite to render it malleable, or, as it is termed, to bring it to the *proper pitch.* The copper in this state is what is termed *dry.* It is brittle, of a deep red colour inclining to purple, of an open grain, and a crystalline structure. In the process of toughening, the surface of the metal in the furnace is first well covered with charcoal; a pole, commonly of birch, is then held in the liquid metal, which causes considerable ebullition, owing to the evolution of gaseous matter. This operation of *poling* is continued, with the occasional addition of fresh charcoal, so that the surface of the metal may be kept covered, until, from the assays which the refiner from time to time takes, he perceives the grain, which gradually becomes finer, to be perfectly closed, to assume a silky polished appearance in the assays when half cut through and broken, and to be of a light-red colour. He then makes further trial of its malleability by taking out a small quantity in a ladle and pouring it into an iron mould, and when *set*, beating it out while hot on the anvil with a sledge. If it is soft under the hammer, and does not crack at the edges, he is satisfied as to its malleability, or, as they term it, that it is *in its proper place.* He then directs the men to lade it out, which they do in iron ladles coated with clay, pouring it into pots or moulds of the size required by the manufacturer. The usual size of the cakes for common purposes is 12 inches wide by 18 in length.

The process of refining or toughening copper is a delicate operation, and requires great care and attention on the part of the refiner to keep the metal in the malleable state. Its surface should be kept covered with charcoal, otherwise it will go back between the rounds of lading, in which case fresh poling must be had recourse to: the cakes are allowed to cool in the pot, and others are laded thereon. Overpoling is to be avoided, as the metal is thereby rendered even more brittle than when in the dry state: its colour also becomes a light yellowish-red, and its structure fibrous. When this is found to be the case, or, as they say, it is *gone too far*, the refiner directs the charcoal to be drawn off the surface of the metal, and thus by taking down the side door and exposing the copper to the action of the air, it is brought back to its proper pitch; that is, it again becomes malleable.

Copper for brass-making is granulated, in order that its surface may be increased, and it may thus combine more readily with the zinc or calamine. This is effected by pouring metal from the ladles in which it is taken out of the furnace into a large ladle pierced in the bottom with holes, and supported over a cistern of water. The water may be either hot or cold, according to the form to be given to the metal. When warm, the copper assumes a round form, and is called *bean shot*. When a constant supply of cold water is kept up, the metal has a light ragged appearance, and is called *feathered shot*. The former is the state in which it is prepared for brass wire making. Another form into which copper is cast, chiefly for export to the East Indies, is in pieces of the length of six inches, weighing about eight ounces each: these are called *japan copper*. The copper is dropped from the moulds immediately on its becoming solid into a cistern of cold water, and thus, by a slight oxidation of the metal, the sticks of copper acquire a rich red colour on the surface.

Various important applications are made of copper in the state of sheets or rolled copper. Copper, like most of the unmixed metals, is generally rolled hot, being malleable at all degrees of heat till it approaches its melting point. Most of its alloys with zinc, frequently called spelter, known in commerce by the general term brass, are malleable only when cold, with the exception of one or two lately brought into use, which are extremely malleable at a certain high temperature. Copper for the purpose of rolling leaves the smelting works in cakes about 12 × 18½ inches thick, each weighing about 90 lbs. The cakes are then put into *muffles*, where they are uniformly heated; the degree of temperature depends on the quality of the copper; in general it is something beyond a bright red heat. In this state they undergo the process technically called *breaking down*, which consists in passing them between strong cast-iron cylinders as in the rolling of iron, the rolls being forced nearer together so as to diminish the intermediate space after each passage of the cakes through them. This process is continued until the cake is lengthened about five fold, by which time it has become too cold for further procedure in that stage. It is then cut by strong shears into pieces, called blanks, of the required weight, which are heated in the muffle and rolled out till they are twice as long as broad. Being again heated, they are now doubled, and thus rolled crosswise till they reach the required lengths, though in this process of finishing it becomes necessary frequently to heat them, and when the sheets are thin to roll several thicknesses together. The oxide of copper, which has in process of rolling been pressed in the surface, must now be removed; to effect which each sheet is first dipped into a saline mixture, and then put into the muffle. When red hot it is withdrawn and plunged into cold water, where the scale or oxide is suddenly cooled, and by its contraction is separated from the sheet and falls to the bottom, leaving the surface of the copper clean. This process also softens the sheet, which is now fit to be worked into any form. The only remaining process is that of shearing the edges, which is effected by a pair of circular shears, which, when required, cut both edges at the same time. Copper is sometimes rolled cold after it has undergone the process of breaking down, as above described, in the same manner as brass; it is generally rolled thus when it is needed hard in texture and bright on the surface.

We shall now describe the more important compounds of copper.

Oxygen and copper may be readily made to combine, and in two proportions; when copper is merely heated, scales are formed upon it, which, when removed, are found to consist of a suboxide and protoxide of copper. If these scales be reduced to powder and heated in dilute sulphuric acid, a red powder is left and a blue solution is obtained. This red substance is the suboxide of copper, and is composed of

1 equivalent of oxygen	8
2 equivalents of copper 32×2	64
equivalent	72

it is therefore a dioxide.

This oxide exists in nature, and occurs in Cornwall in the form of beautiful transparent crystals of a fine red colour, and is hence frequently called *ruby copper*. This oxide is not soluble in acid unless it acquire additional oxygen by the act of solution Thus it is not acted upon by dilute sulphuric acid either hot or cold; but when heated with the concentrated acid, it is decomposed, sulphurous acid being evolved and oxide of copper formed with the oxygen of the decomposed acid. It undergoes the same change by nitric acid, which it decomposes, and combines with the oxygen of it. In muriatic acid it is soluble, but then becomes a chloride from which water throws down a white subchloride and potash yellow or orange dioxide. With ammonia it forms a colourless solution, which becomes speedily blue by the oxidizement that occurs on exposure to the air. This oxide, it is evident from what has been stated, forms no salt with any acid.

Oxide or protoxide of copper. When the scales which have been described as falling from copper by the application of heat and air, are subjected to a high temperature with access of air in a crucible, the whole quantity is converted into protoxide of copper; or when the blue solution, already mentioned as obtained from the scales, is boiled with excess of potash, first a blue precipitate, which is *hydrate of copper*, is obtained, and in a short time it loses water and becomes black—this is the protoxide of copper, consisting of

1 equivalent of oxygen	8
1 equivalent of copper	32
equivalent	40

It may also be obtained by means of potash from any other salt of copper. The properties of this oxide are that it is black, insoluble in water; it combines with acids in general, and is the base of all the salts of copper. It dissolves in ammonia, to which it imparts a splendid blue colour; but it is insoluble in the fixed alkalis. When the vapour of water is passed over ignited copper, the copper is not oxidized, and no hydrogen is consequently given out; it appears therefore that the affinity of copper for oxygen is not very great. This oxide is is not decomposed by the mere action of heat. It sometimes, though more rarely than the dioxide, occurs in nature. It imparts a green colour to glass generally, but by particular management may render it blue.

Azote, hydrogen, and copper do not combine.

Chlorine and copper unite to form two chlorides; the sub or dichloride may be obtained by exposing copper filings to the action of chlorine gas, not in excess; or by evaporating, with as little contact of air as possible, a solution of dioxide of copper in muriatic acid. It is a yellow, translucent, crystalline compound, which is insoluble in water, but dissolved by muriatic acid, from which water throws down a white precipitate, and potash a yellow one. It is applied to no use: it is composed of

1 equivalent of chlorine	36
2 equivalents of copper	64
equivalent	100

When this is exposed to the air it becomes green, and is probably converted into an oxichloride; the same substance is produced by exposing copper to the action of muriatic acid and the air. It is usually called submuriate of copper; this compound is also found in Peru, and is called the *green sand of Peru*, or *Atacamite*.

Chloride of copper may be formed by dissolving the oxide or protoxide of copper in muriatic acid, when a fine green coloured solution is procured, which by evaporation to dryness at a temperature not exceeding 400° leaves chloride of copper; this compound is yellow, and soluble in water, and composed of

1 equivalent of chlorine	36
1 equivalent of copper	32
equivalent	68

Sulphur and copper combine very readily at a moderate temperature. The compound occurs in nature, and is frequently called *vitreous copper*. It is composed of

1 equivalent of sulphur	16
2 equivalents of copper	64
equivalent	80

It is therefore a disulphuret of copper. It may be prepared artificially by heating a mixture of sulphur and copper. The native compound is black, frequently shining, and crystallizes in six-sided prisms, &c.; it is met with also amorphous. The artificial compound is brittle and brownish-black. When exposed to heat and air the sulphur is expelled and oxide of copper remains. Nitric acid converts it into sulphate of copper; the same effect is produced by exposing the artificial compound to air and moisture.

Sulphuret of copper is obtained by adding sulphuretted hydrogen gas to any salt of the oxide of copper, as the sulphate, nitrate, &c. A black precipitate is thrown down, which contains twice as much sulphur as the last mentioned, or it is composed

1 equivalent of sulphur	16
1 equivalent of copper	32
equivalent	48

No use is made of this compound; it is converted into sulphate by treatment with nitric acid. It is not acted upon by dilute acids in general.

Bromine and copper.—This compound is in the form of small translucent plates. It is insoluble in water; muriatic acid dissolves without decomposing it; but neither sulphuric nor acetic acid, even when concentrated and boiling, has any action upon it. When heated out of the contact of air, it remains undecomposed; whereas, when the air is present, vapour is emitted, which gives the flame a green colour, and oxide of copper remains in the crucible. It is composed of—

1 equivalent of bromine	78
1 equivalent of copper	32
equivalent	110

Bibromide of copper may be formed by dissolving oxide of copper in hydrobromic acid; it is a deliquescent salt, which crystallizes in yellow needleform crystals. It contains two equivalents of bromine.

Iodine and copper combine to form iodide of copper. The compound is, however, but little known; when an alkaline iodide is poured into a solution of copper, a grey precipitate is obtained, which appears to be a mixture of iodine and iodide of copper.

Fluorine and copper. These substances combine; but little is known respecting the compound. When carbonate of copper is dissolved in hydrofluoric acid, carbonic acid is evolved, and an insoluble compound, which appears to be fluoride of copper, is formed.

Selenium and copper. When sileniuretted hydrogen gas is passed into a solution of copper, black seleniuret of copper is formed and precipitated; when dried, it has a deep grey colour, and is susceptible of a polish. When heated, it loses half of its selenium, and a button of seleniuret of copper remains.

Phosphorus and copper, when heated together, form a fusible white, crystalline, hard, brittle phosphuret. It is best obtained by passing the vapour of phosphorus over copper wire heated to redness. It is a diphosphuret composed of—

1 equivalent of phosphorus	16
2 equivalents of copper	64
equivalent	80

Copper and other metals form *alloys of copper;* those which result from its union with tin and with zinc are the most important. Some of the former have already been noticed under the head of bronze and bell-metal, and of the latter under that of brass. *Tutenag* is said to be an alloy of copper, zinc, and a little iron; and *tombac, Dutch gold, similor, Prince Rupert's metal,* and *Pinchbeck* are alloys containing more copper than exists in common brass. *Mannheim gold* is a peculiar alloy of copper and zinc, which is said to consist of three parts of copper and one part of zinc. The new standard measures made by Mr. Bate were formed from an alloy 57·6 parts copper, 5·9 tin, and 4·8 brass. This was preferred on account of its being less liable to oxidize than brass. *Packfong*, or the white copper of China, is an alloy of copper, nickel, and zinc, now extensively employed in this country under the name of *German silver;* it is nearly as white as silver, and takes a fine polish; it requires great caution in rolling. According to Dumas, that which is used for spoons and forks consists of copper 50, nickel 25, zinc 25; these proportions being slightly varied for different uses. The Chinese packfong, he says, consists of copper 40·4, nickel 31·6, zinc 25·4, iron 2·6 in 100 parts.

Copper and antimony, combined in the proportions 3 parts of the former to 1 part of the latter, is lamellar, brittle, and has a violet colour; but when equal quantities of the metals are used, the compound has not this colour, and it becomes whiter as the proportion of antimony is increased.

Copper and arsenic form a greyish white mixture, with a compact granular texture; it is not applied to any purpose whatever.

Acids and oxide of copper form salts, some of which occur in nature, and others are very extensively used in the arts. Our limits will permit the mention of the more important only.

Acetic acid and copper form two salts; namely, the acetate of copper, sometimes called *distilled verdigris*, and the diacetate of copper, or *common verdigris*. The diacetate was formerly prepared almost exclusively in France, by causing the husks and stalks of the grape after wine-making to ferment in contact with copper plates. It is now prepared in England by more direct processes. This salt, when pure, is in the form of light blue acicular crystals, of a silky lustre; they are decomposed by water into acetate, which remains dissolved, and a subsalt, which is precipitated. It is usually obtained in large masses, which have no crystalline form, having been packed while moist in leather bags. This salt is decomposed by the stronger acids, by the alkalis, and by heat. It is much employed as a pigment, and in hat-making, dyeing black, and several processes in the chemical arts. It consists of—

1 equivalent of acetic acid	51
2 equivalents of oxide of copper	80
6 equivalents of water	54
equivalent	185

Acetate of copper is prepared by dissolving the diacetate in acetic acid; twigs are put into the solution, upon which the salt crystallizes; it is of a beautiful deep green colour, and the form of the crystal is an oblique rhombic prism; it is soluble in five parts of boiling water, and but little soluble in alcohol. When submitted to destructive distillation, it yields very strong acetic acid, with some other products. It is composed of—

1 equivalent of acetic acid	51
1 equivalent of oxide of copper	40
1 equivalent of water	9
equivalent	100

Arsenious and arsenic acid both combine with oxide of copper. The arsenite of copper is employed as a pigment, under the name of mineral or Scheele's green. It is prepared by adding a solution of arsenite of potash to one of sulphate of copper, by which arsenite of copper is formed and precipitated. Arseniate of copper is found in Cornwall in various forms and composition, and constitutes a beautiful series of copper ores. It may be artificially prepared by mixing solutions of arseniate of potash and sulphate of copper.

Carbonic acid and copper combine in two proportions, which may be artificially prepared, and occur in nature. The green carbonate called malachite is found principally in Russia, and is of a fine green colour. It is artificially prepared by mixing hot solutions of sulphate of copper and carbonate of potash. It is composed of—

1 equivalent of carbonic acid	22
2 equivalents of oxide of copper	80
1 equivalent of water	9
equivalent	111

It is used as a pigment under the name of *green verditer;* it is decomposed by the stronger acids and by heat.

Blue carbonate of copper is found in France and Siberia beautifully crystallized, and is obtained artificially by decomposing nitrate of copper. It is of a fine light blue colour, and known by the name of *refiners' verditer.* It is employed as a pigment, especially as a water colour for paper-hangings. It is composed of—

2 equivalents of carbonic acid	44
3 equivalents of oxide of copper	120
1 equivalent of water	9
equivalent	173

It is decomposed in the same way as the green carbonate

Nitric acid and copper readily combine; the salt may be prepared either by dissolving the metal or the oxide of copper in the acid; it is a crystalline deliquescent salt, which dissolves readily in water and in alcohol. Much of this salt is formed by the silver refiners by precipitating silver from solution by copper; it is then used for making *blue verditer*. It is composed of—

1 equivalent of nitric acid .	54
1 equivalent of oxide of copper	40
equivalent .	94

When carbonate of lime is added to the solution, a subnitrate is precipitated.

Phosphoric acid and copper, from phosphate of copper. This salt occurs native in crystals, and may be artificially prepared by mixing nitrate of copper with phosphate of soda. It is a light blue precipitate, insoluble in water, and readily dissolved by acids. There probably exist two or three phosphates. It is not an important salt.

Sulphuric acid and copper form *sulphate of copper, blue vitriol*, or *Roman vitriol*, or *blue copperas*. It is prepared in large quantity for the use of the colour-maker and dyer, and is one of the most useful of the salts of this metal. It is readily prepared by dissolving the oxide in the dilute acid; by evaporation large and beautiful blue crystals are obtained, which have the form of rhombic prisms. This salt is soluble in about four parts of water at 60°, and in two parts at 212°. When heated, it loses the greater part of its water of crystallization, and becomes powdery and white; by a very strong heat the sulphuric acid is expelled, and oxide of copper is left; when solutions of the alkaline carbonates are added to a certain extent, subsulphate of copper is precipitated; and this is used as a pigment. It is composed of—

1 equivalent of sulphuric acid	40
1 equivalent of oxide of copper	40
5 equivalents of water . .	45
equivalent .	125

These are the principal salts of copper; but many more may be prepared. These salts are all either blue or green when combined with water; they are all decomposed by potash and soda, which at first throw down blue hydrate of copper, which, when heat and the alkali are used in excess, becomes black oxide. The soluble salts of copper are all precipitated of a reddish-brown colour by the ferrocyanide of potassium, yield a black sulphuret with hydrosulphuric acid, are soluble in ammonia, and yield a precipitate of metallic copper when iron is put into their solutions.

The uses of copper are so numerous, that it would require a volume to describe them all. It is used for coin, for making boilers and numerous utensils, for covering the bottoms of ships and the tops of houses, and in the construction of voltaic batteries. Its various important alloys are mentioned under the heads of BRASS, BRONZE, BELL-METAL, &c.

Copper, in a metallic state, produces no action in the human system. When in the form of oxide, its action is considerable, though variable, being dependent on the kind and quantity of acid which it may meet with in the stomach; but all its salts occasion peculiar effects, which may be fatal if the dose be large. It is not necessary that the substance should be introduced into the stomach, for the salts of copper act in whatever way they are introduced into the system, and the more energetically, the more directly they enter the blood. The greater the degree of solubility, the more rapidly are the formidable symptoms displayed. The preparations of copper used in medicine are, the sulphate, or blue vitriol, called also blue-stone; the ammoniated sulphate or ammoniuret; and the diacetate, or verdigris. The two former are used internally, the latter rarely; it and the sulphate being applied by surgeons to wounds and sores in particular states.

Sulphate of copper influences powerfully the nervous system, and acts as a tonic and antispasmodic: it has also some astringent properties. In a considerable dose it causes vomiting; in still larger doses it causes purging, accompanied with tenesmus, followed by convulsive agitation of the head, or rigidity amounting to tetanic, laborious respiration, pain and tightness of the head, insensibility, lethargy, and speedy death. In some instances the narcotic symptoms are the first to be displayed, those of irritation succeeding; jaundice, if the patient survive, or yellowness of the corpse is no uncommon occurrence; a fact to be borne in mind as a distinctive mark of poisoning by copper among metals: the same sign, however, occurs in poisoning from aconite and most ranunculaceous plants. If the effect of the poison when copper has been taken has been speedy, few traces of morbid action are found in the intestinal canal; and 'too much reliance ought not to be placed on mere bluish or greenish colouring of the membranes of the stomach; for Orfila and Guersent have both observed that the inside of the stomach as well as its contents may acquire these tints in a very remarkable degree in consequence of natural disease.' (Christison.)

In cases of slow poisoning by copper, such as happen when some of its salts in substance or solution have been taken daily for a considerable time, fatal results follow; and the copper may be detected accumulated in the liver, though not discoverable in any other organ of the body. The circumstance of the copper being carried to the liver explains the frequent occurrence of jaundice, as stated above.

In small medicinal doses, sulphate of copper has been employed in diarrhœa, which, when chronic, it often checks; even in Asiatic cholera it has proved useful. Indeed it seems to check augmented secretion from all mucous surfaces, on which account it may be used in chronic discharges from the urino-genital organs, and also of the lungs, to benefit which last organ it is usually given as an emetic. It may likewise be employed as an emetic in cases of poisoning by narcotic agents, in preference to tartrate of antimony or ipecacuanha, as its action is not preceded by nausea, which promotes the absorption of the poisonous agent.

Its chief internal use, however, is as a tonic and antispasmodic, in many convulsive and nervous diseases, such as epilepsy and chorea. In these last-named diseases the ammoniacal sulphate is often to be preferred, given in the form of pill. Sulphate of copper is however in most frequent use by surgeons as an external application to wounds when indolent, or filled with the unhealthy kind of granulations termed 'proud flesh:' it is similarly used in some forms of ophthalmia, especially of the inner surfaces of the eyelids.

Diacetate of copper is rarely given internally; but it is the frequent source of accidental or intentional poisoning, when its general effects are nearly the same as those of the sulphate. In the form of a liniment it is of great utility in certain affections of the mouth and gums, applied by means of a camel's-hair brush. Likewise as an ointment to stimulate old and indolent ulcers it is superior to all other means.

Poisoning often results from the formation of verdigris in copper vessels used in cooking, or the more reprehensible practice of putting copper coins into pickles to make them a fine green colour. It seems that copper vessels, if kept clean, are not dangerous, provided whatever is boiled in them (unless of an acid nature, which will always form some dangerous compound,) be not allowed to stand to cool in the vessel, but be instantly poured out. Tinning the interior of copper vessels affords protection so long as the tinning remains entire. In case of poisoning, the best antidotes are whites of eggs, milk, or wheat flour; ferrocyanate of potass, or iron filings in gum-water, may be given; sugar or any syrup is useful. But liver of sulphur should never be given, and least of all should vinegar.

COPPER, STATISTICS OF. No effective attempt has ever been made to ascertain the actual productiveness of the mines in this country, and all that is hitherto known on that subject is derived from partial inquiries of individuals. By this means a tolerably accurate account has been taken of the produce of the copper mines in Cornwall, reaching back to 1771, with the exception of a few intermediate years, the returns of which are wanting. Since 1821 similar accounts have been procured of the produce of other mines in the United Kingdom. The average annual produce of the Cornish mines at different periods between 1771 and 1820, was as follows: 1771 to 1775, 3450 tons; 1776 to 1780, 3310 tons; 1781 to 1785, 3990 tons; 1796 to to 1800, 5174 tons; 1801 to 1805, 5544 tons; 1806 to 1810, 6575 tons; 1811 to 1815, 7181 tons; 1816 to 1820, 7018 tons. Since then the annual produce has been as follows:—

Years.	Copper produced from Ores sold in Cornwall.	Copper produced from ores sold at Swansea.	Produce of Devonshire and Staffordshire.	Produce of Isle of Anglesey.	Total.
	Tons.	Tons.	Tons.	Tons.	Tons.
1821	8,515	344	871	558	10,288
1822	9,140	388	716	774	11,018
1823	7,927	353	694	705	9,679
1824	7,823	605	654	623	9,705
1825	8,226	729	667	736	10,358
1826	9,026	668	615	784	11,093
1827	10,811	772	562	681	12,826
1828	9,921	977	533	757	12,188
1829	9,656	1,221	454	726	12,057
1830	10,748	1,196	510	778	13,232
1831	12,044	1,240	486	915	14,685
1832	11,947	1,320	400	783	14,450
1833	11,191	1,15	406	505	13,260
1834	11,224	1,580	538	700	14,042
1835	12,270	2,832			

The copper yielded by the British mines being more than sufficient for the use of the kingdom, a considerable quantity is exported every year, both in its unwrought and in a manufactured state. The exports since 1820 have been:

Years.	Unwrought.	Coin.	Sheets, nails, &c.	Wire.	Other sorts of wrought copper.	Total quantity exported.
	cwts.	cwts.	cwts.	cwts.	cwts.	cwts.
1820	41,155	10	58,121	8	22,663	121,958
1821	34,543	155	66,676	21	24,035	125,431
1822	25,829		65,070	40	22,731	113,671
1823	24,082	802	56,146	98	25,387	106,516
1824	19,209	95	62,920	292	23,580	106,096
1825	10	2134	51,437	40	25,002	78,624
1826	2,604	1807	65,264	11	26,307	95,994
1827	26,583	1450	74,943	8	40,439	143,424
1828	21,591	1150	52,412	71	48,897	124,121
1829	52,978	15	59,871	13	46,643	159,521
1830	59,722	640	66,331	16	56,443	183,154
1831	67,200	96	70,477	149	32,690	170,613
1832	77,497	2	79,944	13	37,155	194,612
1833	47,887	15	91,366	16	16,947	156,233
1834	81,978		81,363	44	14,344	177,731
1835	63,252		103,433	56	15,197	182,225

In the accounts of exports of English produce and manufactures exported, the Custom House statements include brass and copper manufactures together; the total quantity and declared value of these shipments in each year, from 1827 to 1835, have been as follows:

	cwts.	Decl. Value.		cwts.	Decl. Value.
1827 .	147,222 .	786,955*l.*	1832 .	213,482 .	916,563*l.*
1828 .	128,106 .	678,786*l.*	1833 .	192,974 .	884,149*l.*
1829 .	161,241 .	812,366*l.*	1834 .	205,960 .	961,823*l.*
1830 .	189,592 .	867,844*l.*	1835 .	242,095 .	1,094,749*l.*
1831 .	181,951 .	853,124*l.*			

The principal shipments in 1835 were made to the following countries, viz.: India, 73,377 cwts., 316,120*l.*; France, 67,832 cwts., 298,903*l.*; United States of America, 35,626 cwts., 166,060*l.*; Netherlands, 16,409 cwts., 75,027*l.*; Brazil, 8265 cwts., 39,429*l.*; Italy, 8106 cwts., 35,902*l.*; British West Indies, 6080 cwts., 32,393*l.*; Foreign West Indies, 4595 cwts., 21,554*l.*; and British North American Colonies, 2571 cwts., 12,792*l.*

Within the last few years a considerable quantity of copper ore has been brought to England for the purpose of its being smelted and re-exported in the metallic state. These importations, which have come chiefly from Colombia and Chile, have been, 1825, 2 cwts.; 1826, 1297; 1827, 659; 1828, 6693; 1829, 24,258; 1830, 28,733; 1831, 50,919; 1832, 79,115; 1833, 118,632; 1834, 139,740; 1835, 278,900. (*Tables of Revenue, Population, Commerce, &c. of the United Kingdom, compiled at the Board of Trade*, parts 3, 4, and 5.)

COPPER, ALLOYS OF. [COPPER.]

COPPER, ORES OF. [COPPER.]

COPPER-NICKEL. [NICKEL.]

COPPER-PLATE. [ENGRAVING.]

COPPER-MINE RIVER is a river in North America, which falls into the Arctic Ocean. It rises in a rocky country, near 65° N. lat. and 112° W. long., where a series of lakes unite and form the river. The most southern of these lakes is Lake Providence (about 64° 50′ N. lat.). The river first runs nearly due north, until it has passed 66° 30′ N. lat., when it turns west and flows along the foot of a rocky, but not high chain of mountains. Having attained 116° 30′ W. long. it turns abruptly north, and breaking through the mountains continues its course in a northern direction to its mouth 65°50′ N. lat., and a few minutes east of 116° W long. Its whole course may be about 300 miles. It contains numerous rapids, but none which form insuperable difficulties to canoes and boats which descend the river. The most difficult part is the Bloody Falls, about 10 miles from the mouth. Hearne discovered the mouth of this river in 1771, and it was the first place on the coast of the Arctic Sea of America which was visited by Europeans. Sir J. Franklin descended the greatest part of the river in his first journey. (Franklin and Richardson.)

COPPERAS. There are three metallic salts which are occasionally called copperas, as sulphate of copper (blue copperas), sulphate of iron (green copperas), and sulphate of zinc (white copperas).

COPPICE, a wood or plantation of various kinds of trees, which shoot up from the root when cut down, and which are periodically cut down before they acquire any considerable size. The most common trees planted or used for this purpose are the oak, the chestnut, the maple, the birch, the ash, and the willow. The hazel and the alder are also frequently planted in coppice, the former in dry and chalky soils, the latter in moist and marshy situations. Timber trees are generally allowed to grow in coppice, or more properly the coppice is the underwood where timber is the principal object. There is a doubt, however, whether it is judicious to allow many trees to stand where there is a ready sale for coppice wood. The quick return of the latter overbalances the greater price of old timber. In consequence of this opinion, large trees fit for ship-building, which require a long time to arrive at the required size, are become very scarce; and many woods, once thickly studded with majestic trees, are reduced to mere coppice wood. The value of a well-managed coppice is considerable where the produce can be readily manufactured into useful articles, and carried to a good market. Ash hoops, hop-poles, chestnut gate-hurdles, and sheep-hurdles are the principal articles manufactured or prepared in a newly-cut coppice. What is of no use for these purposes is made into faggots for fuel, where this is scarce, or converted into charcoal, which is more easily transported. A good coppice will bear to be cut down every eight or nine years, and will thus be worth, according to situation, from 6*l.* to 15*l.* per acre, or even more, when sold to those who undertake to cut and prepare the wood.

Little attention is generally paid to the coppice, except when it is fit to be cut, but this is a great mistake: with a little attention a coppice may be doubled in value in a few years. It should be carefully drained where the water has not a ready outlet. Where the most profitable kinds of wood are deficient fresh plants should be supplied. The whole should be kept well stocked, but not overstocked; and the pruning-knife should be used where it appears necessary, especially where hop-poles are in request, which usually bear a good price. Hop-poles require a longer time to attain the proper size, and more room to grow. For this purpose the coppice may be thinned out, without being entirely cut down. When a coppice is cut, attention must be paid to the manner in which the poles and rods are cut off from the stem. They should be divided by a clean slanting cut with a very sharp axe or bill-hook, so as not to shatter the stump which is left. The wound will then soon heal over, and the stump will not be injured by the wet and decay, as is too often the case. When fresh ground is planted for a coppice, it should always be previously trenched and drained. The extra expense of this will soon be repaid. Scotch firs may be planted at first as nurses and shelter to the oaks and other forest trees. In seven or eight years the firs will have acquired a considerable height, and may be thinned out or cut down: they never shoot again from the root. The other trees may be left to grow a few years longer before they are cut down. After the first cutting, attention must be paid to the stumps and all superfluous shoots removed. In seven or eight years a thick coppice will be formed, which will increase in value every time it is cut, and will produce a very good annual rent for land which would not have been profitable in cultivation, either as pasture or arable farms. The annual expense of a coppice is trifling, and the regular returns are certain and profitable. When a portion of coppice is cut every year, so as to have a regular rotation, the income is as regular as that of any other part of an estate. A proportion of coppice on an estate is essential to the production of game and to its preservation.

The ground most favourable for coppice is that which is too steep or rocky for cultivation, and where the climate will not allow of the vine. Where the land is flat, and can be well drained, arable farms will always be most profitable, unless in some poor sandy soils, where corn will not grow without extraordinary manuring, while the roots of some kinds of trees will sink to a great depth and find there the nourishment necessary to their growth. In such sandy soils the birch, the maple, and the acacia sometimes grow luxuriantly, when the grass on the surface scarcely shows signs of vegetation. On wet and boggy soils the willow and the alder are almost the only trees that will thrive. Whoever plants a coppice must be well acquainted with the soil to a considerable depth, and must choose his plants accordingly.

COPT, the name given to the Christian descendants of the antient Egyptians. It is correctly pronounced either Ckoobt or Ckibt, and it is generally believed that the name is derived from Coptos, once a great city in Upper Egypt, now called Ckooft or Gooft, to which, during their persecution by the Roman emperors, many of the Egyptian Christians retired. They are not an unmixed race, their ancestors in the earlier ages of Christianity having intermarried with Greeks, Nubians, and Abyssinians. The secession of the early Christians of Egypt from the Church of Constantinople occasioned bitter enmities to spring up between them and the Greeks, on which account they suffered so much persecution, that they united with the Arab invaders of their country to expel the Greeks; but though their revenge was gratified, they were compelled to bow to a heavier yoke. With the exception of a small proportion who profess the Romish or the Greek faith, the Copts are Christians of the sect called Jacobites, Eutychians, Monophysites, and Monothelites, whose creed was condemned by the council of Chalcedon A.D. 451. The number of churches and convents in ruins prove that the Copts were once far more numerous than at present: they do not now compose more than one-fourteenth part of the population of Egypt, their number not exceeding 150,000, about 10,000 of whom reside at Cairo. Conversions to the Mohammedan faith, and intermarriages with the Moslems, have occasioned this decrease in their numbers; to which may be added the persecutions which they endured from their Arabic invaders and subsequent rulers. They were forced to adopt distinctions of dress, and they still wear a turban of a black or blue, or a greyish or light brown colour, in contradistinction to the red or white turban. The distinction is generally carefully observed in the towns, but less so in the villages. Under the dominion of the present Báshaw of Egypt, the Copts are not now the despised race they once were: some of them have even been raised to the rank of Beys. The male adults pay a tribute, besides the income tax which they pay in common with the rest of the inhabitants; but they are exempt from military service. This immunity is the result of Moslem prejudice.

In some parts of Upper Egypt there are villages exclusively inhabited by the Copts, and in every village of moderate size is a Mo'al'lim (a title given to all Copts except those of the poor class or peasants), who keeps the register of the taxes. Most of the Copts in Cairo are employed as secretaries and accountants, or tradesmen; they are chiefly engaged in the government offices; and as merchants, goldsmiths, silversmiths, jewellers, architects, builders, and carpenters, they are generally considered more skilful than the Moslems. In the villages they are employed in agriculture, like the rest of the peasantry. The patriarch, or head of the Coptic church, judges petty causes among his people in the metropolis, and the inferior clergy do the same in other places; but an appeal may be made to the cadi. A Moslem aggrieved by a Copt may demand justice either from the patriarch or cadi, but a Copt who seeks redress from a Moslem must apply to the cadi. The Copts are somewhat under the middle size. They are extremely bigoted, and bear a bitter hatred to all other Christians; they are of a sullen temper, extremely avaricious, great dissemblers, ignorant, and faithless. In their habits they scarcely differ from their fellow-countrymen. Their dress, with the exceptions already noticed, is similar. The women veil their faces, according to the custom of the country. The Copts frequently indulge in excessive drinking; but in their meals, their mode of eating, the manner in which they pass their hours of leisure, which is chiefly in smoking their pipes and drinking coffee, they resemble the other inhabitants of the country.

The Coptic language is now understood by few persons, and the Arabic being adopted in its stead, it may be considered a dead language. There are numerous schools, but for boys only; very few females among them can read, and those have been instructed at home. The boys are taught the Psalms of David, the Gospels, and the Apostolical Epistles, in Arabic; and then the Gospels and Epistles in Coptic. The antient language is not understood grammatically; and there are scarcely any who can do more than repeat what they have committed to memory of the Scriptures and Liturgy. The Coptic fell gradually into disuse after the Arab conquest; in Lower Egypt the inhabitants had ceased to speak and to understand it before the tenth century, but in Upper Egypt it lingered several centuries longer. All the Copts who have been instructed at school still pray, both in the church and in private, in Coptic; and the Scriptures are always read in the churches in that language; but they are explained from books in Arabic. The British and Foreign Bible Society has printed the Psalter and Gospels in Coptic and Arabic.

The Coptic hierarchy consists of a patriarch, a metropolitan of the Abyssinians, bishops, arch-priests, priests, deacons, and monks. The patriarch is styled 'Patriarch of Alexandria,' but generally resides in Cairo. He is usually chosen by lot, and always from several monks of the convent of St. Anthony, in the Eastern Desert, who are nominated by the superior. He continues to observe the monastic regulations, one of which is to remain unmarried. The metropolitan of Abyssinia, who always resides within his diocese, is appointed by the patriarch, and retains his office for life. The number of bishops is twelve, who are generally chosen from the monastic order. The arch-priests are numerous, and are selected from among the priests. The priests are required to be of the age of thirty-three years at the least, and are not permitted to marry, though they may have married before taking the priesthood; but if the wife dies they cannot marry again; and the widow of a priest is not allowed to marry a second husband. The priests are supported only by alms and by what they obtain by their own industry. A deacon must be either a person unmarried, or have been only once married to a virgin bride. By taking a second wife he loses his office. The monks undergo a severe novitiate, and take the vow of celibacy. The churches contain ill-executed and gaudy pictures of various saints, but no images are admitted. The number of Coptic churches and convents is said to amount to 146, but the former are few in comparison with the latter The form of service is not characterized by much solemnity, and the conduct of the priests is often somewhat indecorous. Baptism is practised under a belief that if the ceremony be omitted the child will be blind in the next world. The children are generally circumcised; but in Cairo the custom is less strictly observed than in other parts of the country. Confession is required of all members of the Coptic church, and is indispensable before receiving the Lord's supper. Wednesday and Friday are observed as fast-days, except during the fifty days immediately following the Great Fast. The seven great festivals are as follows:—the Nativity of Christ, Baptism, the Annunciation, Palm Sunday, Easter, the Ascension, and Whit-Sunday. The Copts are not allowed by their church to intermarry with persons of any other sect.

The most recent notice of this people (from whence the above statements are taken) is contained in the second volume of *An Account of the Manners and Customs of the Modern Egyptians, written in Egypt during the years* 1833-34 and 1835, by Edward William Lane; 2 vols., London, 1836.

COPTIC LANGUAGE. We designate by the term Coptic the language spoken and written by the inhabitants of Egypt since the introduction of the Christian religion into that country; and we distinguish it from the more antient Egyptian language, which was in use under the Pharaohs and the Ptolemies. The origin of the word *Copt* is doubtful; some have derived it from the name of the city Coptus: we are inclined to recognise in *Copt* the main part of the antient name of the country Αἴγυπτος. The name *Copts* seems to have been used as the common designation of the Christians in Egypt from the time of the Emperor Heraclius, when the patriarch Benjamin was permitted to return from his exile in the Thebaïs (about A.D. 644) and to resume his functions as a bishop at Alexandria. (Le Quien, *Oriens Christianus*, ii. 481.) What was the relation of the antient to the more recent language of Egypt, we are as yet unable to determine, as our information respecting the former is very imperfect. From the analogy however of other languages, the successive changes of which can be traced with tolerable accuracy, we are warranted in supposing that the old Egyptian language bore a relation to the Coptic, similar to that which the Latin does to the Italian, the Zend to the modern Persian, or the Sanscrit to many of the vernacular dialects now spoken in India. Though we cannot here support the assertion by any direct evidence, we may consider it as an established fact, that the antient Egyptians possessed an extensive written literature, besides the monumental inscriptions which still exist. It is by no means probable, that the conquest of Egypt by Cambyses, or the period of Persian dominion which followed that event, should have materially injured the literature of the country; and the subsequent dynasty of the Ptolemies seems to have encouraged rather than to have checked the progress of literature in Egypt. Plutarch tells us (*Vit. Anton.*, c. 27), that Cleopatra spoke several barbaric languages fluently, and though he does not expressly mention the Egyptian, there can hardly be a doubt that it was among the number. Egypt lost much of its consequence when it became a Roman province; and when Alexandria ceased to be a royal residence, arts and literature would naturally fall into decay. Another cause which proved fatal to Egyptian literature was the early introduction of Christianity into Egypt. This event which contributed to extend the study of Greek literature and the use of the Greek language, at the same time deprived the antient literature of the country, as chiefly connected with the old religion, of the better part of its interest. Nor have intentional measures for destroying Egyptian books been wanting. The Emperor Severus collected as many of the Egyptian writings relative to the mysteries of the priests as he could obtain, and buried them in the tomb of Alexander (*Dion. Cass.*, lxxv., c. 13); and Diocletian ordered all books on alchemy to be destroyed, from an apprehension that by the cultivation of that science the Egyptians might again become wealthy, and thus find means to shake off their allegiance to the Roman empire. (Suidas, v. *χημεία* and *Διοκλητίανος*.) Notwithstanding these unfavourable circumstances, the language of the country continued in ordinary use, particularly in the interior provinces. Many hermits in the desert of Thebaïs, and many bishops of Upper and Lower Egypt, knew no other language; and the Egyptian, or as it is more appropriately called during these later times, the Coptic language survived for seven or eight centuries after the conquest of Egypt by the Arabs. We cannot be surprised if at last it entirely disappeared. Vexations of all kinds, religious persecutions, banishments, massacres, and devastations by fire and sword, had from century to century thinned the native population of the country, which had in the same proportion been replenished by settlers from different Arabic tribes of Africa and Asia. In the same manner the Coptic language gradually gave way to the Arabic, which is now the language generally in use throughout Egypt.

The literature extant in the Coptic language is by no means rich. The only part of any intrinsic value seem to be the Coptic translations of the Bible, probably made towards the close of the third and in the beginning of the fourth century, and following, as far as the Old Testament is concerned, the Septuagint version, the readings of which, as well as those of the Alexandrine text of the New Testament, they may serve to determine. Besides these, there exist Coptic translations of sermons from the Greek fathers, fragments of the decrees of councils, likewise generally translated from the Greek, liturgies, acts of martyrs, original mystic treatises on ethics, with numerous examples from the lives of pious hermits, and translations from the Greek of some apocryphal books of the New Testament. Coptic literature offers little or nothing of sufficient interest in itself to make the study of the Coptic language attractive; and, except its use in biblical criticism, its study is of importance only as furnishing the only means by which the inquiry into the hieroglyphic records of antient Egypt may with any chance of success be approached.

Such as we find it, the Coptic language exhibits evident traces of the fate of the country in which it was spoken. Under the Ptolemies, and afterwards under the Romans, new forms of government and administration were introduced into Egypt; and the inhabitants necessarily borrowed from their conquerors the names of public offices and other terms relating to political matters. The Coptic language received a further supply of foreign words in consequence of the introduction of Christianity. A great number of Greek words were retained in the Coptic versions, partly it seems from an apprehension of profaning the Christian doctrine by venturing to translate expressions deemed peculiarly holy in the Greek original text; but doubtless, in a great measure, also from ignorance or laziness, or from a desire to display learning by the use of Greek words. It has been remarked, that the proportion of Greek expressions is not the same in all Coptic writings; and that only a few occur, for which equivalents might not be found among the genuine Coptic words.

It is well known that the antient Egyptians, besides the hieroglyphics, possessed an alphabet or syllabic system of writing of their own. In the modern Coptic we find the Greek alphabet employed, with eight new letters added to it, to express certain articulations peculiar to the Copts. It is uncertain at what period the Greek alphabet came into use.

Athanasius, bishop of Kous, in an Arabic treatise on the grammar of the Coptic language, a manuscript of which is preserved in the Royal Library at Paris, informs us that there were three dialects of Coptic; namely, the dialect of Misr or Upper Egypt, commonly called the Sahidic; the Bahiric, so denominated from Bahirah, or Lower Egypt, and usually called the Memphitic; and the Bashmuric, spoken in the district of Bashmur, in the Delta. In the Bahiric, or Memphitic dialect, as well as in the Sahidic, we possess manuscripts of nearly the whole of the Bible and of the services of the Coptic church, besides some other less important works; but in the Bashmuric dialect only a few fragments have hitherto been discovered and published. The character common to all these dialects is that of a language which, having lost its original power of expressing by grammatical inflection the relations of notions in sentences, has, like most other modern languages, resorted to particles and auxiliary words to supply that deficiency. The precision with which these auxiliary words are employed, and the extent to which they can be combined in forming derivative words, are remarkable, and may well be compared with the use of letters and other symbols in an algebraical formula. The plural of nouns is distinguished from the singular by a monosyllabic prefix; the genders of substantives are seldom marked by a peculiar termination, but are determined either by the article, or by the addition of a word implying 'male' and 'female.' There are no terminations of case; and all changes of declension must be expressed by means of particles. There is a definite and an indefinite article. The definite article has in the singular distinct forms for the masculine and feminine genders, but does not distinguish the gender in the plural; the indefinite article admits of a distinction of number only. The degrees of comparison are expressed by subjoining auxiliary words to the adjective. The personal pronouns are almost the only part of speech that has preserved some traces of inflection: besides these, the Coptic has separate forms for the possessive, the demonstrative, the relative, and the interrogative pronouns, and it has pronominal suffixes and insertions (infixes) which are applied to nominal and verbal inflexions. Ordinal numbers are formed by prefixing various auxiliary words to the cardinal numbers. The verb has only an active voice, and the passive must be expressed by circumlocution, usually by the third person of the plural (as in Latin, *ferunt* = *fertur*, or in English, *they say* = *it is said*.) The imperative generally exhibits the root of the verb in its pure state. The conjugation of verbs is accomplished by adding pronominal prefixes to the root, which vary to a certain extent in the different tenses; if a verb in the third person singular is preceded by a relative pronoun, its pronominal prefix is usually dropped; there are no participles in the strict sense of that term. The number of prepositions in the Coptic language is considerable.

Of the three dialects, the Memphitic, Sahidic, and Bashmuric, the first appears to be the most polished. The Sahidic has admitted a greater number of Greek expressions. Words which in Memphitic end in *i*, have in Sahidic *e* for their termination. The Sahidic substitutes the sound *h* for the Memphitic *kh*, and the tenues *π*, *κ*, *τ*, for the aspiratæ *θ*, *χ*, *ϑ*, also sometimes *oo* for *ω*, and *sh* for *j*. The Bashmuric agrees with the Sahidic in preferring the tenues *π*, *κ*, *τ*, to the corresponding aspiratæ, and *h* to *kh*; moreover, it substitutes the vowel *a* for the Memphitic *o*, and *e* for the Memphitic *a*, *ei* often for *i*, *au* for *ov*, *b* for *f*, and particularly *l* for *r*.

(Henry Tattam, *A Compendious Grammar of the*

Egyptian Language, London, 1830, 8vo., and *Lexicon Ægyptiaco-Latinum*, Oxford, 1835, 8vo.; Am. Peyron, *Lexicon Linguæ Copticæ*, Turin, 1835, 4to.; Quatremère, *Récherches Critiques et Historiques sur la Langue et la Littérature de l'Egypte*, Paris, 1808, 8vo.)

CO'PULA. In logic the word copula means the term which connects the subject with its predicate, as in the sentences 'I *am* a Christian,' and 'the tree *is* green,' the expressions 'I' and 'tree' respectively denote the subject, and the verbs 'am' and 'is' serve for the copula.

Philosophers have endeavoured to explain how the copula effects by its interposition one judgment of two ideas, and forms it into a whole. The erroneous modern theories of philosophers otherwise celebrated, such as Kant and Fichte, on this obscure part of metaphysics, greatly influenced the whole of their systems. The following remarks will be found calculated to elucidate this interesting topic.

Knowledge and science consist in the transferring of the truth in nature (in the universe, including the mind and even what is logically possible) to the sphere of human perception; and the whole universe may thus be converted into a countless number of real and lasting impressions. To effect this there must be faculties as numerous as there are classes of truth in nature. Of the latter there is, 1st, the truth of the *identity* of things; every thing resembles and corresponds to itself. This appears so plain that it might be deemed superfluous to mention it, the contrary being indeed impossible. But such is the case in every instance of truth, though each particular instance is not so apparent as this fundamental axiom of A = A. 2ndly, The truth of *unity* in the variety of things—things differ in their accidents, but are substantially the same; for instance, all trees are comprised under the same idea of trees, but they differ in their accidents, such as leaves, flowers, fruits, &c. 3rdly, The truth of *synthesis* of substance and accident—accidents are found closely blended with substance; for instance, in a mineral we cannot separate its colour, gravity, crystalline form, taste, &c.; we cannot put the substance in one place and the accidents in another. 4thly, The truth of *cause* and *effect*—each effect has its cause. 5thly, The truth of *relations of aptness* and *progress* in nature. 6thly, The truth that there exists in nature the *infinitely small*. 7thly, The truth that in nature there is the *infinitely great*. First existed nature with its truth; next creatures existed, and received their faculties of perceiving certain descriptions of truth. Plants are destitute of those faculties; animals in general possess two; those animals which form the transition to man have three; and man has five. In the Deity alone can the whole seven be united.

The first faculty (of perceiving the identity of things) is that of *consciousness* in its general acceptation. It grows into memory, when the brain is developed. (Imagination or phantasy arises from spontaneity, and has no truth in nature corresponding to itself; it is the faculty of blending what is merely probable, and its product is art.) The second faculty is that of *abstraction*, by which unity is perceived in the variety of things: it is found in all animals that have a brain. 3rdly, The faculty of *relation* (intellect), effecting by means of the copula a judgment, in which substance and accidence (in logic called subject and predicate) are connected. As mysterious as this connection is in nature, so mysterious is the copula: the instrument by which the process is performed is the brain. The fourth faculty is that of *drawing conclusions*, or of forming from two judgments (A is B, B is C) a third (C is A). This faculty leads to a communicative language; man only possesses it, and therefore he only, even when deaf and dumb, is capable of speaking. This faculty forms the solitary and certainly important difference between man and the superior animals which form the transition to man. By means of this faculty, man readily attains the fifth, namely, that of discovering *the relation of aptness in nature;* these relations are *ideas*, whence this faculty is called the faculty of *idealizing*. The seventh faculty, of forming an idea of the *infinitely great*, can be attributed to an Almighty God alone. In opposition to what we have explained, the system of Kant asserts, that we cannot know whether or not the truth referred to exists in nature, which we construe merely from our intuitive and mental powers, and which therefore may turn out to be different from what it appears to us.

COPYHOLD, a term in English law applied to lands held by what is called tenure by copy of court roll, the nature of which is thus described by Littleton (§ 73, 4, 5), 'Tenant by copy of court roll is as if a man be seised of a manor, within which manor there is a custom which hath been used time out of mind of man, that certain tenants within the same manor have used to have lands and tenements to hold to them and their heirs in fee-simple or fee-tail, or for term of life, at the will of the lord, according to the custom of the same manor. And such a tenant may not alien his land by deed, for then the lord may enter as into a thing forfeited unto him. But if he will alien his land to another, it behoveth him after the custom to surrender the tenements in court into the hands of the lord to the use of him that shall have the estate. And these tenants are called tenants by copy of court roll, because they have no other evidence concerning their tenements, but only the copies of court rolls.' From this it appears that the title to copyhold lands is not only modified but altogether constituted by custom; subject to the estates in them which the custom confers they are held by the lord under the common law as part of the demesnes of his manor. For these customary estates were in their origin mere tenancies at will, though by long indulgence they have in many instances acquired the character of a permanent inheritance descendible (except where otherwise modified by custom) according to the rules of the common law; and as tenancies at will they continue to be considered in all questions relating to the *legal* as distinguished from the customary property in the land.

The origin of copyholds is involved in great obscurity. The opinion generally adopted among our lawyers and antiquarians, and supported by the authority of Littleton, Coke, Sir Martin Wright, and Mr. Justice Blackstone, is, that copyholders have gradually arisen out of the villeins or tenants in villeinage who composed the mass of the agricultural population of England for some centuries after the Norman conquest, through the commutation of base services into specific rents either in money or money's-worth. (See Co. Litt., 58 a—61 a; Blackstone's *Comm.*, ii., p. 92; Wright *on Tenures*, 3rd edit., p. 215.) See also Hallam's *Middle Ages*, vol. iii., p. 254. [VILLEINAGE.]

Although the revolution in the condition of these classes of persons was accomplished gradually, it seems in the middle of the 13th century to have begun to assume a more decided character. There are proofs of as early a date as the reign of Henry III. of a limitation of the services of villeins to certain specified acts which were recorded in the lord's book. The descendants of persons so privileged began to claim a customary right to be entered on the court roll on the same terms as their predecessors, and, in process of time, prevailed so far as to obtain a copy of the roll for their security. It is said in the year-book of the 42nd of Edw. III. to be 'admitted for clear law that if the customary tenant or copyholder did not perform his services the lord might seize his land as forfeited,' which seems to imply a permanent interest in the copyholder, so long as he performed the services. This view of the law is confirmed by Britton in a passage cited by Lord Coke (Co. Litt., 61 a) and was adopted by the judges in Edward IV.'s time, who held that a copyholder might maintain an action of trespass against the lord for dispossession.

The two great essentials of copyhold tenure, according to Blackstone, are: 1. That lands be parcel of and situate within that manor under which they are held; and 2. That they have been demised or demisable by copy of court roll immemorially. 'For immemorial custom, says that author, ii., p. 96, is the life of all tenures by copy; so that no new copyhold can, strictly speaking, be granted at this day.'

The burdens to which a copyhold tenure is liable in common with free tenures, are fealty, services, reliefs, and escheats; besides which it has certain liabilities peculiar to itself in the shape of heriots and fines. A heriot is the render of the best beast or other chattel (as the custom may be) to the lord on the death of a tenant.

Of fines, some are due on the death of a tenant and others on the alienation of the land; they are sometimes fixed by the custom, sometimes arbitrary; but in the latter case it is an established rule of law that the lord cannot demand by way of fine upon the descent or alienation of the land more than the amount of two years improved value of the property, after deduction of the quit-rents to which it is liable. The ordinary mode of alienating a copyhold estate in fee-simple is by *surrender and admittance*, which is effected in the following manner:—The copyholder appears in court and professes to surrender or deliver up his land to the lord (either in person, or which is more usual, as repre sented by his steward), expressing the surrender to be to the use of A, and his heirs; and thereupon A is *admitted* tenant of the land to hold it to him and his heirs at the will of the lord according to the custom of the manor. He then pays a fine, and also (if required) does fealty. All these circumstances, or at least the surrender and admittance are entered on the court rolls; and the new tenant, paying his fees to the steward, receives a copy of this fundamental document of his title. Surrenders are made in various forms, as by the delivery of a rod, glove, or other symbol, to the steward or other person taking the surrender. Surrenders may also be made to the lord in person out of court; to the steward; and by special custom to the lord's bailiff; to two or three copyholders, or into the hands of a tenant in the presence of other persons. But when a surrender is taken out of court it must be presented by the homage or jury of copyholders at the next general court, except where a special custom authorizes a presentment at some other court. Admittances also may be made out of court and even out of the manor.

The words in the admittance 'to hold at the will of the lord,' are characteristic of those customary estates to which the term copyhold is in ordinary legal language exclusively appropriated, in contradistinction to what are sometimes called 'customary freeholds' (which estates are very common in the north of England), and antient demesne lands. These are all included under the term copyhold in the statute 12 Car. II. c. 24, which abolished all the old tenures in England except common soccage, copyhold, and some other specified tenures. Though customary freeholds and antient demesne lands for the most part pass by surrender and admittance, the admittance is expressed to be 'to hold according to the custom of the manor.'

The Statutes of Wills (32 Henry VIII. c. 1, and 34 and 35 Henry VIII. c. 5) do not include copyholds, and therefore formerly it was necessary in order to enable a person to dispose of copyholds by will that he should first have surrendered them 'to the use of his will,' as it was called. This ceremony was rendered unnecessary by the statute 55 Geo. III, c. 192, which however does not extend to customary freeholds. A devise of copyholds by will may be made without observing the formalities prescribed by the statute of frauds (29 Car. II. c. 3), the terms of that statute not extending to copyholds. The Statute of Entails (13 Ed. I.), commonly called the Statute of Westminster the 2d, does not extend to copyholds; but in most manors a custom of entailing copyholds has prevailed. These entails might formerly be barred by a proceeding in the Lord's Court, analogous to a common recovery, or in the absence of a custom authorizing such a proceeding, by a mere surrender. And now by statute (3 & 4 Wm. IV. c. 74, § 50-54 inclusive) entails of copyholds may be barred by assurances made in pursuance of the provisions of that act. It is a general rule that no statute relating to lands or tenements in which those of a customary tenure are not expressly mentioned, shall be applied to customary estates, if such application would be derogatory to the customary rights of the lord or tenant. Hence neither the provision in the Stat. of Westm. the 2d, (13 Ed. I. c. 18) rendering debtors' lands liable to process of execution by writ of elegit, nor the Statute of Uses (27 Henry VIII. c. 10), nor the Statutes of Partition (31 Henry VIII. c. 1, and 32 Henry VIII. c. 32), nor the statute enabling persons having certain limited interests in lands, to grant valid leases (32 Henry VIII. c. 28), nor any of the local Registry Acts are applicable to copyholds.

Copyholds cannot be seized upon an outlawry, nor are they assets for payment of specialty debts at law, nor are they even liable for debts due to the crown, although they have always been subject to sequestration under the decree of a court of equity. But copyhold lands belonging to traders have been subjected to the operation of the bankrupt laws (v. stat. 6 Geo. IV. c. 16, sec. 68 and 69; 3 and 4 Wm. IV. c. 74, sec. 66;) and by stat. 3 and 4 Wm. IV c. 104, copyhold lands of all persons whatever which have not been devised for payment of debts, are rendered assets to be administered in a court of equity for the payment of specialty and simple contract debts. Copyholds are not liable (except by special custom) to the incidents of curtesy or dower. The latter, where authorized by the custom, is called the widow's 'free bench.' These estates being considered continuations of that of the deceased tenant, are perfected without admittance. A purchaser or devisee of copyholds has an incomplete title until admittance; but the customary heir is so far legal owner of the land *before admittance* that he can surrender or devise it, or maintain an action of trespass or ejectment in respect of it. The lord may by a temporary seizure of the land compel an heir or devisee to come in and be admitted; and he is himself compellable by a mandamus of the Court of King's Bench to admit any tenant, whether claiming by descent or otherwise.

By the general custom of all manors, every copyholder may make a lease for any term of years, if he can obtain a license from the lord, and even without such license he may demise for one year, and in some manors for a longer term, and the interest thus created is not of a customary nature, but a legal estate for years, of the same kind as if it had been created out of a freehold interest. But every demise without license for a longer period than the custom warrants, and in general, every alienation contrary to the nature of customary tenure, as a feoffment with livery of seisin, is followed by a forfeiture to the lord. A copyhold estate may also be forfeited by waste; as by cutting down timber, or opening mines, when such acts are not warranted by the custom. In the absence of such special custom, the general rule seems to be that the right of property both in trees and mines, belongs to the lord, while only a possessory interest is vested in the tenant; but neither can the lord without the consent of the tenant, nor the tenant without the license of the lord, cut down trees, or open and work new mines. In like manner forfeiture may be incurred by an inclosure or other alteration of the boundaries of an estate, refusal to attend the customary courts, or to perform the services, or to pay the rent or fine incident to the tenure. The 9th section of the 1st Wm. IV. c. 65, protects infants, lunatics, and married women from the last mentioned cause of forfeiture. In case of felony or treason being committed by a copyholder, the lord has the absolute benefit of the forfeiture, unless it has been expressly provided otherwise by act of parliament. In all cases of forfeiture the lord may recover the forfeited estate by ejectment, without prejudice to the rights of the copyholders (if any there be) in reversion or remainder. He may waive the forfeiture by a subsequent act of recognition of the tenure. If he does not take advantage of the forfeiture for twenty years, his right to do so is barred by the act for the Limitation of Actions, 3 and 4 Wm. IV. And if he neglect to take advantage of the forfeiture in his life-time, his heir cannot avail himself of it.

The lord may also become entitled to a customary tenement by escheat for want of heirs. Formerly where a copyhold was surrendered to a mortgagee and his heirs, and no condition was expressed in the surrender, and the mortgagee died intestate and without an heir, the lord was entitled to enter for escheat. To remedy this, the 4 & 5 Wm. IV. c. 23, enacts that where a trustee or mortgagee of lands of any tenure whatsoever, dies without an heir, the Court of Chancery may appoint a person to convey or surrender the legal estate for the benefit of the persons entitled to the equitable interest in the property, and provides against the future escheat or forfeiture of lands by reason of the attainder or conviction of trustees or mortgagees who have no beneficial interest therein.

If the lord (having acquired a copyhold tenement by forfeiture, escheat, or surrender to his own use) afterwards grant it away by an assurance unauthorized by the custom, the customary tenure is for ever destroyed. And if he makes a legal conveyance in fee-simple of a copyhold tenement to the tenant, the tenement is said to be enfranchised, *i. e.* converted into freehold.

Copyholders were till very lately incapable of serving on juries, or voting at county elections of members of parliament; but the former disability was removed by 6 Geo. IV. c. 50, sec. 1, and the latter by the 2 & 3 Wm. IV. c. 45, sec. 19. As to the qualification for killing game under 22 and 23 Car. II. c. 25, sec. 3, there seems to be no distinction between freeholders and copyholders.

There are no lands of a copyhold tenure in Ireland.

End of Volume the Seventh.

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THE PENNY CYCLOPÆDIA

OF

THE SOCIETY FOR THE DIFFUSION OF USEFUL KNOWLEDGE.

COPYRIGHT, or, as it was formerly termed, copy, has been defined by Lord Mansfield, 'to signify an incorporeal right to the sole printing and publishing of somewhat intellectual, communicated by letters.' By this 'somewhat intellectual' is to be understood something proceeding from the mind of the person by whom, or through whom, such a right is claimable. Yet, although mere republications of the compositions of others are no subject for copyright, it is by no means limited to such productions as contain new or original ideas. Thus translations both from ancient and modern languages, notes and additions to existing works, even mere compilations and abridgements, are similarly protected. As to these last however it is often a question for courts and juries to decide, whether the compiler or abridger really intended to present the original matter in a more useful or agreeable form, expended his own labour upon it, and so entitled himself to protection, or whether he only sought, under false pretexts, to defraud the author or his assigns of a portion of their lawful profits. This decision depends of necessity on the circumstances of each particular case. Further, a right of copy attaches to the authors of ideas expressed by other symbols as well as letters, to musical composers for example.

The origin of copyright must be sought in the general conviction which has always prevailed of its justice and expediency. 'When a man,' says Blackstone, 'by the exertions of his rational powers has produced an original work, he seems to have clearly a right to dispose of that identical work as he pleases; and any attempt to vary the disposition he has made of it, appears to be an invasion of the right. Now the identity of a literary composition consists entirely in the sentiment and the language. The same conceptions, clothed in the same words, must necessarily be the same composition; and whatever method be taken of exhibiting that composition to the eye or ear of another, by recital, by writing, or by printing in any number of copies, or at any period of time, it is always the identical work of the author which is so exhibited, and no other man, it hath been thought, can have a right to exhibit it, especially for profit, without the author's consent.'

Accordingly it has been supposed that a common-law right of copy existed in England previously to any statute on the subject. As a legal proposition however this cannot be supported by the proper and direct proof of a fair judicial decision before the passing of the first statute relating to it in the reign of Queen Anne; inasmuch as it never appears to have been directly controverted up to that time. But, in the absence of positive authority, it may be fairly inferred, from the old charters of the Stationers' Company, and much more from their registers, whence it appears that some thousands of books, even as early as the times of Elizabeth, passed from one owner to another by descent, sale, and conveyance; from acts and ordinances of parliament which necessarily imply a recognition of it by the nature of their provisions respecting printing; and from decrees of the Star-chamber, which, though not binding precedents, are evidence of the opinion of many learned men as to the then state of the law. It is further to be noted, that the non-existence of express decisions on the point is accounted for down to 1640 by the necessity of obtaining a license prior to the printing of anything, so that authors had no occasion to apply to civil tribunals for protection, as none but themselves and those claiming under them were so licensed, and he who printed a book without this was subject to enormous penalties.

It has hardly been controverted in the various arguments that exist upon this common-law right of copy that literary compositions in their original state, and the incorporeal right of the publication of them, are the private and exclusive property of the author. The question made has been that this property was put an end to by publication: and yet without publication it is useless to the owner, because it is without profit, and property without the power of use or disposal is not property. In that state it is lost to society as a means of improvement, as well as to the author as a means of gain. Publication is therefore the necessary act and only means to render such a property useful to the public and profitable to the owner. If, says Lord Mansfield, the copy which belonged to the author before publication does not belong to him after, where is the common law to be found which says there is such a property before. All the metaphysical subtleties from the nature of the thing may be equally objected to the property before. It is equally detached from the manuscript or any physical existence whatsoever. There is in fact nothing in the act of publication to vary the nature of the right, so that that which is necessary to make a work useful and profitable should be taken as destructive at once of an author's confessed original property against his expressed will. It has accordingly been the almost unanimous opinion of the high authorities who were called on to decide the point, that by the common law of England authors were entitled to copyright, and as there was nothing in statute or custom to determine it, or distinguish this from other species of property, that such right was once perpetual. The arguments for the contrary opinion are collected in the judgment of Mr. Justice Yates in the case of Millan v. Taylor, 4th Burrow, p. 2354.

From the above premises arose the question, after the passing of the first statute respecting literary property in 1710, whether by certain of its provisions this perpetual copyright at common law was extinguished for the future. After some less important decisions in the negative on motion in the Court of Chancery and elsewhere, the question was solemnly argued before the Court of King's Bench, during the term, when Lord Mansfield presided, in 1769. The result was a decision in favour of the common-law right as unaltered by the statute, with the disapproval however of Mr. Justice Yates. Subsequently, in 1774, the same point was brought under the consideration of the House of Lords, and the decision of the court below reversed by a majority of six judges in eleven, as Lord Mansfield, who adhered to the opinion of the minority, declined to inter-fore; it being very unusual, from motives of delicacy, for a peer to support his own judgment on appeal to the House of Lords. It is somewhat remarkable, that although this could be hardly termed a decision, as the judges were in point of fact divided equally, it has since been held so important as a precedent and sustained in so many subsequent cases, that it must now be considered as settled law that perpetual copyright is put an end to by the statutes.

The two universities were not slow to protect themselves from the consequences of this decree in the case of Donaldsons and Beckett, and obtained from Parliament, in 1775, the following year, an act for enabling the two universities in England, the four universities in Scotland, and the several colleges of Eton, Westminster, and Winchester, to hold in perpetuity their copyright in books given or bequeathed to the said universities and colleges for the advancement of useful learning and other purposes of education. This protection, sanctioned by penalty and forfeiture, so long as such books are printed at the presses of the universities and colleges respectively, is still enjoyed, unaffected by the general statutes on the subject; and a similar protection is extended to the university of Dublin by 41 Geo. III., c. 107.

The chief provisions of the 8 Anne, c.19, entitled 'An act for the encouragement of learning, by vesting the copies of printed books in the authors or purchasers of such copies during the times therein mentioned,' as regards the effecting of that purpose, were, that the authors of books already printed, and those claiming under the author, should have the sole right and liberty of printing them for a term of 21 years and no longer; and that the authors of books to be printed, and their assigns, should have the same right for 14 years and no longer. And the last clause of the statute directed that after the expiration of these 14 years the same right should return to the authors, if living, for another 14 years. The persons infringing these provisions were to be punished by forfeiture of the pirated book to the proprietor, and a penalty of one penny for each sheet, one-half to go to the crown and the other half to the informer, provided always the title to the copy of the book had been duly entered with the Stationers' Company.

The 41 Geo. III., c. 107, which extended the same law to Ireland, gave a further protection to authors and their assigns by action for damages and double costs, and raised the penalty per sheet to three pence, to be divided in the same way.

The 54 Geo. III., c. 156, by which literary property is at present mainly regulated, is entitled 'An act to amend the several acts for the encouragement of learning by securing the copies and copyright of printed books to the authors of such books and their assigns.' By the fourth section of the act, after reciting the statutes of 8 Anne and 41 Geo. III., by which authors and their assigns had the sole liberty of printing for 14 years and no longer, and after reciting that it will afford encouragement to literature if the duration of copyright were further extended; it is enacted, that after the passing of this act, the author of any book, and his assigns, shall have the sole liberty of printing and reprinting such book for the full term of 28 years from the day of publication, and, if the author shall be living at the end of that period, for the residue of his natural life.

With regard to books at that time already published, it is enacted that if the authors then living should die before the expiration of fourteen years from publication, their representatives should have the benefit of the second fourteen years; and if the authors should survive till twenty-eight years from publication, themselves should have the benefit for the remainder of their lives. But the rights of all assigns are saved in both cases.

The penalties for the infringement of copyrights are the same as in the former statutes, but with the limitation that all legal proceedings under the act must be commenced within one year.

The results to be collected from the statute, and from subsequent decisions upon it, as far as protection to the rights of authors is involved, may be briefly stated thus, as a summary of the existing law.

1. The published works of any author deceased before the 29th July, 1814, are wholly unaffected, and at this time public property. 2. The published works of any author at that period living, but who died within fourteen years from the time of first publication, go after his death to benefit his assigns, if he has assigned his interest therein, for the remainder of that fourteen years; but in all cases whether he has or has not assigned, to his personal representatives for another fourteen years. They afterwards become public property. 3. The published works of any author at that period living, but who dies more than fourteen, and less than twenty-eight years from the date of publication, go to his assignees if he has assigned, and to his personal representatives if he has not, for the residue of the twenty-eight years. They afterwards become public property, as they are at his death if he survive twenty-eight years. 4. The published works of any author at that period living, more than twenty-eight years having then elapsed since publication, are unaffected by the act, and continue, as they were before, public property. Such is the law with regard to works published before the passing of the 54 Geo. III., c. 156, with regard to works published since it is as follows:—

1. If an author does not assign his interest in the work, and lives more than twenty-eight years after publication, the copyright remains his for life, and after his death becomes public property. 2. If the author does assign his interest, the copyright attaches to his assigns for his life; and if he die within twenty-eight years, it attaches to them for the remainder of that term. It afterwards becomes public property. 3. If the author does not assign his interest, and dies within twenty-eight years from publication, the copyright attaches to his personal representatives for the remainder of that term. It then becomes public property.

It has been said that the exclusive property of authors in their manuscripts has always been recognized by the law. But this principle extending only to prevent the printing or circulating copies of them without the license of the owner, it was found necessary to pass recently a statute for the peculiar protection of the authors of dramatic compositions. This is the 3 Will. IV., c. 15, entitled 'An Act to amend the Laws relating to Dramatic Literary Property,' which, after reciting the 54 Geo. III. c. 156, provides that the author of any dramatic piece, not hitherto printed or published by authority of him or his assigns, shall have as his property the sole liberty of representing it, or causing it to be represented, at any place of dramatic entertainment; and the author or assignees of any such work, printed and published within ten years before the date of the act, shall have the same privilege for twenty-eight years from publication, and for the remainder of the author's life, if he longer live. The penalty for violating these enactments is to be enforced by action for damages, with double costs, to be brought within twelve months from the commission of the offence.

There are certain works excepted from the benefit of the law of copyright from the nature of their contents. Such are, all publications injurious to public morality, inimical to Christianity, or stimulating, either as libellous or seditious, to a breach of the peace. This must however be understood of their general tenor, and not of isolated passages. As far as a rule on the subject can be laid down, it is, that any work containing matter for which a public indictment or private prosecution could be sustained is not protected by the law, but may be pirated by other parties at pleasure, who, if sued for penalties under the act, are allowed to give in evidence the nature of the composition which they have published, in order to defeat the action. This is a remarkable exception to the general rule of law, that none shall take advantage of his own wrong; and its operation is quite as remarkable, the effect of the rule having often been to disseminate more widely that which the law has declared not to merit protection.

The protection given to authors by the statute of copyright is coupled with conditions of some particularity, although it is by express words in the fifth section exempted from depending on them. Besides the registry at Stationers' Hall, which is to be made within one month for books published within the bills of mortality, and within three months for all others, at a penalty of five pounds, and eleven times the price of the book, the 54 Geo. III., c. 156, requires that eleven copies of every work shall be delivered on demand in writing within twelve months for the use of the British Museum, Sion College, London, the Bodleian Library at Oxford, the Public Library at Cambridge, the Library of Advocates at Edinburgh, the libraries of the four Scotch universities, and the libraries of Trinity College and the King's Inns, Dublin. It has been decided, and the decision is most important, as affecting many works of the greatest value and expense, that works published in parts or numbers are not liable to this tax until completed. 2 Younge and Jervis, 166; 4 Bing. 540. Farther, by a very recent statute, 6 and 7 W. IV., c. 110, the 54 Geo. III., c. 156, is repealed, so far as relates to the delivery of copies of books to the four universities of Scotland, Sion College, and the King's Inns, Dublin, compensation being given to those institutions upon an estimate of the annual value of books supplied upon an average of three years, ending the 30th of June, 1836.

Besides the special copyrights of the universities secured to them as before mentioned by statute, there still exist certain prerogative copyrights attaching to the owners in perpetuity. Of these the chief belong to the king, which were more numerous and considerable formerly than at present. Many are now quite obsolete, such as those of almanacs, law-books, and Latin grammars; and others very questionable, such as that of the exclusive right to print the English translation of the Bible. The king has a prerogative copyright in the liturgy and other services of the church, in proclamations, orders in council, and other state papers, and in the statutes. It has been decided, that the University of Cambridge shares by letters patent in the king's prerogative of printing acts of parliament. The House of Lords also exercises an exclusive privilege, somewhat fallen into disuse, of publishing its own proceedings as the supreme court of judicature.

The usual modes of legal proceeding to prevent or punish the infringement of copyright, or as it is more usually termed, piracy, are by action for damages, or for the penalties given by the statute; or more commonly still, by obtaining an injunction in equity to prohibit the unlawful publication, which affords immediate and summary redress. This is always granted where the legal title of the plaintiff to the work is made out, and the identity of the pirated publication with his own shown to the satisfaction of the court. The proof even of an equitable title has been held sufficient to qualify him for this remedy. Mawman v. Tegg, 2 Russ. 385. Neither will the court be restrained from granting the injunction, by proof that the matter pirated forms only a part of the publication complained of, and that what is original will be rendered useless to the defendant and the public by prohibiting its sale. But as this mode of proceeding presses very severely upon defendants, and often inflicts irreparable injury, the court, where any doubt attaches, will either refuse the injunction altogether, or grant it only on condition of the plaintiff's bringing an action immediately, to have the merits of the case decided by a jury with the smallest possible delay.

These legal protections are for the most part found effectual in restraint of domestic piracy. But over the frequent and daily-increasing practice of foreign piracy, by reprinting English works abroad, they exercise no useful control, although the 54 George III., c. 156, expressly includes within its prohibitions the importers of foreign editions, and the sellers of them with a knowledge of their origin. Notwithstanding this, most popular productions of English authors are immediately reprinted in France and Germany, and are to be obtained in England at little more than their original cost. A practice so destructive of the fair profits of mental labour can only be effectually redressed by prevailing on foreign countries to extend the benefit of their own laws against literary piracy to alien as well as native authors. With respect to America, a memorial has recently (1836) been transmitted from this country to Congress, praying for some law to protect English copyright in the United States. Many English works are reprinted in America; and the reprints may be, and frequently are, with a little contrivance sold in England at lower prices than the original publication. In this instance the English author loses in another way: his English edition, which would sell in America, is supplanted there by an American reprint, which costs the publisher only paper and printing. The American author suffers in the same way in England. Some arrangement therefore between these two countries for the extension of copyright would often make a book twice as valuable to the author, and would of course be for the benefit of the reader, as it might be published at a lower price

A notice of the law of copyright would be incomplete which did not advert to some other compositions which receive from statute a protection analogous to that of literature. Such are engravings, etchings, and prints, maps and charts, and sculpture of all kinds. These resemble written works as regards the incorporeal right in them accruing to the author by the exertion of his mental powers in their production, but differ as they also require a good deal of his manual skill and labour, and are therefore his property upon the same general principles as any other manufacture. Such productions therefore are even more plainly entitled to the protection of the law than books.

The chief statutes affecting the copyright in works of design, engraving, and etching, are the 8 George II., c. 13, which vests it in the inventor, designer, and proprietor, for fourteen years from the first publication, and enforces this provision against any person pirating the same by forfeiture of the plate and prints, and a fine of five shillings for each print, to be recovered by action within three months of the discovery of the offence. The 7 George III., c. 38, extends the term of copyright to twenty-eight years; and in addition to the subjects of the former statute includes maps, charts, and plans, under the same conditions. It also extends the time of bringing an action for the penalties to six months. The 17 George III., c. 57, gives the owner of the copyright a further remedy of action for damages and double costs within the same limits of time.

With regard to models, casts, and other sculptures, the 38 George III., c. 71 vests the right and property in these for fourteen years in the proprietor, and gives him a special action on the case against the offender, if brought within six months. These provisions were rendered more effectual by 54 George III., c. 56, by which double costs were given, and an additional term of fourteen years superadded in case the maker should be living at the end of the first term.

As to sculpture certainly, but more doubtfully as to prints, for there have been conflicting decisions on the point, the work must bear upon it the name of the maker and the date of publication to entitle it to the protection of the law.

The right of patents also presents many legal features analogous to those of copyright, but this subject requires a separate notice. [PATENT.]

COQUIMBO. [CHILE.]

COQUIMBO, a town of Chile, and the capital of the province of Coquimbo, about seven miles from the bay of Coquimbo, was founded in 1544 by Don Pedro Valdivia, who called it La Serena, by which name it is still sometimes known. It is a poor town, with a population which has been estimated at 10,000 souls; but other estimates reduce it to 4000. The streets are all at right angles to each other, of moderate width, but very dirty; the houses, which are generally of one story, have small gardens attached to them, owing to which circumstance the town occupies a much greater surface than the population would lead one to expect. It contains six or seven churches and a public hospital. The Puerto, or port, is nothing more than a collection of about a dozen miserable huts, with a custom-house, situated at the head of a small indentation of the coast open to the northward. No fresh water can be procured, and supplies of all kinds are scarce and dear. There are no foreign importations direct to Coquimbo: supplies are obtained from Santiago or Valparaiso. From 500,000 to 550,000 dollars are annually exported to Europe in British men-of-war, besides gold; but the duty on this article being very heavy, it is always smuggled on board, and consequently no estimate of the quantity shipped can be formed. The port is in 29° 57′ S. lat., 71° 17′ W. long., about 200 miles north of Valparaiso.

The district abounds in mines of gold, silver, copper, and iron: the iron is not worked, on account of the scarcity of fuel.

COR CA'ROLI, a name given by Halley to the star of the third (or 2½) magnitude in Canes Venatici, in memory of Charles I. It is situated on the neck of the lower dog, and, when figured, has a heart surmounted by a crown. The name is not much in use among astronomers.

COR LEO'NIS. [REGULUS.]

CORA'CINA, a genus separated from the crows by Vieillot, and divided by him into four sections. The first comprises those species which have the bill furnished at its base with velvety feathers (*Les Col-nus*, naked necks); the second those whose nostrils are covered with setaceous feathers, directed forwards, and whose upper mandible is notched towards the end (*Les Choucaris*, Graucalus); the third those whose bill is naked at the base, and notched at the point (*Coracina gymnocephala*, Vieill., *Corvus calvus*, Latham, for example); and the fourth, that curious species on which Geoffroy St. Hilaire founded his genus *Cephalopterus.*

Cuvier, in the last edition of the 'Règne Animal,' defines Graucalus to be the Greek name of an ash-coloured bird (oiseau cendré), and says that three Choucaris out of four are of that colour. M. Vieillot, he adds, confounds these birds with his *Coracinæ*, which comprise the *Gymnoderi* and the *Gymnocephali*.

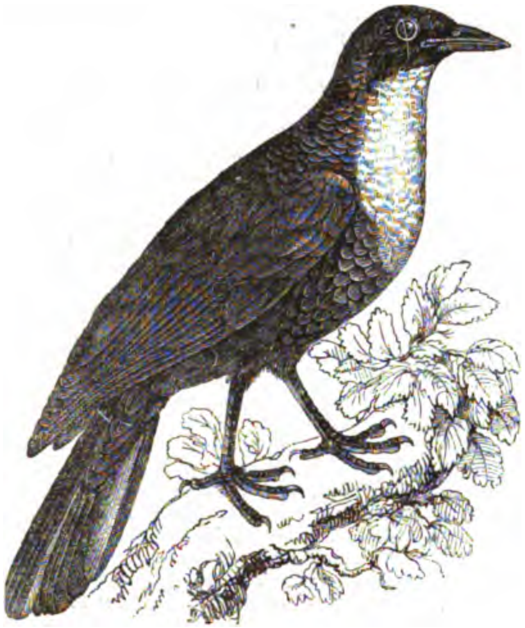
M. Lesson, who places the group under the *Ampelidæ*, observes that the genus *Coracina* is far from being determined. Thus, he observes, M. Vieillot places under it the *Cephalopterus* of M. Geoffroy-Saint-Hilaire, the *Choucari*, and the *Col-nu*, or *Gymnoderus*. (He might have added the *Gymnocephalus* of Geoffroy and Cuvier.) Temminck adds to it many of the *Cotingas* of Le Vaillant; but for his own (Lesson's) part, he adopts the term *Coracina* for that group of birds which Cuvier has collected together under the name of *Piauhaus*.

Genera. Coracina, Lesson. (Coracina, Temminck; Les Piauhaus, (Cotinga) Cuvier; Piauhau, Querula, Vieillot.)

Bill depressed, smooth, ciliated at the base, thick, narrowed at the point, angular above, a little curved towards the end, slightly toothed at the point; lower mandible a little flattened below; head and neck feathered, but without any ornamental plumes, and without any naked skin.

Example. *Coracina scutata*, Temm. *Coracias scutata*, Lath.

This species differs but little from *Coracina rubricollis*, *Muscicapa rubricollis* of Gmelin, in the colour of its plumage; but the wings are shorter. In *C. rubricollis* the plumage is all black, with the exception of the throat and front of the neck, which are of a purpled rose-colour. In *C. scutata* the red, which covers the throat and breast, goes as low as the upper part of the belly, and the bill is not black, as it is in *C. rubricollis*. Locality, Brazil, which is also the habitat of *C. rubricollis*

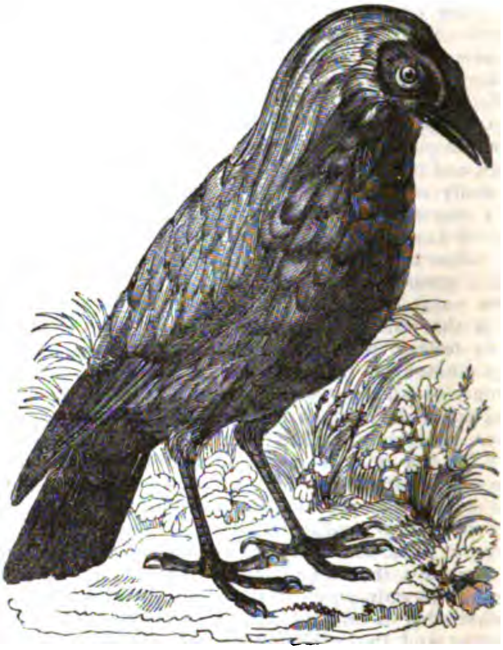


[Coracina scutata.]

Gymnocephalus. (Coracina, Vieillot.)

M. Lesson observes that MM. Vieillot and Temminck place the *Gymnocephali* (Bald heads) among the *Coracinæ*, and that Cuvier contents himself with observing that *Corvus calvus*, Latham, the type of this new genus, has the bill of the Tyrants, with the ridge (culmen) a little more arched, and a great portion of the face denuded of feathers. Le Vaillant, he states, regarded this denudation of the skin in the front of the head as the result of a particular habit, and in the 'History of the Birds of Paradise' has printed a note, in which he affirms that he had received from Cayenne a specimen, having this part well covered with feathers; but, M. Lesson adds, that he himself had seen at Rochefort more than twenty skins of *Gymnocephali*, and that all had the face bare of feathers. However it may be, he continues, this genus entirely requires revision.

Example. *Gymnocephalus calvus*, *Coracina gymnocephala*, Vieill., *Corvus calvus*, Lath., *Capuchin Bald-Head*. Size of the crow, and of the colour of Spanish snuff, or, as some authors write it, Capuchin colour, whence the Creoles of Cayenne give it the name of 'Oiseau mon père.' The quills and the tail-feathers are black. The large beak and ample forehead bare of feathers give a singular air to this bird. Vieillot observes that it has been compared to the rook, on account of the nakedness of the head, a comparison which seems to him just; 'for,' says Vieillot, 'it has not this part naked till it is adult, the young, like the young rook, having the head entirely feathered, and even the nostrils covered with small setaceous feathers, as I can testify, from the inspection of a young individual, of which I have made mention in the first edition of the *Nouveau Dictionnaire d'Histoire Naturelle*.' Locality Guiana.

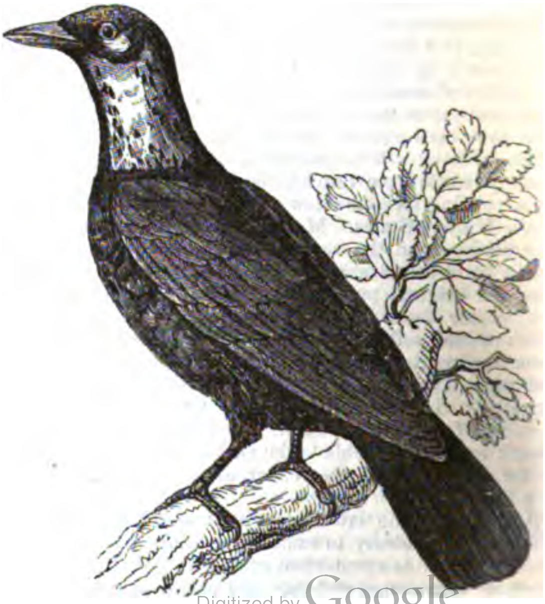


[Gymnocephalus calvus.]

Gymnoderus. (Coracina, Vieill., Temm. Cotinga, Le Vaill.)

The principal characters of Gymnoderus, Geoffroy-Saint-Hilaire, rest on the possession of a bill like that of the *Coracinæ* and *Cephalopteri*, with a partially naked neck and a head covered with velvety feathers.

Example. *Gymnoderus fœtidus*, *Coracina gymnodera*, Vieill., *Corvus nudus*, Lath., *Gracula nudicollis*, Shaw., *Gracula fœtida*, Linn., *Col-nu*, Buff. Rather larger than the jackdaw, but the body is thick and fleshy. The sides of the neck are entirely naked, and only present some traces of down. Buffon's figure, on the contrary (Planches



[Gymnoderus fœtidus, male.]

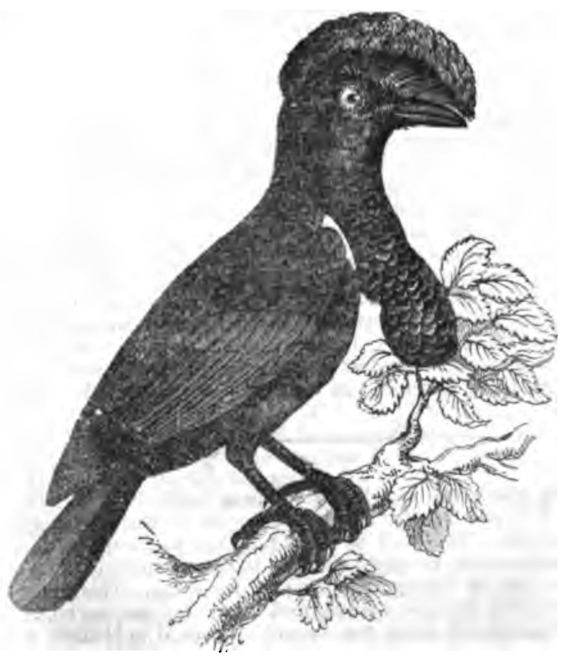
enlum. 609), represents this part as being clothed with a considerably thick down. Upper part of the head, back of the neck and throat, covered with small close-set feathers like black velvet. External edges of the quills of the middle of the wing, the last quills, and all the wing coverts, bluish grey. Great quills and tail-feathers black, with bluish reflections. The rest of the plumage, bill, and feet, black. Eyes red brown, with a yellow skin beneath. The female is smaller, and of a brownish black. Locality, Brazil and Guiana.

Cephalopterus.

Bill strong, robust, mandibles nearly equal, the upper one convex and scarcely curved at the summit, not notched at the point; lower mandible flattened below. Nostrils longitudinal, open, hollowed into an oval excavation; bristles at the border of the bill, which infringe a little on the frontal feathers. Two rows of feathers, taking their origin on the forehead, and elevating themselves into a plume or crest on the head. The feathers of the neck form a kind of pendant pelerine in front of the neck, which is naked.

Example. *Cephalopterus ornatus*, *Coracina cephaloptera*, Vieill. Colour a uniform blue black. Head and base of the bill ornamented with a plume or crest, forming a sort of parasol, composed of straight elevated feathers, with white and stiff shafts, and terminated by an ear (épi) of black beards, which projects forwards (se renverse en devant). The sides of the neck are naked, but long feathers forming a loose pelerine, and hanging down lower than the breast, spring from beneath the throat and from the sides of the neck. Tail long, slightly rounded. General plumage of a deep black. Crest and feathers of the pelerine giving metallic reflections (Lesson).

The bird that furnished the description was brought to M. Geoffroy-Saint-Hilaire from Lisbon. M. Lesson states that the belief was that it came from Brazil, but that a well-informed Portuguese had told him that it was from Goa. M. Vieillot says that the colour of the naked skin of the neck is cerulean blue. Mr. Swainson, in his 'Natural History and Classification of Birds,' London, 1836, says, 'The crest of this extraordinary bird is immensely large, advancing so far in front as to touch the end of the bill, and it is compressed in the same manner as that of *Rupicola;* but the ends of the feathers, instead of meeting so as to form a sharp ridge, suddenly recede from each other, curve outwards, and form a most elegant drooping line of plumes, hanging over on the sides, so as to shade the face like an umbrella. The figures that have hitherto been given of this rare bird are all taken from the specimen in the Paris Museum, and which has been sadly distorted in the setting up. A minute examination of this specimen has convinced us that the frontal feathers, instead of being raised over the bill, as Temminck represents them, partly repose and overshadow it, at least as much as do those of *Calyptomena* and *Rupicola* (vol. i. p. 41).' The species above noticed is the only one known.



[Cephalopterus ornatus.

CORAL. [Polyparia Corticifera.]

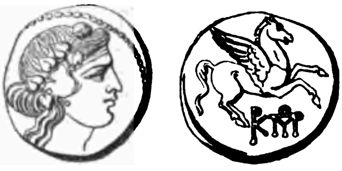
CORALLIA. [Polyparia Corticifera.]

CORALLINES. [Pseudozoaria.]

CORANTO, a quick dance. [Courante.]

CORBEL, a projecting piece of stone, wood, or iron, placed so as to support a weight of materials. Corbels are sometimes in the form of the modillion or mutule employed in entablatures, and also like the console of a window. Small semicircular towers projecting at the angles on perpendicular surfaces of large towers or other edifices are supported on a series of plain or moulded corbel stones. In some of the colleges in Oxford and Cambridge the mullions and roof of semicircular windows are supported in the same manner. The machicolations of towers are almost always supported on corbel stones, as may be observed in the old gates of Southampton, Canterbury, and York. This projecting of one stone beyond another is technically called 'corbelling out.' This is done in brickwork as well as in masonry. In the interior of some churches the construction of the roof appears to be supported on corbels, the ends of which are often carved, and represent an angel holding a shield. In Norman architecture the cornice is supported by a row of corbel stones, the ends of which are also carved. In old English castles the main beams of the floors were frequently carried on large corbel stones, as at Porchester Castle. The term bracket is sometimes used for a corbel. Bracket however is better applied as synonymous with cantilever. Small wooden brackets often differ from corbels and cantilevers in being merely nailed to a perpendicular piece of wood and not having a bearing on a wall, as is always the case with corbels and cantilevers.

CORCY'RA (Κέρκυρα, Kerkúra), the Roman name of the modern island of Corfu. Though the name is written Kerkura in the Greek authors, it seems that all the extant coins have ΚΟΡΚΥΡΑ (Korkura). [Corfu.]



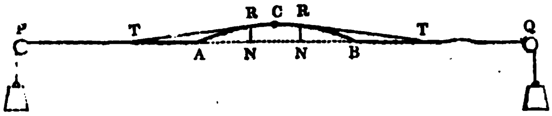
[Coin of Corcyra.]

British Museum. Actual size. Silver. Weight, 76 grains.

CORD, frequently spelt chord, means an elastic string fixed at the two extremities and stretched with force sufficient to enable it to yield a musical note. [Acoustics, vol. i., p. 97. Throughout this article A means the article Acoustics, and the page and column of vol. i. are referred to.] The close analogy which exists between a string and a column of air in a state of vibration would require more space to elucidate properly than this subject will allow us to give: we shall therefore assume some results of mathematical reasoning, point out the probability of those results, and consider the theory of the vibrating cord independently.

Firstly, we suppose our cord to be of uniform thickness and density, so that any given length is precisely of the same quality, from what part soever of the string it may be cut. The want of this condition being practically fulfilled is sometimes sensibly felt in violin and violoncello strings, which are then called *false*. A player whose intonation is perfect upon a perfect string, has to learn a new instrument when he attempts to play with a false string; to say nothing of the harmonics which must be heard more or less becoming discordant.

Let us first suppose a string of indefinite length, and not so acted upon by gravity as to hang downwards, stretched at the two ends by equal weights. The string is a cylinder of uniform diameter and density. Let us next suppose that a part of the string is placed on a mould which catches two points and holds them fast, and stretches the intermediate part into a curve which differs very little from a straight line. Let the mould be suddenly removed, and let us further suppose that, in removing it, we are able to communicate any velocities we please to the different points of the stretched part. We have then, at the moment of starting, a system represented in the following diagram, where AB



(dotted) represents the part in question before the mould was applied, and it is ACB the instant the mould is taken away, all the points between A and B being in a state of motion upwards or downwards. The string will not remain an instant in its present state: the first presumption is that the moment the points A and B are set free a disturbance will take place in the parts of the string both between P and A, and between Q and B, the disturbance travelling from A towards P as well as from B towards Q. The first point in which we are interested is this: with what velocity will the disturbance be propagated? and the answer is, that the disturbance travels throughout the string with the same velocity, depending upon its material and the weight with which it is is stretched, according to the following law: Let each of the equal weights P and Q be as heavy as c feet of the string: then the velocity of communication is so many feet per second as a bullet would acquire, if it were allowed to fall *in vacuo* down a perpendicular of c feet, or $\sqrt{2gc}$ where g is the velocity which gravity communicates in one second, or $32\frac{1}{6}$ feet. For instance, let the string be iron wire, every cubic foot of which weighs 7200 ounces avoirdupois. Let the diameter be one-twentieth of an inch, and let the weights P and Q be each 20 pounds or 320 ounces. Then the weight of x feet of the string is ($\frac{1}{40}$ of an inch being $\frac{1}{480}$ of a foot)

$$3{\cdot}14159 \times (\tfrac{1}{480})^2 \times x \times 7200 \text{ ounces}$$

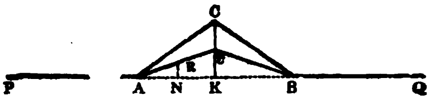
which made equal to 320 gives $x = 3259{\cdot}5$ feet and

$$\sqrt{2 \times 32\tfrac{1}{6} \times 3259{\cdot}5} = 457{\cdot}93 = 458 \text{ nearly,}$$

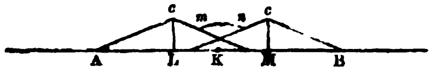
or 458 feet per second is the rate at which the disturbance is communicated. [CYLINDER.]

We now ask what is the nature of the disturbance communicated. It suggests itself as possible, that there may be some species of disturbances which travel only in one direction: for instance, that we might so proportion the velocities of the disturbed points to their positions, that AP should remain undisturbed, that the points from A towards the right should drop one after another into their places, while those from B to Q should be successively disturbed. The answer, again derived from mathematics, is, that such disturbance is possible, and that the conditions under which it will take place are: 1. That C being the highest of the disturbed points, all the points from A to C must be moving *downwards* at the first instant, and all those from B to Q *upwards*. 2. That the velocity of the points must be as follows: At any point R draw a tangent RT to the curve of disturbance. Then the velocity of the point R must be such as would, if continued uniformly, carry the point R from R to N or from N to R in the same time as the whole disturbance is propagated from T to N. These conditions being fulfilled, we may represent the successive states of the string by cutting out a piece of paper of the form ACB, and carrying it along the string PQ at the uniform rate per second which we have found for the propagation of the disturbance. If the directions of the velocities be all reversed, then the disturbance travels from B towards P. Let us call such disturbances *simple;* and with respect to the direction in which they travel, *direct* or *retrograde.* We further learn from mathematical analysis, that any disturbances whatsoever, taking place upon the same points at the same instant, produce a compound disturbance of which the values of RN and the velocities at the point R in the compound disturbances are the algebraical sums of the values of RN, &c., in the component disturbances. And moreover, that any disturbance whatsoever, be the law of its form and velocities what it may, can be compounded of two simple disturbances, one direct and one retrograde. So that the moment the mould is removed, the disturbances will begin to travel in different ways. As long as they have not completely separated, there will be points remaining under the effects of both; but when they have had time to separate completely, we should, were the rapidity of transmission not too great, see the direct disturbance travelling by itself in one direction and the retrograde in the other.

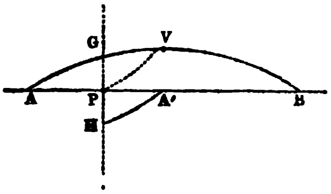
To illustrate this, suppose we wish to ascertain the effect of the disturbance ACB, as drawn, the velocities throughout being nothing at all at the instant the mould is withdrawn. The two simple disturbances which would produce

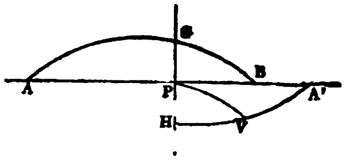


this are two of the form AcB, such that at any point R the velocity would bring the point through RN while the disturbance is communicated through AN. If we suppose a direct and retrograde disturbance of such a kind, there will be at the first moment no velocity at any point of ACB, since those of the direct and retrograde disturbance compensate each other throughout. But let a time elapse during which the direct and retrograde disturbances travel to M and L. Then the form of the string at that moment will be Ac m n cB, where the part m n arises from the composition of the two parts of the disturbances which yet remain acting on the same points. (See another instance of composition, A. 92.)

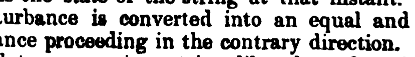


We may thus trace the effect of disturbance upon an indefinitely extended string; but such a string would produce no musical sound, for which (A. 95,2) it is necessary that there should be a continued reiteration of the same action upon the air repeated at equal intervals. Now supposing a finite string, stretched at the ends, we must ask what takes place when the disturbance comes to the end of the string. And from mathematical analysis again, the following is the answer: Let P be the fixed end of the string, and choose the instant at which, had the string continued, the disturbance would have been B V A. Make a disturbance H A′ equal and opposite to G A, and let it be compounded with G V B, on the supposition that it is part of a disturbance proceeding from P, such as would by itself bend the string in the opposite direction. Then P V B or P V A′ is the state of the string at that instant. In fact, the disturbance is converted into an equal and opposite disturbance proceeding in the contrary direction.





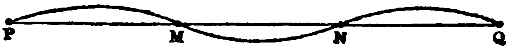
Now let us suppose a string like that of a piano-forte, sharply struck near one end. It is altogether a gratuitous assumption, knowing what we do of the imperfect elasticity of matter, to suppose that the disturbing effect of the blow immediately affects the whole string. A certain disturbance is produced upon a part (it may be a very small part) of the string. Then what is that perceptible phenomenon, the reiteration of which produces a musical tone? Let us suppose the string struck at one-fourth of the length from its end, and suppose that the tension is such that disturbance is propagated at the rate of 2000 feet a second, the length being four feet. A disturbance is produced at M,



from which two simple disturbances begin to travel towards P and Q, at which they are reflected with the same velocities. They will be at N together producing a disturbance (now recompounded) of the same amount as before, but on the opposite side of the string. This takes place while four feet are described at 2000 feet per second, or is repeated 250 times per second. From M to N there is then a succession of effects upon the air, which are most powerful at M and N, owing to the coincidence of the disturbances. This is repeated 250 times in a second, and yields the musical note corresponding to that number of aerial pulsations per second.

We must again advert (A. 97-2) to the use of the term vibration. The complete vibration in our use of the word is made while the disturbance travels from M to N. Thus some writers say 16 vibrations per second give the lowest musical sound, where we say it is 32. But their vibration is double of ours.

By supposing the whole string put in vibration, or any simultaneous disturbances communicated to it, the effect may similarly be shown to be, that at the end of the time during which disturbance would be propagated along the whole string the effects are all reversed, but are of the same magnitude; while in a second of such time they are all restored. We thus easily arrive at what is called the fundamental sound of a string. With regard to the harmonics (A. 96-2) of a string [Harmonics], they are not so easily shown to be necessary. We shall, however, first show that such effects are always possible; that is to say, that if a string begin to vibrate so that its two halves, or its three thirds, &c. are disturbed together, such an effect will be produced. Suppose, for instance, the initial state of the string to be P M N Q, where P M, M N, and N Q are the thirds. During the time in which the direct disturbance of P M would be communicated to M N, that of M N would be communicated to N Q, the direct disturbance in N Q would be made retrograde, and so on. Hence though the whole string may vibrate, each of the parts has a vibration by itself in one third of the time. If we were to destroy the vibration of the whole string by compounding with the preceding such a disturbance as would always destroy the velocities at M and N, there would then be three strings, each vibrating in one-third of the time of the whole string. The ear can appreciate such contemporaneous sets of vibrations, and accordingly in this case perceives both the fundamental note of the string and the twelfth above it. If a large and miscellaneous set of disturbances be communicated at once, those only will exhibit cycles of effects, which make the halves, the thirds, &c. vibrate together, and we can say little more without entering into mathematics. But in a string it may always be observed that we seldom hear the octave of the fundamental note, and generally the twelfth and seventeenth. No reason can be given for this which is perfectly unobjectionable· we do not know whether it is the aptitude of the ear to distinguish these, or of the string to take the corresponding divisions, which is the cause of the phenomenon.



The time of vibration of a string, that is, of complete reversal of all the initial effects, is $l \div \sqrt{2gc}$, where l is the length, and c is as before. It is therefore directly as the length and inversely as the square root of the tension; results which are amply confirmed by experiment.

In all that has preceded we have supposed the string perfectly elastic, and without friction. Neither of these suppositions is true, but since the velocity of propagation of every disturbance is independent of its extent, the gradual diminution of the latter will not affect the phenomenon on which the musical qualities of the string depend.

(A. 97-2.) The method of observing the curves in which each point of a string vibrates, recommended by Dr. Young, was to use a string round which small wire is coiled, like the larger string of a violoncello, and to observe with a microscope the reflection of a candle or other bright spot on one of the coils. Sir J. Herschel suggests that a thin slit should be made in a window-shutter, and that the string should be placed with the point to be examined cutting the vertical plane of light. This point would therefore appear bright while the rest is dark. In either case the rapidity of the vibrations would make the curve described by the bright point permanent.

A single string fitted up for experiments is called a Monochord.

CORD (in music). [Chord.]

CORDAY D'ARMANS, MARIE ANNE CHARLOTTE, commonly called **CHARLOTTE CORDAY**, who numbered among her ancestors the great tragedian Corneille (Lepau, *Chefs d'Œuvre de Corneille*), and was of noble family, was born at St. Saturnin, near Seez, in Normandy, in 1768. The republican principles of the early revolutionists struck deep root in her enthusiastic mind, and her zeal for their establishment was heightened after the rise of the Jacobins, and the overthrow and proscription of the Girondists, May 31, 1793, by the presence and conversation of those chiefs of the latter party who fled into Normandy, in hope to rouse the people in their favour. Resolved to advance the cause which she had at heart by some extraordinary action, Charlotte Corday travelled to Paris, where, having gained admission to the galleries of the Convention, she was still more incensed by the threats and invectives which she heard showered upon her own friends.

Being thus confirmed in the determination to assassinate one of the principals of the dominant faction, whether to deter them by terror, as an act of revenge, or as an example of what she regarded public justice, she chose Marat, one of the most violent and bloody of the Jacobins, to be her victim. After two unsuccessful attempts, she obtained admission to the chamber in which he was confined by illness, July 15, under pretence of communicating important news from Caen; and being confirmed in her purpose by his declaration that in a few days the Girondists who had fled thither should be guillotined in Paris, she suddenly stabbed him to the heart: he gave one cry and expired. Being immediately arrested and carried before the *tribunal revolutionnaire*, she avowed and justified the act. 'I have killed one man, she exclaimed, raising her voice to the utmost, to save a hundred thousand; a villain, to rescue innocents; a wild beast, to give peace to my country. I was a republican before the revolution, and I have never been wanting in energy.' (Mignet, vol. ii., p. 5.) Notwithstanding her confession, the court, with an affectation of impartiality which in this case could be ventured on, assigned her a defender, and went through all the formalities of trial. The speech of her advocate is rather remarkable. He neither denied nor extenuated the act; and acknowledged it to have been long premeditated. 'She avows everything, and seeks no means of justification; this, citizen-judges, is her whole defence:—this imperturbable calmness, this total self-abandonment—these sublime feelings, which, even in the very presence of death, show no sign of remorse, are not natural. It is for you, citizen-judges, to fix the moral weight of this consideration in the scales of justice.'

Charlotte Corday returned thanks to the pleader. 'You have seized, she said, the true view of the question: this was the only method of defence which could have become me.' She heard her sentence with perfect calmness, which she maintained to the last moment of life. Her personal charms were of a high order; and her beauty and animation of countenance, even during her passage to execution, added greatly to the interest inspired by her courage and loftiness of demeanour. She was guillotined July 17, 1793. (*Biog. Univ.*; Montgaillard, *Hist. de France, &c.*, vol. iv., p. 55—59.)

CORDELIERS, so named from wearing a knotted cord for a girdle, were the strictest branch of the Franciscan or Grey Friars. Chaucer mentions them in the 'Romant of the Rose,' l. 7461, but they were not much known by this appellation in England. The name Cordeliers is said to have been first given to certain Franciscans (at that time but recently established) who accompanied the army under St. Louis to the Holy Land. They served in a Flemish corps, the commander of which considered it his duty to report to the king not only their bravery, but their zeal in re-animating the soldiers of his division, who had been on the point of giving way. The king inquired the designation of the pious men, but the officer had lost his recollection of it; he could only say that they were those 'qui sont liés de corde.' From this they received the new appellation of Cordeliers. St. Louis, upon his return to France, gave great encouragement to these Franciscans, and founded a convent for them in Paris. There were ultimately, according to Moreri, no fewer than 284 male and 123 female convents of Cordeliers in that country. (Moreri, *Dict. Historique*, chiefly from Hermant, *Histoire des Ordres Religieux*.)

CORDIA'CEÆ, a small natural order of Monopetalous exogens, with a shrubby or arborescent habit, a gyrate inflorescence, and a drupaceous fruit. The leaves are alternate, usually covered with asperities, and destitute of stipules. The calyx is inferior and five-toothed; the corolla regular, with five stamens proceeding from the tube, and alternate with the segments. There is a pendulous ovule in each cell, and the style is twice-forked. The cotyledons are crumpled or folded in plaits lengthwise. The affinity of the order is almost equal between Boraginaceæ and Convolvulaceæ, but preponderates in favour of the former. The only economical plants contained in it are the Sebesten plums, the produce of Cordia Myxa and Sebestena, the rind of which is succulent and mucilaginous. All the species are tropical.

CORDON, a military term to denote a line of posts and sentries placed around a district or town to prevent any communication between it and the rest of the country. It is chiefly resorted to in cases of any contagious disease having broken out in a place, when it is called a cordon sanitaire; and in order to be effectual, each sentry ought to be able to see his two next comrades right and left. This can be done more easily in the day-time by taking advantage of commanding positions or open grounds; but at night the sentries must necessarily be more numerous and nearer each other.

Cordon in French means also the insignia of an order of knighthood, answering to the English word riband when taken in a similar sense: 'cordon bleu,' 'blue riband,' &c.

CORDONNIERS, originally cordouanniers, cordwainers in English, a word derived from cordoban, the soft tanned leather used for the upper part of shoes, which was first brought from Cordova in Spain, where it was manufactured by the Moors. A society existed at Paris in the sixteenth and seventeenth centuries, under the name of Frères Cordonniers, consisting of the shoemakers of that city, who formed a company, having their magistrates and other officers, and a common treasury, from which the indigent of their own trade were supported. The society was placed under the protection of St. Crispin, who had been himself one of the same trade.

CO'RDOVA, or more properly CO'RDOBA (*Corduba*, *Colonia Patricia*, and simply *Patricia*), was the birthplace of the two Senecas and Lucan. Cicero in his oration for Archias speaks rather disparagingly of the Cordubese poets of his day. Under the Spanish caliphs it became the first seat of learning and the terror and admiration of Europe, from 755 to 1234, when Ferdinand III. of Castile took it. It then contained 300,000 inhabitants. Soon after, in 1238, he repelled its masters, the Moors, as far as Granada, and prepared their total overthrow, which Ferdinand and Isabella accomplished in 1492. Of all the Asiatic grandeur of that empire there is only left its first mosque, which is unique in its kind, but has been partly defaced by its transformation into a Christian cathedral, more particularly since 1528, when some of its 1000 columns were destroyed to erect a chapel in the centre.

Cordova was also the centre of an extensive trade, and noted for the preparation of the goat skins called *cordoban*, a word corrupted into our cordwain, whence shoemakers derived in England their old name of cordwainers, and in France that of cordouanniers, and at last cordonniers.

Although Cordova has sunk into decay under the Christians, it has not ceased to produce literary men, among whom are Juan de Mena, Fernan Perez de Oliva, Ambrosio Morales, Góngora, &c. The great captain, although called Gonzalo de Cordoba, was a native of Montilla.

Cordova at present contains only 45,000 inhabitants within its vast Roman and Moorish inclosure. The *plaza mayor*, or great square, is remarkable for its size, regularity, and neat piazzas. The bishop's palace is a massive building. That of the Moorish kings is now turned into stables for stallions of the renowned Cordovese breed. The town is situated on the north bank of the navigable river Guadalquivir, at the commencement of the finest plain of Andalusia, and on a gentle declivity which descends from the Sierra Morena, and shuts out the north and east winds. The climate of Cordova is delightful and healthy, and the soil extremely fertile. It is 75 miles north-east of Seville, 120 north-east of Cadiz, and 180 south-south-west of Madrid. It is in 37° 52′ N. lat., 4° 45′ W. long.

(Ponz, *Viaje de España*; Laborde, *View of Spain*, vol. ii., p. 29; Gibbon's *Rome*; Talbot's *Travels*; Fisher's *Travels*, &c.)

COREA, is a large peninsula on the eastern coast of Asia, whose sovereign is tributary to the emperors of China and Japan, but otherwise independent.

The peninsula is surrounded on the east by the sea of Japan, on the south by the straits of Corea—which divides it from the Japanese island of Kiou-siou—and on the west by the Hoang-Hai or Yellow Sea, which separates it from China Proper. It extends, from south to north, from 34° to 40° N. lat., or about 420 miles; but the countries north of the peninsula, as far as 43°, are also subject to the sovereign of Corea, so that the whole country from south to north may be 630 miles. Its width, lying between 124° and 134° E. lat., varies from 100 to 200 miles. Its area may be about 90,000 square miles, or somewhat more than Great Britain.

Corea appears to be a very mountainous country. On its northern boundary is the Chang-pe-shan, a high mountain-range, partly covered with snow, which separates the Coreans from their northern neighbours, the Manchoo. From this chain another branches off in a south-south-east direction, which traverses the whole of the peninsula as far as the strait of Corea. Its highest part is near the shores of the sea of Japan, towards which it descends with great rapidity; and in this part the level or cultivable tracts are of small extent. The numerous offsets to the west, which are less elevated and steep, contain between them large and well-cultivated valleys.

The largest rivers occur in the northern part of the country, where the Thumen-Kiang, rising in the centre of the Chang-pe-shan, runs north-east, and towards its mouth east. It falls into the sea of Japan. Its banks, though fertile, are uninhabited, in conformity to the order of the Chinese emperor; the object of this policy being to have a well-settled boundary between Corea and the Manchoo. The Yalu-kiang rises nearly in the same place, and runs first west, then south. It falls into the Hoang-Hai, according to the Chinese geographers, with twelve mouths. It is said to be navigable for junks 35 miles (100 lees), and for barges about 180 miles (520 lees). The rivers which traverse the valleys of the peninsula have a short course.

The coasts of Corea are high and bold, except in the innermost recesses of the numerous bays and harbours. There are few islands along the eastern shores, except in Broughton's Bay (39° 30′ N. lat.), where they are numerous. In the strait of Corea they are also very numerous, and still more so between the island of Quelpaerts and the southern coast. Between 34° and 35° N. lat. and 125° and 126° E. long., Captain Maxwell found the sea literally dotted with islands and rocks, which he called the Corean Archipelago, and the most south-western group Amherst Isles. Farther north (38° N. lat.) is another group, called James Hall's Archipelago. These islands are rocky and high, but generally inhabited. They are rarely more than three or four miles in length. The largest, the island of Quelpaerts, south of the peninsula, is about sixty miles in circuit, and in the centre a peak rises upwards of 6000 feet above the sea.

Corea is a very cold country. For four months the northern rivers are covered with ice, and barley only is cultivated along their banks. Even the river near King-ki-tao freezes so hard that carriages pass over the ice. In summer the heat appears not to be great. On the eastern coasts fogs are frequent; and La Perouse thinks he may compare them in density with those along the coasts of Labrador.

Rice is extensively cultivated on the peninsula, as well as cotton and silk, which are employed in the manufactures of the country, and exported in the manufactured state. Hemp is also cultivated, and in the northern district ginseng is gathered. Tobacco is raised all over the country.

Horses and cattle are plentiful on the mountain-pastures The former, which are small, are exported to China. In the northern districts the sable and other animals give fur. The royal tiger, which is a native of the country, is covered with a longer and closer hair than in Bengal. On the eastern coast whales are numerous. It seems that Corea is rich in minerals. Gold, silver, iron, salt, and coals, are noticed in the Chinese geography.

The inhabitants, who are of the Mongol race, resemble the Chinese and Japanese, but they are taller and stouter Among them are some whose appearance seems to indicate a different origin. They speak a language different from the Chinese and Manchoo, though it contains many Chinese words. They have also a different mode of writing it, though the Chinese characters are in general use among the upper classes. In manner and civilization they much resemble the Chinese, and are likewise Buddhists. Education is highly valued, especially among the upper classes. They seem to have a rich literature of their own, but their language is very imperfectly known in Europe. The valleys seem to be well peopled; but we are so little acquainted with the interior, that hitherto nobody has ventured to give an estimate of the population.

King-ki-tao, the capital, which is a few miles north of a considerable river Han-kiang, appears to be a large place, and is said to possess a considerable library, of which one of the brothers of the king is chief librarian. The name of this town is properly Kin-phu, near Hanhang, or Hanyang. The mouth of the river Tsing-kiang (between 34° and 35°), on the western coast, is said to have a very spacious harbour.

Fushan, according to the Chinese geography, called by Broughton Chosan or Thosan, is a bay at the south-eastern extremity of the peninsula, opposite the Japanese island of Tsu-sima, at the innermost recess of which the town of King-tsheou is built, which carries on an active trade with Japan, and is the only place to which the Japanese are permitted to come.

In industry the Coreans do not appear to be much inferior to the Chinese and Japanese. They mainly excel in the manufacture of cotton cloth and cotton paper, both of which are brought in great quanties to Peking. Other manufactured articles which are exported are silk goods, plain and embroidered, and mats. They have attained considerable skill in working iron, as swords are sent, with other articles, to the emperor of China as tribute.

No country is less accessible to Europeans than Corea. They are not permitted to remain even a few days on any part of the coast. It is not well known what is the reason of this policy, but it seems that the mutual jealousy of the neighbouring Chinese and Japanese holds the king in great subjection. The commerce of the country is accordingly limited to China and Japan; and even with these countries is restricted in a very strange way. No maritime intercourse is allowed between China and Corea, but all commerce is carried on by means of the narrow road which leads along the sea to the town of Fang-hoan, in Leao-tong. But as it traverses the wide district which by order of the Chinese emperor must remain uninhabited, it has become the haunt of numberless ferocious animals, and hence the passage is much dreaded by travellers. Commerce therefore is principally carried on in winter, when the shallow Hoang-Hai is covered with ice along its shores, which are more favourable to the transport of goods than the bad mountain-roads. Besides the above-mentioned manufactured goods, gold, silver, iron, rice, fruits, oil, and some other articles, are brought by this road to Peking. We do not know what the Coreans take in return to their country. The commercial intercourse between Corea and Japan is limited to that between the island of Tsu-sima and the bay of Chosan, and is carried on by Japanese merchants, who have their warehouses at each place. They import sapan-wood, pepper, alum, and the skins of deer, buffalos, and goats, with the manufactured articles of Japan, and those brought by the Dutch from Europe; they take in return the manufactures of Corea, and a few other articles, especially ginseng.

We know nothing of the political condition of the country, except what is communicated by Klaproth from the Japanese geographer Rinsifee; according to whom there are sixty-four commanders of 10,000 men, which would give an army of 640,000 men, and 213 war-vessels. Ritter thinks that these and many other statements of the geographer are taken from the court-almanac of King-ki-tao, and that little reliance can be placed on them. (Broughton; Maxwell, in Ellis's *Journal of Lord Amherst's Embassy*; Mac Leod; Basil Hall; Hamel van Gorcum; Klaproth, in *San Kohf Tsou*; and Ritter's *Asien*.)

CORELLI, ARCA'NGELO, on whom his countrymen bestowed the cognomen of 'Il Divino,' was born at Fusignano, in the Bolognese territory, in 1653. Adami says that his instructor in counterpoint was Simonelli; and it appears pretty certain that his master for the violin, the instrument of his early adoption, and which he never abandoned, was Giambattista Bassani of Bologna. It is stated by the Rev. Mr. Mainwaring, in his Life of Handel, that Corelli went in 1672 to Paris, but that through the jealousy of Lully he was soon obliged to quit that city. On this fact Dr. Burney attempts to throw discredit, but there is no reason to doubt its correctness. In 1680 Corelli visited Germany, where he received extraordinary honours, not only from the public, but from sovereign princes, among whom the elector of Bavaria distinguished himself by the hospitable manner in which he treated the great musical genius. He returned to Rome at the expiration of about two years, and published his first set of 'Twelve Sonatas for two Violins and a Base,' in 1683. A second series appeared in 1685, entitled 'Balletti da Camera.' These were succeeded in 1690 by a third set; and the fourth was published in 1694. His admirable sonatas for violin and base, or harpsichord, in which all violinists are early initiated, were printed, with a dedication to the electress of Brandenburg, in 1700. When James II. sent, in 1686, the earl of Castlemaine as ambassador to the pope, Christina of Sweden, then at Rome, celebrated the event by having an opera written, composed, and performed, in the holy city. The band employed on this occasion consisted of 150 stringed instruments, a prodigious and unprecedented force for those days, and Corelli was chosen as leader, which duty he performed in so satisfactory a manner, that the Italian opera in Rome was placed under his direction chiefly, and in 1700 had arrived at a degree of excellence which it had never before attained in the capital of Italy. He now gained the friendship of the well-known patron of art, the Cardinal Ottoboni, at one of whose *Accademie* he met Handel, then travelling in Italy. As a mark of attention to the great German composer, the cardinal had the serenata, *Il Trionfo del Tempo e della Verità* (afterwards altered into *The Triumph of Time and Truth*) performed, the overture to which being in a style quite new to Corelli, he led it in a manner that displeased the irascible composer, who rudely snatched the violin from the hands of the gentle Italian. Corelli no farther resented this indignity than by calmly observing, *Mio caro Sassone, questa musica è nelle stile Francese, di ch' io non intendo.* (My dear Saxon, this music is in the French style, which I do not understand.) Some satire was half concealed in this remark, for Handel at that time certainly imitated Lully's overtures, and the inuendo, which was a lenient punishment for conduct so violent, could not have been misunderstood by him. Corelli, however, though an exquisite performer in regard to expression and taste, had devoted more of his attention to those high qualities which ought to be considered paramount to all others, than to what is commonly understood by the term execution; he consequently was sometimes embarrassed by having music placed before him which at first sight he could not easily master, and was abashed on finding that musicians infinitely inferior to himself could play it without preparation or hesitation. It was at Naples that he met with some mortifications of the kind alluded to, which prompted him to quit abruptly, and somewhat chagrined, that city, to which he had been very warmly invited, and where it was intended that he should be received with every mark of distinction.

Corelli's greatest work, his *Concerti Grossi*, or Twelve Concertos, were written many years before they appeared in print. They were engraved in score at Amsterdam, and published in December, 1712, six weeks only before their author breathed his last, an event which took place on the 18th of January, 1713. He was buried in the church of *Santa Maria della Rotunda* (the antient Pantheon), where a monument, with a marble bust, is erected to his memory, near that of the greatest of painters, Raffaelle. On the pedestal is a Latin inscription by the cardinal Ottoboni, which records in simple and elegant terms the merits of the composer and the friendship of the writer.

Like many other original geniuses, Corelli was too sensitive to be happy. Occurrences which he should have suffered to pass unnoticed made a deep impression on him, even to the injury of his health. The success of Valentini, whose concertos and performance, though infinitely inferior to Corelli's, became fashionable at Rome, so much affected the great composer—who, having acquired much wealth, ought to have treated fashion with the disdain it generally deserves—that it is supposed to have aggravated the malady which caused his death. Corelli's best works are imperishable. Rousseau has said, that he who without tears can listen to Pergolesi's *Stabat Mater* may feel assured that he has no genius for music. We will also risk an assertion—that those who can without admiration hear the eighth concerto of Corelli, as performed at the Antient Concert, though they may be able to boast great powers of execution as instrumentalists or vocalists, can have no perception of the higher beauties of composition—can possess no soul for pure harmony.

CORFE CASTLE. [DORSETSHIRE.]

CORFU, the island of, the antient Corcyra, lies off the coast of Epirus, from which it is separated by a channel of very irregular width, being fourteen miles in some places, eight miles opposite the town of Corfu, and only two at its north outlet near Butrinto. The length of the island, which describes a slight curve from Cape St. Catharine, Cassiope Promontorium, in 39° 51′ N. lat., to Cape Bianco, in 39° 21 is about 38 miles. Its breadth is very unequal; in the north part, which is much the widest, it extends nearly 20 miles, from 19° 36′ to 19° 57′ E. long. Further south, the island becomes very narrow, being only six miles between the Bay of Yliapades to the west, and the harbour of Gouin to the east. It widens again in the latitude of the town of Corfu, where it is about eleven miles; it then contracts to the south of it, to three or four miles in breadth, terminating in a high narrow cape. (*Map of the N. part of Greece*, published by the Soc. for the Diffusion of Usef. Know.) The surface of the island is of 227 square miles, and is generally mountainous, especially in the north part. The highest point, according to F. Beaujour, is about 1900 feet above the sea. The mountains are rocky and naked, but the valleys are fertile, and watered by many streamlets, which, however, are mostly dry in summer. The most considerable streams are the Missongi and the Potamo. The island produces oil, wine, vegetables, fruit, flax, and some corn and pulse. Unlike most of the other islands, Corfu produces no currants. There are but few timber-trees on the island. The cattle consists of horses, mules, sheep, and pigs. The game consists of wild fowls, snipes, quails, pigeons, &c. Oil forms the principal article of exportation, and the making of it employs about 1000 presses. The wine, which is mostly of a rough taste, is used at Corfu and in the other islands. Salt is got in considerable quantity in the salt-marshes, which communicate with the sea.

The island is divided into seven cantons: 1°, Corfu, with the town of that name, which is the capital of the island, as well as of the Ionian Islands. The town consists of three parts, the citadel, the town properly so called, and the suburbs. The citadel, which is at the extremity of a cape, and divided from the town by wet ditches and an esplanade, forms a little town with several private houses and churches, and the palace of the lord high commissioner, besides the arsenal and barracks. Two strong castles built upon steep rocks command the whole. The town, properly so called, is surrounded by walls and ramparts, and strengthened by several forts, called Fort Tenedos, Fort Abraham, Fort St. Salvador, and the New Fort. Three gates open on the sea-shore and one on the land-side. The houses are mostly two stories high, with terraces at the top. The streets are tolerably well paved, and are lined with arcades. The cathedral and five other churches belong to the Greek Latin church; there are also many churches and chapels of the Greek communion, among which that of S. Spiridion is the principal. Corfu is the residence of the archbishop of the Greek Latin church, of the senate, the high court of appeal for all the islands, as well as the civil, criminal, and commercial courts for Corfu. The university, which was first opened by Lord Guilford as chancellor in 1824, has four faculties, theology, law, medicine, and philosophy, and fourteen professors. The lectures are given in modern Greek. There are also a secondary school or gymnasium, an ecclesiastical seminary, and several primary schools, all supported by the government, at the annual expense of 3483*l.* sterling; and a society for the improvement of agriculture and industry. There is an account of the system of instruction followed in the secondary schools of the Ionian Islands in *Journal of Education*, No. I. The harbour of Corfu, which is one of the best in the Levant, and has a depth of about 80 feet, is formed by the island of Vido, the rocks called Condilonisi, the Lazzeretto island, and the New Fort.

There being a great scarcity of spring water in Corfu, cistern water is commonly used, and in summer the water for drinking is brought on asses from the river Potamo, about a mile and a half from the town. The suburbs, called Castrati, S. Rocco, and Mandrachio, are considerable. The whole population of the town and suburbs is 15,800, 4000 of whom are Jews. (Neigebaur.) From the suburb of Castrati a walk of about a mile and a half in a southern direction leads to the small bay of Palæopolis, where Chrysopolis, the town of the Phæacians, is said to have stood. The shores of this bay are planted with myrtle, laurel, pomegranate, and orange trees, and are the favourite resort of the citizens. They are called the gardens of Alcinous. (Marmora, *Istoria di Corfu*, with plates of many fine coins of antient Corcyra.)

The other districts of the island are: 2°, Liapades, with the town of the same name, 2500 inhabitants; and Chorachiana, with 2000; besides several villages. 3°, Peretia, which comprises the north-eastern part of the island; the little town of the same name lies at the foot of Mount San Salvador, the highest in the island, having a convent on the summit. On the sea-coast, near the site of the old town of Cassiope, rises a village still called Cassopo. 4°, Agrafus occupies the north-western part, with the little town of the same name, and several hamlets. Twelve miles north-west of this part of the coast is the island of Fano, which lies about 50 miles from the nearest point of the coast of Otranto in Italy. The island is six miles round, barren, and inhabited by a few fishermen. 5°, Spagus, which lies south of the preceding, is the most fertile and populous in the island; it has two good natural harbours, San Nicolo and Affiona. On Cape S. Angelos is a monastery, which stands on the ruins of an old castle built in the thirteenth century by Michael duke of Corfu. 6°, Strongili, south of the canton of Corfu, has two small market-towns and several villages. 7°, Milichia, the southernmost canton, is fertile, and contains about 10,000 inhabitants. (Neigebaur, *Ionische Inseln.*)

The Phæacians, the oldest known inhabitants of the island, are mentioned by Homer as a numerous, thriving, and seafaring people; and he paints in pleasing colours their hospitable and primitive manners. (*Odyssey*, vi. vii.) According to some (Strabo, Casaub. 269), it was called Scheria, and was inhabited by the Liburni, when a Corinthian colony settled on the island, about the time when another colony under Archias founded Syracuse. The Corinthians built the town of Corcyra, which became also the name of the island. This colony rose to be the most powerful naval state of Greece, next to Athens. The Corcyræans having quarrelled with the Corinthians on the subject of Epidamnus [Colony], a war followed between the two states, which was a prelude to the great Peloponnesian war. Corcyra had at first the advantage, and defeated the Corinthian fleet off Actium; but the Corinthians being joined by other states of the Peloponnesus, the Corcyræans had recourse to Athens, which made a defensive alliance with them. The Corcyræan fleet of 110 triremes, besides ten Athenian auxiliary ships, engaged with the Corinthian fleet at the south entrance of the channel, near the coast of Thesprotia. The fight ended in favour of the Corinthians, but the appearance of a fresh Athenian squadron of twenty triremes induced them to return home. (Thucyd. i. 50-1.) After this, Corcyra was distracted by civil commotions between the aristocratic and democratic factions, the former being favourable to the Peloponnesian or Spartan alliance, and the latter to the Athenian. Atrocities were committed by both, which ended in a general massacre of the aristocratic party, connived at by the Athenian commander. (Thucyd. iv. 47-8.) This tragedy occurred B.C. 425. The island remained in the Athenian alliance till the end of the war.

The Illyrian pirates took Corcyra, as well as several towns on the coast of Epirus, about 220 B.C.; but the Romans under Caius Fulvius came with a fleet, defeated the Illyrians, and retook Corcyra, which from that time seems to have remained under the patronage of Rome. (Polybius ii. 1.) About 210 B.C., we find the consul Valerius Lævinus stationed at Corcyra with his fleet, giving assistance to the Ætolians in their wars against the Acarnanians. (Livy xxvi. 24.) Corcyra under the Romans was an important station for their fleet, and also a resting-place for those who went and came from Greece by way of Brundisium. It continued to belong to the eastern empire until the eleventh century of our æra, when Robert Guiscard, the Norman conqueror of Apulia, took the island. When the Latins took Constantinople, and established fiefs in the provinces, Corfu had its dukes, who were styled Despots of Epirus and Corfu. It fell afterwards under the Angevins of Naples, but the people revolted and called in the Venetians in 1386. Corfu remained under Venice till the end of the eighteenth century, notwithstanding repeated attacks of the Ottomans, the most remarkable of which was in 1714, when they besieged Corfu with 30,000 men, and made several assaults, but were repulsed by General Schulemburg, who commanded the garrison. The island was administered by Provveditori sent from Venice; but the internal or municipal administration was in the hands of the native nobles. The judicial system appears to have been bad, and murders were very frequent. When Bonaparte overthrew the Venetian senate, under pretence of establishing a popular government, the democrats who came into office at Venice sent commissioners to Corfu with orders to deliver the forts to their allies the French, who sent troops on board the Venetian men of war, and took possession of the island without opposition. In 1799 a united Russian and Turkish force wrested Corfu from the French, and in the following year the republic of the seven united Ionian islands was constituted under the protection of Russia and the Porte. By the peace of Tilsit Russia gave up the seven islands to the French, who sent garrisons from the coast of Naples. The English however took all the islands except Corfu, which was given up by France by the peace of Paris in 1814. The seven islands were then restored to their independence, and formed into a state under the protection of the king of Great Britain, represented by a lord high commissioner, who resides at Corfu.

The present constitution of the seven islands was proclaimed in January, 1818, under the sanction of Great Britain. The parliament or legislative assembly consists of forty members, eleven of whom have their seats *de jure*, consisting of the six members of the last senate, of the four regents of the larger islands going out of office, and one of the regents of the three smaller islands taken by turns. The other twenty-nine members are elected by the electoral bodies of the different islands, seven for each of the islands of Corfu, Cephalonia, and Zante, four for Santa Maura, and one for each of the other three islands, Cerigo, Ithaca, and Paxo. They are elected for five years, which is the term of duration for each parliament, unless it be dissolved before that period by the lord high commissioner. The members, as well as the electors, are all of the class of nobles, which is numerous, including almost all the landed proprietors. The qualifications requisite in order to be inscribed among the nobles are specified in the constitutional charter given by the Emperor Alexander in 1803, in conformity with the old usages of the country, by which the inhabitants were classed into three orders, nobles, burghers, and peasants. The burghers may become nobles on certain conditions. The peasants are free in their persons, but have no elective rights, and they are generally very poor.

The senate, which consists of a president and five members, all from the class of the nobles, forms the executive. The president, who has the title of highness, is appointed by the king of Great Britain: the other five members are chosen by the parliament, subject to the approbation of the lord high commissioner. The senators are elected for five years; the president is appointed for two years and a half: the senate appoints to all administrative offices and situations.

The lord high commissioner convokes the parliament once a year, and opens the session by a speech. He also prorogues or dissolves it. Bills are brought before the House, either from the senate, or from the lord high commissioner through the senate, or lastly, by any member of parliament. After passing the House of Parliament, the bills must be approved by the senate, and lastly must receive the sanction of the lord high commissioner.

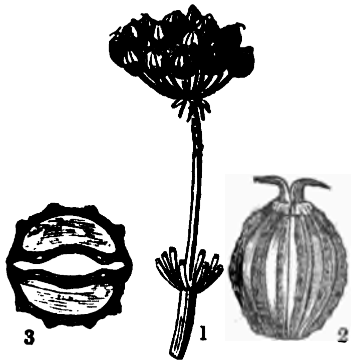
In every island there is a regent, or chief civil and political officer, appointed by the senate, and likewise a resident appointed by the lord high commissioner. There is also in each island a municipal council, named by the order of nobles; the regent is the ex-officio president of the council. In every island there are also civil, criminal, and commercial courts, the judges of which are appointed by the senate. A high court of appeal for all the islands, called the Supreme Court of Justice, sits at Corfu, and is composed of four judges, two appointed by the senate and two by the lord high commissioner, who may choose them indiscriminately among Ionian natives or British residents.

The lord high commissioner commands the armed force, which consists of a British establishment of about 3000 men, and four regiments of native militia.

The eastern Greek church is considered as the established religion of the state; but the Roman or Greco-Latin church enjoys equal protection. The archbishop and bishops of the established church are consecrated by the patriarch of Constantinople. (*Constitution of the Ionian Islands*, in Dufay's *Recueil de Constitutions*, &c.)

According to the printed official returns of 1833, the whole population of the seven islands was 107,379 males, and 90,588 female natives, besides 11,179 strangers. That of the island of Corfu was 32,909 male and 27,098 female natives, besides 9040 strangers. Of this population about 15,000 were employed in agriculture, 1621 in manufactures, and 1443 in commerce. There were on the island 4005 acres sown with wheat, about 16,500 acres sown with Indian corn, barley, oats, and other grain, 75,700 acres planted with olive trees, 13,900 with vines, about 1000 with pulse, 848 with flax, and 7422 in pasture, besides 33,272 acres uncultivated. There were on the island 4194 horses, 2341 horned cattle, 18,585 sheep, and 16,743 goats. The value of the exports for that year was 129,000*l.* sterling, and the imports were 83,000*l.* The shipping inwards was 254,000 tons, and the outwards 255,000, about one-half of it consisting of Ionian vessels. (*Tables of the Revenue, Population, &c., of the United Kingdom and its Colonies*, Supplement to Part IV.)

CORIA'NDRUM SATI'VUM or COMMON CORIANDER, is an annual umbelliferous plant, inhabiting the southern parts of Europe, and yielding a globular dry fruit, with slight carminative stomachic properties, and a powerful smell something like that of bugs. The leaves that grow next the root are nearly entire or gashed, and wedge-shaped; the stem-leaves have a bipinnatifid structure, and their segments are deeply divided; while the uppermost leaves are parted in many very narrow linear spreading segments. The flowers are pale pink, with no general involucre, but with partial ones, each of which consists of eight sharp linear leaflets. The fruit is globular, and will separate into two hemispheres, each of which has five very imperfect wavy primary ridges and four secondary straight elevated ones. There are no vittæ on the outside of the hemispheres, but two occur in their commissure.

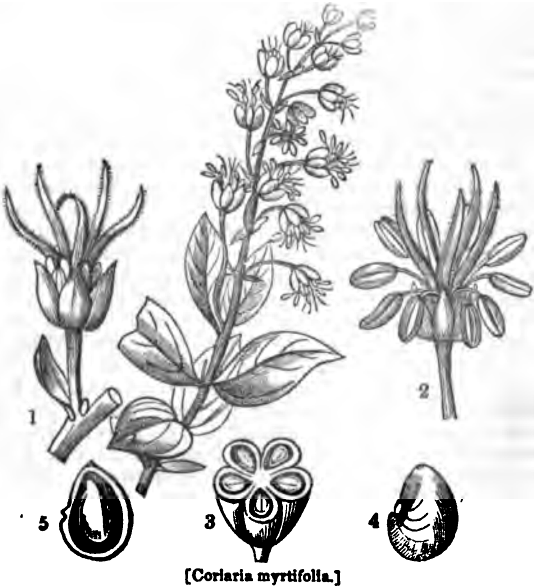


[Coriandrum sativum.]

1. A portion of an umbel, in fruit. 2. A fruit magnified. 3. A transverse section of the same.

Coriander fruit, or seeds as they are incorrectly called, are used in sweetmeats, in certain stomachic liqueurs, and in some countries in cookery; they are little esteemed in England.

CORIARIA'CEÆ, a very small natural order of gynobasic polypetalous exogens, with opposite or alternate exstipulate leaves, ten stamens with an hypogynous inser-



[Coriaria myrtifolia.]

1. A flower with its bract, the anthers not yet visible. 2. The same with the anthers projecting. 3. A cross section of the ovary. 4. A seed. 5. A vertical section of the same.

tion, and five distinct ovaries, with distinct spreading stigmas. The two genera, of which alone the order consits. are nearly allied to Rutaceæ, but their leaves are not dotted. The only plant that gives the order any interest is Coriaria myrtifolia, a shrub inhabiting the South of Europe, and employed by dyers for staining black. Its fruit is succulent and said to be poisonous.

CORINTH (Κόρινθος), a city of antient Greece, the capital of a small but wealthy and powerful district in the Peloponnesus. The Corinthian territory was bounded on the north by the Crisæan bay, on the north-east by Megaris, on the east by the Saronic bay, on the south by Argolis, and on the west by the territories of Sicyon. The city was built upon a level to the north of a steep and high mountain called the Acrocorinthus, which served as a citadel, and was included within the wall. (Strabo, Casaub., p. 379.) Corinth had two ports; the nearer, Lechæum, on the Crisæan bay, was connected with the city by two parallel walls, which were partially destroyed by the Lacedæmonians, B.C. 393. (Xenoph. *Hellen.* iv. 4, § 13.) This harbour, which Colonel Leake conceives to have been for the most part artificial, is now nearly filled up; all that remains of it is a lagoon near the supposed site. (Leake's *Morea*, iii., p. 234.) The other port, Cenchreiæ, on the Saronic bay, does not appear to have been connected with the city; it was, however, a more considerable place than Lechæum, and contained several temples. (Pausan. ii. 2.) A few miles to the north of Cenchreiæ was a small bay, called Schœnus. Here was the narrowest part of the isthmus, and a kind of canal called the Diholcus, of which there are still some remains, was carried from the harbour of Schœnus to the eastern extremity of Port Lechæum, and ships were run ashore at one of these points and dragged to the other sea. This work existed in the time of Aristophanes (*Thesmophor.* 645); but in the Peloponnesian War it appears that they had a method of transferring naval operations from the Crisæan to the Saronic bay without dragging their ships across the isthmus. (Thucyd. ii. 93.) A little to the south of the Diholcus was a wall, which was always guarded when any danger threatened the Peloponnese.

The old name of Corinth was Ephyra; and under this name it was one of the seats of the Æolian race. Even in the time of Homer it was called 'the wealthy' (*Iliad*, ii. 570), an epithet which it acquired, according to Thucydides (i. 13), from the commercial spirit of its inhabitants, occasioned by the favourable situation of the town, which threw all the inland carrying trade of Greece into its power; while the difficulty of weathering Cape Maleæ (which was proverbial) made it the emporium of most of the trade between Asia and Italy. (Strabo, p. 378.)

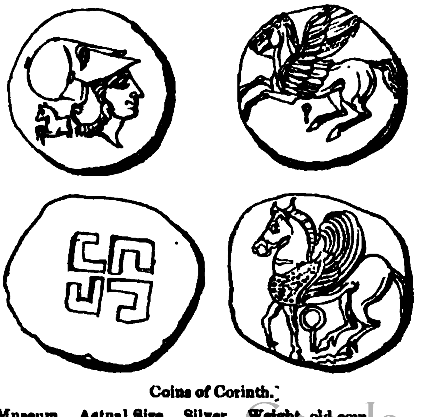
About thirty years after the Dorian invasion of the Peloponnese (*i. e.* about 1074 B.C.), Ephyra fell into the power of Aletes, the son of Hippotes, a Heracleid, who had slain a soothsayer on the passage from Naupactus, and had been compelled to separate himself and his followers from the army of the Dorians. The city then assumed the name of Corinth, or the Corinth of Jupiter (Müller, *Dorians*, book i. ch. 5, § 8); and the Æolian inhabitants became a subject class, though not altogether deprived of their civic rights. The descendants of Aletes ruled Corinth for five generations with royal power; but at length a rigid oligarchy was substituted for the monarchical form of government, and the power was vested in prytanes chosen annually from the powerful Heracleid clan of the Bacchiadæ. The members of this clan intermarried only with one another, and consequently kept aloof from all immediate intercourse with their fellow-citizens, whom besides they did not treat with much forbearance. In the year 660 B.C. Cypselus, an opulent citizen of Æolian descent, putting himself at the head of the lower orders, overthrew the oligarchy without much difficulty, and assumed the sovereign power. Although he taxed and oppressed the Dorian caste so much that many of them were obliged to emigrate, he seemed to have possessed the full confidence of the great mass of the citizens, and always reigned without a body-guard. His son Periander, who succeeded to his authority, occupies a very prominent place in the ancient history of Greece. He was much more despotic than his predecessor; he had a body-guard of 300 men, and trampled at pleasure upon the rights of his countrymen. His reputation for wisdom (by which we must understand that practical wisdom which consists in governing men) procured him a place among the seven sages of Greece. Upon his death in 579 B.C. his power devolved to one of his relatives, Psammetichus, the son of Gordias, who after three years was deposed by the Lacedæmonians. The former constitution was then restored, but doubtless much modified, and Corinth remained an oligarchical state till the beginning of the fourth century B.C. In the Peloponnesian War, which was in some measure brought about by them, the Corinthians were staunch supporters of the Lacedæmonians, and the bitterest enemies of Athens. About 394 B.C. a democratical faction endeavoured to upset the aristocracy, and to unite Corinth with Argos, but without any permanent success. (Xenoph. *Hellen.* iv. 4.) Timophanes re-established the monarchical form of government by means of the mercenaries which he commanded; but he was soon removed by assassination. (Aristot. *Polit.* v. 6; Corn. Nepos, *Timol.*, c. i.; Plutarch, *Timol.* iv.) Like the other states of Greece, Corinth felt the influence of the Macedonian power, and was garrisoned by Macedonians under Antigonus, but liberated by Aratus (Pausan. ii. c. 8, § 4.) The Corinthians took the lead in the Achæan confederacy, and were at first allies of the Romans (Pausan. vii. c. 8, § 3); but at last the temptations held out by the wealth of the place, and the pretext furnished by some insults which the Corinthians had offered to the Roman embassy (Strabo, p. 381), led to the destruction and plunder of the town by L. Mummius, in 146 B.C., according to an express decree of the Roman senate. (Liv. *Epit.* lii.) Many works of art were destroyed, but some of the finest pictures and statues were removed to Rome, and contributed to encourage a taste for the fine arts in Italy. (Strabo, p. 381.) Corinth was restored by Julius Cæsar about 100 years after its conquest by Mummius, and peopled with freedmen, who enjoyed the privileges of a Colonia. When Pausanias visited Corinth in the second century of our æra, there were still many fine buildings, and other monuments of the former splendour of the city. (Pausan. ii. c. 1, § 7.) There now remains little but the ruins of a Doric temple, probably the oldest existing specimen of that style.

The colonies of Corinth were very numerous; but, as has been justly remarked by Müller (*Dorians*, i., c. 6, § 7), they were all sent out from Lechæum, and confined to seas west of the isthmus. The most celebrated were Syracuse and Corcyra. Potidæa, in Pallene, however, is an exception to Müller's remark.

Its wealth and the confluence of merchants from all parts favoured everything which ministered to the gratification of the senses; and both architecture and the other fine arts were, according to the testimony of the ancients, successfully cultivated in this wealthy emporium. (Pindar, *Olymp.* xiii., 25—31.)

The Corinthian territory is fertile and well watered. The fountain Peirene, on the Acrocorinthus, was celebrated by the poets (Strabo, p. 379); but in the time of Hadrian, the inhabitants were so little satisfied with the springs in the town, that they induced the emperor to supply them with water from the Stymphalus by means of an aqueduct twenty miles long. The modern name Gortho is merely an abbreviation of the ancient name of the city. (Leake's *Morea*, iii. p. 262.)

According to the fable Bellerophon caught the winged horse, Pegasus, while drinking at the fountain of Peirene. The Pegasus appears on the coins of Corinth and some of its colonies.



Coins of Corinth.

British Museum. Actual Size Silver. Weight, old coin. other, 132 grains

CORINTHIAN ORDER. [CIVIL ARCHITECTURE; COLUMN.]

CORINTHIANS, ST. PAUL'S TWO EPISTLES TO THE. The First Epistle of St. Paul to the Gentile and Jewish converts to Christianity in the city of Corinth is generally considered by the commentators and critics to have been written A.D. 57 or 58. Of this opinion are Michaelis, Mill, Whitby, Pearson, Benson, Paley, Adam Clarke, Greswell, &c.; but the date assigned to it by Beausobre, L'Enfant, and Lardner is A.D. 56. The place from which it was written is stated in the concluding postscript to be Philippi, which, as it apparently contradicts the apostle's statement in verse 8, 'I shall remain in *Ephesus* until Pentecost' (ἐπιμενῶ δὲ ἐν Εφέσῳ), the latter place is commonly given as the more probable; especially as these postscripts appear to be in other instances erroneous, and without authority. In order to perceive the design of these epistles, it is necessary to observe the following circumstantial facts which gave occasion to the writing of them:—Christianity was first preached at Corinth by St. Paul, who resided there about eighteen months, between A.D. 51 and 53. His successors were Apollos, Aquila, and Sosthenes. But shortly after his departure several other learned and eloquent teachers of Christianity drew away most of the Christian converts from the Gospel doctrine as set forth by St. Paul, and formed them principally into two separate parties, the one contending for the rigid observance of the Jewish ritual, the other for indulgence in some of the idolatrous and lascivious customs of the worship of Venus, to whom a magnificent temple, containing a thousand prostitutes (Strabo, Casaub., 378), was dedicated in the centre of this great commercial city, which bore a proverbial character for luxury and licentiousness. Some writers conjecture that the Judaizing preachers of the Gospel in Corinth were some of the twelve apostles: since Paul asserts that on this question he withstood Peter to the face, and (2 Cor. xi. 22, 23) he speaks of these teachers as Hebrews and ministers of Christ. On being apprised of this condition of the Corinthian church, St. Paul wrote his first epistle, the contents of which may be considered under two general heads: first, the reproval of abuses and corruptions which disgraced the Christian community of Corinth; secondly, the reply to various questions, for the decision of which the Corinthians had appealed to the judgment of their apostle. After commencing with the usual salutation, he proceeds therefore to rebuke their schisms and assumption of knowledge and wisdom; exhorting them to become united to himself, as having a prior claim to their respect and attention (c. i. to iv.). He next reproves them for not having delivered unto Satan one who had his father's wife (c. v.); for not suffering themselves to be defrauded rather than go to law; and especially for their indulgence in fornication (c. vi.). Then follow answers to the questions, in which instructions are given concerning marriage, celibacy of virgins and widows, the eating of idolatrous sacrifices, the exercise of supernatural gifts, the proprieties to be observed by public preachers, and the forbidding women to address congregations (c. viii. to xiv.). A censure is passed upon the profane observance of the Lord's Supper, for in eating it, each before another took his own supper, so that while one was hungry another was drunk (ἕκαστος γὰρ τὸ ἴδιον δεῖπνον προλαμβάνει ἐν τῷ φαγεῖν· καὶ ὃς μὲν πεινᾷ, ὃς δὲ μεθύει) c. xi. 21. From c. xv. 12, it appears that it was taught among the Christians of Corinth that there is no resurrection of the dead. St. Paul thence takes occasion to expatiate upon the subject to the end of this chapter, which forms the most imposing part of the Church of England Burial Service. The epistle closes with an exhortation to the Corinthians to secure the collection of money for the necessitous saints in Judæa, both hearers and preachers, which is several times enforced with various arguments, especially in c. ix. and xvi., and in c. viii. and ix. of the second epistle, of which we now come to speak. It is generally agreed that it was written A.D. 58, about a year after the first, and from Philippi, as the postscript asserts. The main purpose of St. Paul in this epistle was to repel the imputations which it appears his first epistle had induced the opponent teachers to make, both as to his doctrines, authority, and personal appearance. It is in fact an apologetic oration, in which the apostle enlarges on his spiritual office, power, and qualifications; and speaks of his supernatural revelations, as far exceeding the pretensions of his rivals at Corinth, whom he designates 'false apostles, deceitful workers, and ministers of Satan,' xi. 13. He explains at length the cause of his not having visited the Corinthians as he promised, declares his great success in preaching, mentions his numerous sufferings and disasters incurred for the sake of the faithful, enforces the necessity of completing the contribution for the saints, and concludes with a farewell salutation.

The great rhetorical merits of this address are critically discussed in the 'Disputatio Inauguralis de alterâ Pauli ad Corinthios Epistolâ,' by M. Royards, 8vo., 1818. All the passages in the fathers of the first three centuries which contain any citation from, or allusion to, these two epistles of St. Paul, are collected in the 2nd vol. of Dr. Lardner's Credibility. The words in the first epistle, Ἔγραψα ὑμῖν ἐν τῇ ἐπιστολῇ (c. v. 9), have been the subject of great controversy, as implying that another epistle, not now extant, was written before the one which is called the first. A long list of the critics and divines who have given opinions about it, may be found in Horne's Introduc., vol. iv. p. 353. Numerous critical particulars may be found in the following works:—Michaelis, Introduction to the New Testament, by Bishop Marsh, vol. iv. p. 42-74; Eichhorn, Einleitung in das Neue Test., vol. iii. pp. 91-201; Macknight on the Epistles; Horne's Introduction, vol. iv., pp. 349-357, and 603; Greswell, Harmony of Gospels, vol. ii., pp. 33-38; Paley's Horæ Paulinæ, pp. 66-98; Critical Commentaries by Piscator, Pollock, Schlater, and others, are enumerated in Watts' Bibliotheca, where a very copious list is given of sermons on texts from these epistles, both which were first printed separately from the Testament by Melancthon at Wittenberg in 1521.

CORIOLA'NUS, CNÆUS MA'RCIUS, the hero of an antient Roman legend, belonging to the latter half of the third century of the city. Dionysius calls him Caius, but Dion and most of the MSS. of Livy are in favour of Cnæus. (Niebuhr's *Hist. of Rome*, vol. ii., p. 234, *Eng. Transl.*) The surname Coriolanus was supposed, in later times, to have been derived from his conquest of Corioli, but it probably arose in the same way as a multitude of other Roman surnames, such as Sabinus, Auruncus, Viscellius, &c., which only indicate the origin of the houses that bore them. A similar connexion might no doubt be satisfactorily traced in many more cases if the names of the towns remained to justify our conclusions. (Niebuhr, vol. ii., p. 242.) The story of Coriolanus, as given by the Roman historians, is so completely poetical in its form, and so rhetorical in its details, that Niebuhr (p. 242) is of opinion that almost the whole of it must be excluded from history. The tale however runs as follows:—

Coriolanus was in the Roman camp when the consul Cominius was laying siege to Corioli. The besieged making a vigorous sally, succeeded in driving back the Romans to their camp; but Coriolanus immediately rallied them, rushed through the gates, and took the place. Meanwhile the Antiates had come to relieve the town, and were on the point of engaging with the consul's army, when Coriolanus commenced the battle, and soon completely defeated them. From this time he was greatly admired for his warlike abilities, but his haughty demeanour gave considerable offence to the commonalty. Not long afterwards, his implacable anger was excited by being refused the consulship; and when, on occasion of a severe famine in the city, corn was at last brought from Sicily (some purchased and some given by a Greek prince), and a debate arose whether it should be given gratis or sold to the plebs, Coriolanus strenuously advised that it should be sold. The people in their fury would have torn him to pieces had not the tribunes summoned him to take his trial. He was banished by a majority of the tribes, and retired to Antium, the chief town of the Volsci, where the king, Attius Tullus, received him with great hospitality. Coriolanus promised the Volsci his aid in their war against Rome, and they forthwith granted him the highest civil honours, and appointed him their general. He attacked and took many towns; among others Circeii, Satricum, Longula, and Lavinium. At last he directed his march to Rome itself, and pitched his camp only a few miles from the city, where he dictated the terms at which the Romans might purchase a cessation of hostilities. Among other things he demanded that the land taken from the Volsci should be restored, that the colonies settled there should be recalled, and that the whole people should be received as allies and citizens with equal rights; and that all those who had enlisted themselves under his banners should be recalled as well as himself. Coriolanus allowed them two terms, one of thirty and the other of three days, for making up their minds. After thirty days had expired, a deputation of four leading senators came before his tribunal, but were repulsed with threats if they should again offer anything but unreserved submission.

On the second day the whole body of priests and augurs came in their official garb and implored him, but in vain. On the third and last day which he had allowed them he intended to lead his army against the city, but another expedient was tried, and succeeded. The noblest matrons of the city, led by Veturia, the mother of Coriolanus, and his wife Volumnia, who held her little children by the hand, came to his tent. Their lamentations at last prevailed on his almost unbending resolution, and, addressing his mother, he said with a flood of tears, 'take then thy country instead of me, since this is thy choice.' The embassy departed; and dismissing his forces, he returned and lived among the Volcsi to a great age. According to another account he was murdered by some of the Volsci, who were indignant at his withdrawing from the attack.

After his death however the Roman women wore mourning for him as they had done for some former heroes. The public gratitude for the patriotic services of Volumnia were acknowledged by a temple, which was erected to Female Fortune. Shakspeare has founded his play of 'Coriolanus' on certain parts of the legend.

(Dionysius Halicarnassensis, viii.; Plutarch, *Life of Coriolanus;* Livius ii., 33—40; Florus i., 11: Niebuhr's *Hist. of Rome,* vol. ii., pp. 234—243.)

CORK, botanically considered, is the soft elastic bark of a kind of oak inhabiting Spain and Portugal. [QUERCUS.] The bark of all trees consists of a parenchymatous or soft cellular substance, and of a harder ligneous tubular tissue: in most species the latter is most abundant; in the cork the former constitutes the mass of the bark, and hence its elasticity and the facility with which it is cut in all directions. When however it is first generated, the bark of the cork-tree is far less elastic than it becomes subsequently; which is owing to its consisting in the first instance of a large proportion of woody matter. When the latter is once formed, which takes place in the first year of its growth, it never increases, however long the bark may remain in a living state; but the parenchymatous substance will go on growing as long as the bark is alive, a provision of nature connected with the annual increase in diameter of wood and the necessity of the bark giving way to the pressure from within. If the growth of the parenchyma is prolonged and rapid, a corky substance is the necessary consequence, as in certain kinds of elms, the common oak itself, and many other trees; but it does not occur in any European tree in such excess as in the cork. As soon as the bark dies, it of course ceases to grow, and then, not distending as it is pressed upon from within, it falls off in flakes which correspond to the layers that are formed annually. These flakes are the layers of cork which the Spaniards collect under the name of the outer bark, while the inner living bark is or rather should be spared. We are told, however, by Captain S. Cook, that recently the Spaniards have committed the inconceivable absurdity of stripping off the inner bark also, although it is of no value except for tanning, and although its removal of course destroys the trees. The same intelligent observer states that the cork-tree occurs in Spain throughout the whole extent of the Tierra Caliente, but is most abundant in Catalonia and Valencia, whence the principal exports have been made. Cork appears to be a corruption of the Latin word *cortex.*

CORK TRADE. [BARK.]

CORK, a maritime county of the province of Munster in Ireland, bounded on the north by the counties of Limerick and Tipperary, on the east by the county of Waterford, on the south by the Atlantic Ocean, and on the west by the county of Kerry. It lies between 51° 27′ and 52° 13′ N. lat., nearly under the same parallels with South Wales, and is by much the largest county in Ireland. Its greatest length from Youghall on the east to the mouth of the Kenmare river on the west, is 93 Irish or 110 English miles; and its greatest breadth from the Old Head of Kinsale upon the south to Charleville on the north, is 44 Irish or 56 English miles.* The area is estimated at 2654½ square statute miles, or 1,698,882 English acres; but this estimate is not to be depended on for accuracy: the indentations of the coast from Youghall to Kenmare give a coast-line of about 200 miles. Population in 1821, 629,786; in 1831, 703,716.

The chief mountain groups, which with bogs and unprofitable lands occupy upwards of two-ninths of the entire surface, may be considered as offsets of the main ridge which separates Cork from Kerry. This ridge, the southern extremity of which separates Bantry Bay from the river of Kenmare, runs N.N.E. and S.S.W., and on the side towards Cork sends off numerous lateral elevations. Of these the two chief are the ranges north and south of the valley of the Lee, which river divides the county into two nearly equal portions. The northern range, which is by much the more extensive, consists of the almost continuous groups of the Muskerry, Boggra, and Nagles mountains, and stretches in a uniform direction from the Kerry boundary on one side of the county, to within a few miles of the borders of Waterford on the other. The Shehy group, which forms the southern boundary of the basin of the Lee, runs a much shorter distance from the main ridge; but the upland country of Kinalmeaky, into which it subsides, prolongs the elevation in a line parallel to the direction of the Boggra range across the entire extent of the county, from Dunmanway on the west to the high grounds above Cork and Passage on the east. North and south of this central valley are the districts which form the basins of the Blackwater and the Bandon; the former included between the mountains of Limerick and Tipperary, and the Boggra groups; and the latter between the Shehy range and those elevations which rise southward towards the sea-coast. These three principal valleys are nearly symmetrically situated, and their respective rivers run very nearly parallel to one another, their general course being from west to east: all have their rise among the eastern declivities of the Kerry ridge, and each, as it approaches the termination of its course, takes a southward direction for some miles before entering the sea. In like manner each is naturally navigable throughout this latter portion of its course, as the Blackwater from Youghall at its mouth to Cappoquin; the Lee from the sea to Cork; and the Bandon from Kinsale at its mouth to Inishonan. The Blackwater is by much the largest river of the three, and drains a proportionately greater extent of country. The bogs and waste lands lie among the mountain groups described; the remainder of the county is well tilled and productive, particularly along the banks of the rivers enumerated, and in the districts included between their embouchures.

Beginning from the east, the harbour of Youghall has a tolerable anchorage in six fathoms water without the bar, where vessels may wait the tide, which gives twenty feet of water on the bar at neaps. Three leagues south is a good anchorage and fishing ground, in five to twelve fathoms water at Ring Point. From this the coast is rocky, with the exception of the extensive strand of Ballycotton Bay, to the entrance of Cork harbour four leagues farther west. This harbour is so commodious, says Smith, that it will admit the largest vessels at any time of the tide without striking sail, and has a land-locked anchorage in ten fathoms water in some places, and in seven fathoms' water within a cable's length of the shore. On the shoalest part of the bar are thirty feet water at ebb-tide. From this westward to Kinsale harbour the coast is rocky and dangerous. The harbour of Kinsale has thirty feet of water on the bar, and anchorage within in seven fathoms; but it is not so capacious as that of Cork. There is also good anchorage in any depth of water on both sides of the promontory to the west called the Old Head of Kinsale. The bay of Courtmasherry, next west, is fit for vessels of 200 tons, but exposed. Cloghnakilty harbour is encumbered with a bar, on which are only two fathoms' water at full sea, and vessels embayed here are in considerable danger. The harbour of Glandore has fourteen to thirty feet of water in its channel, and a land-locked anchorage. Castlehaven Creek has safe anchorage in fourteen feet; and Baltimore Bay pretty good in six fathoms. Baltimore is situated on the eastern side of an extensive bay, bounded on the east by Cape Clear Island, and on the west by Mizen Head: it contains the several minor bays of Baltimore, Roaring Water, Crookhaven and Inisherkin, in all of which merchant vessels may find anchorage. West from Mizen Head the bay of Dunmanus runs inland twelve miles in a north-east direction, with ten to thirty fathoms of water throughout, and no bar; but it is little frequented, in consequence of the contiguity of Bantry Bay, from which it is separated by the narrow mountainous promontory terminating in Minteroana or Sheep's Head. Bantry Bay is forty fathoms deep at the mouth, twenty-six miles long, and from three to five miles broad. Bear Island at its entrance protects it from the south-westerly swell, and affords the land-locked anchorage of Bearhaven in ten to sixteen fathoms' water, for an unlimited number of vessels. Further up, Whiddy Island incloses the minor bays of Bantry and Glengariff, the latter much celebrated for the magnificence of its scenery: it is calculated that all the shipping of Europe could ride secure in this noble harbour. Bearhaven has been proposed as a station for packet-ships to North America, in connexion with the projected south-western line of rail-road from Dublin.

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* These measurements are given from Smith. Doctor Beaufort makes the length 78 Irish or 99 English miles; and the breadth 56 Irish or 71¼ English miles.

Facilities for water-carriage are confined to the coast: the inland navigation of the Bandon is very inconsiderable; that portion of the Blackwater which is navigable lies in the county of Waterford; and the traffic between Cork and the sea is more a harbour than a river navigation. It has been proposed to render the Bandon navigable, from Dunmanway, near its source, to Inishonan; also the Blackwater, from Mallow to Cappoquin; but neither design has been practically attempted. The only lakes in the county are two small but very picturesque sheets of water, near the source of the Lee, and some pools on the coast.

The road to Dublin, carried over the eastern flank of the Nagles mountains by Rathcormack, unites the valleys of the Lee and the Blackwater from Cork to Fermoy. The road from Cork to Mallow, carried over the western flank of the same range, forms another line of communication between these valleys, and is used as the post-line to Limerick. Westward from Mallow to Millstreet, a distance of nearly eighteen miles, the range of the Boggra mountains formed an impassable barrier, until, in 1823, permission was obtained from government to make a road through the centre of this group at an expense of about 10,000*l.*, one-half to be levied by county presentments, and the other half to be defrayed out of the Consolidated Fund. This road has now been open for several years, and saves the inhabitants of the valley of the Blackwater a distance of fully twenty miles Irish on every journey to and from the Cork market. It also supplies an easy means of transit for fuel to the low countries, both north and south. Before this road was opened, the only means of procuring fuel from the upland bogs was on the backs of small horses, or of men and women. Other new roads have been made at the public expense within the county in the neighbourhoods of Cloghnakilty, Bandon, Skibbereen and Courtmasherry. Prior to the year 1829, a great part of the north-western district of the county was almost inaccessible. This district formed part of a tract of 970 square miles, comprised between the Shannon and the Blackwater, which up to the year 1822 had contained no road passable for horsemen in wet weather. 'The entire district must have remained neglected by the hand of civilization from the period at which its antient proprietors, the later Earls of Desmond, had been dispossessed of it in the reign of Elizabeth.' (*Report on the Crown Lands of Poble O'Keefe*, 22 *March*, 1831.) The whole district contained but two resident landed proprietors, whose houses were distant 38½ miles from one another. The inhabitants were poor and ignorant, and the inaccessible nature of the country made it the asylum of smugglers and outlaws. Through the northern parts of this district seventy-five miles of good road were made by government in the years 1823—9. The consequences were an immediate increase of industry and produce, and a very rapid improvement in morals and intelligence. Still there remained the southern portion of the district, comprising 128,000 acres in the north-west of Cork through which no road had yet been carried. To open up this tract, a road was projected in 1829, from Castle Island in the county of Kerry eastward, so as to meet the lately-constructed Boggra road at its terminus on the Blackwater, by which a communication would be opened between Castle Island and Mallow, which would shorten the distance from the former town to Cork by twenty-two miles. A second line, connecting this road with the post-line from Cork to Killarney, was also projected, by means of which Killarney would have a direct communication through Mallow with Waterford. About the same time, a tract of 9000 acres in the heart of the unopened district escheated to the crown. Possession being obtained of 5000 acres, the attention of government was, in January, 1831, directed to the best means of improving the wretched tenantry found occupying the estate. It was found that the projected road from Castle Island would cross the head of the Blackwater within the estate, and that the vicinity of the ridge would be an eligible site for a village. The village of King William's Town has accordingly been built under the superintendence of Mr. Griffith: it consists of a carman's inn, a model farm-house, a few suitable houses for shopkeepers, artisans, and labourers, and a large school-house. The estate, which, on its reversion, 'was saturated with water, and covered with thick matted beds of moss, rushes, and heath, the growth of ages,' unfenced, unmanured, and inaccessible, is now to a great extent drained and divided into well-fenced farms for grazing and tillage, to which the newly-opened road affords a ready supply of lime for manure, as well as a convenient means for carriage of produce to market. The condition of the tenantry is rapidly improving, and there is every prospect of complete success attending these benevolent exertions of the government. Up to the 12th February, 1833, the amount granted by the Treasury for the improvement of these estates was 6500*l.* The estimate for the Castle Island and Mallow, and Killarney and Mallow roads, was 23,812*l.* 1*s.* 2*d.*: of this amount government defrayed 17,000*l.* A sum has also been advanced by the present Board of Works, for the construction of a new road from Glengariff to Killarney, across the ridge of the Bantry mountains. The remaining roads of the county are under the control of the Grand Jury. A rail-road has been projected from Cork to Passage, where there is a much frequented ferry between the mainland and Cove.

The climate is moist but genial in the south and east. The annual average of rain at Cork for the eleven years preceding 1748 was 38·26 inches. The wind blows between south and north-west for more than three-fourths of the year.

From the east of Limerick and south of Tipperary the limestone field extends towards the Blackwater, which it skirts for a part of its course on both sides between Mallow and Fermoy, until overlaid by the shale and sandstone beds of the Munster coal district, which occupy the whole extent of the uncultivated country described above. The limestone again occurs in stripes along the valley of the Lee, and occupies the basin on which the city of Cork is built, from which it stretches eastward in two parallel belts across the low sandstone country to the banks of the Blackwater. The Boggra and Nagles ranges consist of sandstone, which rock prevails throughout the district watered by the Lee. South of the Lee, the slate-clay, on which the sandstone rests, crops out in longitudinal strata that have a uniform direction from N.N.E. to S.S.W. and a prevalent dip to the S.E. This rock, varying from the hardest grit to clayey rubble, constitutes the whole of the southern portion of the county from the mouth of the Lee to the mountains of Bear and Bantry, where its elevations attain an altitude of above 2500 feet. Among these are some peaks of quartz formation, of which the most remarkable is Sugarloaf-hill, which rises over the bay of Glengariff. The veins, which occupy many of the fissures of this rock, abound in ores of iron, copper, lead, and manganese.

The soil of the coal district on the north-west is cold, stiff, and moory. In the north-east, where limestone abounds, it is warm and friable. Along the valley of the Lee is a red, crumbly, and heavy soil, which requires considerable manuring with lime or sea sand. Throughout the schistose formations, south of the valley of the Lee, the earth is generally dry and sandy, requiring much dung to make it bear corn. Marl, fullers' earth, and clay for brick kilns and potteries, are found in considerable abundance. The best cultivated parts of the county are the eastern portions of the basins of the Blackwater and the Lee, and the low district included between their embouchures. The system of agriculture in these districts is good. There is a large resident proprietary, and every evidence of wealth and comfort. The remainder of the county, except in the neighbourhood of towns and gentlemen's demesnes, presents a strong contrast. The extreme west is barren from one extremity of the boundary line to the other. The transverse ranges of moorland and bog are totally unreclaimed, and the population on their borders are poor and ignorant. The county is, nevertheless, improving: this improvement is mainly attributable to the construction of roads by the government.

The county comprehends 22 baronies, one county of a city, and sundry corporate districts. Duhallow, Orrery and Kilmore, Fermoy, Condons and Clongibbons, occupy the district of the Blackwater, enumerating from west to east. West Muskerry, East Muskerry, Barretts, Barrymore, Kilnatalloon, and Imokilly, occupy the district of the Lee in the same order. Bear, Bantry, West Carberry, west and east divisions, East Carberry, west and east divisions; Ibaune and Barryroe, Courcies, Kinnalmeaky, Kinnalea, Kinsale, and Kerrycurrihy, occupy the remainder of the county in like manner on the south.

To these are to be added the county of the city of Cork, and the liberties of Youghall and Mallow. Other corporate towns have liberties, but not extensive enough to come under this division.

Cork county lies within the dioceses of Cork, Cloyne, Ross, and, to a small extent, in Ardfert and Aghadoe, and contained, in 1792, 269 parishes and 105 churches.

The county was formerly represented by 26 members in the Irish parliament, of whom two were returned by the county, and a like number by the city of Cork and each of the following boroughs: Kinsale, Youghall, Bandon, Mallow, Doneraile, Rathcormack, Middleton, Charleville, Castlemartyr, Baltimore and Cloghnakilty. These, with the exception of Doneraile and Rathcormack, still possess charters of incorporation, and are governed by corporate authorities.

With the exception of Cork, Bandon, and Youghall, these boroughs, at the time of the Union, lost their privilege of representation. The representation in the imperial parliament is now confined to two members for the county, two for the city of Cork, one for Bandon, and one for Youghall. The total amount of Union compensations was 150,000*l.* The other places of importance in the county are Bantry (population 4275); Cove (pop. 6966); Dunmanway (pop. 2738); Skibbereen (pop. 4430); Mitchelstown (pop. 3545); Fermoy (pop. 2557); Kanturk (pop. 1349); Newmarket (pop. 1437); Cloyne (pop. 2227); Millstreet (pop. 1935); Macroom (pop. 2058); Buttevant (pop. 1536).

The principal copper-mines in Ireland are situated at Allahies, about ten miles west of Skibbereen. They were first worked in 1814, and now give employment to about 1500 people. The ore contains from 55 to 65 per cent. of copper. In the same neighbourhood the ashes of a bog impregnated with copper yielded a considerable return until burned out. A deposit of manganese is worked with good profit on the same coast. Veins of sulphate of barytes occur in the neighbourhood of Bantry, and specimens of asbestos have been procured at Bearhaven. The coal of the district of the Blackwater is anthracite or blind coal. The chief workings are at Clonbannon and Dromagh, near the crown estate, where there is a good home consumption at the distilleries in the neighbourhood. The district is, however, still too inaccessible to encourage extensive operations. There is abundance of iron ore, if coal could be had for smelting. While the county was well wooded iron works were carried on to a considerable extent. The East India Company had iron works on the Bandon in 1612, and paid 7000*l.* for a tract of wood for their furnaces. About the year 1632, the Earl of Cork had in his various bloomeries 1000 tons of bar and 20,000 tons of pig iron; besides 200 tons drawn out and faggotted into rods. Bar-iron was at that time worth 18*l.* per ton.

The export of produce is the principal trade: 30,000 firkins of butter, value about 50,000*l.*, are annually brought to market from the western district; but a considerable part of this is supplied from the borders of Kerry and Limerick. The following abstract exhibits the quantities of grain sold at some of the principal market towns in the year 1835:—

	Barrels of Wheat of 20 stone.	Barrels of Barley of 16 stone.	Barrels of Oats of 14 stone
Cork . . .	82,838	64,294	130,826
Bantry . .	8,453	200	3,421
Macroom .	3,263	—	12,000
Dunmanway	9,741	578	—
Fermoy . .	56,330	12,360	34,384
Mitchelstown	—	1,250	3,429
Kanturk .	8,900	100	550
Kinsale . .	—	1,320	—
Middleton .	12,493	30,225	7,306

No returns from Skibbereen, Cloghnakilty, Bandon, Mallow, Charleville, and Youghall.

The linen and woollen manufactures at one time flourished in several towns of this county; but trade in these branches has for many years back been languishing.

TABLE OF POPULATION.

Date.	How ascertained.	No of houses.	Families.	Families chiefly employed in agriculture.	Families chiefly employed in trade, manufactures, and handicraft.	Families not included in preceding classes.	Males.	Females.	Total.
1792	Estimated by Dr. Beaufort	68,639	..	..	..	..	..	..	343,000
1813	Under Act of 1812 . .	91,447	..	..	..	..	..	..	523,936
1821	Under Act 55 G. III., c. 120	103,279	115,959	..	..	..	314,172	315,614	629,786
1831	Under Act 1 Wm. IV., c. 19	106,893	118,356	81,623	16,531	20,212	348,402	355,314	703,716

Cork is the assize town. The county gaol, about three-quarters of a mile from the city, is considered the most perfect institution of the kind in Ireland. There are seventeen bridewells in the other principal towns. Quarter sessions are held twice a year at Bandon, and once at Skibbereen and Bantry respectively. The number of the constabulary in the county of Cork, on the 1st January, 1836, was 15 chief constables, 85 constables, 426 subconstables, and 17 horse do.: total expence for 1835, 19,807*l.* 15*s.* 5*d.*, of which 9334*l.* 12*s.* was chargeable against the county.

Before the coming of the English, Cork was a separate kingdom, of which the princes were the Mac-Carthys. The antient kingdom of Cork included, besides the present county, a considerable tract in Kerry and Limerick. It was divided into Desmond, or South Munster, on the west; Muskerry, a part of Ormond, or West Munster, on the north-east, and Carbery on the south-west. In all these districts the Mac-Carthys were the most powerful. The native families next in importance were, in Desmond, the O'Sullivans; in Carbery, the O'Donovans, and O'Driscols; and in Muskerry, the O'Learys on the south-west; the O'Lehans (from whom Castle Lyons) on the south-east, the Mac-Donohgs on the north-west, and the O'Keefes on the north-east. In 1172 Dermod Mac-Carthy, king of Cork, swore fealty to King Henry II., but he broke his engagements ten years afterwards by falling on the English under Raymond Le Gross by land, while his ally, Gilbert, son of Targesius, with a fleet of 35 sail from Cork, attacked Earl Strongbow by sea at Dungarvan. His kingdom, thus forfeited, was bestowed by King Henry, in 1177, on Robert Fitz-Stephen and Milo de Cogan. The city of Cork with the cantred adjoining was reserved to the king. Of the thirty-one cantreds conveyed by the king's grant, Cogan and Fitz-Stephen obtained possession of seven, lying near the city, which they divided, the three eastward cantreds falling to Fitz-Stephen's lot and the four westward to Cogan's. On the remaining 24 cantreds they levied rents from the native princes. Fitz-Stephen dying without issue, his grant went chiefly to the families of Barry and Roche. Cogan's share falling ultimately to coheiresses, was divided among Robert de Carew, Patrick de Courcey, and Maurice Fitz Thomas (Fitz John Fitz Thomas Fitz-Gerald), who was created earl of Desmond in 1329. The estates of this last family were further increased by large grants from Robert Fitz-Geoffrey Cogan, who had intruded on the portions of the Carews and De Courceys in 1438; so that the eighth earl of Desmond found himself in possession of almost the entire kingdom of Cork; but assuming to himself the right of levying separate exactions on the king's subjects, after the Irish manner, was attainted of treason and beheaded at Drogheda, 15th February, 1467 Nevertheless his estates passed, and in the person of his descendant Gerald, the fifteenth and last earl, had grown to an amount unexampled in the history of private property in Ireland. They extended upwards of 150 miles throughout the counties of Waterford, Cork, Kerry, and Limerick, and comprehended an area of 574,628 acres, according to the rough estimate of these times, the calculation seeming to have reference only to profitable land. Before the Desmond possessions had grown to this extent, the entire county of Cork had become Irish in language and habit.

Most of the old nobility of English descent had taken part with the defeated Yorkists in the latter end of the preceding century, and the Irish, on these noblemen leaving their estates to assist Simnel and Warbeck, had returned from their fortresses and over-run the new plantations. The families of Carew, Barnwell, De Courcey, Balram, Mandeville, and Arundel, were thus expelled from the country, while their places were occupied by the descendants of the Irish clans above mentioned. The reformation had made little progress in a country so indisposed for the reception of anything English, and on the breaking out of the northern rebellion in Elizabeth's time, Cork was considered the fittest place for an attempt in favour of the Catholic cause under the auspices of King Philip of Spain, to whom the country had been offered by Pope Gregory XIII. The principal Irish agent in bringing about the invasion was James Fitz-Maurice, the brother of the 15th Earl. On his landing with some Italian troops, accompanied by Saunders, the pope's legate, 1st July, 1578, he was joined by his brother Sir John of Desmond, and by James Fitz-Gerald, the earl's brother. The earl himself made some show of attacking them at first, and during the early part of the war which ensued took no active part against the queen; but having refused to yield up his castles and come in on the summons of the Lord Justice Sir William Pelham, he was, with all his family, proclaimed traitor, 1st November 1579. On this he set up his standard at Ballyhowra in Cork, declared for the Catholic cause, and seized on Youghall. The war which ensued was predatory and sanguinary on both sides, and lasted till November 1583, when the unfortunate earl, after losing all his castles, and being driven to lurk for months together in the woods, was put to death by one Kelly, who found him in a wretched cabin, where he was hiding, in the county of Kerry. The forfeited estates were divided into seigniories, and granted to English adventurers. Upwards of 20,000 acres fell to Sir Walter Raleigh, who had been active in the suppression of the rebellion. The other grantees in Cork were:—Sir Warham St. Leger, 6000 acres; Hugh Cuffe, Esq., 6000; Sir Thomas Norris, 6000; Arthur Robins, Esq., 18,000; Sir Arthur Hyde, 5574; Fane Beecher, Esq., 12,000; Hugh Worth, Esq., 12,000; Thomas Say, Esq., 5775; Arthur Hyde, Esq., 11,766; Edmond Spenser, Esq., 3028; Sir Richard Beacon (in Cork and Waterford), 6000.

On the 7th December, 1602, Sir Walter Raleigh conveyed his proportion in Cork and Waterford for a small sum to Sir Richard Boyle, afterwards earl of Cork. A large part of Beecher's seigniory was purchased by Sir Richard about the same time. On the latter he built the fortified town of Bandon, which he peopled with English settlers; and so stocked and planted his whole estate with British, that in 1611 his tenants on Raleigh's portion mustered 550 foot and 80 horsemen, and in 1622 on Beecher's portion, 564 foot and 66 horse, the horse being mostly gentlemen and freeholders. Before this settlement the county had been much distracted by the wars consequent on the landing of the Spaniards, 23rd September, 1601, in support of Hugh earl of Tyrone, then in rebellion in Ulster. Tyrone had shortly before this raised James Fitz Thomas, the nephew of the late earl, to the title. He was known as the *Sugaun* or Straw Earl; and in his rebellion was joined by great numbers of the native Irish under Florence Mac Carthy, who had also been created Mac Carthy More by Tyrone, in place of Daniel, lately deposed from the chieftainship by the same authority. This war was quieted just before the arrival of the Spaniards by the capture of the two leaders. Mac Carthy was executed, and the Sugaun Earl, being imprisoned in the tower of London, died there in 1608.

By the latter end of December, 1601, the rebellion was at an end; numbers of the chief rebels had fled to Spain, and after the exhibition of some discontents on the proclamation of King James, April, 1603, the country settled into tranquillity. Sir Richard Boyle now began to regulate the various boroughs which he had enlarged or founded on his estates, procuring charters for Youghall, Bandon, Cloghnakilty, and Baltimore. His family preserving the same policy afterwards, raised Middleton, Doneraile, Castlemartyr, and Charleville, to the rank of corporate towns; so that the whole representation of the county ultimately rested in the various branches of the Boyle family. The services of the British tenantry planted by this enterprising nobleman were soon called for, on the breaking out of the rebellion of 1641. The good conduct of the various bodies of this militia, under the command of lords Broghill, Kinalmeaky, Dungarvan, and Shannon, lord Cork's sons, materially conduced to the pacification of Munster. Throughout the war the English were generally successful in retaining the walled towns and castles. Lord Castlehaven had some successes on the other side in 1645, taking Mitchelstown, Liscarrol, Mallow, Doneraile, and various castles north of the Blackwater in this county; but these places did not long remain in his hands. The chief battles fought in Cork during this war were at Liscarrol, 3rd September, 1642, where Lord Inchiquin, accompanied by the sons of the earl of Cork, with a force of 2000 foot and 400 horse, totally defeated the Irish under general Barry, who is said to have had 7000 foot and 500 horse; and at Knockinoss, near Mallow, 13th November, 1647, where the same general, with 4000 foot and 1200 horse, routed the Irish, being 8500 strong, under the command of lord Taaffe and Sir Alexander (son of the famous Colkitto) Macdonnel. Four thousand Irish fell on the field of battle; and for his good conduct on the occasion lord Inchiquin was voted a present of 1000*l.* by the parliament. About 1657 lord Broghill began to agitate the question of the restoration, which event he was mainly instrumental in bringing about in 1660. He was now created lord Orrery, and advanced to the presidency of Munster, the affairs of which he managed with great prudence till 1668, when, falling into disfavour at court, he was deprived of his commission. In the same year he successfully defended himself on an impeachment before the Commons; and being restored to the favour of the king, returned to his native country, where he died in 1679. The forfeitures consequent on this rebellion affected chiefly the estates of lords Roche and Muskerry.

During the war of the Revolution, Cork was again the theatre of a desultory but sanguinary series of conflicts between the native Irish of the rural districts and the militia of British descent.

The chief sufferers by the forfeitures consequent on the war of the Revolution were Donogh lord Clancarty, Sir Richard Nagle, colonel Barrett, and the viscount Kenmare. The extent of land forfeited was 244,320 acres, valued at 32,133*l.* 12*s.* 6*d.* per annum; or 417,737*l.* 2*s.* 6*d.* at the then rate of purchase. This was by much the most extensive forfeiture in any one county. Among the numerous minor proprietors who suffered confiscation, the name of Hugolin Spencer, a descendant of the poet, occurs.

The antiquities are chiefly military, and comprise some of the finest buildings of the kind in Ireland. The castle of Kanturk, built by Mac Donogh, prince of Duhallow, is a square of 120 feet by 80, and about 70 feet in height. Lohort castle, built in king John's reign, is a massive keep, 80 feet high. Liscarrol castle, of the same date, is an oblong of 120 by 240 feet. Blarney castle, built by Cormack Mac Carthy in 1449, is still a fine ruin, though only one-fourth of the original building is now standing: the walls are 18 feet thick. The other castles still standing in the county are very numerous, and of great historical interest.

The dioceses of Cork, Cloyne, and Ross, with which the county is nearly co-extensive, rank respectively 19th, 25th, and 21st, among the 32 Irish dioceses in point of education The average of educated persons in the three dioceses is 6.8 per cent.

The amount of direct taxation levied by grand jury presentment on this county in 1810 was 66,849*l.* 0*s.* 7*d.*, and in 1829, 72,969*l.* 2*s.* 7*d.*; being on an average of the twenty years included, 65,570*l.* 7*s.* 11½*d.* On a valuation made by order of the grand jury in 1829-30, the rent value has been estimated at 1,135,923*l.* 16*s.* 2*d.* per annum. (Smith's *History of the County of Cork*, Dublin, 1750, and Cork, 1825; Townsend's *Statistical Survey of Cork*, Cork, 1815; Cox's *History of Ireland; Parliamentary Reports and Papers.*)

CORK, a bishop's see in the archdiocese of Cashel, in Ireland. The chapter consists of a dean, chanter, chancellor, treasurer, archdeacon, and twelve prebendaries. This diocese stretches across the central district of the county of Cork, and embraces the county of the city. It extends in length, from east to west, 74 miles, and from north to south 16. It contains 83 parishes, constituting 65 benefices. In 1792 the numbers were, 94 parishes, 49 benefices, and 41 churches. In 1834 the numbers were, churches of the establishment, 58; other places of worship in connexion therewith, 26; Roman Catholic ditto, 73; Presbyterian ditto, 3; other Protestant dissenting ditto, 16. In the latter year the gross population of the diocese was 340,594; of whom there were 35,229 members of the Established Church, 303,984 Roman Catholics, 510 Presbyterians, and 871 other Protestant Dissenters; being in the proportion of 1 Protestant of whatever denomination to 8¼ Roman Catholics nearly. There were at the same time in this diocese 346 schools, educating 24,448 young persons, being in the proportion of 7$\frac{18}{100}$ of the entire population under daily instruction; in which respect Cork stands 19th among the 32 dioceses of Ireland, and is on a par with Dublin. Of the above schools 20 were, in 1834, in connexion with the Board of National Education.

The foundation of this see is ascribed to St. Barr, about the beginning of the seventh century. It became united to Cloyne, about 1464, and so continued till 1586, when, together with Cloyne, it was annexed to the diocese of Ross, and so continued till 1678, when these dioceses were again divided, Cork and Ross going together, and Cloyne separately. By the 3rd and 4th Wm. IV., c. 37, these sees are to be again united, on the united see of Cork and Ross becoming vacant. (Beaufort's *Memoirs of an Ecclesiastical Map of Ireland.*)

CORK, a city, the assize town of the county of Cork, in the province of Munster, in Ireland, situated in the county of the city of Cork, on both sides of the river Lee, four miles from its entrance into Cork harbour. 51° 54′ N. lat., 8° 30′ W. long. Distant from Dublin 124 Irish, or 158 English miles.

The county of the city consists of the city, suburbs, and liberties, and contains 45,000 statute acres, being a borough subject to the city magistrates, and liable to city taxation. There are numerous charters, of which the earliest bears date 26th Henry III., and the latest 31st Geo. II. By charter 10th March, 6th James I., the city and all the lands extending from its walls, for the circuit of three miles on every side, were erected into a separate county, the bounds of which were laid down by commissioners. The suburbs on each side of the island were defined by act 53 Geo. III., c. 3; but since that period, 1813, they have extended considerably.

The school of St. Barr is supposed to have first drawn inhabitants to this neighbourhood. The city was walled in by the Danes in the ninth century, and was afterwards repaired by King John. The situation was on an island of an oval form, round which the river ran in two channels; beyond these were narrow marshes skirting steep banks, which surrounded the basin occupied by the old town on every side. These marshy flats have subsequently been drained and built upon, and the city now spreads over the high ground on both sides of the river. Prior to the reign of Edward IV., it would appear that the suburbs of the old city also had spread over these grounds, as a charter of the second year of that reign recites, 'that inasmuch as the suburbs extending a mile on every part of the city had been destroyed by Irish enemies, the rent of 80 marks a year payable by the townsmen to the crown should be remitted, and the cocket or customs of the city should be granted for the purpose of constructing walls, until the inhabitants should be able to go peaceably one mile outside the same.' During the period alluded to in the account of Cork county, when the Irish had overrun the possessions of the decayed Yorkist nobility, and down even to the time of Elizabeth, the inhabitants of the city lived as if in a state of continual siege, never venturing beyond their walls except in numerous bodies, nor daring to marry out their daughters into the country, 'but contracting one with another among themselves, whereby all the citizens were related in some degree or another.' (Camden.)

About 1620 Cork was counted the fourth city of Ireland, being inferior both to Waterford and Limerick. From its low situation Cork can never be a place of defensive strength. The only severe siege it ever endured was in 1690, when held by Governor Mac Eligott, with six Irish regiments, for James. The siege was conducted by the duke of Marlborough, with whom were the dukes of Wirtemberg and Grafton (natural son of Charles II.), with a force of about 10,000 foot and 1200 horse. The town held out for five days; and after the English had lost a considerable number, among whom was the duke of Grafton, the garrison surrendered as prisoners of war. The city has enlarged rapidly since the beginning of the last century, and continues to extend, although not so rapidly as during the time of the late war which was very beneficial to Cork in a local point of view.

Cork is governed by a common council, consisting of the mayor, two sheriffs, recorder, and as many aldermen as with these shall not exceed the number of twenty-four. A corporate combination which originated about seventy years ago, under the name of the Friendly Club, operates to the unfair exclusion of Roman Catholics. Out of 2665 freemen, there were in 1833 only 73 Roman Catholics. The freemen are exempt from paying tythes. Of the whole number, 1593 were non-residents, of whom the majority had been created by special favour of the Common Council. The average income of the corporation is 6237*l.* per annum, which is rather more than the merely municipal expenditure; but by Grand Jury presentments, and otherwise, a sum of about 54,000*l.* per annum is disposed of at the discretion of the corporate authorities.

The port and harbour of Cork are under the regulation of a Board of Commissioners, acting under 1 Geo. IV., c. 52, the nominees of the corporation. Receipts and expenditure as follows:—

1830	Dr.	7872*l.*	9*s.*	3*d.*	Cr.	8388*l.*	0*s.*	0*d.*
1831		8172	8	2		8015	4	3
1832		6855	3	4		7236	11	2¼

The paving, lighting, and cleansing of the city lie with Wide Street Commissioners, originally appointed by 5th Geo. III., c. 24, modified by subsequent and local acts. The annual expense for lighting was, in 1833, 3200*l.*; and for paving, repairing, widening, &c., of streets, 5600*l*, of which 2800*l.* is defrayed by the county at large. This board is likewise under corporate control. It receives its income by Grand Jury presentments.

The supply of water is regulated by a Pipe Water Company incorporated under several acts, of which the last was 26 Geo. III., c. 38. A fourth part of the shares belong to the corporation. The charge to the inhabitants is two guineas per annum per house. There are no public fountains. Receipts of the company for 1833, 1577*l.* 5*s.* 8*d.*

The Grand Jury which presents for the public expenditure is nominated by the sheriffs: a sum of about 29,000*l.* is annually presented, all of which, with the exception of the income of the Wide Street Board, is disposed of by the Grand Jury. There is no municipal police, nor night watch of any kind. The turnkeys employed in the goal and bridewell, twenty-five in number, are the only force for the preservation of the peace supported by the corporation. The corporation is one of those subject to the 'New Rules' of 25 Ch. II.

The number of the constabulary in the county of the city of Cork on the 1st January, 1836, was—chief constables, 2; constables, 11; sub-constables, 62; horses, 6: expense for 1835, 2632*l.* 6*s.*, whereof 1260*l.* 19*s.* 5*d.* chargeable against the corporation of the city.

The convict establishment at Cork consists of a penitentiary, or convict depôt, at Cork, and a hulk at Cove. In 1834, the number of committals to the depôt was 284, and the expense 1899*l.* 2*s.* 8½*d.*: and the number of committals to the hulk at Cove, 441, and the expense, 2886*l.* 10*s.* 2*d.*

Of the charitable institutions the principal is the Foundling Hospital, originally intended as a workhouse. The Act which founds the institution has a clause permitting the reception of exposed children, and of this advantage has been taken to turn the institution solely to that purpose. In 1833 the number of children at nurse was 1319, and those within the walls 446. All are educated as Protestants. The hospital derives its income from a tax of one shilling per ton on all coals that come into the harbour. This impost is collected to a distance of twelve miles from the city. In 1833 it averaged upwards of 6000*l.* per annum. Skiddy's Almshouse, Bertridge's charity, the Blue Coat Hospital, and Green Coat Hospital, are other charitable foundations under the control of the corporation. Relief is extended from these solely to Protestants. The house of industry is supported by voluntary contributions and city and county Grand Jury presentments. Income in 1833, 4936*l.* 1*s.* 10*d.* Paupers admitted same year, 1850. Attached is a lunatic asylum supported by county and city Grand Jury presentments. Account presented in 1833, 4890*l.* Number of patients, 343. An hospital with 140 beds is attached. There are also two infirmaries and a Fever Hospital; but the accommodation is still far from being sufficient. A sum of 30,000*l.* was, in 1833, bequeathed by a Mr. Lapp for the support of the aged Protestant poor of the city.

The city rental is estimated at 122,000*l.* on an allowance of 25 per cent. under real value. The number of the distressed population is very great. In 1832 it was estimated that of a city population of 86,534, 23,021 were depending on casual employment for subsistence · of these, 6250 were considered to be destitute. Poverty at present prevails to a frightful extent in the suburbs.

The main street which crosses from north to south, perpendicular to the length of the island, is the most antient part of the city. It was formerly divided into north and south by a bridge and castle. The Exchange, a heavy square building, stands on the site of the latter. The old castle and gates which terminated this street have been removed, as also the prisons subsequently built upon their sites. The island was formerly intersected by numerous canals, which have been arched over from time to time, and now form the principal modern streets. The Grand Parade was thus formed in 1780; Patrick Street, in like manner, in 1783; and Nile Street in 1795. The South Mall, the best street in Cork, and Nelson's Place, had likewise a similar origin. The insular appearance of the central part of the city is thus in great measure removed. Cork now covers a large extent of high ground on both banks of the Lee, as well as the low ground which was formerly occupied by marshes between. The greater part of these marshes were drained about 1720—30. The parish of St. Paul was formed of these marshes, and the church of St. Paul built on the reclaimed land in 1723. About the same time the cathedral, which had suffered in the late siege, was rebuilt, as also Christchurch, for a like reason. St. Anne's Shandon was rebuilt in 1722, and St. Peter's in 1782. The appearance of the city is materially affected by an unsightly variety of colours, arising from the different sorts of building materials employed. One side of the steeple of St. Ann's, or Upper Shandon Church, has been built of red sandstone, and the other three of dark limestone. New quays are being constructed, which add much to the convenience and beauty of the city. Mr. Inglis calls Cork 'a very fine city, surpassed by few in the excellence or width of its streets, and deficient only in the architectural beauty of its public buildings.'

Three large Roman Catholic chapels of cut stone are building; and the court-house, now in hand, is to cost 16,000*l.*

Since the termination of the late war, the trade of Cork has, in some measure, changed its character. Owing to the cessation of government contracts there is no longer the same field for great mercantile houses; the number of minor dealers has increased proportionately. The carriage trade from England is at present very brisk from the smaller traders supplying themselves direct from London or Bristol. The chief import trade is that of timber, of which the annual average is 15,000 tons. The chief export trade is in bacon, butter, corn, live stock, and provisions. Cork butter holds a very high character in the market, chiefly owing, it is said, to the superior cooperage of the casks. The export of bacon and live-stock is on the increase. The manufacture of glass, metal castings, and iron-work, is carried on briskly. Leather is manufactured to the value of 100,000*l.* per annum. A woollen manufacture gives employment to about 200 persons. There are numerous and very extensive distilleries and breweries, and a large manufacture of flour and meal.

Merchant vessels unload at Passage, about six miles from the city, from which goods are transported in lighters of about thirty tons to the quays. The amount of Customs collected in the district of Cork for the year 1835 was 216,446*l.* 1*s.* 7*d.*; and of Excise duty for the same district, 252,452*l.* 14*s.* 5½*d.*

The number of stamps issued to newspapers in Cork in 1835, was—

Cork Constitution . .	150,675
Cork Evening Herald .	58,350
Cork Southern Reporter .	189,700
People's Press	12,628
Mercantile Chronicle .	30,001

TABLE OF POPULATION.

Date.	How calculated.	Houses.	Families.	Families chiefly employed in agriculture.	Families chiefly employed in trade, manufactures, and handicraft.	Families not included in preceding classes.	Males.	Females.	Total.
1792	Estimated by Dr. Beaufort.	8,100	No return.	No return.	No return.	No return.	No return.	No return.	73,000
1813	Under Act of 1812.	7,652*	,,	,,	,,	,,	,,	,,	64,394*
1821	Under Act.	11,180	21,528	,,	,,	,,	46,787	53,871	100,658
1831	Under Act.	11,986	19,951	1,967	10,989	6,995	48,312	58,704	107,016

In 1834 there were in the nineteen parishes comprehended, wholly or in part, within the county of the city of Cork, 139 schools, educating 5935 males and 4489 females; total children under instruction, 10,424. Of these schools, 26 give gratuitous instruction; several of these are under the management of religious sects. The Cork library, which was founded in 1807, owes its origin to the exertions of the Rev. Doctor Hincks, and formerly enjoyed an annual parliamentary grant. There is also a Mechanics' Institute, with a school for 120 children.

(Smith's *History of the County of Cork;* Inglis's *Ireland;* Croker's *Sketches in the South of Ireland*, London, 1823; *Parliamentary Reports and Papers.*)

CORMORANT. [PELECANIDÆ.]

CORN-TRADE. From a very early period of our history the corn-trade of the country has been the subject of legislative interference and restriction. At first, and while the kingdom was thinly peopled, it was deemed good policy, in order to insure a sufficient supply of food for its inhabitants, to forbid the exportation of corn, while its importation was freely permitted; but, in later times, during which the population has increased with a rapidity rarely seen in long-settled countries, the policy of the legislature has been altogether different. The object has been to stimulate home production by prohibiting importation, or by restricting it in such a degree as to secure to the native farmers a monopoly of the home market. It needs no argument now to show that the policy of our ancestors was ill calculated to insure the end which they had in view, that of providing a sufficiency of cheap food for the common people; how far the opposite policy has been found to answer the avowed object of its advocates it is not our present intention to inquire. That object professes to have for its ultimate aim the securing of a constant sufficiency of a principal article of food, independent of all foreign countries, by means which shall insure to the home grower an adequate return for the capital and skill employed.

The earliest statute extant upon this subject is the 34th Edw. III., c. 20, passed in 1360-61, by which it is enacted, that 'the passage of corn shall be prohibited in all the ports of England, so that none have licence nor warrant to pass with such corn in anywise, unless it be to Calais or Gascoigne, or to other special places which it behoveth that the king cause to be furnished with the corn of England, and that at his own ordinance and licence.'

The phraseology of this act has led to the supposition that exportation was previously illegal, except with a licence from the king, and that the object in framing this law was to define and restrict the royal prerogative in this particular. In 1394 another act was passed (17 Richard II., c. 7) of a somewhat contrary tendency. By this new law licence is granted by the king—such are the terms of the act—'to all his liege people of his realm of England, to ship and carry corn out of the said realm, to what parts that please them, except to his enemies, paying the subsidies and devoirs thereof due, notwithstanding any ordinance, proclamation, or any defence (prohibition) made before this time to the contrary; nevertheless he will that his council may restrain the said passage when they shall think best for the profit of the realm.' This act was confirmed in 1425 by the act 4 Henry VI., c. 5. Eleven years later it was thought necessary to fix a limit in regard to price at which the liberty to export should cease, and that limit was declared (15 Henry VI., c. 2) to be 6*s.* 8*d.* per quarter for wheat and 3*s.* per quarter for barley. This act was passed for only a limited time, and had expired, when, in 1441, on the meeting of parliament, it was renewed in the following terms: 'Our sovereign lord the king, forasmuch as this statute is not now in his force, and that many counties adjoining to the sea may not sell the substance of their corn but by carriage and bringing by the sea, hath ordained, that the statute and ordinance aforesaid, now expired, shall begin to hold his force at the Feast of the Nativity of our Lady next ensuing, and shall endure from thence till the parliament next to be holden after the same feast, so that a parliament be holden within ten years next ensuing after the first beginning of this present parliament, and if so that there be no parliament holden within the same ten years, that then it shall continue and endure till the end of the same ten years:' in 1444 this act was 'ordained to be perpetual, and stand in his force for ever' (23 Henry VI., c. 5).

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* Return incomplete.

The limited permission thus given to export their produce must be attributed to the increasing power of the land owners; and it may be taken as evidence that the cost of production in this kingdom was at least equally moderate with the cost in neighbouring countries, that in all this time no attempt was made to prohibit or restrict the importation of the produce of other countries. Such a restriction was however imposed in 1463 by the statute 3 Edward IV., c. 2, which on the plea that 'the labourers and occupiers of husbandry within this realm of England be daily grievously endamaged by bringing of corn out of other lands and parts into this realm of England, when corn of the growing of this realm is at a low price,' enacts that 'no person, from the feast of Saint John the Baptist next ensuing, shall bring into England any wheat, rye, or barley, not of English or Irish growth, unless the price of wheat shall exceed 6*s.* 8*d.* the quarter, that of rye 4*s.*, and that of barley 3*s.*, on pain of forfeiture of the grain.' The statutes here mentioned, by which the prices were established at which the importation and exportation of corn were respectively to cease, continued in force until 1534, when a new act (25 Henry VIII., c. 2) prohibits, except by licence from the crown, the exportation of grain, the reason for which alteration is thus quaintly expressed in the preamble to the act: 'Forasmuch as dearth, scarcity, good, cheap, and plenty of cheese, butter, capons, hens, and other victuals necessary for men's sustenance, riseth and chanceth of so many and divers occasions that it is very hard and difficile to put any certain prices to any such things, no person or persons, unless it be by licence under the king's great seal, from henceforth shall carry or convey any corn, beeves, muttons, veals, porks, or any other of the above said victuals to any parts beyond the sea, except only for the victualling the towns of Calais, Guinnes, and the marches of the same, and except for victualling of ships passing the seas.' The civil wars which preceded the accession of Henry VII. had caused much land to be thrown out of cultivation, and the act of 1534 was probably occasioned by the consequent diminution of produce, but this attempt failed, as it necessarily must, to increase the supply of grain, which effect would best have been brought about by a removal of all restriction. Such a course would have ill agreed with the imperfect ideas upon such subjects which then prevailed; but as the evil was increased during the next 17 years, and it was thought necessary to apply some remedy, the statute 5 and 6 Edward VI., c. 5, was then passed. This statute is entitled, 'An act for the maintenance and increase of tillage and corn,' and it enacts that thenceforth at least as much land should be tilled in every parish as had been under the plough at any time since the accession of Henry VIII., under a penalty, to be exacted from the parish, of 5*s.* for every acre that should be deficient. The general permission to export grain, which had been taken away in 1534, was restored in 1554 (1 and 2 Philip and Mary, c. 5) whenever the prices were at or under 6*s.* 8*d.* per quarter for wheat, 4*s.* for rye, and 3*s.* for barley. The preamble to this act makes it appear that it was passed, not in consequence of the prevalence of any sounder views of public economy, but because it was found impossible to prevent exportation, and it was thought that better success would attend the regulation than the prohibition of the trade. In 1562 an alteration in the law was made, by enlarging the limits of the prices which governed exportation, and these were fixed at 10*s.* per quarter for wheat, 8*s.* for rye, and 6*s.* 8*d.* for barley; and nine years later it was enacted (13 Eliz., c. 13) that corn might be exported on payment of certain specified duties at all times when no proclamation had been issued to the contrary. The law of 1463 had all this time been in existence, prohibiting importation while the prices of wheat, rye, and barley should be under 6*s.* 8*d.*, 4*s.*, and 3*s.* respectively; but the prices that had for some time prevailed rendered this law inoperative, and the law of 13 Elizabeth therefore gave virtual freedom to the trade in corn.

In the succeeding reigns and up to that of William and Mary this system was continued, but accompanied by various modifications as regards the limiting prices and the rates of duty chargeable. The prices at which export was permitted were from time to time enlarged, until, in 1670, wheat might be shipped away at any time when the price did not exceed 53*s.* 4*d.* per quarter. At the same time import duties were imposed, so heavy as to amount to a prohibition, the object of these regulations being to keep the price of wheat always as high as 53*s.* 4*d.* per quarter for the advantage of the land-owners. Not satisfied, however, with this degree of favour, this powerful class succeeded in 1689 in procuring an act (1 William and Mary, c. 12) whereby they secured the payment of a bounty amounting to 5*s.* per quarter on the exportation of wheat when the price did not exceed 48*s.* per quarter; and bounties according to the same scale were granted for the export of barley and other grain.

Not content with interposing obstacles to a free trade in corn with other countries, our ancestors thought fit to place restrictions upon that trade within the kingdom. It was imagined that if the consumers could be brought to deal immediately with the growers, the profit of intermediate dealers would be saved. Under this impression, both parties looked unfavourably upon those dealers, the sellers imagining that they could obtain better prices and the buyers that they could purchase cheaper but for the middlemen, while the common people were easily led to believe that the dearths which then frequently occurred were attributable to the practices of the dealers in buying up corn and withdrawing it from the market. An act was passed, declaring it to be an offence to buy corn in one market with intent to sell it again in another, and persons guilty of this offence, to which the name of *engrossing* was given, were punished with imprisonment and the pillory. By a statute of Elizabeth, no person was permitted to convey corn from one part of the kingdom to another, unless he had a licence for the purpose, the right of granting or withholding which was confided to the magistrates in quarter sessions. These restrictions were modified in 1624, and by the act 15 Charles II., c. 7, the engrossing of corn was made legal, whenever the price of wheat did not exceed 48*s.* per quarter. So recently as the year 1800, when the price of wheat exceeded 100*s.* per quarter, engrossing however has been held to be an offence at common law, and a corn-dealer was convicted of it, but was not brought up for judgment.

The act of 1689 was modified in 1773, by reducing to 44*s.* per quarter the price at which the payment of bounty was to cease, and in 1815 the granting of bounty was discontinued by law. In fact no bounty could have been claimed at any time after 1792, in which particular year the average price for the whole year was below the price fixed in 1773. At that time (1773) importation was permitted upon payment of the nominal duty of 6*d.* per quarter whenever the price should be above 48*s.* This permission was considered injurious to their interests by the landowners, who, on the plea that the country might become dependent upon foreign countries for its supply of food, succeeded in 1791 in obtaining an act whereby the price at which importation was allowed at 6*d.* per quarter was raised to 54*s.*, a duty of 2*s.* 6*d.* was imposed when the price was between 50*s.* and 54*s.*, and 24*s.* 3*d.* per quarter was charged when the price was below 50*s.* A new law, passed in 1804, shifted the price at which the prohibitory duty of 24*s.* 3*d.* was charged to 63*s.*; between that price and 66*s.* the duty was 2*s.* 6*d.*; and above 66*s.*, only 6*d.* per quarter. Under the act of 1791 the maritime counties of England were divided into twelve districts, and importation and exportation were regulated in each district by their respective prices, but in 1804 this plan was altered, and the aggregate average of the twelve districts was taken as the measure for regulating importation and exportation to and from the kingdom.

A bill for raising the duties on importation, which was brought into the House of Commons in 1814, met with so much opposition that it was abandoned; but in the following year an act was passed, after great opposition, and exciting great clamour on the part of the people, allowing the free importation of corn from foreign countries, in order to be warehoused or re-exported, but forbidding the importation for consumption, unless the average prices were, for wheat 80*s.*; for rye, pease and beans, 53*s.*; for barley 40*s.* and for oats 26*s.* Every description of corn might be brought for consumption from the British colonies, when the prices were, for wheat 67*s.*, rye, peas, and beans 44*s.*, barley 33*s.*, and oats 22*s.* The deficient harvests of 1816 and 1817 raised the prices above these limits, and so much grain was imported free of duty that a considerable surplus was left for future and more abundant years. One of these years of abundance occurred in 1822, and during the next twelve months the prices of grain fell below what they had been in any year since 1792. It was expected, on the part of the land-owners, that the effect of the act of 1815 would have been to keep the price of wheat steady at or about 80*s.* per quarter, but this expectation was so far from being realised, that, if we except the year of scarcity already mentioned, the average price of the period which elapsed before the system of prohibition was exchanged for that of a graduated duty in 1829, was only 58*s.* 5*d.* per quarter In the mean time, by an act passed in 1823, the law of 1815 was modified so as to allow of importation whenever the prices were, for wheat 70*s.*, for rye, peas, and beans 46*s.*, for barley 35*s.*, and for oats 25*s.* per quarter, but a duty of 17*s.* a quarter for wheat (and other rates in proportion for other grain) was to be payable during the first three months of importation, and 12*s.*, &c. thereafter· the prices of corn were never such during its continuance as to bring this act into operation. In 1825 the importation of wheat from the English colonies in North America was legalised upon payment of a duty of 5*s.* per quarter, without reference to the price in the English market. In 1826, a long continued drought caused great apprehensions concerning the coming harvests, and in order to prevent the opening of the ports to fresh importations, and the consequent probable admission of a quantity of corn beyond the actual wants of the country, by which prices would have been affected perhaps for years after, permission was given to the government to admit by proclamation 500,000 quarters of foreign wheat then warehoused in the kingdom.

The inconvenience of the system of alternate prohibition and unlimited importation was at length fully recognised by all parties, and in 1829 the act was passed (9 Geo. IV. c. 60) by which the trade in corn has since been regulated The principle of this act is the constant freedom of importation upon the payment of duties fluctuating according to the average price of grain, decreasing as the price advances, and increasing as the price falls. The following table exhibits the scale of duties graduated according to the average prices of the different kinds of grain.

WHEAT.

When the price shall be—	per qr.	
62*s.* and under 63*s.* per qr. .	24*s.*	8*d.*
63 ,, 64 ,,	23	8
64 ,, 65 ,,	22	8
65 ,, 66 ,,	21	8
66 ,, 67 ,,	20	8
67 ,, 68 ,,	18	8
68 ,, 69 ,,	16	8
69 ,, 70 ,,	13	8
70 ,, 71 ,,	10	8
71 ,, 72 ,,	6	8
72 ,, 73 ,,	2	0
above 73*s.* . . . ,	1	0
under 62*s.* and not under 61*s.*	25	8

and in respect of each integral shilling, or any part of such integral shilling, by which such price shall be under 61*s.*, such duty shall be increased by 1

OATS.

When the price shall be 25*s.* and under 26*s.* per qr., 9*s.* 3*d.* duty; and in respect of every integral shilling by which such price shall be above 25*s.*, such duty shall be decreased by 1*s.* 6*d.* until such price shall be 31*s.* Whenever the price shall be above 31*s.*, the duty shall be 1*s.* Whenever such price shall be under 25*s.* and not under 24*s.*, 10*s.* 9*d.*; and in respect of each integral shilling, or any part of each integral shilling, by which such price shall be under 24*s.*, the duty shall be increased by 1*s.* 6*d*

BARLEY.

When the price shall be 33*s.* and under 34*s.* per quarter, 12*s.* 4*d.* per quarter duty; and in respect of every integral shilling by which such price shall be above 33*s.*, such duty shall be decreased by 1*s.* 6*d.*, until such price shall be 41*s.*, and whenever the price shall be at or above 41*s.*, the duty shall be 1*s.* per quarter. Whenever the price shall be under 33*s.* and not under 32*s.*, 13*s.* 10*d.*; and in respect of each integral shilling, or any part of each integral shilling, by which such price shall be under 32*s.*, the duty shall be increased by 1*s.* 6*d.* per quarter.

RYE, PEASE, AND BEANS.

When the price shall be 36*s.* and under 37*s.* per quarter, 15*s.* 6*d.* per quarter, and in respect of every integral shilling by which the price shall be above 36*s.*, the duty shall be decreased by 1*s.* 6*d.* until such price shall be 46*s* When the price shall be at or above 46*s.*, 1*s.* When the price shall be under 36*s.* and not under 35*s.* per quarter, 16*s.* 9*d.*; and in respect of each integral shilling, or any part of each integral shilling, by which such price shall be under 35*s.*, the duty shall be increased by 1*s.* 6*d.* per quarter.

If the produce of and imported from any British possession in North America, or elsewhere out of Europe, the duties are as under:—

Wheat, until the average price shall be 67*s.* per quarter	5*s.*	0*d.*
„ when the average price shall be above 67*s.*	0	6
Barley, until the average price shall be 34*s.* per quarter	2	6
„ when „ at or above 34*s.*	0	6
Oats, until the average price shall be 25*s.* per quarter	2	0
„ when „ at or above 25*s.*	0	6
Rye, pease and beans—		
„ until the average price shall be 41*s.* per qr.	3	0
„ when „ at or above 41*s.*	0	6

Meal or flour, the produce of each different kind of grain, is admitted at rates of duty equivalent to those chargeable on each kind of grain respectively. In calculating such duties the following quantities by weight of meal or flour are deemed to be equivalent to one quarter of grain, viz. Wheat-meal or flour, 392 lbs.; barley-meal, bean-meal, and meal of maize or Indian corn, 384 lbs.; rye-meal, 424 lbs.; and oatmeal, 176 lbs.

Having thus offered a brief sketch of the laws by which the trade in corn has been and is regulated in this country, it remains to be shown what has been the course and extent of that trade during the period for which authentic records exist.

Various attempts have been made at different times to estimate the consumption of this kind of food within the kingdom, but in the absence of any machinery for that purpose, such estimates must always partake of a great degree of uncertainty.

The following estimate of the produce of England about the close of the seventeenth century, was made by Mr. Geoffrey King, whose statistical calculations have usually been received with much confidence. At that time wheat formed a much smaller proportion of the food of the English people than it does at present.

Wheat . . .	14,000,000	bushels.
Rye	10,000,000	
Barley . . .	27,000,000	
Oats . . .	16,000,000	
Pease . . .	7,000,000	
Beans . . .	4,000,000	
Vetches . .	1,000,000	
	79,000,000	in all.

The quantities here assumed were not all consumed within the kingdom, a part being exported under the Bounty Act, as hereafter stated. Mr. Charles Smith, the author of the celebrated 'Tracts on the Corn Trade,' estimated that the six millions of inhabitants, then supposed to be living in England and Wales, consumed annually 3,750,000 quarters of wheat, 1,016,125 barley, 999,000 rye, 1,791,125 oats—and that there were besides used annually within the kingdom—

90,000	quarters	wheat—distilled, and made into starch
3,300,000	„	barley—made into beer;
117,000	„	ditto—applied to other uses;
2,461,500	„	oats—used for horses, &c.
11,000	„	rye—used by tanners, and for fattening hogs;
90,000	„	beans and pease—for negroes, horses, and hogs;
134,000	„	pease—for sailors, &c.;
90,000	„	rape and other seed—for obtaining oil.

The aggregate of these quantities makes up nearly 50 per cent. more than the estimate of Mr. King, without making any allowance for the shipments to foreign countries, which, at that time, averaged about 1,500,000 bushels annually, and not taking into account the quantity required for seed, which must have amounted to about as much as the exports.

Dr. Colquhoun estimated the average annual consumption of the United Kingdom in 1812, as follows:—

Species of Grain.	Population using each kind of grain.	Average quantity.	Consumed by man.	Consumed by animals.	Used in beer and spirits.	Used in various manufactures.	Total number of quarters.
		Bushels.	Quarters.	Quarters.	Quarters.	Quarters.	
Wheat	9,000,000	8	9,000,000	..	..	170,000	9,170,000
Barley	1,500,000	10	1,875,000	210,000	4,250,000	..	6,335,000
Oats	4,500,000	12	6,750,000	10,200,000	..	..	16,950,000
Rye	500,000	10	625,000	59,000	..	1,000	685,000
Beans and Pease	500,000	8	500,000	1,360,000	..	..	1,860,000
	16,000,000		18,750,000	11,829,000	4,250,000	171,000	35,000,000

No allowance for seed is included in this estimate, which, besides, was made when the population was less than two thirds of its present amount. If we allow that four millions of the population in Ireland are fed without having recourse to corn, we still have more than twenty-two millions of grain-consuming people. Taking those circumstances into consideration, it will perhaps not be beyond the truth if we estimate the quantity of grain actually used in the United Kingdom at about fifty-five millions of quarters annually. The most careful estimate that has yet been made concerning the employment of the soil in the United Kingdom gives rather more than nineteen millions of statute acres for arable and garden land; and if we assume that the produce of all kinds of grain, taking one kind with another, amounts to three quarters to the acre, which is known to be very near to the actual produce, we arrive by that mode of computation at a result which agrees substantially with the estimate already offered.

The circumstance to which allusion has just been made, that half the population of Ireland do not employ grain for their subsistence, leaves a considerable quantity of the produce of that part of the kingdom for use in England. The greater part of Irish grain thus brought to other parts of the kingdom consists of oats; the quantity of wheat is also considerable. The shipments have increased very materially since the Union up to 1828, but since that time have been nearly stationary, as will be seen from the following statement, which includes all sorts of grain.

	Quarters.		Quarters.		Quarters.
1801	900	1813	977,164	1825	2,203,962
1802	467,067	1814	812,805	1826	1,692,189
1803	343,548	1815	821,192	1827	1,829,743
1804	316,958	1816	873,865	1828	2,826,135
1805	306,923	1817	699,809	1829	2,305,806
1806	466,947	1818	1,207,851	1830	2,212,729
1807	463,406	1819	967,861	1831	2,419,643
1808	656,770	1820	1,417,120	1832	2,605,734
1809	933,658	1821	1,822,816	1833	2,736,281
1810	632,849	1822	1,063,089	1834	2,742,586
1811	430,189	1823	1,528,153	1835	2,679,342
1812	600,268	1824	1,634,024		

The proportions of different kinds of grain in the last three years of the series were as follows :—

	1833.	1834.	1835.
Wheat	844,201	779,504	661,776
Barley	107,519	221,578	166,503
Rye	167	982	615
Oats	1,762,519	1,719,501	1,822,767
Indian corn	117	75	——
Beans	19,113	18,770	24,234
Pease	2,645	2,176	3,447
	2,736,281	2,742,586	2,679,342

Until the breaking out of the war of the French Revolution, this country may be said to have been an exporting country for corn. In the ten years from 1760 to 1769 there were only two years in which the quantity of wheat exported did not exceed the quantity imported; the aggregate average price during those ten years being 45*s.* 10*d.* per quarter; or excluding the two years of importation (1767 and 8), 41*s.* 9*d.* per quarter. At these prices the export was not much stimulated by the bounty, the whole excess of the quantity sent abroad being only 1,384,561 quarters. In the next decennary period, five were years of export and five of import, the average prices of each division being 40*s.* 6*d.* and 49*s.* 5*d.* respectively. In the next period of the like duration, viz., 1780 to 1789, six were years of export and four of import, the average prices being 44*s.* 5*d.* for the years of exportation, and 47*s.* 10*d.* for the other years. Of the next decennary period, 1792, the last year of peace, was likewise the last year of exportation; if that year, when the average price was 41*s.* 9*d.*, be excluded, the average price of the period was 57*s.* 6*d.* per quarter, and the importation amounted to 3½ millions of quarters. The importations of wheat from foreign countries, including our North American colonies, in each year from 1800 to 1835 inclusive, and the average price according to the London Gazette, have been as follows :—

	Quarters.				Quarters.		
1800	1,242,507	110*s.*	5*d.*	1818	1,503,518	83	8
1801	1,396,359	115	11	1819	122,133	72	3
1802	498,359	67	9	1820	34,274	65	10
1803	297,145	57	1	1821	2	54	5
1804	398,067	60	5	1822	..	43	3
1805	842,879	87	1	1823	12,137	51	9
1806	280,776	76	9	1824	15,777	62	0
1807	379,833	73	1	1825	525,231	66	6
1808	..	78	11	1826	315,892	56	11
1809	424,709	94	5	1827	572,733	56	9
1810	1,491,341	103	3	1828	842,050	60	5
1811	238,366	92	5	1829	1,364,220	66	3
1812	244,385	122	8	1830	1,701,885	64	3
1813	425,559	106	6	1831	1,491,631	66	4
1814	681,333	72	1	1832	325,435	58	8
1815	..	63	8	1833	82,346	52	11
1816	225,263	76	2	1834	64,653	46	2
1817	1,020,949	94	0	1835	29,483	39	4

It was one principal object of the framers of the law of 1829 to prevent fluctuations in the prices of English grain. How far that object has been attained will be seen by the following statement of the highest and lowest prices that have occurred in each of the years since elapsed, and the per-centage difference between the same, calculated upon the lowest price of the year.

	Highest.		Lowest.		Per-centage fluctuation.
	s.	*d.*	*s.*	*d.*	
1829	75	3	56	3	33¾
1830	72	11	56	1	30
1831	73	5	60	5	21½
1832	63	5	52	5	20¾
1833	55	5	49	10	11¼
1834	49	6	41	5	19½
1835	42	10	36	8	17

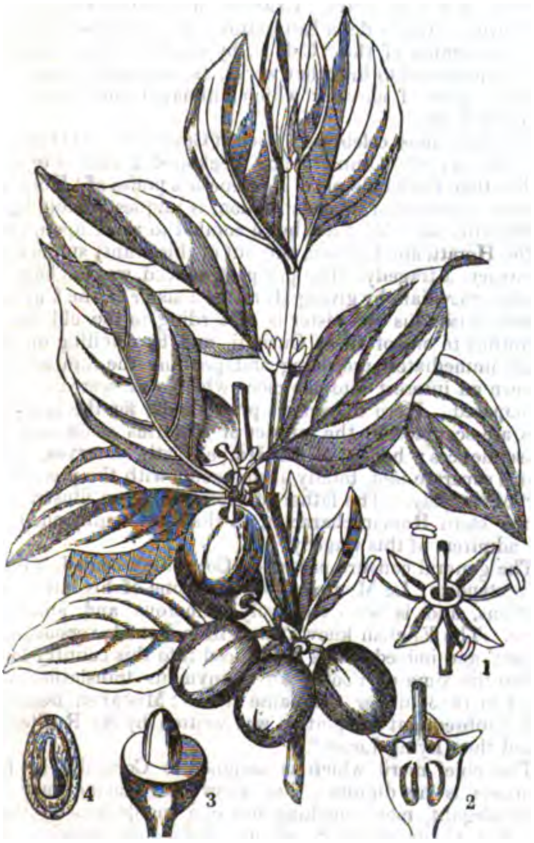
The fluctuation during the whole period of seven years is thus seen to have exceeded 100 per cent. if calculated upon the lowest price.

The principal supplies of foreign corn to Great Britain are drawn from Danzig, Hamburg, Rostock, and the ports of Russia on the Baltic. The shipments from Danzig are of the produce of Poland, and are brought down the Vistula on rafts to the port of shipment. The permission to import from British colonies at a low rate of duty has not occasioned the shipment of any considerable quantity. There is reason for believing that the produce of our North American colonies is not usually more than enough, if indeed it be enough, for their own consumption, and that in every case where corn has been shipped thence for England, at least an equal quantity has been procured from the United States to supply its place. During the last one or two years this trade has been interrupted by the high prices in the United States, and the shipments to Europe from British America have consequently nearly ceased.

CORNA'CEÆ, a small natural order of polypetalous exogens, recently cut off from Caprifoliaceæ, to which they were formerly referred. They consist principally of shrubs, very rarely of herbaceous plants, having opposite strongly-veined leaves without stipules, an inferior ovary, in each of whose cells is one pendulous ovule, four valvate petals, four stamens alternating with them, and a drupaceous fruit with two cells; the embryo lies in some fleshy albumen.

Many of the species are cultivated in European gardens, especially Cornus mas, or cornel-tree, Cornus alba, sanguinea, and sericea, called dogwood, together with Benthamia fragifera. They are valued either for their bright red shoots, which in the winter are highly ornamental, or for their richly-coloured fruit. Benthamia fragifera, in particular, has its drupes collected in roundish strawberry-like heads, which have a beautiful effect in the south-west of England, whither it has been some years introduced from the Himalaya Mountains. The bracts of some species of this order are very large, and resemble petals, and being white, they are a gay substitute for the flowers themselves, which are small and inconspicuous. This is particularly the case with Cornus herbacea and florida, and Benthamia fragifera. Medicinally, Cornaceous plants are of great importance. The American physicians esteem the bark of Cornus florida and sericea equal to Cinchona as a febrifuge.

Formerly the Cornus mas used to be cultivated in gardens for the sake of its fruit, which were called cornelian cherries. It is a deciduous tree, with clusters of small starry yellow flowers appearing in the spring before the leaves. The leaves are ovate-lanceolate, acute, wavy, and of a dull greyish green. The fruit consists of oblong drupes of a red or occasionally a yellow colour; they are excessively austere before ripe, but eventually *blet* like medlars, and then become eatable.



[Cornus mas.]

1, an expanded flower, with the petals and stamens; 2, an ovary cut through vertically, showing a cup-like disk surrounding the base of the style, and the pendulous ovules; 3, a fruit cut so as to show the stone; 4, a vertical section of the stone, exhibiting the embryo and albumen.

CORNA'RO, LUIGI, or LEWIS, a Venetian nobleman, celebrated for the successful care he took of his health, by means of diet. He was originally of a weak constitution, and by the time he had attained mature manhood his intemperate indulgence in eating, drinking, and other pleasures, had brought on so many disorders that life was a burden to him. He informs us, that from his thirty-fifth year to his fortieth, he spent his nights and days in almost unremitted suffering. Having tried all their other remedies in vain, his physicians earnestly recommended a more temperate course of life, and when he was forty he began gradually to diminish the quantity of his food, and to eat and drink nothing but what nature required. At first he found this severe regimen very disagreeable, and he confesses that he did occasionally relapse to 'the flesh-pots of Egypt.' But as each of these relapses brought back his old symptoms, he soon exerted all his resolution, and by a spare and simple diet became a hale man within a year. From temperance he proceeded to abstemiousness, until at last the yolk of an egg was often considered sufficient for a meal. His health and spirits kept improving all the while, and as for enjoyment in eating, he says he brought himself to relish dry bread much more than he had ever done the most exquisite dainties of the table. At the same time he carefully avoided heat and cold, over-fatigue, late hours, sexual excesses, and all violent passions of the mind, having fully ascertained that nothing is more destructive of health and longevity than an indulgence in ambition, envy, hatred, and the like. Melancholy was to be equally avoided, but from this depressing passion his light food and peaceful slumbers kept him wholly free. He recommended, by practice, exercise, riding on horseback, the sports of the field, and those gentle excitements derivable from fine scenery in the country, the contemplation of architectural and other works of art in towns and cities, and the hearing and playing of music.

He records of himself, that when he was a very old man he used often to sing with his grandchildren, and that too with a voice louder and clearer than when he was a young man.

When he was seventy years old he suffered a dreadful accident, by which his head and body were battered, and a leg and arm dislocated. Considering his advanced age, the physicians thought these injuries must speedily prove fatal, but after his limbs had been set, he recovered under the slightest medical treatment, and without experiencing any fever. Hence he inferred that a life of strict temperance is a safeguard against the ill effects that generally follow such accidents. When he was about seventy-eight, the quantity of nourishment he took in the twenty-four hours was, of bread, light meat, yolk of egg, and soup, twelve ounces in all; of wine, fourteen ounces; and these were portioned out into four separate meals. By the advice of his medical friends he then added two ounces to his solid food, and two ounces to his wine; but this trifling increase was soon given over, as it destroyed his ease and vivacity, and made him peevish and melancholy. In his eighty-third year he wrote his treatise 'Of the Advantages of a Temperate Life.' He subsequently added three other discourses on the same subject, the fourth and last being included in a letter to Barbaro, the patriarch of Aquileia, to whom he states, that though at the age of ninety-five, he is still in possession of health, vigour, and the perfect use of all his faculties.

Cornaro died at Padua in 1566, when, according to the best authorities, he was ninety-eight years old. His work was very frequently published in Italy, both in the vernacular tongue and in Latin. It has been translated into all the civilized languages of Europe, and was once a most popular book. There are several English translations of it, the best being one which bears the date of 1779. Addison praises the original work in the 'Spectator.' 'This treatise,' he says, 'has been taken notice of by several eminent authors, and is written with such a spirit of cheerfulness, religion, and good sense, as are the natural concomitants of temperance and sobriety. The mixture of the old man in it is rather a recommendation than a discredit to it.' Cornaro's system has had many followers. The best authenticated case we know of its being rigorously and successfully pursued in England is that of Thomas Wood, a miller of Billericay in Essex, to whom a neighbouring clergyman lent the 'Life of Cornaro.' (*Medical Transactions of the College of Physicians.*) The old Venetian does not insist on such extreme abstinence as he practised—both the quality and the quantity of food, he says, ought to depend on the constitution; but he is probably right in hinting that men of all constitutions shorten their lives and weaken their enjoyments by over-eating and drinking.

CO'RNEA. [EYE.]

CORNEILLE, PIERRE, commonly called the father of the French drama; not that he was really the earliest of the French dramatists, for he was preceded by Jodelet, Garnier, and many more, but because he so far excelled his predecessors, that they are now forgotten, while he remains one of the French classics. He was born in the year 1606

Rouen, where his father was an advocate. Pierre himself was destined for the bar, and had begun to practise in that profession, in which, however, he had but little success. Having been taken by one of his friends to see a lady of whom the latter was enamoured, he fell violently in love with her himself, an incident which furnished him with the plot of his first comedy *Milete*, produced in 1629, which was followed by the dramas of *Clitandre*, *La Veuve*, *La Galérie du Palais*, and *La Place Royale*, all produced between that time and the year 1636. It appears that Cardinal Richelieu then aspired to be the grand arbiter in matters of dramatic taste. He sketched the plan of a comedy, with which Corneille, although a poet patronized by the Cardinal, had the hardihood to find fault, and this produced a lasting hostility on the part of the priest-prime-minister against the dramatist.

In 1636 Corneille's fame rose at once to its height. M. Chalon had recommended him to study the Spanish dramatists, particularly Guillen de Castro; and it is on the 'Cid' of this author that the celebrated Cid of Corneille was principally founded. This piece delighted the Parisians to enthusiasm; they had seen nothing equal to it, and they looked on it as a complete miracle. The author had before exhibited some tragic power in an earlier work called 'Medée,' but it is not till the production of the Cid that we must look on him as 'le grand Corneille.'

The French Academy, which was founded by Richelieu, was by no means disposed to share the general enthusiasm. They (or rather Chapelain) wrote an elaborate critique on the Cid, in which they ventured to point out some defects, while they allowed the poet genius of the highest order, and rather found fault with the subject of the drama than Corneille's manner of treating it. This critique is in most editions of Corneille's works, affixed to the tragedy of the Cid, under the title of 'Sentimens de l'Académie Françoise sur la Tragi-comédie du Cid.'

Corneille felt himself hurt by an imputation cast upon his inventive powers; it was hinted that he borrowed his plot from the Spanish, because he had not imagination enough to contrive a new one. He long sought for a subject which should silence these aspersions of his enemies, and at last turned his attention to Roman history, from which he drew the plots of his tragedies 'Horace' and 'Cinna,' both produced in 1639. The former fully proves his ingenuity in moulding a complicated story out of scanty materials.

These were followed by 'Polyeucte,' founded on the history of the martyr of that name, which by some is reckoned his chef-d'œuvre. 'La Mort de Pompée,' and 'Le Menteur' (an adaptation of the Spanish comedy 'La Sospechosa Verdad') succeeded, and were followed by a train of pieces with varying success till the year 1653, when the tragedy of 'Pertharite' was produced, and was decidedly unsuccessful. This misfortune disgusted Corneille for a time with the stage, and he turned his attention to other kinds of poetry, and began to versify Thomas à Kempis, 'De Imitatione Christi.' Six years wore off his disgust, and he again turned to the drama: the success of 'Œdipe,' produced in 1659, encouraged him to go on. He even turned his attention to opera writing, and the 'Toison d'Or' remains a specimen of what he has done in that species of composition. The success of this piece was decided, but it was only the flame of an expiring lamp; in vain he wrote fresh tragedies, in vain did his friends laud them to the skies; the public began to suspect that his genius was worn out, and he had ceased to be popular before the production of his last pieces, 'Pulcherie' (1672) and 'Surena' (1674). His latter works have sunk entirely into oblivion. He died in the year 1684, at the age of seventy-eight, having been a member of the Académie thirty-seven years. In private life he was a quiet domestic man, with a bluntness of manners that was almost repulsive. If we may trust his biographers, he had a few small faults, but no vice; his whole pleasure was centred in his own family. He and his brother had married two sisters, and resided together in one house, till death separated them.

It was, we have seen, by the 'Cid,' that Corneille first rose into celebrity; two or three passages of his 'Medée' are occasionally quoted, to show the development of a young poet, but as a whole it is forgotten, and probably would never have been cited, had not its author distinguished himself by his subsequent productions. His early comedies have sunk deservedly into oblivion, being dry tedious pieces of declamation, without point, and founded on a false morality; their only redeeming merit is ingenuity of construction.

If we now peruse the 'Cid,' we shall be at a loss to discover the cause of that enthusiasm which its appearance created in France, when, as it is said, all Paris saw Chimène (the heroine) with the eyes of Rodrigue (the hero) But it must be remembered that the French stage was in a wretched state before the appearance of Corneille; the pieces of his predecessors were for the most part dull and heavy, and without the slightest attempt at delineation of character. As a specimen of these old dramas, we refer to a translation of Garnier's 'Cornelia,' in Dodsley's old plays, which, strange to say, is commended by Ben Jonson. The chief fault found with the 'Cid' by contemporary critics was the selection of the subject. Don Rodrigue, to revenge a blow given to his father, kills the father of Chimene, his mistress, in a duel; she at first makes every effort to accomplish his death, but at length, at the request of the king of Spain, she marries him. It is the contention between love and duty in the heart of the heroine which is the leading feature of the drama. The Aristarchus of the 'Académie' called the lady a monster of filial impiety, and said that she had no right to love Rodrigue at all; the opposite party contended that the preservation of her early love under all circumstances, was perfectly amiable and feminine. This literary battle, indeed, seemed rather to be fought for the morals of the heroine, than the merits of the play. Those who would wish to read the charge and its answer, may turn to the 'Examen' above referred to, and La Harpe's 'Cours de la Littérature.' It should be observed that this drama of the 'Cid' is, by critics of the romantic school, preferred to his other works, as partaking somewhat of that spirit of chivalry which animated their idol, the Spanish drama.

The other most celebrated piece of Corneille's is 'Horace,' the last act of 'Cinna' being reckoned a chef d'œuvre rather than the whole play. Fontenelle's praise of 'Horace,' for the ingenuity of its construction, is unquestionably just. 'Corneille,' says he, 'has but a combat to work upon, that of the Horatii and Curiatii, and out of this scanty subject he constructs a tragedy.' The prospect, indeed, was but barren, yet the tragedian, by giving Horatius a sister of the Curiatii to wife, while his own sister is (according to the old story) betrothed to one of these Curiatii, and by dwelling on the times immediately preceding and pending the combat, has thrown an interest into his piece which was scarcely to be anticipated. Here indeed his praise ends, for the last two acts are occupied by the murder of Horatius' sister, and its consequences; hence, as La Harpe justly observes, they form a separate plot, totally unconnected with the preceding part of the play. The father of Horatius, as an illustration of the stern Roman character, is the most commended by the admirers of this tragedy.

The general censure passed on Corneille's comedies does not extend to 'Le Menteur,' which is one of his later productions, and is an excessively humorous and amusing piece. The English know it well from Foote's version, the 'Liar;' and indeed it was introduced into this country long before the time of Foote; an anonymous translation was acted in 1685, under the name of the 'Mistaken Beauty,' and a subsequent adaptation was written by Sir R. Steele, called the 'Lying Lover.'

The chief merit which is assigned to Corneille by his admirers is his dignity; they allow that Racine may be more elegant, more touching, but in a 'noble ferocity' they say that Corneille stands alone. It must be remembered that when Corneille wrote the French tongue was still in an uncultivated state; he must not therefore be taken as a model of French style, his verse being often defective, and his language disfigured by barbarisms.

Voltaire, on learning that a great-niece of Corneille was entirely without fortune and almost without friends, took her into his house at Ferney, where she completed her education, and in a few years was married by Voltaire to a captain of dragoons. Besides giving her a marriage portion, Voltaire undertook to write a commentary on Corneille, for the benefit of his protégée. The work, which was printed by subscription, and liberally patronized by the French king, the Duc de Choiseul, Madame de Pompadour and others, brought in 50,000 francs, as an addition to the young lady's marriage portion. Voltaire, though a great admirer of Corneille, was not blind to his numerous faults, which he has pointed out at full length in his 'Commentaries in two vols. 8vo. (vols. 48, 49). Edition of Lequien, Paris, 1826.

CORNEILLE, THOMAS, brother of Pierre, was twenty years younger, being born in the year 1625. He distinguished himself in early life by a comedy in Latin verse, which he composed during his education at the Jesuits' College. Like his brother he began by imitating the Spanish dramatists, and in the course of his career produced no less than forty-two pieces, tragedies and comedies. Nothing could exceed the popularity of some of his plays, which, however, was but transient, as they have, with about two exceptions, been long forgotten. The works by which he is chiefly remembered are 'Le Comte d'Essex,' and 'Ariane,' both tragedies. The former is much censured for the ignorance which it displays of English history: the latter is commended for the character of its heroine: here, however, its merit ends; the rest of the *dramatis personæ* being mere nullities. On the death of his brother, Thomas Corneille took his place in the *Académie*, and contributed to the 'Dictionnaire:' he also assisted his friend De Vise in editing the 'Mercurie Galant,' a noted periodical, and became a member of the Academy of Inscriptions. He died at Andelys in 1709, having shortly before lost the use of his sight.

CORNELIAN CHERRY. [Cornaceæ.]

CORNET, a commissioned officer in a regiment of cavalry. He is immediately inferior to a lieutenant, and his rank corresponds to that of an ensign in a battalion of infantry.

The word is derived from the Italian *cornetta*, signifying a small flag; and hence, both in the English and French services during the sixteenth and seventeenth centuries, it was applied not only to the officer who had charge of the standard, but to the whole troop, which seems then to have consisted of 100 men and upwards, and to have been commanded by a captain.

CORNET, a shrill wind instrument formed of wood, which seems to have been known from the earliest times, and continued in use till the latter part of the seventeenth century, when it was laid aside for the oboe. In the *Musurgia* of Luscinius is a rude wood-cut of the cornet; but it is represented in a more satisfactory manner in Mersenne's *Harmonie Universelle*, from which it appears that the instrument was blown by a mouth-piece, and that there were treble, tenor, and base cornets. The compass of the first was from A, the second staff in the treble, to E in alt. The last was bent in rather a serpentine form, and reached nearly five feet in length, therefore was deep in tone.

CORNET-STOP, in the organ, is an imitative treble-stop, consisting of five ranks of pipes, in organs on a large scale, each key of the instrument causing all the five pipes to sound at once. These are tuned to a given note, its octave, twelfth, fifteenth, and seventeenth, though the whole together produce the effect of a single note. This is a harsh stop, and is now only used in union with others; but formerly, compositions were written exclusively for it, called *Cornet Pieces*, which, happily, the present improved taste in organ-playing has proscribed.

CORNICE. [Civil Architecture; Column.]

CORNOUAILLES, a name sometimes given to the town of Quimper, capital of the department of Finistère in France; but more commonly appropriated to a district formerly constituting the domains of a Breton count, who took his title from it. Its extent is not clearly ascertained, some making it co-extensive with the diocese of Quimper; others also including in it the diocese of St. Pol de Léon. It is noticed here only from the coincidence of its name with that of a part of England (Cornwall), from which it is probable that many of the Bretons emigrated.

CORNS are in the first instance merely thickenings of the cuticle, generally of the toes, arising from continued pressure over a projecting portion of bone. While superficial, a corn is moveable, and retains the lamellated structure of the cuticle; afterwards it acquires a base, attaches itself more firmly to the subjacent parts, and becomes a complete corn. 'A bursa or bag of synovial membrane, similar to those bursæ which are of original formation, but of very small size, is formed between the thickened cuticle and the cutis; it is this combination of thickened cuticle with a subjacent bursa which constitutes a perfect corn.' Corns are either hard and dry, which is the case when they are situated externally; or they are soft, when situated between the toes. The inconveniences arising from corns are generally slight; sometimes they are very serious. The bursa under a hard corn is apt to suppurate, and the inflammation, pain, and irritation, are excessive. Tight or improperly-shaped shoes being the primary cause of corns, shoes or boots fashioned to the natural shape of the foot must be worn, and the material of which they are formed should be soft and pliant. To avoid pressure upon a corn already existing, a portion of leather spread with diachylon or other emollient plaster having a hole in it corresponding with the size of the corn may be worn; or if the outer portion of the corn, which is quite insensible, be pared or scraped away, temporary relief is obtained. For a corn which has become very sensible, the application of lunar caustic or concentrated nitric acid is necessary; if there be reason to suspect the existence of an inflamed bursa containing pus, the outer portion must be cut away with the scalpel, and the bursa freely laid open, so that the matter may escape, which will give great relief. If a soft corn become very sensible, as it often does, without an abscess existing beneath, concentrated nitric acid should be applied. Bunions differ from corns, inasmuch as the part affected is generally of greater extent; a bursa is always connected with them, and when inflamed, serum is secreted, which, if pressure and all causes of irritation be avoided, is again speedily absorbed. If the bursa be much inflamed, leeches and fomentations are necessary; and should pus have formed, it must be let out. If the abscess do not speedily heal, nitric acid should be carefully applied to its inner surface. Extirpation of corns has been recommended, but it is not free from danger, and should never be attempted except by a very skilful and dexterous person. A wound or laceration of the tendons or fibrous structures around the joints, is sometimes followed by the most alarming symptoms, even by tetanus and death. Amputation of the toe has been practised. (See Sir B. Brodie's excellent Lecture on Corns and Bunions, *Medical Gazette*, 13th February, 1836.)

CORNU AMMO'NIS, the old Latin name for the now well known fossil shell, the Ammonite. These *Cornua Ammonis*. *Cornes d'Ammon* of the French, were so called from a fancied resemblance to the horns with which the head of Jupiter Ammon was sculptured. In the earlier times their origin was variously accounted for: some thought them petrifications of real rams' horns, taking the name above mentioned in a strict and downright matter-of-fact sense; others thought they were the curled tails of certain animals; some took them for petrified marine worms rolled up; others saw in them coiled serpents, whence they were called *snake-stones*. The legends of the saints invested them with a sacred interest.

> Of thousand snakes, each one
> Was changed into a coil of stone,
> When holy Hilda pray'd.

And the prayer, we are told, was not only followed by petrification, but by decapitation. We believe that there is a similar tradition of St. Keyna, who, when she found herself in a wood at Keynsham, between Bath and Bristol, surrounded by serpents, changed them by the fervour of her devotions into headless stones. Nor were these opinions confined to the mere vulgar. Wormius described Ammonites as petrified adders. Langius considered them to be either the vertebræ of serpents or convoluted marine insects. These notions were not lost on the dealers; and there are few fossil collections which do not even now possess what was called *a perfect Cornu Ammonis*, that is, an Ammonite with a carved serpent's head ingeniously fitted on to the fossil shell by way of aperture. Our limits will not permit us to dwell on this fabulous part of the history of Ammonites further than to observe that other learned men, Torellus Sarayna, Frascatorius, &c., considered them as *lusus Naturæ*, formed by the plastic power of the earth. The antients held them in high estimation as very sacred and of the highest value to the dreamer. Thus Pliny (*Hist. Mund.*, book xxxvi., c. 10), 'Hammonis cornu inter sacratissimas Æthiopiæ gemmas, aureo colore, arietini cornus effigiem reddens, promittitur prædivina somnia representare;' and even to the present time the Indians are said to ascribe extraordinary properties to them.

To the zoologist Ammonites are objects of great interest, and to the geologist they are of the utmost consequence. 'It is easy,' says Mr. Phillips, in his 'Guide to Geology, (8vo. 1834) 'to see how important, in questions concerning the relative antiquity of stratified rocks, is a knowledge of Ammonites, since whole sections of them are characteristic of certain systems of rocks.' (sec. 82.) Dr. Buckland (*Bridgewater Treatise*, p. 333,) thus comprehensively describes the range of these extinct cephalopodous mollusks: 'The family of Ammonites extends through the entire series of the fossiliferous formations, from the transition strata to the chalk inclusive.

According to Mr. Owen's system (respiratory), the Ammonites form the fourth genus of his second family (*Ammonitidæ*) of his first order *Tetrabranchiata*, of the class *Cephalopoda*. For Mr. Owen's definition of the Ammonitidæ, see CEPHALOPODA, vol. vi., p. 428. M. De Blainville, in his 'Malacalogie,' thus defines the shell of *Ammonites*.

Shell discoid, more or less compressed; whorls of the spire more or less evident; the aperture with borders a little widened or opened out (evasés); the partitions constantly sinuous; a dorsal siphon.

In the 'Additions and Corrections,' the author states that he had observed at M. Defrance's many beautiful individuals of different species of Ammonites, which had been generously communicated to M. Defrance by M. Deslongchamps, of Caën, which present their apertures in a very complete state, and which he has figured. M. De Blainville further states that he is satisfied that this aperture is not always widened, as he had stated after an English author, and that it is often even rather contracted. The most constant character, he adds, is, that the border or lip is swollen into a thick margin (bourrelet), which is very regularly symmetrical, as in other univalve shells; and that this border, often subauriculated or rather notched at its root, is remarkably sinuous on each side; so that it becomes necessary to add to the character of this genus—'aperture symmetrical, a little widened or contracted, the border or lip thickened into a margin (bourrelet), and often notched or sinuous and auriculated in a variable manner at the origin.' This addition, though correct to some extent, should not be taken for granted as a *general* proposition, for there are certainly exceptions. M. Rang makes the genus Ammonites (Bruguière) embrace the following genera: Orbulites, Planorbites, Planulites, of Lamarck; Ellipsolites, Amalthea, Pelagusa, Simplegas, of De Montfort; Ammonelliptites of Parkinson; Ophiopomorphites of Plott; Globites, Ceratites, and Goniatites, of De Haan.

The following is M. Rang's definition:—

Animal unknown.

Shell discoid, with the spire convoluted on the same plane, either enveloping or not enveloping; whorls contiguous, partitions more or less lobated on their borders, with ramifications or digitations; last chamber occupying the whole of the last whorl of the spire.

M. Rang observes that M. Defrance and M. D'Orbigny have remarked a particular disposition in the form of the borders of the aperture of Ammonites; these borders are sometimes furnished with a margin which is thick and reflected outwards; at other times two elongated tongue-like processes, terminated in a point or digitated, extend from each of the sides; lastly, adds M. D'Orbigny, in some others, a third appendage is given off from the middle of the two tongue-like processes, and bends (se replie) over the entrance of the aperture.

M. Rang proposes three groups:—

1.

Those with an embracing spire (spire embrassante). Example, *Ammonites subradiatus*, &c.

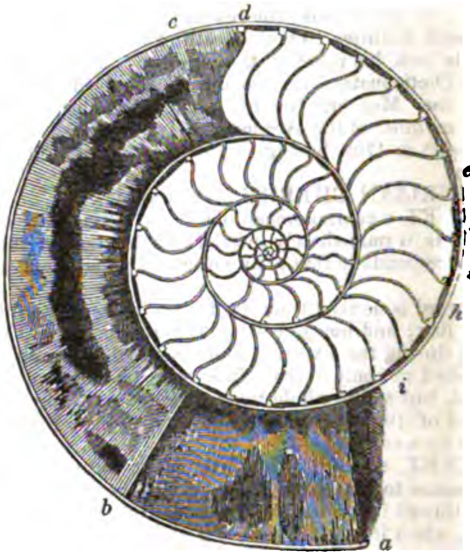
2.

Those with a demi-enveloping spire. Example, *Ammonites Mantellii*, &c.

3.

Those with a spire entirely uncovered. Example, *Ammonites giganteus*, &c.

Having given this sketch of the opinions of the authors above quoted, it will be necessary to meet the question whether the Ammonites were external or internal shells. Cuvier and Lamarck thought that they were internal. The former says (*Règne Animal*, last edition) 'La petitesse de leur dernière loge peut faire croire que, comme la spirule, elles étoient des coquilles intérieures.' These are great names, but we must differ from them. Mr. Owen, in his arrangement above quoted, says, 'Animal unknown, presumed to resemble the Nautilus'—'shell external' . . . . . 'the last chamber the largest and lodging the animal;' and this we think was the actual state of things. Dr. Buckland, in his 'Bridgewater Treatise,' says, 'The smallness of the outer chamber or place of lodgment for the animal is advanced by Cuvier in favour of his opinion that Ammonites, like the Spirula, were internal shells. This reason is probably founded on observations made upon imperfect specimens. The outer chamber of Ammonites is very seldom preserved in a perfect state; but when this happens, it is found to bear at least as large a proportion to the chambered part of the shell as the outer cell of the Nautilus Pompilius bears to the chambered interior of that shell. It often occupies more than half, and, in some cases, the whole circumference of the outer whorl. This open chamber is not thin and feeble, like the long anterior chamber of the spirula, which is placed within the body of the animal producing this shell, but is nearly of equal thickness with the sides of the close chambers of the Ammonite.'



[Ammonites obtusus.]

From Dr. Buckland; *a*, *b*, *c*, *d*, outer chamber. It should be remembered that the specimen is apparently imperfect at the aperture. The siphon or tube of communication may be traced from *d*, where it opens into the last or outer chamber, along the edge of the section, *e*, *f*, *g*, *h*, *i*, to the very nucleus of the shell. The waved transverse lines represent the partitions of the chambers.

The large proportion of the outer chamber is very strongly marked in specimens of Ammonites rostratus, that have the aperture perfect or nearly so.

[Ammonites rostratus.]

'Moreover,' continues Dr. Buckland, 'the margin of the mature Ammonite is in some species reflected in a kind of scroll, like the thickened margin of the shell of the garden snail' (bourrelet of the French), 'giving to this part a strength which would apparently be needless to an internal shell. The presence of spines also in certain species (as in Ammonites armatus, A. Sowerbii) affords a strong argument against the theory of their having been internal shells. These spines, which have an obvious use for protection, if placed externally, would seem to have been useless, and perhaps noxious, in an internal position, and are without example in any internal structure with which we are acquainted.'

Mr. De la Beche has proved from the mineral condition of the outer chamber of Ammonites from the lias at Lyme Regis, that the entire body was contained in it, these animals having been suddenly destroyed, and buried in the earthy sediment of which the lias is composed, before their bodies had either undergone decay or been devoured by the then existing crustaceans. Dr. Buckland notices this in his treatise, and adds, that in the Ammonites in question, the outer extremity of the first great chamber in which the body of the animal was contained, is filled with stone only to a small depth (cut of *Ammonites obtusus*, *a* to *b*); the remainder of this chamber, from *b* to *c*, being occupied by brown calcareous spar, which has been ascertained by Dr. Prout to owe its colour to the presence of animal matter, whilst the internal chambers and siphuncle are filled with pure white spar. 'The extent of the brown calcareous spar, therefore, in the outer chamber,' continues Dr. Buckland, 'represents the space which was occupied by the body of the animal after it had shrunk within its shell at the moment of its death, leaving void the outer portion only of its chambers, from *a* to *b*, to receive the muddy sediment in which the shell was imbedded. I have many specimens from the lias of Whitby of the *Ammonites communis*, in which the outer chamber thus filled with spar occupies nearly the entire last whorl of the shell, its largest extremity only being filled with lias. From specimens of this kind we also learn, that the animal inhabiting the shell of an Ammonite had no ink-bag; if such an organ existed, traces of its colour must have been found within the cavity which contained the body of the animal at the moment of its death.'

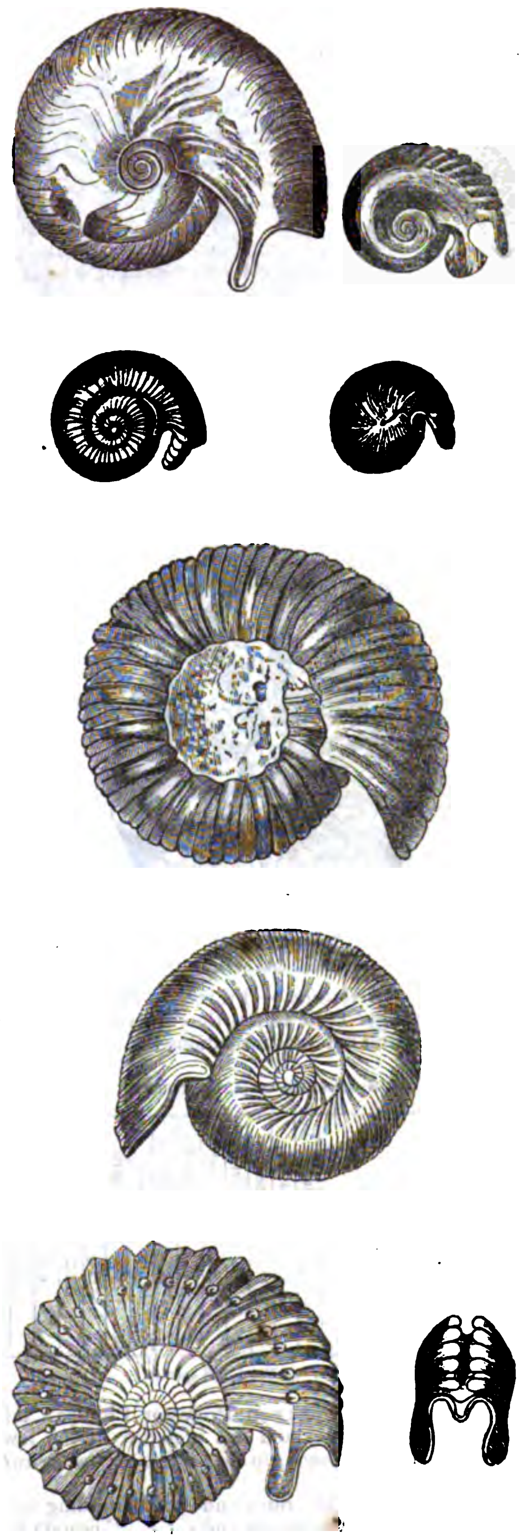
Dr. Buckland very happily illustrates the different arrangements by means of which a union of lightness and strength is secured to the shell both from the external conformation and the mode in which the transverse plates are disposed; and as our limits will not allow us to enter minutely into the subject, we must refer the reader to the 'Bridgewater Treatise' for the interesting details, which show that a more perfect instrument for affording universal resistance to external pressure—an instrument in which the greatest possible degree of lightness combined with the greatest strength was required—could scarcely be imagined, and must confine ourselves to the doctor's summary. 'As the animal increased in bulk, and advanced along the outer chamber of the shell, the spaces left behind it were successively converted into air-chambers, simultaneously increasing the power of the float. This float being regulated by a pipe passing through the whole series of the chambers' (see the cut of *Ammonites obtusus*), 'formed an hydraulic instrument of extraordinary delicacy, by which the animal could at pleasure control its ascent to the surface or descent to the bottom of the sea. To creatures that sometimes floated, a thick and heavy shell would have been inapplicable; and as a thin shell inclosing air would be exposed to various and often intense degrees of pressure at the bottom, we find a series of provisions to afford resistance to such pressure in the mechanical construction both of the external shell and of the internal transverse plates which formed the air-chambers. First, the shell is made up of a tube coiled round itself, and externally convex. Secondly, it is fortified by a series of ribs and vaultings disposed in the form of arches and domes on the convex surface of this tube, and still farther adding to its strength. Thirdly, the transverse plates that form the air-chambers supply also a continuous succession of supports, extending their ramifications, with many mechanical advantages, beneath those portions of the shell which, being weakest, were most in need of them.'

Reinecke[*], Von Buch[†], Zieten[‡], and De Haan[§] are among the other moderns who have written treatises on this interesting genus, or have illustrated it; and much information will be found in the works of Parkinson, Schlotheim, James Sowerby (*Min. Con.*), De la Beche, Phillips, and others.

The species are very numerous. De Blainville quotes Defrance for 120 species, adding that he (Defrance) asserts that there are no more, but inquiring on what Defrance rests his assertion. M. Brochant, in his translation of De la Beche's Manual, enumerates 270.

The method of arrangement is various by various authors; but we think that when the subject is better known than it is at present, the shape of the aperture, which varies considerably, ought to be considered a leading character.

[Ammonites with perfect mouths.]



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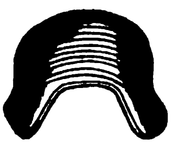
[*] Maris protogæi Nautilos et Argonautos vulgo *Cornua Ammonis* in agro Coburgico et vicino reperiundos descripsit et delineavit, etc., D. I. C. M. Reinecke. Coburgi, 1818, 8vo.

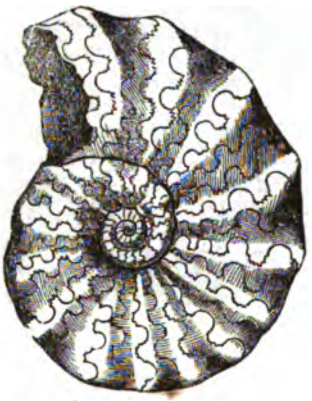
[†] Ueber die Ammoniten in den älteren Gebirgs-Schichten. Gelesen in der Akademie der Wissenschaften, am, i. April, 1830. 4to. Recueil de Planches de Pétrifications remarquables, par Leopold de Buch. Berlin, 1831, folio.

[‡] Die Versteinerungen Wurtembergs, &c. Stuttgart, 1830, and following years. Folio.

[§] Specimen philosophicum inaugurale, exhibens monographiam Ammoniteorum et Goniatiteorum, etc. 1825. Lugduni Batav.



These cuts, which are copied from De Blainville, will not only give the reader some idea of the shape of the aperture, but also of the external appearance of the shell, while the following, from Dr. Buckland's Bridgewater Treatise, will convey a notion of the concamerations in some of the species. An internal view of a very simple form of these and of the siphon or pipe will be seen in the cut of *Ammonites obtusus.*



[Ammonites nodosus.]

Geological Distribution.—Professor Phillips, in his 'Guide to Geology' (8vo. 1834), thus distributes the Ammonites among the different formations.

SUB-GENERA OF AMMONITES.

	Goniatites.	Ceratites.	Arietes.	Falciferi.	Amalthei.	Capricorni.	Planulati.	Dorsati.	Coronarii.	Macrocephali.	Armati.	Dentati.	Ornati.	Flexuosi.
In Tertiary strata . .														
In Cretaceous system . .	..	..	..	2	4	..	..	..	..	9	14	13	2	3
In Oolitic system . .	..	..	..	22	27	12	26	5	11	11	11	4	5	3
In Saliferous system . .	..	3	12											
In Carboniferous system .	7													
In Primary strata . .	17													

Total, 223 species.

The strata termed primary in Professor Phillips's table are those which Dr. Buckland has included in the lower region of the transition series in his section. (*Bridgewater Treatise*, pl. 1.)

We are indebted to Dr. Buckland for forwarding to us several specimens of Ammonites and some orthocerata from the Isle of Man, where they were collected by Captain Bentham in a small bay near Castletown, in a confined space (of a few yards), about high water-mark, resting on clay slate. The rock in which they were found appears to be transition limestone imbedded in slate. The shells are converted into arsenical pyrites, and some of them are included in lumps of the same mineral.

Geographical Distribution.—As the Ammonites were evidently principal agents for keeping within bounds the mollusks, &c., the crustaceans, and perhaps fishes of the periods prior to the chalk formation, and belonging to the latter epoch, we should expect to find them widely distributed. Accordingly, they occur in Europe, Asia, and America in strata apparently of the same date. In some instances, the genera and even the species are identical. Dr. Gerard found in the Himalaya Mountains, at an elevation of 16,000 feet, *Ammonites Walcoti* and *Ammonites communis*, fossils that are found in the lias of Lyme Regis. M. Ménard met with one in the Maritime Alps at an elevation of 1500 toises. Their numbers must have been great. M. Dufresne informed Lamarck that the road from Auxerre to Avalon in Burgundy was absolutely paved with them. The individual agency too of some of these carnivorous instruments for preserving the balance of marine animal power must have been of no small importance. Lamarck says that he has seen Ammonites of two feet (French) in diameter. Mr. James Sowerby and Mr. Mantell record Ammonites in the chalk with a diameter of three feet; and Dr. Buckland states that Sir T. Harvey and Mr. Keith measured Ammonites in the chalk near Margate which exceeded four feet in diameter; and this in cases where the diameter could have been in a very small degree enlarged by pressure.

Dr. Buckland is of opinion that the Rhyncholites, or beak-stones, which occur so abundantly in the oolite of Stonesfield, in the lias at Lyme Regis and Bath, in the Muschelkalk of Luneville, &c., were the mandibles of Ammonites as well as of fossil Nautili, and there can be no reasonable doubt of the fact.

We must here close a subject on which we could say much; and we leave it the more willingly, because the student will find in Dr. Buckland's Treatise a full and copiously illustrated account of Ammonites, more especially as regards the varied properties of support and the hydraulic action of the siphuncle.[*] *Ammonites heterophyllus*, figured at plates 38 and 39, affords a beautiful example, as the Doctor observes, of the manner in which the mechanical strength in each transverse plate is so disposed, as to vary its support in proportion to the different degrees of necessity that exist for it in different parts of the same shell.

CORNUCO'PIA, or **CORNU-COPIÆ**, the horn of plenty, fabled to have had its origin in the infant days of Jupiter. Ovid, in his 'Fasti' (lib. v. 115-128), tells us that one of the goats of Amalthea, who nursed Jupiter in Crete, broke off its horn against a tree, when the nymph, having wreathed it with flowers and filled it with fruit, presented it to the god. Jupiter, when he came into power, called his nurse to the skies, and made the horn the emblem of fertility. The Greeks called it κέρας Ἀμαλθείας, *the horn of Amalthea*. In his 'Metamorphoses' (lib. ix. v. 82, &c.), Ovid derives the origin of the Cornucopia from a different fable. He speaks of it as the horn of the river god Achelous, broken off by Hercules, and consecrated by the Naiads:—

> 'Naïdes hoc, pomis et odoro flore repletum,
> Sacrarunt.'

The Cornucopia occurs very frequently in the types of antient coins, particularly upon those of Sicily. (See the medal of Arsinoe.)

CORNUS. [Cornaceæ.]

CORNWALL, an English county, forming the south-west extremity of the island of Great Britain. The form of the county approaches that of a right-angled triangle, of which a line about seventy miles long, drawn E.N.E. and W.S.W. from Penlee Point at the entrance of Plymouth Sound, to the Land's End, may be regarded as the base; another line, forty-two miles long, drawn N.N.W. and S.S.E. from Penlee Point to the north-east corner of the county, as the perpendicular; and a line eighty-one miles long, drawn north-east and south-west from the last-mentioned point to the Land's End, as the hypotenuse. The area of the county, exclusive of the Scilly Isles, is 1330 square miles, being rather less than the area of the triangle above described. Cornwall lies between 49° 55′ and 50° 55′ N. lat., and 4° 9′ and 5° 42′ W. long.

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[*] Geology and mineralogy considered with reference to natural theology, by the Rev. William Buckland, D.D., &c., &c., London, 1836, 8vo. See vol. i., p. 333 to 357, and vol. ii., plates 35 to 42.

The only county with which Cornwall is conterminous is Devonshire, which bounds it on the east (or rather on the E.N.E.): on all other sides it is surrounded by the ocean. The north-west coast is high and rocky. Tracing it from the border of Devonshire, it runs south by west, and forms two very shallow bays (Bude Bay and Widemouth Bay), succeeded by the headlands, Dazard Point, Castle Point, Penkenner Point, and Carnbeak. From Carnbeak the coast runs south-west, and forms several headlands, Tintagell Head being the principal; and several small bays as far as Pentire and Stepper Points, near the mouth of the river Alans or Camel, the entrance of which forms the haven of Padstow. A few miles W.S.W. of these is Trevose Head, the most prominent headland on this side of the county: this is succeeded by Constantine, Watergate, and Towan bays, Towan Head, Fistal, Cranstock, and Holywell bays, Penhale Point, Ligger or Piran Bay, and St. Ives' Bay, Gurnard's Head, Cape Cornwall, Polpry and Peden-Mean-Due points, the last of which is less than a mile from the Land's End. The general direction of the coast from Trevose Head to Cape Cornwall is south-west; from Cape Cornwall to the Land's End due south. Along this side of the county are scattered several islets and insulated rocks, but nothing that is worthy of notice. Off the Land's End are the Scilly Islands, a numerous and not unimportant group. [Scilly Islands.]

The coast from the Land's End to Plymouth Sound is marked by bolder promontories and deeper bays: it possesses for the most part the same character as that just described, but there are more frequent intervals of low and shelving beach. From the Land's End to Mount's Bay, the coast forms a line convex to the ocean, broken by a number of small headlands with intervening coves. Mount's Bay takes its name from St. Michael's Mount, a remarkable insulated rock opposite the town of Marazion, and connected with the main land by a causeway over the sands· Cuddan Point forms the eastern boundary of the bay. From Cuddan Point the coast runs south-east to the Lizard, the most southern point of England: and from thence turning north-east, forms the headlands of Innis Head, Black Head, Chynals Point, Dranna Point, Nare Point, Rosemullion Head and Pendennis Point, which last two form the extremities of Falmouth Bay. Between Nare Point and Rosemullion Head is the wide æstuary of the Helford river. Between Pendennis Point and Zone or St. Ann's Point (the next important headland) is the wide æstuary of the Fal, known by the name of Carrick Road, of which Falmouth harbour and St. Mawes harbour are branches. From Zone Point the coast still runs north-east to Greber Head, forming Gerrans, Veryan, Megavissey, St. Austell and St. Blazey bays, with the intervening headlands Pennare Point, Dodman or Deadman Point (379 feet high), Chapel Point, and the Black Head. From Greber Head the coast runs east to the Rame Head and Penlee Point (which is the entrance of Plymouth Sound), forming Looe and Whitesand bays. The rocks and islets along this coast are too unimportant to require notice.

Launceston, which has commonly been considered as the county town, is on the eastern border of the county; but Bodmin, which has a better title, is more central: it is about 210 miles from London in a direct line W.S.W., or 235 miles by the road through Salisbury, Dorchester, Exeter, and Launceston.

The population of the county by the census of 1831 was 300,938, including the Scilly Islands, or 298,473 without them; the latter number, compared with the area of the county as stated above, gives about 224 inhabitants to a square mile: which is considerably under the average of England and Wales, and still more under the average of England alone. (Arrowsmith's *Map of England and Wales; Ordnance Map; Population Returns for* 1831; Paterson's *Roads*.)

Surface, Hydrography, Communications.—From the central part of Cornwall, which is the highest, the land slopes towards the sea on each side. The whole surface of the county is irregular. The great post-roads pass over the central high ground, which, being for the most part waste moorland, give travellers a more unfavourable opinion of the soil, than, taken altogether, it deserves: for, in many parts, it is pleasingly diversified by hill and dale; some of the valleys are beautifully picturesque, presenting corn and meadow land, wood and water. On the northern coast the land is generally high, with short narrow valleys: on the south coast the valleys are wider. The central ridge approaches, on the border of Devonshire, the N.W. coast the streams that flow from its S.E. side have consequently a longer course, and are the most considerable in the county. The height of some of the hills is considerable, but they have not generally striking or picturesque forms, except where they extend down to the coast, and form abrupt headlands, as at Tintagell, Cape Cornwall, and the Land's End. The principal elevations are—Brown Willy, at the source of the river Fowey, 1368 feet; Carraton, or Caradon Hill, north of Liskeard, 1208 feet; Kit Hill, on Hingeston Down, near Callington, 1067 feet; Hensbarrow Down, north-west of St. Austell, 1034 feet; Cadon barrow, near Tintagell, 1011 feet; Carnmarth, south-east of Redruth, 849 feet; Carnmenelez, Carn-Menelis, or Carnbonellis, south of Redruth, 822 feet; Carnminnis, south-west of St. Ives, 805 feet; Carn-Brea, south-west of Redruth, 697 feet; Pertinney, near the Land's End, 689 feet; Bindown, between East Looe and Liskeard, 658 feet; Bodmin Down, south-west of Bodmin, 645 feet; St. Agnes Beacon, near St. Agnes, 621 feet; St. Stephen's Down, north of Launceston, 605 feet; the town of Launceston, 591 feet; St. Buryan, near the Land's End, 415 feet; the town of Redruth, 414 feet; Maker Heights, on Plymouth Sound, 402 feet; and Sennen, near the Land's End, 387 feet. The above elevations are, with one or two exceptions, from the 'Ordnance Survey.'

The principal rivers of Cornwall are the Tamer, with its tributaries; the Fawey, or Fowey; the Fal; the Alan; the Seaton; the Looe; the Hel, or Helford; and the Heyl. The Tamer rises in the moors which form the north-east point of the county, and extend into Devonshire; and flows south-south-east into Plymouth Sound, forming, almost throughout its course, the boundary between Cornwall and Devonshire. It has no tributary worthy of notice, until it reaches the little village of North Tamerton, where it receives two large streams, the Deer and the Claw, from Devonshire. Lower down it receives a more considerable stream, to which in the 'Ordnance Survey' no name is given, but which Messrs. Lysons designate as the river Werington, from a village near its banks. The Attery, a smaller river, which flows by Launceston, falls into the Tamer, about a mile below the Werington; and about the same distance below that the Tamer is joined by the river Lyd, from Devonshire, and a few miles farther down by the river Inny, from Cornwall. Below the junction of the Inny the course of the Tamer, hitherto tolerably straight, becomes more sinuous, especially where it skirts the base of Hingston Down. The bed of the river then widens, and it becomes an æstuary, or tide-water. Near its mouth it receives the Tavy, from Dartmoor forest; and the Lynher or St. German's river from the downs between Launceston and Bodmin. The whole course of the Tamer is about 56 miles; viz. 24 from the source to the junction of the Attery, just below which it becomes navigable; about 21 from thence to the point to which the tide flows; and about 11 miles of tide-water, including Hamoaze, which is the harbour of Plymouth, or rather of Devonport. The length of its principal Cornish tributaries is as follows: the Werrington, about 17 miles; the Attery, about 10; the Inny, about 18; the Lynher, about 22; and the Tidi, a feeder of the Lynher, 9 or 10 miles.

The Fawey or Fowey rises on the east side of Brown Willy, to the right of the high road from Launceston to Bodmin. It flows south-south-east for several miles, and then turning westward receives on the right the rivers St. Neot's and Warleggan, besides a number of brooks: it then turns south, and passing Lostwithiel, falls into the sea at the borough of Fowey. It is not navigable above the point to which the tide flows. Its whole length is about 30 miles; the tide flows about 5 miles up; formerly it flowed higher up.

The Alan or Camel (i. e. the Crooked River) rises about 3 miles north-north-east of Camelford, and flows south-by-west past Camelford, until it is joined by the river De Lank, which rises near Brown Willy, and flows through a marshy valley. From this junction the course of the Camel is rather more to the south-west, until it is joined by the united waters of two brooks from the south and south-west afterwards it flows north-west to Padstow a little below which it falls into the sea between Pentire Point and Trevose Head, on the north-west coast. Its whole course is about 28 miles, of which about 7 are navigable from the tide flowing up. It receives a considerable tributary (10 to 12 miles long) about 2 miles above where the navigation commences. The mouth of the Camel forms a harbour for ships of 200 tons.

The Fal rises in Tregoss Moor, near the high road from Bodmin to Truro; and flows south, or south-by-west, to Grampound and Tregony, receiving by the way the water of a number of brooks. From Tregony it flows south-west 5 or 6 miles into the Mopus Road formed by the waters of St. Clement's Creek, which rises near St. Michael or St. Mitchell, and flows south-by-west, and of the rivers St. Allen, Kenwin, and another, which meet at Truro, just before they join St. Clement's Creek. From its junction with the Mopus Road the Fal flows southward into Carrick or Carreg Road, where it is joined by a river from the neighbourhood of Redruth. Falmouth Harbour is an inlet of Carrick Road on the west side; St. Mawes Harbour is another inlet on the east Road. The whole course of the Fal is probably about 25 miles, of which more than half is tide-water; the tide also flows up St. Clement's Creek for some distance, up the united channels of the Saint Allen and the Kenwin, as far as Truro, and up Falmouth Harbour as far as Penryn. Vessels of 100 tons can get up to Truro and Penryn. Carrick Road, with its inlets, is reckoned one of the finest harbours in Great Britain.

The Seaton and the Looe are two small rivers, rising not far from Liskeard, and flowing south into the sea: the former on the east, and the latter on the west of the town of Liskeard: the Seaton, which is the longer of the two, is rather more than 10 miles long. The Looe, which falls into the sea between the towns of East Looe and West Looe, is joined near its outfall by the Black Looe. The tide flows for a short distance up both these streams. Another river of nearly similar name (the Loo) which runs by Helston, forms a lake or pool immediately below that town.

The Hel or Helford is a small river, remarkable only for its large æstuary, which penetrates about 4 or 5 miles inland, nearly half the length of the river: the mouth of the Hel is between Nare Point and Rosemullion Point, near Falmouth. The river Heyl, which falls into St. Ives Bay, is about as long as the Hel, and has also a large æstuary. It is indeed only their tide-waters that render the Cornish rivers of any account as means of communication. Except the Tamer, they are not navigable above the point to which the tide flows. The æstuary of the Hel forms a haven for vessels of 200 tons; that of the Heyl, owing to a bar at the mouth, is accessible only to sloops of 50 or 100 tons burthen.

Cornwall has four navigable canals. The Bude and Holsworthy canal, part of the course of which is in this county, runs eastward from Bude Haven, to near the channel of the Tamer; from which point the Bude and Launceston Canal branches off to the south-south-east to Launceston. The chief object of these canals is to facilitate the introduction of Welsh coal, and the carrying of shelly sand from the coast to the interior, to be used as manure. The Liskeard and Looe canal runs south from Liskeard to the æstuary of the river Looe, and is designed to facilitate the transport of timber, coal, manure, and the mineral products of the district. A canal extends about 5 miles east and west from near St. Columb Major to Mawgan Porth, on the coast near Towan Bay: it was intended for the export of minerals, and conveying manure to the adjoining lands, but was never completed, and its channel is now partly filled up.

The mail-road from London to Falmouth passes over a considerable part of the county. it enters it by Poulston bridge, over the Tamer, not far from Launceston, and runs south-west by Launceston, Bodmin, and Truro. A road branches off to the right from this at the village and ex-borough of St. Michael's, and another at Truro; these, uniting at Redruth, proceed by Marazion, or Market Jew, and Penzance to the Land's End. Two other branches run from the neighbourhood of Penryn, and one from Penryn itself, unite not far from that town, and proceed by Helstone to Marazion, where they join the road to the Land's End. Another road from London by Exeter and Tavistock crosses the Tamer at New Bridge, and runs south-west by Callington, Liskeard, and Lostwithiel, St. Austell, and Grampound, to Truro. A branch road from Launceston runs in a circuitous direction by Camelford and Wadebridge to St. Columb: and a road along the coast runs from Mount Edgecumbe or Plymouth Sound to East and West Looe and Fowey. The mail-coach roads are very good.

Geological Character.—The rocks which predominate in Cornwall are among the lowest in the arrangement of the strata of our island, and belong to the primitive and transition classes. The high land which occupies the centre of this peninsular county, and extends from between Launceston and Bodmin on the north-east to the Land's End on the south-west, is composed of granite, which in several extensive districts rises to the surface. The highest parts of this ridge are towards the north-east, and the elevation gradually diminishes towards the south-west; the height at which the granite is found on the surface also diminishes. The granite cliffs of the Land's End are not more than fifty or sixty feet high. Occasional veins or shoots from this granite formation penetrate northward and southward into the superincumbent strata; but they do not generally extend far from the principal masses of granite, nor are they insulated. It may be observed, that the eminences which are formed of granite commonly have their north-east side more abrupt than the south-west. The granite of Cornwall contains numerous metallic veins, both of copper and tin. It is liable to decomposition, to which cause is ascribed the existence of a tract of loose white kaolin or porcelain earth, some miles in extent, near St. Stephen's, between Bodmin and Grampound, and on the south side of the granite range: it is sent to Worcestershire. The decomposition of granite has probably formed those singular phenomena which were once regarded as relics and memorials of druidical superstition, the Logan or Logging Stone, Cheese-wring, &c. St. Michael's Mount, in Mount's Bay, is chiefly composed of granite, split into irregular masses. The fissures which are found in the Cornish granite have led many to suppose that it was stratified; but the supposition is now generally rejected. Granite is termed by the Cornish miners *Grouan*.

The rock commonly reposing on the granite is the *killas* of the miner, the clay-slate of geologists. It appears to have been erroneously designated grauwacké in the Survey of the Geology of Devonshire and Cornwall, by Dr. Berger, in the 'Geological Transactions,' vol. i. pp. 93 et seq. Grauwacké is found, indeed, accompanying the clay-slate, but not to any great extent. On the south or south-east side of the granite formation, the strata dip south-east at an angle of about seventy degrees; on the opposite side of the granite formation the dip is nearly north-east. The killas is traversed by veins or dykes of porphyritic rocks, termed by the miners *Elvan*. These dykes (or channels, in the language of the miners) are rarely found in the granite; their general direction on the surface is east and west, or rather, according to Mr. Greenough's Geological Map, north-east and south-west; they vary from a few fathoms to fifty and even eighty fathoms in thickness; and in some cases are continuous through a long tract of country. The metallic veins, both of tin and copper, commonly pass through them, but are for the most part narrower when in the *Elvan* than when in the superincumbent and subjacent rocks. Roofing slate is quarried in this formation (the killas) near Tintagell Head. What is termed granite of the newer formation, but which is not true granite, is found in Cornwall resting on the clay-slate. A substance approaching to gneiss sometimes intervenes between the granite and the clay-slate.

The metallic veins which contain copper or tin, or both, run usually east and west, and penetrate both the granite and clay-slate; those which contain lead, silver, cobalt, or antimony, run north and south, with little exception, and are believed to be always in the clay-slate.

The Lizard Head and the neighbouring country are composed of serpentine: the relative geological position of this rock and the clay-slate has not been ascertained. The serpentine is accompanied by other rocks, mica slate, diallage, metalloïde, and greenstone. Near the Lizard it incloses veins of soap stone, which, when first raised, is so soft that it may be kneaded like dough, but becomes friable after being exposed to the air; it is used in the manufacture of porcelain. The serpentine incloses and passes into asbestus, and small quantities of native copper have been found in it.

Thin beds of limestone are found in Cornwall, alternating with killas, or clay-slate; it is of a blue colour, and contains veins of calcareous spar.

Copper and tin are the most important minerals of Cornwall. The extent of the metalliferous veins is unknown, as well as the depth to which they extend: no miner has yet seen the end or bottom of a vein. Their width varies much, from the thickness of a sheet of paper to thirty feet; but they are usually from one to three feet in thickness. The ores of copper or tin do not often occur together in the same vein at any great depth. If tin be discovered first, it sometimes disappears, after sinking 100 feet more, and is succeeded by copper; in others, tin is found to the depth of 1000 feet beneath the surface, almost without a trace of copper; if copper be first discovered, it is very rarely, if ever, succeeded by tin. It is seldom that either ore is found nearer to the surface than 80 or 100 feet. If a copper vein meets one of tin, it usually passes through it, and heaves it out of its course. The veins not metalliferous usually pass through the tin and copper veins, or lodes, as they are termed: these non-metalliferous veins have their course usually north and south.

The copper and tin mines, excepting some mines, chiefly of tin, near Callington, are south-west of the rivers Alan and Fowey. The chief mining district extends from St. Agnes on the north coast by Redruth to the neighbourhood of Helston and Marazion; and some mines are worked west of Marazion. St. Austell is in the centre of another but less extensive mining district near the south coast. (*Transactions of Geological Society;* Phillips's *Selection of Facts as to the Geology of England and Wales;* Greenough's *Geological Map of England and Wales.*) Some of the more remarkable natural curiosities of the county will be noticed under a subsequent head.

The lead-mines of Cornwall are not numerous, though the ore has been discovered in many parts of the county. Some silver is obtained from the veins of lead, and from a copper mine called Huel Mexico, between St. Agnes and St. Michael. Iron ore is also obtained, and shipped to Wales. Zinc, antimony, cobalt, and arsenic are procured, as well as some other of the semi-metals. Freestone of different qualities is quarried.

Agriculture.—Cornwall, being situated between two seas, is more subject to variations of weather than most other counties; the mountains attracting the clouds, charged with moisture, which the prevalent west winds bring from the Atlantic. From this cause, the harvest is not in general so early as in the more inland counties, which are in a more northern latitude by two or three degrees. The soil of the mountainous districts is extremely barren and unproductive; but in a few of the vales a tolerably rich soil is found, well adapted to the growth of corn, roots, and artificial grasses. The substratum of the whole county being rocky, and slate being the predominating rock, the surface consists chiefly of an argillaceous earth produced by the decomposition of the slate, mixed with various portions of vegetable matter accumulated in the course of ages. This soil is not naturally stiff or retentive of moisture, but rather a loose and porous soil. Excess of wet will sometimes convert it into a soft mud, where the substratum is not sufficiently porous to allow the water to percolate freely; but generally the land is not of a cold wet nature, like the clays in the midland counties. The most fertile lands are found from Endellion to St. Columb, on the north coast, in the peninsula which terminates in the Lizard Point, the neighbourhood of Burian and St. Germain's, the lands near the Fawey, and a great part of the hundred of Stratton. The rest of the county is comparatively barren. As may be expected from the nature of the soil, there is no great extent of natural meadows, and the want of them is made up by laying down part of the arable land with artificial grasses. This, however, is not done in the perfect and profitable manner adopted in the northern part of Britain; but the second or third crop of corn has grass-seeds sown amongst it when the land is nearly exhausted and full of noxious weeds. The scanty pasture thus produced is neither profitable to the farmer, nor does it serve to restore much fertility to the soil. The system of paring and burning the surface is adopted after the land has been some time in pasture; and with the help of sea-sand, which contains a great portion of comminuted shells, sea-weed, lime, and occasional manuring with pilchards, the land is brought into a state in which it may bear two or three moderate crops of corn. This at least is the old Cornish and Devonshire system, and is still adhered to by many.

Amongst the varieties of grain raised in Cornwall, we may notice the naked barley, which is there called *Pillez.* It is sown in the western part of the county for the purpose of fattening pigs and poultry, and likewise for making gruel to fatten calves. It bears nearly the same price as wheat. If the word be of Cornish origin, as is asserted, meaning *bald,* it would indicate that this variety of barley, highly praised by the French agriculturists under the name of *orge pillet,* has been originally introduced into France from Cornwall. It is highly productive, and well worthy of being introduced into other parts of the country.

The soil and climate of Cornwall are peculiarly favourable to the growth of potatoes, of which two abundant crops are sometimes produced in one season, an early crop taken up in June, and a second in October. The early crop has been known to produce 100 sacks per acre, and the second or main crop twice that quantity. This of course was in a deep and highly-manured soil. In many leases the farmer is restricted from growing potatoes except for his own use, than which nothing can be more absurd, as it deprives the farmer of a means of paying a higher rent, and cultivating his farm to advantage. The only condition should be the purchasing lime and manure in proportion to the potatoes raised and sold.

The principal cattle in Cornwall are of the Devonshire breed. The old Cornish breed, which was a small black mountain breed, is nearly extinct, as are likewise the small Cornish sheep: they have been superseded by better breeds. In no county are oxen more generally used for the plough than in Cornwall. Horses were formerly used only to carry loads on their backs. Good roads and the use of carts and waggons are comparatively new improvements, and by no means general. But there is a very simple and light wain peculiar to this county, which is deserving of notice. It has no sides like a waggon, but hoops over the wheel to keep the load from impeding their motion. It has some distant resemblance to the light waggons used in the mountainous part of Switzerland. The implements of husbandry are either of a rude construction or adopted from other districts. The Cornish plough is simple, and has a straight mould-board: where four or six oxen are put to a plough, the draught is not much considered. To prevent the breaking of the beam, in case stones are met with under the surface, the oxen are attached by a wooden pin, which breaks on any sudden check, acting as a kind of safety valve.

Leases are generally for three lives, renewable on the death of one of the lives by paying a fine; a kind of tenure between a renter and a proprietor. A term of years is preferable, as being more certain. Farms let at rack-rent are let for seven, fourteen, and twenty-one years, as in other counties.

The county is rather bare of trees. Forests probably once existed, but they have now disappeared. Young plantations are much exposed to the sea winds, except where sheltered in valleys. Many proprietors, however, have planted on a large scale; and forest trees are beginning to rear their heads on many eminences, to the great improvement of the face of the country.

In the mining districts the land is naturally barren; but many spots have become clothed with verdure, and are cultivated by the miners, to whom spots of barren soil have been let at a low rent, on condition of their building habitations for themselves and families.

Improvements in agriculture are chiefly introduced by proprietors who occupy their own land. The common farmers, who are not men of capital nor enterprise, prefer following the routine of their forefathers. Large commons give a facility for keeping cattle without much expense, and this is seldom favourable to an industrious cultivation of arable land.

The county is however advancing slowly but steadily towards an improved system of cultivation.

The following are the principal fairs held in Cornwall:—Bodmin, January 25; Saturday after Midlent Sunday; Saturday before Palm Sunday; Tuesday and Wednesday before Whit Sunday; Dec. 6. Bolingey, March 16. Boynton, Aug. 18. Boscastle, Aug. 5; Nov. 22. Camborne, Feb. 24; March 7; Whit Tuesday, June 29; Nov. 11. Camelford, Friday after March 10; May 26; July 17; Wednesday after Michaelmas-day. East Looe, Feb. 13; July 10; Sept. 4; Oct. 6. Falmouth, Aug. 7; Oct. 10. Five

Lanes, Monday week after Jan. 24, last Thursday in October. Fowey, Shrove Tuesday; May 1; Sept. 10. Grampound, Jan. 18; June 11. Goldwithney, Aug. 5. Gweek, nearest Monday to Feb. 20; June 1; nearest Wednesday to Aug. 7; Sept. 22; Oct. 2. Helstone, Saturday before Midlent Sunday; Saturday before Palm Sunday; Whit Monday; July 20; Sept. 9; Oct. 28; Second and Third Saturday before Christmas Eve. Kellington, May 4; Sept. 19; Nov. 12. Kilhampton, Holy Thursday; Three weeks after Aug. 26. Launceston, First Thursday in March; Third Thursday in April; Whit Monday; Old Michaelmas-day; Nov. 17; Dec. 6. Liskeard, Shrove Monday; Monday before Palm Sunday; Holy Thursday; Aug. 15; Oct. 2. Lostwithiel, July 10; Sept. 4; Nov. 13. Marazion, Sept. 29. Menheniot, April 23; June 11; July 28; First Friday in December. Padstow, April 18; Sept. 21. Penryn, Wednesday after March 6; May 12; July 7; Dec. 21. Penzance, March 25; Thurday after Trinity Sunday; Sept. 8; Thursday before Advent Sunday. Redruth, Easter Tuesday; May 2; Oct. 12; Nov. 3. St. Austell, Maundy Thursday; Whit Thursday; First Friday after July 23, and Oct. 16; Nov. 30. Saltash, Feb. 2; July 25. St. Blazey, Feb. 2. St. Columb, Thursday after Midlent Sunday; June 9; Thursday after Nov. 12. St. German's, May 28, Aug. 1. St. Ives, Saturday before Advent. Stratton, May 18, Nov. 8; Dec. 11. Summercourt, Holy Thursday; July 28; Sept. 25. St. Laurence, Aug. 21; Oct. 29. Tregony, May 3; July 25; Nov. 6. Treganatha, May 6; Aug. 6. Truro, Wednesday in Midlent; Whit Wednesday; Nov. 19. Wadebridge, May 12; June 22; Oct. 10. Week, St. Mary, July 29; Sept. 15; Wednesday before Christmas-day. West Looe, May 6.

Divisions, Towns, &c.—Cornwall was formerly divided into seven hundreds—Conarton, Fawiton, Pawton, Rialton, Stratton, Tibesta or Tibesterna, and Winneton or Winnenton. There are now nine hundreds; Stratton hundred and East hundred, on the east along the bank of the Tamer; Lesnewth and West hundreds, to the west of these; Trigg hundred, to the west of Lesnewth; Pyder and Powder hundreds, west of Trigg and West hundreds; and Penwith and Kerrier at the western end of the county. In the above enumeration, when two hundreds are mentioned together, the most northerly is named first. According to Dr. Borlase, it is not easy to discover the limits of the antient divisions, or to reconcile them with the present. He considers that Conarton included the modern Penwith, and Tibesta the modern Powder; Winnenton the modern Kerrier, and Stratton the modern Stratton, Lesnewth and Trigg; Fawiton the modern East and part of West; Pawton, the remainder of West and part of Pyder, and Rialton the rest of Pyder.

The number of parishes according to Camden is 161; according to others as mentioned by Carew, 180; the last population returns give 205, including the parish of Maker, which is partly in Devonshire, and also the parish of St. Mary, which comprehends the Scilly Isles; and counting as one the parishes of St. Erney and Landrake, which in the population returns are given as united.

The number of market towns is thirty, viz.:—St. Agnes, St. Austell, Bodmin, Boscastle, Callington, Camborne, Camelford, St. Columb Major, St. Daye, Falmouth, Fowey, Grampound, Helston, St. Ives, Launceston, Liskeard, East Looe, Lostwithiel, Marazion, St. Mawes, Mevagissey, Padstow, Penryn, Penzance, Polperro, Redruth, Saltash, Stratton, Tregony, Truro. Of these, St. Austell near the coast of the English Channel (population in 1831, 8758); Bodmin, near the centre of the county (pop. in 1831, 3782); Falmouth on Falmouth Haven (pop of parish in 1831, 7284); Helston on the river Loo (pop. in 1831, 3293); St. Ives on St. Ives' Bay (pop. in 1831, 4776); Launceston on a feeder of the Tamer (pop. in 1831, 2231); Liskeard, between the Seaton and the Looe (pop. in 1831, 4042); Penryn near Falmouth (pop. in 1831, 3521); Penzance, near the Land's End (pop. in 1831, 6563); Redruth (pop. in 1831, 8191); Truro (pop. in 1831, 8468); are of sufficient importance to require notice in distinct articles.

St. Agnes is on the N.W. coast, in the hundred of Pyder, between Padstow and St. Ives, 260 or 261 miles from London by Salisbury, Dorchester, Exeter, Lauceston, Bodmin, and St. Michael. It is a small town; the market, for which there does not appear to be any charter on record, has been held from time immemorial for all sorts of wares and provisions except corn. Thursday is the market day. The parish comprehends an important mining district, and had a population of 6642, in 1831. There is a harbour at Trevenaunce, in this parish, which has been much improved of late years; the pilchard fishery has been established here since the beginning of the present century. St. Agnes was anciently called Breanick or Bryanick.

St. Agnes is a parochial chapelry, united with the vicarage of St. Perran-in-Zabulo or Piranzabuloe. The two are stated to produce 419*l.* net yearly revenue, and are in the gift of the dean and chapter of Exeter, in whose peculiar jurisdiction they are. In a dingle called Chapel Combe was an antient chapel called Porth Chapel, the ruins of which were taken down 1780; there are the remains of an antient chapel at Malow or Morlah, in the parish of St. Agnes. There are a free-school, a sunday-school, and three dissenting places of worship. Opie, the painter, was born at St. Agnes.

St. Agnes Beacon is on a pyramidal hill near the town, 621 feet above the level of the sea; it is formed out of an antient cairn or tumulus, and was used as a beacon during the alarm of invasion in the beginning of the present century.

Boscastle, (which name is a corruption of Bottreux castle,) is in the hundred of Lesnewth, and on the north-west coast, not far to the north-east of Tintagell Head. It is a poor little place, but in a very romantic situation. The castle from which it takes its name, is no longer standing. It has a weekly market.

This little town is partly in the parish of Forrabury, a rectory (net annual value 70*l.* with a glebe house), and partly in that of Minster, a rectory (net annual value 224*l.*), both in the diocese of Exeter and archdeaconry of Cornwall, and in the gift of T. J. Phillips, Esq. The joint population of the two parishes does not exceed 855. There is a pier at Boscastle, to which vessels come with coals. Near the market-place are the remains of an antient church or chapel, dedicated to St. James, also some remains near the church of Minster, (which is remote from the town) of a former cell of Black or Benedictine monks dependent upon an abbey at Angers in France.

Callington is in the hundred of East, and on the road from London by Tavistock to Liskeard, Lostwithiel, St. Austell, and Truro; 216 miles from London, and above 40 from Truro. The situation of the town is low and unpleasant, at the foot of Hingston Down, and not far from the Lynher, a feeder of the Tamer; and the buildings, with the exception of the church, are mean and unimportant; the houses are chiefly arranged in one broad street. The church, or rather chapel, was almost wholly rebuilt about the middle of the fourteenth century, by Nicholas de Asheton or Assheton, serjeant-at-law. Some cloth is manufactured here. There is a market on Wednesdays for corn and provisions. Some mines are worked in the neighbourhood. There are two dissenting places of worship. The population in 1831 was 1388.

Callington is a perpetual curacy, held with the rectory of Southill; their joint net annual value is 748*l.* with a glebe house; they are in the diocese of Exeter and archdeaconry of Cornwall, and in the gift of Lord Ashburton.

This was one of the boroughs disfranchised by the Reform Act. It was the last town in Cornwall admitted to the right of sending members, not having acquired that privilege till 1585.

Camborne is in Penwith hundred, and on the road from London by Redruth to St. Ives; 3½ miles from Redruth, and 265 from London. It is neatly built, in the midst of the mining districts: the country around affords some extensive and delightful prospects. The church is a fine specimen of the granite churches of this county, built in the perpendicular English style: there is a good south door under a porch, a modern south chapel, and a modern font. (Rickman's *Gothic Architecture.*) There are places of worship for different classes of Methodists. The market, established in 1802, is considerable; it is held on Saturday: the market-house was built by Lord De Dunstanville, of the parish. The population, in 1831, was 7699.

The living is a rectory (net annual value 790*l.* with a glebe house), in the diocese of Exeter and the archdeaconry of Cornwall, and in the gift of Lord De Dunstanville.

Camelford is in the hundred of Lesnewth, and on the road leading from Launceston by Wadebridge to Padstow, 228 miles from London, and 14½ from Launceston. It is described as an ill-built town, in a situation 'as dismal as can well be imagined.' The streets, however, are broad and well paved; and there is a town-hall, which was built about 30 years since by the Duke of Bedford. The river Camel, which rises about four miles to the N.N.E., flows through the town, and gives name to it. The parish church is at Lanteglos, more than a mile south-west of the town. There is an endowed school. The population of the parish, in 1831, was 1359. There is a market on Friday for corn and provisions. The town was made a free borough by Richard, earl of Cornwall, better known by his subsequently acquired title of King of the Romans, brother of Henry III. The present corporation was incorporated by a charter of 25 Charles II. From the time of Edward VI. the borough sent two members to the House of Commons, who were elected by the corporation and a few freemen. Camelford was disfranchised by the Reform Act.

The living of Lanteglos is a rectory, united with the neighbouring rectory of Advent; their joint annual value is 474*l.* with a glebe house: they are in the diocese of Exeter and the archdeaconry of Cornwall: the patronage is in the king as duke of Cornwall. There was formerly a chapel in the town of Camelford; it is now in ruins. The petty sessions for the hundred are held here. The neighbourhood of Camelford is supposed by some to have been the scene of the battle in which King Arthur fell; and of another fought in 823 between the Britons and the West Saxons under Egbert.

St. Columb Major is in the hundred of Pyder, on a rivulet which flows into the sea between Trevose Head and Towan Head, and a little to the right of the main road from London by Launceston and Bodmin to Truro; 246 miles from London and about 11 from Bodmin. It is a small place, but pleasantly situated, being on the slope of a hill which commands some interesting prospects. The buildings are antient, and the town for the most part ill paved. There is a spacious cross church, the interior of which exhibits some curious specimens of early workmanship and numerous monuments: there was formerly a chantry attached to this church. There are meeting-houses for the Wesleyan and Calvinist Methodists. There were in antient times four free chapels in the parish, which is very extensive, comprehending 11,680 acres, or more than 18 square miles. The population in 1831 was 2790. There is a market on Thursday, and, in the summer, one also on Saturday. The living, a rectory, is of the yearly value of 1296*l.* with a glebe-house: it is in the diocese of Exeter and archdeaconry of Cornwall.

St. Daye is in the parish of Gwennap, in the hundred of Kerrier: it is between Truro and Redruth; 261 or 262 miles from London, and about 2 miles from Redruth. It appears to have been of more consequence in former times, but had fallen much into decay: of late years it has greatly recovered, owing to the increase of the mining population in the neighbourhood. There was formerly a chapel, of which there are now no traces: this chapel is said to have been much resorted to by pilgrims in former days, and from the resort of these pilgrims arose a market, which continued to be held without any charter: this market was however given up. The present market, which is held on Saturdays for butchers' meat and other provisions, was established some years since for the benefit of the miners. The parish of Gwennap, which is rather large, contained in 1831 a population of 8539, principally consisting of miners.

The living of Gwennap is a vicarage (net annual value 482*l.* with a glebe-house) in the diocese of Exeter and archdeaconry of Cornwall, and in the gift of the dean and chapter of Exeter. There is near St. Daye a curious amphitheatre of rude construction, supposed to have been of British origin; it was selected by Wesley as a place for public preaching, and is still used by his followers at some of their anniversaries.

Fowey, in the hundred of Pyder, is on the right or west bank of the river Fowey, near its mouth, 240 miles from London, through Tavistock, Callington, and Liskeard, or 243¼ miles through Plymouth and East Looe. The scenery around this town is very picturesque. The rocks about Polruan, on the opposite side of the river (which here expands into a good haven), rise to a considerable height, and are broken into rude cliffs and bold promontories. At the mouth of the haven are the ruins of two square stone forts or blockhouses, one on each side, built in the reign of Edward IV. to protect the entrance. They were provided with port-holes for cannon, and had apparently four floors: the walls are six feet in thickness. The harbour is now defended by two modern batteries, and by a fort, called St Catherine, which was built in the reign of Henry VIII. The town is built in a very straggling manner, the houses extend a considerable way along the haven, and the streets are so narrow and full of angles as to be almost impassable for carriages. Most of the buildings are of stone. The church is a spacious and lofty fabric of the perpendicular English style of architecture: it was rebuilt, or at least much altered about 1466. There was formerly in the town a chapel called St. Catherine's Chapel, which gave name to St. Catherine's Hill: it existed in Leland's time. There is a spacious market-house, with a town-hall over it, and a public walk overlooking the town and harbour.

The population of Fowey in 1831 was 1767. The chief business of the town consists in catching and curing pilchards: this fishery employs many vessels. Fowey is a corporate town; the corporation consists of a mayor, recorder, eight aldermen, and a town-clerk. Fowey sent members to parliament from the time of queen Elizabeth up to the passing of the Reform Act, by which it was disfranchised. The living is a vicarage, of the annual value of 179*l.*, with a glebe-house, in the diocese of Exeter and archdeaconry of Cornwall. There is a market on Saturday. There are two free-schools, and an almshouse for eight poor widows. The harbour has excellent anchorage, and is always safe.

Fowey was antiently a place of greater importance than it is now. The townsmen acquired wealth by feats of war and by piracy in the wars of Edward I. and III., and Henry V., and their wealth enabled them to increase the commerce of the town to a great extent. Fowey furnished more ships to the fleet of Edward III. before Calais than any other port in England, and more mariners than any other port except Yarmouth. About the same time the Fowey men had a sharp battle with the Rye and Winchelsea men, because they (the Fowey men) would 'vale no bonet, being required:' the Fowey men obtained the victory, and hence rose the name of 'the gallaunts of Fowey.' The French burnt the town in 1457. When peace was made between England and France in the time of Edward IV. the Fowey men still kept up hostilities, for which the king ordered their fleet to be confiscated. The possession of the town was repeatedly contested in the struggle between Charles I. and his parliament.

Grampound is in the parishes of Creed and Probus, in the hundred of Powder, 248 miles from London, by Tavistock, Liskeard, and St. Austell. The river Fal flows through the town, the greater part of which is to the east of that river, and consists of one main street on the declivity of a hill. The town did not contain in 1831 more than 113 houses, and 715 inhabitants. The parish church is at Creed, a mile from the town, but there is a small chapel of ease in the town, and a granite cross. The market is inconsiderable: it is held on Saturday. There is a corporation, consisting of a mayor, eight aldermen, a recorder, and town-clerk. Grampound sent members to parliament from the reign of Edward VI. until 1821, when it was disfranchised for bribery. The living of Creed (or St. Creed,) is a rectory of the net annual value of 351*l.*, with a glebe-house, in the diocese of Exeter and archdeaconry of Cornwall. Grampound has been supposed, but with little reason, to have been a Roman station.

East Looe is in the parish of St. Martin, in the hundred of West: it is on the left or east bank of the river Looe, which here falls into the sea; 234 miles from London by Plymouth. It is built on a flat piece of ground between the river Looe and the sea, and is described as a labyrinth of short narrow dirty alleys, above which rises the low embattled tower of a little chapel of ease. On the land side rises a high steep hill, over which the road leads into the town. East Looe is united with West Looe on the opposite side of the river by a bridge of thirteen, or, according to other accounts, fifteen arches: this bridge is 141 yards long, but only 6 feet two inches wide: there was formerly upon it a chapel or oratory dedicated to St. Anne. The number of houses in 1831 was 167: the inhabitants were 865. They are chiefly engaged in the pilchard fishery. The harbour, formed by the mouth of the river, admits vessels of 100 tons, and is protected by a battery of ten guns. There is a market on Saturday. The town was incorporated by Queen Elizabeth; the corporation consists of a mayor, recorder, and eight burgesses, and an unlimited number of freemen. It returned members to parliament from the time of Elizabeth to the passing of the Reform Act, by which it was disfranchised. The election was in the mayor burgesses, and freemen. There is an endowed free-school for teaching mathematics, especially those branches connected with navigation. There is an endowment of 27*l.* per annum attached to the chapel of ease, which is held with the living of St. Martin.

The living of St. Martin is a chapelry of the annual value of 481*l.*, with a glebe house, in the gift of the duke of Cleveland and the earl of Sandwich. It is in the diocese of Exeter, and the archdeaconry of Cornwall.

East Looe was formerly of much greater importance: it united with Fowey in sending a member to a council of trade held at Westminster in the reign of Edward I., and furnished 20 vessels and 315 men to the fleet of Edward III.

Lostwithiel (otherwise Loswithiel and Lestwithiel) is in the hundred of Powder, on the west or right bank of the Fowey, 234½ miles from London, by Tavistock and Liskeard. The number of houses in 1831 was 217, chiefly of stone, and covered with slate, of which large slabs are quarried in the neighbourhood. The streets are narrow and roughly paved. The church is a curious edifice, with a tower, in the early English style, and an octagonal lantern and spire of decorated English: there is a fine east window. The aisles are of later date. Within the church is a singular octagonal font. Near the church is an antient building said to have been a palace of the dukes of Cornwall. There is a town-hall, in which the Epiphany and Midsummer sessions for the county are held; the county members were also elected here until the division of Cornwall by the Reform Act. There are a grammar-school and a writing-school, supported by the corporation, and a school endowed by the trustees of Mr. St. John Eliot's donation. The market is on Friday. The population of the parish in 1831 was 1548: but the borough extends beyond it into the parish of Lanlivery.

The corporation of Lostwithiel consists of seven capital burgesses, one of whom is annually elected mayor, and seventeen assistants, or common-councilmen. The borough sent members to parliament from the time of Edward I. until it was disfranchised by the Reform Act.

The living is a vicarage of the net annual value of 96*l.*, in the diocese of Exeter and the archdeaconry of Cornwall.

Lostwithiel was made a free borough by Richard earl of Cornwall and king of the Romans. Edmund, earl of Cornwall, son of Richard, was also a great benefactor of this town, conferring upon it several important privileges, some of which however were lost upon his death. In the civil war of Charles I. and the Parliament, the Royalists under Sir Richard Grenville were defeated in a skirmish near Lostwithiel by the Parliamentarians. Restormel castle, in the parish, was however soon afterwards taken by Sir Richard Grenville, and the earl of Essex, commander-in-chief of the Parliamentarians, retired from Lostwithiel, where he had his quarters, to Fowey, where his infantry was obliged to capitulate, though on very favourable terms.

Lostwithiel is, by some antiquaries, considered to have been a Roman station: Camden and Borlase fix here the Ουξελα (Uxela) of Ptolemy, which later antiquarians fix on the Parret, in Somersetshire.

Marazion, or Market Jew, is in the hundred of Penwith, on the coast of Mount's Bay, 281 miles from London, through Exeter, Launceston, Bodmin, Truro, and Helston; and 15 miles from the Land's End. This town is built on the slope of a hill, which rises towards the north and shelters it from cold winds. The mildness of temperature which results from its situation, renders the town and neighbourhood inviting to invalids, though these advantages are partly counterbalanced by the quantity of rain. The town contained 260 houses in 1831, and had a population of 1393. The parish church (that of St. Hilary) is two miles distant.

There are two dissenting places of worship, if not more. This town was formerly of more importance than it is now. At present there is one market held on Saturday, and well supplied. Ready-made shoes are sold in considerable quantities. The chief trade of the town consists in the importation of timber, coals, and iron, for the use of the neighbouring mines. The origin of the popular name of this town, Market Jew, has been much disputed: some have supposed it had at an early period a market to which foreign Jews came to buy tin; others that the name was derived from a market held on Thursday (*die Jovis*); it more probably has arisen from a popular corruption of the antient name, which appears to have been variously written, Marchadyon, Merdresein, Marghasyon, and Marghasiewe, from which last Market Jew seems to have sprung. It appears to have been burnt by the rebels under Humphrey Arundell of Lanherne, in 1549, and most of the public buildings and dwelling houses lay in ruins till long after.

Marazion has a corporation consisting of a mayor, eight burgesses, and twelve capital inhabitants. It appears to have elected two members of parliament in the year 1658, but it does not appear that they ever took their seats: it is thought to have had representatives at an earlier period.

The parish of St. Hilary, in which Marazion stands, had in 1831 a population of 1728, besides the population of the town, making 3121 in all: many of these are engaged in mining. The living is a vicarage in the diocese of Exeter and archdeaconry of Cornwall, of the net annual value of 311*l.*, with a glebe-house.

Opposite the town of Marazion is St. Michael's Mount, which is connected with the main land by the sands when the tide is out, but is insulated when it is high water. Across the sands is a narrow causeway of pebbles to render the communication more perfect. According to some antient traditions, the Mount was formerly attached to the shore, and surrounded with trees; but an examination of the geological features of the spot has shown that the traditions are groundless, and that the Mount could not have been separated from the land but by some great convulsion far beyond the reach of tradition or historical record.

It is supposed, and apparently with reason, that St. Michael's Mount was the Ικτις of Diodorus Siculus, the depôt for the tin refined and cast into ingots by the Britons. Previous to 1044 a priory of Benedictine monks had been established on the island; in that year Edward the Confessor gave to the monks the Mount, with all its appendages; but before 1085 Robert earl of Moreton (Mortagne?) and Cornwall, annexed it to the abbey of St. Michael in periculo Maris in Normandy. It was included in the suppression of the alien priories in the reign of Edward III., but restored as a religious house, and afterwards given, first by King Henry VI. to King's College, Cambridge, and then by King Edward IV. to the Brigitine nunnery at Sion, in Middlesex. At the Dissolution the lands belonging to this house were valued at 110*l.* 12*s.* The Mount is said to have been regarded with religious reverence as early as the fifth century. In the dark ages it was much resorted to as a place of pilgrimage. It was regarded also as a stronghold, and a castle was built on it. The Mount was seized and the monks expelled by Henry de la Pomeroy, who supported prince (afterwards king) John in his attempt to seize the throne during the captivity of his brother, Richard Cœur de Lion. It was however surrendered by Pomeroy on the approach of the royal army, supported by the sheriff with the posse comitatus: the monks were restored, and a small garrison placed in the castle. In the War of the Roses, the castle was seized by the earl of Oxford, a Lancasterian, after the battle of Barnet; the Yorkists besieged the place for several months, and at last took it by capitulation. Perkin Warbeck had possession of this castle for a while, and left his wife here as in a place of security. Upon the suppression of the monastery, the Mount was given to Humphrey Arundell of Lanherne: and when he placed himself at the head of the Cornish insurgents in 1549, the possession of this strong-hold was obstinately contested. In the civil war in the time of Charles I., the Mount was held for the royalists by Sir Francis Bassett, but was taken by the Parliamentarians in 1646. In Leland's time, there were houses at the foot of the Mount, with shops for fishermen; but before 1700 the place had so far decayed that there remained only one cottage, inhabited by a widow woman. In 1726-27 Sir John St. Aubyn rebuilt the pier, and since then the number of inhabitants has much increased. In 1831 there were 42 houses and 161 inhabitants; but in the pilchard season the number is generally increased. The Mount is extra-parochial.

The island, containing the Mount and a level piece of ground at its foot, is about a mile in circumference, and comprehends 70 acres of surface. The Mount is 231 feet in height from the level of the sea to the platform of the chapel tower. The ascent is steep, and is defended by two small batteries; the summit is occupied by the remains of the monastic buildings, which have been repaired and converted into a dwelling-house. Formerly the inhabitants had no other water than rain water collected in drains; but about the middle of the last century, on sinking a well, a fine spring was found, at the depth of 37 feet. Specimens of tin ore are said to be very plentiful all over the Mount, which is principally composed of granite. Human bones are frequently dug up wherever the soil was deep enough to allow of interment.

St. Mawes is in the parish of St. Just, in Roseland, in the hundred of Powder, on an arm of the Carrick Road, an inlet of the sea on which Falmouth stands: it is 260 miles from London, through Tavistock, Liskeard, and Tregony. This is a wretched little place, consisting of one street under a hill by the sea, and containing a few houses inhabited by fishermen. There was neither church nor chapel until 1812, when the marquis (now duke) of Buckingham built one. The parish church of St. Just is distant two miles. There is a castle built by Henry VIII., nearly at the same time as Pendennis castle, on the other side of the roadsted, but much inferior to it in size; it is now used as a residence for the lieutenant-governor. The market, which is on Friday, is very small. St. Mawes returned two members from 1562 up to the passing of the Reform Act, by which it was disfranchised. The parish of St. Just contained, in 1831, 337 houses and 1558 inhabitants. The living is a rectory of the net annual value of 425*l.*, with a glebe house. It is in the diocese of Exeter and archdeaconry of Cornwall.

Mevagissey, in the hundred of Powder, is a small town on the coast of the channel, on Mevagissey Bay, several miles to the left of the road by St. Austell and Grampound to Truro and Falmouth, 250 miles from London. The parish, which is small, contained in 1831 340 houses, and 2169 inhabitants. In 1821 the population was 2450: the diminution is ascribed to the failure of the pilchard fishery, on which the inhabitants chiefly depended. Ships of 100 tons may ride securely in the pool or basin of Mevagissey The market, which is held by prescription, is on Saturday.

The living is a vicarage, in the gift of the Earl of Mount Edgecumbe; net annual value 186*l.*, with a glebe house. It is in the diocese of Exeter, and archdeaconry of Cornwall.

Padstow, in Pyder hundred, is at the mouth of the river Alan, or Camel, which here forms a wide æstuary; it is 246½ miles from London, by Launceston and Camelford. The town is in a vale, adorned with gardens on each side, and the beauty of the situation is increased by the æstuary, which, when the tide is up, presents a clear expanse of water apparently land-locked by the granite cliffs which form the banks. The harbour is the best on the northern coast of Cornwall, and, though the entrance is much obstructed by sand, is capable of receiving vessels of great burden. The streets are in general narrow, and many of the buildings antiquated; but the town has been much improved within the last half century by the erection of many new houses: the general roofing is a fine blue slate. There is an excellent pier, a custom-house, several quays and shipwrights' yards, a workhouse, and a school-room over it. The church is in the perpendicular style of architecture. There were formerly several chapels in this parish; the east wall of that of St. Saviour, on a precipice overlooking the town and harbour, yet remains. The number of houses in the parish in 1831 was 325; the population at the same period was 1822. In the time of Leland the town carried on a considerable trade both with Ireland and Wales; the chief imports now are coals and iron from Wales, timber from Norway, and various goods from Bristol: corn, malt, and block tin are exported. The market is on Saturday. There is a school endowed with 5*l.* per annum from the Rev. St. John Eliot's donations, two Sunday schools, and several day schools, established by voluntary subscription and private benevolence. (Lysons' *Magna Britannia*, 1814.) There is supposed to have been at Padstow a monastery founded by St. Petrock, about A.D. 520, and destroyed by the Danes in 981. The place appears to have had antiently the name of Adelstowe or Aldestowe, and in the Cornish language Lodenek.

The living is a vicarage, of the net annual value of 202*l.*, with a glebe-house. It is in the diocese of Exeter and archdeaconry of Cornwall.

Polperro, in the hundred of West, lies partly in the parish of Lansalloes and partly in that of Talland; it is on the coast between Plymouth and Fowey, 6¼ miles from Fowey, and 237 from London. The situation of this little town is singularly romantic, the houses being on the side of two steep rocky hills, forming a very narrow valley; a small river which divides the two parishes runs through this valley. There is a harbour for vessels of 150 tons; an extensive hook and line fishery is carried on, by which Bath, Plymouth, and other places are supplied with fish: there is also a pilchard fishery, and some trade is carried on in coals, limestone, and grain. There was formerly a chapel dedicated to St. Peter on the brow of the more westerly of the two hills in the parish of Lansalloes; there are some remains of this, called the chapel house. The market is on Friday. The population of Polperro is not given separately in the population returns. The two parishes in which it stands contained together, in 1831, 1725 inhabitants, exclusive of the borough of West Looe, which is in Talland parish.

Lansalloes is a rectory, of the net annual value of 395*l.*, with a glebe-house. Talland is a vicarage, of the net annual value of 110*l.*: both are in the diocese of Exeter and the archdeaconry of Cornwall. There are two endowed charity schools at Polperro; one for boys and one for girls.

Saltash is on the right bank of the Tamar, a little above its junction with the Lynher, and is in the parish of St. Stephens. The town is built on the ascent of a steep hill, the summit of which is crowned by the chapel of ease and the town or mayoralty hall, beneath which is an open market-place. The streets are narrow and indifferently built; the principal street is at right angles to the river: the buildings are chiefly of stone quarried in the rock on which the town stands. Saltash appears to have been of more consequence formerly than at present: it is now chiefly inhabited by fishermen. Some trade is carried on in malt. The number of houses in 1831 was 245; of inhabitants 1637. The rest of the parish, which is tolerably large, contained at the same time 280 houses and 1455 inhabitants. The market is on Saturday. Besides the chapel of ease, there are two dissenting meeting-houses, if not more, and a free school.

Saltash was made a free borough in the reign of John or Henry III. The borough sent members to parliament from the time of Edward VI.: it was disfranchised by the Reform Act. The town of Saltash, as one of the passes into Cornwall, was the object of many contests in the great civil war. It was first fortified by the parliament, but surrendered without resistance to the Royalists under Sir Ralph Hopton in 1642: in 1643 the Parliamentarians, finding it open, hastily fortified it; but the Royalists soon after took it by assault. It was subsequently twice occupied by the Parliamentarians, and as often recovered by the Royalists; but was finally abandoned by the king's troops in 1646. Saltash was antiently called Esse or Asheburgh or Asche. Trematon Castle, in the parish of St. Stephens, will be noticed hereafter.

The perpetual curacy of Saltash is worth 45*l.* per annum, with a parsonage house; the living of St. Stephens is a vicarage, of the net value of 139*l.* per annum, is in the diocese of Exeter and archdeaconry of Cornwall.

Stratton, in Stratton hundred, is in the northern extremity of the county, on a rivulet the waters of which ultimately fall into the sea at Bude Haven, in Bude Bay. It is 222½ miles from London by Exeter, Crediton, Hatherleigh, and Holsworthy. The harbour at Bude admits only small vessels. Sea sand is sent from Bude far inland for manure. The number of houses in the parish in 1831 was 305: the number of inhabitants was 1613.

Stratton, or the immediate vicinity, has been generally allowed to be the site of a Roman station, Musidunum; but its chief historical interest is derived from the battle fought near it in the civil war of Charles I. The scene of action was really in the neighbouring parish of Ponghill: the earl of Stamford, with the parliamentary army, was attacked May 6, 1643, by the Cornish royalists, who were far inferior in number, under Sir Ralph Hopton, Sir Beville Grenville, and others. The Royalists gained a complete victory, taking the camp of the enemy, with all their artillery, baggage, and provisions, and many prisoners. Sir Ralph Hopton was created Lord Hopton of Stratton, and after his death, Sir John Berkeley, who had distinguished himself in the battle, was created Lord Berkeley of Stratton.

Tregony is a borough, in the parish of Cuby, in the hundred of Powder, on the left or east bank of the river Fal, 251 miles from London, through Tavistock, Liskeard, and St. Austell. This town was formerly of some consequence, but it began to decay as Truro began to flourish. The houses are chiefly arranged in one long street on the side of a hill sloping down to the Fal, over which there is a bridge. The number of houses in 1831 was 234: the number of inhabitants was 1127 in the borough, or 1282 in the whole parish. The parish church of Cuby is in the upper part of the town. The market is on Saturday. The corporation of Tregony consists of a mayor, recorder, and seven or eight capital burgesses The borough is said to have sent members to parliament in the time of Edward I.; but if this, which is doubtful, be admitted, it appears that the franchise was disused till the reign of Queen Elizabeth. From that time two were returned until the borough was disfranchised by the Reform Act. Tregony is considered to have been a Roman station, Cenium or Voluba. There was a castle of the Pomeroys at Tregony, of which there are now no remains.

The living of Cuby is a vicarage, united with the vicarage of Tregony, the church of which, dedicated to St. James, was in old Tregony, and was partly standing in the last century: their joint value is 311*l*.; in the gift of J. A. Gordon, Esq.: in the diocese of Exeter and archdeaconry of Cornwall.

Bossiney [BOSSINEY], St. German's, West Looe, and St. Michael's, are decayed boroughs. For the borough of Newport, we refer to LAUNCESTON.

St. German's is in the hundred of East, on the river Tidi, which unites with the Lynher, forming the St. German's river; 228 miles from London through Plymouth and Saltash. It is on the slope of a tolerably high hill, which rises on the north side of it. The houses (which, in 1831, amounted to 491 for the whole parish, one of the largest in the county), are arranged mostly in one street. The inhabitants of the parish (2586 in 1831) derive their chief support from agriculture and fishing. St. German's was at a remote period the seat of a bishopric, which was afterwards united with that of Crediton, and from this union arose the see of Exeter. Athelstan, king of England, had established here a college of priests, who were afterwards made canons of the order of St. Augustine; and the manor of St. German's was divided between the priory thus formed and the bishop of Exeter. At the Suppression, the revenues of the priory were valued at 243*l*. 8*s*., Dugdale and Speed; or 227*l*. 4*s*. 8*d*. according to the Clare MS. Valor. The conventual church, now used as the parish church, was formerly much more extensive. The antient chancel fell to the ground in 1592, in consequence of the necessary repairs having been neglected: the church now consists of a nave and two aisles. The west front has two towers, both of which are supposed to have been once octagonal in the upper part, and quadrangular below: the north tower retains that form, but the south tower has been altered, and is quadrangular throughout. Between the towers is the entrance, formed by a very deep Norman arch with shafts and mouldings, and two small Norman windows above. The architecture of the south aisle is very dissimilar, and the use of the pointed arch indicates its later erection; indeed the pointed arch is found even in the west front, which has probably undergone partial alteration. In the part now employed as the chancel is a rude antient seat, generally called 'the bishop's chair,' but probably nothing more than the seat of one of the monks. There is a fine altar-piece, a pulpit curiously veneered and inlaid, and several monuments. The seat of the earl of St. German's, called Port Eliot, is in the immediate vicinity of the church, and occupies the site of the antient priory: the outside is irregular and devoid of magnificence, but many of the apartments are convenient and spacious, and decorated with paintings. The site of the abbey and other lands were, at the Dissolution, leased to John Champernowne and others, and afterwards granted in fee, in consideration of a sum of money, to Catherine, widow of John, and two other persons. Champernowne is said to have obtained his share in the monastic plunder by a trick creditable to his ingenuity rather than his fairness. Two gentlemen making suit to the king for these lands, Champernowne, then in attendance at court, kneeled behind them when they kneeled to his majesty, as though he had been a party to the petition, joined with them in returning thanks, and afterwards claimed his share, which, on an appeal to the king, was allowed him. From the Champernownes the estate passed to the Eliot family, of which the present earl of St. German's is the representative. There are two cattle fairs in the year. There is a free school, founded and endowed by Nicholas Honey, and we believe farther supported by the Eliot family. St. German's returned members to parliament in 1562, when its right to send was questioned. The right of election was nominally in all householders within the borough (which however contains only a few houses), but was virtually vested in the freemen, who amounted, according to Oldfield's *Representative History*, Lond., 1816, to seven; the borough was disfranchised by the Reform Act. The living is said, in the *Clerical Guide* (1836), to be a perpetual curacy, of the annual value of 101*l*. with a glebe house, in the gift of the dean and chapter of Windsor; in the diocese of Exeter and the archdeaconry of Totnes; but according to Messrs. Lysons (*Magna Britannia*), it is in the peculiar jurisdiction of the bishop of Exeter.

West Looe is separated from East Looe by the river Looe. It contained, in 1831, 126 houses, and 503 inhabitants. It is in the parish of Talland, which includes also a part of the market-town of Polperro. There is a narrow bridge over the Looe, uniting the two boroughs of East Looe and West Looe. There was formerly a chapel at West Looe dedicated to St. Nicholas, but it is now converted into a guildhall. The market, which was on Wednesday, has been long discontinued. This place was incorporated by Queen Elizabeth: the corporation consists of twelve burgesses, including the mayor. This borough sent members to parliament from the time of Edward VI.. the election was in the corporation. West Looe was disfranchised by the Reform Act.

St. Michael's, otherwise Michell, is on the main road from Bodmin to Penzance and the Land's End, 248 miles from London: it is partly in the parish of St. Enoder, and partly in that of Newlyn, both in the hundred of Pyder. This place deserves notice only as being one of the boroughs disfranchised by the Reform Act. It returned two members from the time of Edward VI. The right of election was declared in 1700 to be in the lords of the manor capable of being portreeves (the portreeve is the returning officer), and in the inhabitants paying scot and lot. The latter, in the time of Browne Willis, were in number twenty-six; but Sir Christopher Hawkins having purchased the borough, pulled down the cottages as fast as they became empty, and so reduced the number of voters to four, exclusive of the lords of the manor. The population of St. Enoder was, in 1831, 1124; that of Newlyn, 1218.

The living of St. Enoder is a vicarage, in the gift of the bishop of Exeter, of the annual value of 278*l*., with a glebe-house: that of Newlyn is a vicarage, also in the gift of the bishop, of the annual value of 380*l*., with a glebe-house. Both are in the diocese of Exeter and the archdeaconry of Cornwall. Both churches are distant, St. Enoder three miles north-east, Newlyn two miles north-west, from St. Michell.

Divisions for ecclesiastical and legal purposes.—Cornwall was antiently a diocese by itself; and opposite opinions have been entertained as to the place where the see was first established: according to Camden, Tanner, and Gough (the editor of Camden), the see was fixed at Bodmin first, and afterwards removed to St. German's; while Mr. Whitaker, who is followed by Messrs. Lysons, contends that it was originally fixed at St. German's, and continued there until it was united with the see of Crediton. Out of this union rose the see of Exeter, in the diocese of which Cornwall is now included. The limits of the county nearly coincide with those of the archdeaconry of Cornwall; but thirty-two parishes, according to Messrs. Lysons, are exempt from the archdeacon's jurisdiction. The archdeacon's visitations are held about a month after Easter in each year at Launceston, Liskeard, Bodmin, Truro, Helston, and Penzance. The archdeaconry is subdivided into eight rural deaneries — East, Kerrier, Penwith, Powder, Pyder, Trigg Major, Trigg Minor, and West. The office of rural dean is in this county an efficient office. The deans are appointed yearly, and make regular visitations to all the churches within their deaneries, reporting the state of the churches at the archdeacon's visitation.

Messrs. Lysons give the number of parishes as 203 (two less than those given in the Population Returns), of which 85 are rectories, 100 vicarages, and 18 donatives or curacies.

Cornwall is in the western circuit. The Spring assizes are held at Launceston, the summer assizes at Bodmin. The Epiphany and Midsummer quarter-sessions are held at Lostwithiel, the Easter sessions at Truro, and the Michaelmas sessions at Bodmin. There are a county gaol and house of correction at Bodmin, and another older county gaol at Launceston, which is used at the assizes. The Cornish sessions are not attended by barristers. (Lysons' *Magna Britannia.*)

This county is however under a peculiar jurisdiction, which requires notice here,—that of the duke of Cornwall. The duchy of Cornwall was created in 1337 in favour of Edward the Black Prince, and settled by act of parliament on the eldest son of the king of England. The Duke enjoyed large revenues, arising from the lordship of castles, boroughs, and manors, granted to him in Cornwall and Devonshire; the profits arising from the coinage of tin, and various other sources. The annual revenue on the average of the three years subsequent to the death of the Black Prince was 2493*l.* 7*s.* 3¼*d.*; the clear revenue in the 15th year of Henry VIII. amounted to 10,095*l.* 11*s.* 9¼*d.*; in the 44th year of Queen Elizabeth, in 1602, it had fallen to 4569*l.* 12*s.* 2¼*d.*; and at the publication of Messrs. Lysons' *Magna Britannia* (1814), the gross amount was estimated at 22,000*l.*, of which 8500*l.* arose from the tin-duty in the county of Cornwall, and 3500*l.* from the rents of manors, fines, &c. in the same county: the sources from which the remainder was derived are not mentioned. The tin-duty before the war of 1793 had been 14,000*l.* per annum. The immediate government of the county was vested in the Duke, who has still his Chancellor, Attorney-general, and Solicitor-general, and his court of exchequer. He also appoints the sheriffs. The mining trade is under the separate jurisdiction of the Stannary Courts; the Lord Warden of the Stannaries, and the Vice-warden, are at the head of this jurisdiction, with a final appeal to the duke and his council. The miners claim to be free from all jurisdiction but that of the Stannary Courts, except in cases affecting land, life, or limb. The Vice-Warden's Court is held once a month, and is a court of equity for all matters relating to the tin mines and trade; no writ of error lies to the courts at Westminster, but there is an appeal to the Warden, and from him to the Duke in council, or, when the duchy is vacant, to the King in council. Issues are frequently directed by the Vice-warden to be tried in the Stannary Courts, which are held at the end of every three weeks before the Steward of each of the four 'Stannaries' or mining districts: in these courts all civil actions, in which either plaintiff or defendant is a privileged tinner, are tried before the Steward and a jury: from these courts an appeal lies to the Vice-warden, and from him as in other cases. The four Stannary districts are Foy More, Blackmore, Tywarnhaile, and Penwith and Kerrier. The Stannary laws are revised, or new ones enacted, by the Duke and his council, with the consent of what is called the Stannary Parliament, consisting of twenty-four Stannators, gentlemen of property in the mining districts, chosen six for each stannary. Those for Foy More are chosen by the mayor and corporation of Lostwithiel, those for Tywarnhale by the mayor and corporation of Truro; and those for Penwith and Kerrier by the mayor and corporation of Helston. The last Stannary Parliament was held at Truro in 1752, and continued by adjournments to September, 1753. The Stannary laws have been repeatedly published. The Stannary prison was at Lostwithiel, but by the recent Act (which we shall presently mention) it is now at Bodmin. The antient records of the Stannaries were kept at Lostwithiel till they were burnt in the great civil war of Charles I., in 1644, by the parliamentary army.

An act was passed in the 6th and 7th Wm. IV., cap. 106, entitled 'An Act for the better and more expeditious Administration of Justice in the Stannaries of Cornwall, and for enlarging the Jurisdiction and improving the Practice and Proceedings in the Courts of the Stannaries.' By section 4 of this act, the equitable jurisdiction of the Vice-Warden is extended to all matters connected with the working of lead, copper, or other metal or metallic minerals within the county of Cornwall. By section 6, the Stannary Courts are consolidated, and are to be held before the Vice-Warden, who is to have the same authority that the stewards had. By section 14, the Vice-Warden is authorized to make rules and orders for the regulation of the practice and proceedings of his court; such rules as relate to the Equity side of his jurisdiction to be confirmed by the Lord Chancellor, and such as relate to the Common Law side by one of the judges of the superior courts of Common Law at Westminster. The Vice-Warden's Court (section 21) is made a Court of Record, and is held at Truro. For other details, see the Act.

Previous to the Reform Act Cornwall had the largest share in the parliamentary representation of all the English counties: up to 1821 it had sent forty-four members, viz. two for the county, and two each for twenty-one boroughs, none of them of any great importance, and some of them utterly insignificant. The county was represented in parliament at the time of the first summons of Edward I., and in the latter part of that monarch's reign it returned two knights of the shire, and representatives for the six boroughs of Launceston, Bodmin, Lostwithiel, Helston, Truro, and Liskeard: to these were added, in the reign of Edward VI., Saltash, Camelford, West Looe, Grampound, Bossiney, St. Michael's, and Newport; in the reign of Mary, Penryn and St. Ives; and in that of Elizabeth, Tregony (though it has been asserted that this borough sent members in the time of Edward I.), St. German's, St. Mawes, East Looe, Fowey, and Callington. In 1821 Grampound was disfranchised. By the Reform Act the county was formed into two divisions, each returning two members: St. Michael's, Bossiney, St. Mawes, East and West Looe, St. German's, Newport, Camelford, Tregony, Saltash, Callington, Fowey, and Lostwithiel were disfranchised; and the members for Liskeard, Launceston, St. Ives, and Helston reduced to one each; making the number of members sent by the county only fourteen. The chief place of election for the eastern division of the county is at Bodmin, and the polling stations are Bodmin, Launceston, Liskeard, Stratton, and St. Austell. The chief place of election for the western division is Truro, and the polling stations are Truro, Penzance, Helston, and Redruth. The town of Falmouth was, by the Boundary Act, included in the borough of Penryn: the boundaries of other boroughs were enlarged, but no other addition was made that requires notice here.

Natural Curiosities.—The granite rocks of Cornwall present in different places an appearance so singular, that they have been mistaken for the efforts of human art in its earliest and rudest stage. The Cheese Wring or Wring Cheese occupies the highest ridge of a hill north of Liskeard, one of the hills which gradually decline from Brown Willy and Rough Tor, the highest parts of the county. The summits of all these hills are covered with granite cairns in different states of ruin, and their sides are strewed with bowlders which have fallen from them. Cheese Wring is a cairn or heap consisting of five stones piled one on the other, of which the upper ones are so much the largest as to overhang on all sides the lower ones, which form their base. The collective height of the whole pile is about fifteen feet, according to Dr. M'Culloch, whose account (*Geological Transactions*, vol. ii. pp. 66-78) we follow; but Dr. Borlase states it at thirty-two feet. The formation of this group is ascribed by Dr. M'Culloch solely to natural causes. It is, in fact, the remain of a much larger mass, the lateral parts of which have fallen away, not being so well poised as the singular part which yet remains. The granite of Cornwall is in general split by fissures, which tend for the most part to the horizontal or perpendicular; and by these fissures it is divided into cubical or prismatic masses. Where the rock rises above the surface, the influence of the atmosphere causes a gradual decay, by which first the angles formed by the fissures with the external face of the rock become rounded, then the surfaces in contact become separated, the masses originally angular acquire a curvilinear outline; and if the centre of gravity of the whole mass be high and far removed from the perpendicular of the fulcrum, the upper parts of the mass fall down, and by the continuance of the disintegration acquire the spheroidal form which the granite bowlders often exhibit. If, however, the centre of gravity be in the perpendicular of the fulcrum, the mass retains its position, as in the case of Cheese Wring, or produces the phenomenon that will be next described.

The Logging (or, as it is sometimes written, Logan) Stones are stones which are poised on a fulcrum, and which rock, when moved by an adequate force. The most remarkable of these Logging Stones is near the Land's End, on a peninsula of granite jutting out 200 yards into the sea, the isthmus still exhibiting some remains of the antient fortification of Castle Treryn. The granite which forms this peninsula is split by perpendicular and horizontal fissures into a heap of cubical or prismatic masses. The whole mass varies in height from 50 to 80 or 100 feet; it presents on almost every side a perpendicular face to the sea, and is divided into four summits, on one of which, near the centre of the promontory, the stone in question lies. The general figure of the stone is irregular; its lower surface is not quite flat, but swells out into a slight protuberance, on which the rock is poised. It rests on a surface so inclined, that it seems as if a small alteration in its position would cause it to slide along the plane into the sea; for it is within two or three feet of the edge of the precipice. The stone is 17 feet in length, and above 32 in circumference near the middle, and is estimated to weigh nearly 66 tons. The vibration is only in one direction, and that nearly at right angles to the length. A force of a very few pounds is sufficient to bring it into a state of vibration; even the wind blowing on its western surface, which is exposed, produces this effect in a sensible degree. The vibration continues a few seconds. There is another Logging Stone at St. Just, and a third at Sithney, which has been thown down; but this near the Land's End is the largest.

On the horizontal surface of the granite the action of water has formed excavations with rounded bottoms, occasionally circular in their outline, and as regularly spheroidal as if shaped with a turning-lathe. They are of various depths, and sometimes communicate with each other. The surface of 'the rock basin quoit' at Carn-brea is honeycombed by these hollows. In the parish of Constantine are two very singular monuments. One is a huge stone resembling an inverted cup or mortar, but not hollow, so regularly formed as to present the appearance of art. It is 30 feet in girth and 11 high, according to Dr. Borlase. The other monument is a vast stone perched on the points of two rocks, so that a man may creep under it; it is 33 feet long from north to south, which is its greatest dimension; the breadth from east to west is 18½ feet, and the thickness or vertical dimension is 14½ feet; the circumference is computed to be 97 feet, and the girth about 60 feet; it is estimated to weigh at least 750 tons. The top is honey-combed by rock basins similar to the rock basin quoit at Carn-brea. There are in Cornwall and the Scilly Isles other stones similarly supported; they are commonly designated by the name 'Tol-men,' *i. e.*, hole of stone. (Borlase, *Antiquities of Cornwall.*)

The cairns on Carn-brea Hill, near Redruth, and the Roche Rocks, a little to the left of the road from Bodmin to Truro, are of granite, and owe their picturesque form to natural causes.

History and Antiquities.—Before and at the time of the Roman invasion, Cornwall was probably included in the territory of the two tribes, the Damnonii and the Carnabii. Ptolemy mentions only the former of these, whom he terms Δουμνόνιοι, Dumnonii; and they seem to have occupied the south-eastern part, comprehending all the Channel coast. The Carnabii are not, we believe, noticed by any writer except Richard of Cirencester, who considers that they gave to the county the name which it had in the Latin of the Middle Ages, Cornubia. It is, however, more probable that the district gave name to the people, and that both Carnabii and Cornubia contain the Celtic root kern or corn,' signifying a horn. The second part of the modern designation of Cornwall is derived from the Saxon Wealas, a name given to the Britons, some of whom, on the Saxon invasion, retired into the western part of the island, and maintained a long struggle for their national independence. Mr. Whitaker considers that the Cimbri, a people mentioned also by Richard, extended into Cornwall; but this supposition does not appear to be well supported.

At an early period this part of the island was frequented by the Phœnicians of Gadeira (Cadiz), who came hither to procure tin, lead, and skins, but especially the first; in return for which they gave salt, earthenware, and copper goods. (Strabo, lib. iii. 175.) It was probably from these Phœnicians that the western extremity of Britain, with the Scilly Islands, obtained the name of the Cassiterides (κασσιτερίδες), 'tin-islands,' from a root which, in some of the oriental tongues, as well as in Greek, denotes tin. The Greeks appear to have had some knowledge of those parts of the island where tin was wrought, before the time of the Roman conquest. (Borlase, *Antiquities of Cornwall.*)

To this remote period we may probably refer some of the rude stone monuments which are still numerous in this part of the island. Rough blocks or obelisks standing in pairs, and supposed to be memorials of the dead, are found at Dryft, in the parish of Sancreet, between Penzance and the Land's End, and at Trewren, in Maddern parish, near Penzance. There are two stones at Bolleit in St. Buryan or Burian (also near the Land's End) which are a furlong apart, one twelve, the other fifteen feet high. On the downs between Wadebridge (near Padstow) and St. Columb are nine rude stone blocks or pillars placed in line, bearing north-east and south-west, and called the Nine Maids. The circles of stones are numerous in this county, and are generally known by the name of Dawns Men, *i. e.*, the stone dance. Boskednan circle, in the parish of Gulval, and Boscawen-ûn in St. Buryan, are formed of stones placed at some distance from each other, and, for the most part, according to the plates given by Dr. Borlase, yet erect. Boscawen-ûn has a stone in the centre fixed in the ground, and leaning so far, that unless fixed at the base, it would surely fall. Other circles are formed by stones not erect, but placed near each other, so as to form a kind of fence; such are Zenor Circle, between St. Ives and Cape Cornwall, and Kerris Roundago, near Penzance, an oval inclosure, with four stone pillars at one end, marking out a quadrangular space. All these are in the western part of the county. Near Liskeard are three circles, very near each other, formed by erect stones placed at some distance; several of the stones have been carried away, and others overthrown. Popular superstition has attached to this monument a legend that the blocks were once men transformed into stones as a punishment for engaging in the sport of hurling on the Lord's Day: hence the name given to this monument of 'The Hurlers.' A similar legend is attached to a monument in the parish of St. Buryan, where nineteen maidens are said to have been turned into stone for dancing on the Lord's Day. At Botallack, in St. Just parish, near Cape Cornwall, are several stone circles intersecting each other; and on the hill Carn-Meneles in the parish of Wendron, between Redruth and Helston, is a stone circle, having in the middle of it a natural rock of four masses piled on each other after the manner of the Cheese Wring. Other stone circles are found at Tredinek in Gulvall parish, near Penzance; at Crellas, in Sancreet parish, between Penzance and the Land's End; and in two of the Scilly Islands, St. Mary and Tresco. There are also in Cornwall several circles, which Dr. Borlase supposes to have been devoted to the purposes of an amphitheatre. They are called 'plân an guare,' 'the plain of sport or pastime.' The amphitheatre of St. Just, near Cape Cornwall, may be taken as a specimen of these circles; it consists of circular stone seats rising regularly one above another, and enclosing an area of 126 feet diameter. The seats or steps, six in number, are of stone, 14 inches wide and 1 foot deep, surmounted by a rampart 7 feet wide, and rising 1 foot above the highest seat, with a ditch outside 10 feet deep from the top of the rampart. In the other amphitheatres the seats are usually of turf, as at Piran Round, or Perran Round, between St. Columb Major and St. Agnes. If we may infer anything from the more regular construction of these circles, we should assign to them a much later date than the period of which we are now speaking.

Various other antiquities may be noticed here as having probably had a British origin, though of uncertain date. There are several barrows, or sepulchral mounds, composed some of loose stones, others of earth, and others of stones and earth mingled. Some of these, on being opened, have been found to contain sepulchral urns; others, in the Scilly Isles, have an outer ring or edge of large stones, and within a cavity formed by stone walls, with flat stones at the top, and the cavity covered with the mound of loose stones or earth. There are also several cromlechs, the top stones of which are in Cornwall called 'quoits.' The quoit of Lanyon Cromlech is 19 feet long and 47 feet in circumference: its thickness varies, being in some parts as much as 2 feet; it is raised so high that a man can sit on horseback under it. It has four upright stones, but one is too short to give it any support.

Among the smaller relics of antiquity may be mentioned the sepulchral urns dug up from some of the barrows; some hollow instruments of brass or other mixed metal, apparently the heads of weapons called celts, a similar instrument of stone: spear-heads and broken pieces of copper swords; lumps of fine copper, evidently designed for melting; and a considerable number of gold coins found in 1749 near Karn-bré or Carn-brea Hill, in the neighbourhood of Redruth: these coins, which are described as rude imitations of Greek coins, are considered by Dr. Borlase to be British. Messrs. Lysons would refer the neatly-executed sepulchral urns to the Roman period, as well as the barrows that contain them; possibly, however, they may be more antient, as well as the brass or copper weapons and instruments;

for instruments of copper and pieces of earthenware are recorded by Strabo among the Phœnician importations.

There are also in Cornwall several artificial caves or subterranean galleries, formed by walls of upright stones, with other stones laid across; some of the galleries extend 30, or even 60 feet in length. The upright stones, or obelisks, with inscriptions in the Roman character, and in the Latin tongue, must be referred to a period subsequent to the Roman invasion; and from their inscriptions or symbols, several must have been posterior to the introduction of the Christian religion. Other miscellaneous antiquities of British origin we must pass over.

The period at which Cornwall fell under the power of the Romans is not known. Dr. Borlase ascribes the conquest to Agricola; Dr. Stillingfleet to Vespasian. As however none of the Roman historians who have recorded the affairs of Britain noticed the conquest of Cornwall, or of the tribes inhabiting it, it is probable that it was not signalized by any great exploits. Some of the older antiquaries denied that Cornwall ever came under the Roman dominion; but, apart from the improbability of the rich mines of this county escaping the notice, or being defended from the power of that people, the quantity of Roman coins and other Roman remains found in Cornwall, shows that Cornwall shared in the general subjection of South Britain.

The geography of Cornwall during the Roman period is very obscure. Ptolemy notices the headlands of Antivestæum, or Bolerium (Αντιουέσταιον, or Βολέριον), supposed to be the Land's End; and Ocrinum, or Damnoniun (Ὄκρινον, or Δαμνόνιον), supposed to be the Lizard: and Richard of Cirenceater adds the Κριοῦ μέτωπον, or Rame Head. Ptolemy mentions the æstuaries of the river Tamarus (Τάμαρος) which the name enables us to identify with the Tamer, and the Cenion (Κενίων), probably the Fal, which has the most remarkable æstuary west of the Tamar. Of the towns of the Damnenii, mentioned by Ptolemy, Voluba, or Voliba (Οὐολίβα), has been fixed at Tregony, or Grampound, or perhaps at Wolvedon, where is a camp, probably Roman, on the Fal, (the name of which has been supposed to be incorcorporated in the word Vol-uba), and at Lostwithiel, or elsewhere on the Fowey. Uxela (Οὔξελα), which some have fixed at Lostwithiel, is more generally regarded now as having been in Somersetshire. Tamare (Ταμαρή) fixed by Horsley at Saltash, is by others removed into Devonshire, to Tamerton. To these towns, all mentioned by Ptolemy, we may add on the authority of Richard, Cenia, whose name seems to connect it with the Fal, the Κενίων of Ptolemy, but which is nevertheless fixed by some at Condurra, on the river Hel, or Helford, where are the remains of a Roman camp; Musidum, or Musidunum, which is fixed near Stratton; and Halangium, supposed to be Karnbré. Two if not three Roman roads enter Cornwall from Devonshire. One was the continuation of the great road which ran westward from Isca Dumniorum, or Exeter, and it is said may be traced on the downs west of Liskeard; it is conjectured to have proceeded westward by Lostwithiel, St. Austell, and Grampound (or Tregony), to Bossens (where is a Roman camp), near the river Heyl, which falls into St. Ives' Bay, and from thence to Marazion, or rather to St. Michael's Mount, the presumed Ictis (Ἴκτις) of Diodorus. The other road came from the north of Devon to Stratton, and is conjectured to have led towards Bude Haven, which was probably then a large and more important harbour. The existence of a third Roman road is doubtful. A road, probably British, the direction of which is marked by the occurrence of barrows, runs from the Land's End, near Redruth, Michel or St. Michael's, and St. Columb, towards Stratton. Besides the places above mentioned, Launceston has been supposed to be a Roman station. Cornwall was included in Britannia Prima.

Upon the departure of the Romans, Cornwall recovered its independence, which it maintained for a long time against the invading Saxons. The famous Arthur, whose history has been so distorted by fable as to cast a doubt over his existence, is generally reputed to have been a native of this county.

The continued and resistless pressure of the Saxons having driven westward those Britons who refused to bear the yoke of the invaders, Cornwall and Devonshire became the place of refuge to many. It was probably about this time that part of the superabundant population thus compressed into the extremity of the island, took refuge in Bretagne, already colonized by their countrymen [BRETAGNE], and gave to a district there the name of the country which they had left. [CORNOUAILLES.] The Cornish Britons and those of Wales appeared to have recognised one supreme authority until about the middle of the seventh century, when Cadwaladyr, the last British sovereign, abdicated his throne, and went to Rome, where he died. Upon his death, A. D. 680, Ivor, son of Alain, king of Bretagne, was sent by his father with a powerful fleet to obtain the crown, and met at first with considerable success, defeating the West Saxons, and obtaining possession of Cornwall, Devonshire, and Somersetshire: he was however afterwards driven from the island by the West Saxon king Kentwin. In A. D. 710, Ina, king of Wessex, defeated the Cornish Britons, under their king Geraint. Œthelheard, successor of Ina, renewing hostilities, was defeated by Rodri Maelwynawc at Heilyn. In A. D. 743, Cuthred, king of Wessex, defeated the Britons, but from his having the assistance of the Mercians, we consider it likely that it was the Britons of Wales, not Cornwall (as Messrs. Lysons suppose), who were attacked by him. The Cornish Britons had however to sustain the hostility of Cynewulf, one of his successors.

In A. D. 800, Egbert ascended the throne of Wessex, and his first hostilities were directed against Devonshire and Cornwall: the Britons were defeated in 813, and he ravaged the country unchecked. In 823 a great but indecisive battle was fought at Gafulford (supposed to be Camelford), between the Cornish Britons and the Saxons, who had by this time acquired the partial if not the total possession of Devonshire. Twelve years afterwards, in 835, the Cornish men, assisted by the Danes, who were beginning to assail England, were defeated on Hengston-hill (Hingston Down), near Callington, by Egbert, who had now established the permanent supremacy of Wessex, and deprived the Britons of the relief which they had hitherto experienced from the dissensions of the Anglo-Saxon princes. Irritated by the aid which they had given the Danes, Egbert prohibited the Britons from setting foot within the Saxon territories on pain of death. During the reign of the successors of Egbert, we hear little of Cornwall until we come to the time of Athelstan, by whom the whole country, including the Scilly Isles, was reduced and incorporated with the now consolidated kingdom of England. From this time the provincial history of Cornwall offers little to interest the reader for many centuries. Some ravages of the Danes, and some intestine commotions, are the only memorable events. The attempt of Henry de la Pomeroy to seize St. Michael's Mount, in order to support the rebellion of Prince John against his brother, Richard I., has been already noticed.

Of the obscure and troubled period over which our historical notice extends, Cornwall retains many memorials in the camps and earth-works, which are more numerous in this country than in any other. These are, for the most part, nearly round or oval, a form which induces us to refer them to any other than a Roman origin. They possibly were formed during the severe and protracted struggles of the Cornish Britons with the Anglo-Saxons. In many places of the coast, a small promontory, or portion of the cliff, is enclosed by a rampart, or vallum, running from one edge of the cliff to the other, and strengthened on the land side by a ditch. These, if situation be any clue to their origin, may be ascribed to the Danes. The space enclosed is considerable; in one case (in the parish of St. Gorran, near Mevagissey,) it amounts to 100 acres. Our space forbids a description of these works, and a mere catalogue would be useless.

The ruins of castles and of monastic establishments belong to a later period than the earth-works; but in these Cornwall is not remarkably rich. On the hills are the remains of rude circular buildings, called castles, the walls of which were formed of dry stones, not joined with any cement: these must be referred to an early period; Dr. Borlase considers them to be of Danish origin. In the narrow part of the county west of Mount's Bay and St. Ives' Bay, there are no less than seven of these castles, of which the most remarkable are Caer Bran in Sancreet parish, Castle an Dinas in Ludgvan parish, and Chûn Castle in Morvah. Chûn Castle consists of an oval enclosure surrounded by a wall, which Borlase estimates to have been originally 15 feet high, or rather more; 8 feet thick at the present top, but thicker at the foundation; outside of this is a ditch 30 feet wide; and outside of this, an outer wall, probably 10 feet high, and about 5 feet thick. The entrance, made intricate for the purpose of defence, is enclosed by walls running from the outer wall, on one side of the entrance quite to the inner wall, and on the other to within three feet of it: two other walls running from the outer to the inner wall serve, with the entrance, to divide the ditch into three parts. Round the outer wall is a ditch, the width of which is not given. The space enclosed by the inner wall is 125 feet from east to west, and 110 from north to south; it is divided into several compartments ranged round the inside of the wall: there is a well in the enclosure.

Of castles intended for residence as well as defence, may be mentioned Karn-brê, or Carn-brea Castle, on Carn-brea hill, near the Land's End. This is very small, scarcely 60 feet long by 10 wide, built upon a ledge of rock, whose uneven surface has caused great diversity in the level of the rooms upon the ground floor. The building had three stories in some parts, in others but one. Part of the building is very antient and of rude architecture, and the less antient part is thought to have been built on older foundations. Carn-brea hill abounds with antiquities: there is an antient camp of irregular form, some cairns, and other antiquities of rough stone. Tintagell Castle has been already noticed. [Bossiney.] For Launceston Castle, see Launceston.

Trematon Castle is on an eminence over the river Lynher, in the parish of St. Stephens, and not far from Saltash. It has a base court surrounded by an embattled wall of irregular form, following the shape of the hill on which it stands, and pierced with loop-holes. The keep is on an artificial mound, at the north-east corner of the base-court, about 30 feet high: the walls of the keep are 30 feet high, and 10 thick: it is nearly oval, and its inner dimensions are 66 feet by 52. It has no windows in the outer wall. In the time of William Rufus this castle was held by the Valletort family. In the Cornish rebellion in 1549 (reign of Edward VI.), Trematon Castle was defended for a while against the rebels by Sir Richard Grenville.

Of Restormel Castle, in the parish of Lanlivery, near Lostwithiel, the only part now remaining is the keep, a building of large dimensions: it is on a steep mound, formed out of a rocky hill, and has a deep ditch. The enclosure of the keep is an exact circle of 110 feet diameter within; it has walls 10 feet thick at the top: from the present floor of the ground-rooms to the top of the parapet, is 34½ feet. Restormel Castle was a seat of the family of the Cardinans; it afterwards came into the possession of the earls of Cornwall: it is still attached to the duchy.

The castles of Fowey and St. Mawes have been noticed above. For Pendennis Castle, see Falmouth.

There are few remains of monastic buildings in Cornwall. The church of St. German's priory has been already described: the monastic remains on St. Michael's Mount have been also noticed. Of the monastery of St. Benet, near Lanivet, there are considerable remains, now occupied as a dwelling-house. The tower of the church is also standing. There is no certain account of this religious house, which is said to have been a Benedictine nunnery, subordinate to some foreign monastery. The chapel of St. Lawrence's Hospital, near Bodmin, remains. Morwinstow Church, in the northern extremity of the county, and Kilhampton or Kilkhampton Church, near Stration, are very antient, being wholly or chiefly of Norman architecture. Sheviock Church, near St. German's, has some portions of early English, and other portions of decorated English architecture.

In the war of the Roses, the Cornish men seem to have taken the Lancasterian side, induced mainly by the influence of Sir Hugh Courtenay of Boconnoc, and Sir John Arundell of Lanherne: they were present in the field at Tewkesbury; and it was in their country (at St. Michael's Mount) that the Earl of Oxford, one of the Lancasterian leaders, sought to make a stand after that fatal day. In the reign of Henry VII. (1495), they rose in rebellion on occasion of a tax levied to defray the expense of a war with Scotland. Thomas Flammock or Flamank, a man of respectable family, and a lawyer; Michael Joseph, a smith of Bodmin, and Lord Audley, were the leaders of this revolt: the common men were armed with bows and bills. The insurgents advanced towards the metropolis, but were entirely defeated on Blackheath, and their leaders executed. In 1497 the Cornish men were again in arms to support Perkin Warbeck, but the flight of that pretender caused the failure of the attempt. In the reign of Edward VI., in 1549, a new revolt broke out, connected with the religious revolution of that period. The Cornish men took up arms to sustain the antient (Catholic) church, and besieged Exeter; but were forced to raise the siege, and at last, though not without difficulty, were subdued. The change of the religious institutions of the county led to the change of the common language of Cornwall; the people, for the most part of British descent, with comparatively few Saxons settled among them, had retained a language of their own, a dialect of the Celtic. The introduction of the English church service paved the way for its gradual decline. When Carew published his survey of Cornwall in 1602, it was going fast into disuse: 'the English speech,' says he, 'doth still encroach upon it, and hath driven the same into the uttermost skirts of the shire. Most of the inhabitants can speak no word of Cornish, but very few are ignorant of the English, and yet some so affect their own, as to a stranger they will not speak it; for if, meeting them by chance, you inquire the way or any such matter, your answer shall be "*Mee a nawidra cowza Sawzneck,*" "I can speak no Saxonage."' In the reign of Charles I., some aged people near Penryn were quite ignorant of the English language. In the early part of the last century, the Cornish was still spoken by the fishermen and market women, near the extreme southern point of the county. At present this antient tongue is the study of the scholar and antiquary alone. A few MSS. in it are extant; the most remarkable of which are some interludes, partly written in the fifteenth century.

In 1595 Penzance and one or two places near it were burnt by the Spaniards.

In the great civil war of Charles I. and his parliament, the Cornish men seem to have been on the whole in favour of the king. At the beginning of the contest indeed, the Parliamentarians, under the leadership of Sir Alexander Carew of Anthony, and Sir Richard Buller of Morval, secured the eastern part of the county, and garrisoned Launceston and Saltash. Sir Nicholas Slanning, a zealous Royalist, held Pendennis Castle for the king; and the Royalists rising under the command of Sir Ralph Hopton and others, drove the parliament forces from Launceston and Saltash, and obtained entire possession of the county; these events were in 1642. In the winter of that year, the parliamentary forces under Ruthen, governor of Plymouth, attempted to regain it, but were defeated on 19th January, 1643, on Broad Oak or Bradock Down, near Liskeard. Saltash, which Ruthen had hastily fortified, was taken by storm, Ruthen escaping to Plymouth; and on May 15th, the Parliamentarians, under the Earl of Stamford, were entirely defeated at Stratton. The Cornish men afterwards distinguished themselves on the Royalist side at the battle of Lansdowne and the siege of Bristol in the same year: and the king in reward of their loyalty wrote them a letter of thanks, which he ordered to be printed and published, and a copy to be read in every church and chapel in the county. In July, 1644, the Earl of Essex marched into Cornwall at the head of the parliamentary forces, and took possession of Launceston, Saltash, Bodmin, Lostwithiel, and Fowey; but being followed by the royal army, under the king in person, was forced to retreat to Fowey with his infantry, his cavalry having previously got clear off. From Fowey Lord Essex escaped with some other persons to Plymouth; but his infantry, 6000 in number, under Major-General Skippon, were forced to capitulate 2nd September. In October, Saltash, which the Royalists had recovered, was seized by a detachment of the parliamentary garrison at Plymouth, but retaken by storm by Sir Richard Grenville. In the autumn and winter of 1645, Charles II., then Prince of Wales, spent some time in Cornwall: in March, 1646, he embarked at Pendennis Castle for the Scilly Isles, upon the approach of the Parliamentarians under Fairfax, who, after defeating Lord Hopton at Torrington, entered Cornwall, forced the Royalist cavalry to surrender, and acquired possession of the whole county. The Royalist army had been disorganized by the disputes of their leaders. Pendennis Castle, one of the last places in England which held out for the king, surrendered in August, 1646. The Scilly Islands had some time before been seized by the victorious party, and Prince Charles forced to flee, first to Jersey, and afterwards to France. In 1648 an attempt to raise forces to restore the king's cause was defeated by Sir Hardress Waller. In 1650 the Scilly Islands were held for the king by a body of English and Irish forces; but the islands were all taken in 1651 by the fleet under Sir George Ayscough.

The Dutch made two attempts on the Cornish coast in the war between them and the Commonwealth, but were defeated in both. Since this period the local history of Cornwall affords little interest.

Statistics.—*Population.* Cornwall may be considered as an agricultural as well as a mining county. It ranks the twenty-seventh on the list of agricultural counties, and has remained stationary in this respect since 1811. Of 67,737 males twenty years of age and upwards inhabitants of the county (in 1831), 24,464 were engaged in agricultural pursuits (of these 16,243 were labourers), and only 107 in manufactures, or in making manufacturing machinery. Of this latter number 50 were employed in the Juan iron foundery and rolling-mill at St. Erth, 17 in powder-mills at St. Gluvias and Stithians, 5 in a manufactory of tin at Gulvol, and the remainder in weaving, &c. at various places. The number of labourers of twenty years of age and upwards employed in labour, not agricultural, was 22,706.

The following table contains a summary of the number of inhabitants, in 1831, showing their occupations in each hundred, &c. in the county.

HUNDREDS, &c.	HOUSES.				OCCUPATIONS.			PERSONS.			Males twenty years of age.
	Inhabited.	Families.	Building.	Uninhabited.	Families chiefly employed in agriculture.	Families chiefly employed in trade, manufactures, and handicraft.	All other families not comprised in the two preceding classes.	Males.	Females.	Total of persons.	
East	5,548	6,529	32	271	3,117	1,796	1,616	15,630	16,133	31,763	7,660
Kerrier	9,178	10,244	136	400	2,478	2,056	5,710	24,361	26,952	51,313	11,566
Lesnewth . . .	1,568	1,685	7	65	938	346	401	4,179	4,098	8,277	2,079
Pennrith . . .	13,082	14,156	274	662	2,470	2,860	8,826	35,060	37,342	72,402	16,316
Powder . . .	11,110	12,255	148	611	3,125	3,075	6,055	30,019	31,892	61,911	14,475
Pyder	4,539	4,828	54	155	1,934	834	2,060	12,883	12,806	25,689	6,073
Stratton . . .	1,545	1,744	32	49	1,086	390	268	4,517	4,298	8,815	2,229
Trigg	2,371	2,586	26	127	1,173	703	710	6,441	6,616	13,057	3,194
West	3,083	3,525	29	162	1,904	740	881	9,083	9,171	18,254	4,233
Launceston (borough and town) . .	324	496	5	15	22	267	207	1,030	1,201	2,231	533
Falmouth (town) .	652	1,203	7	10	..	228	975	1,858	2,903	4,761	774
Scilly Islands . .	521	565	8	11	104	87	374	1,152	1,313	2,465	605
Totals . . .	53,521	59,816	758	2538	18,351	13,382	28,083	146,213	154,725	300,938	69,737

The population of Cornwall at each time the census was taken since the commencement of the present century was—

	Males.	Females.	Total.	Inc. per Cent.
1801	89,868	98,401	188,269	..
1811	103,310	113,357	216,667	15
1821	124,817	132,630	257,447	19
1831	146,213	154,725	300,988	17

Showing an increase of 112,719 between the first and last periods; which is an increase of rather more than 59¾ per cent., or 2¾ beyond the general rate of increase throughout England.

County Expenses, Crime, &c.—The sums expended for the relief of the poor at the four dates, when the census was taken, were—

	£		
In 1801	54,648	which was at the rate of	5*s.* 9*d.*
„ 1811	103,736	,, ,,	9*s.* 7*d.*
„ 1821	104,178	,, ,,	8*s.* 1*d.*
„ 1831	102,151	,, ,,	6*s.* 9*d.*

for each inhabitant.

The sum expended for the same purpose in the year ending 25th March, 1836, was 74,856*l.* 3*s.*; assuming that the population has increased at the same rate per-centage as in the ten years preceding that period, the above sum gives an average of 4*s.* 7*d.* for each inhabitant. All these averages are below those for the whole of England and Wales.

The sum raised in Cornwall for poor-rate, county-rate, and other local purposes, ending 25th March, 1833, was levied upon the various descriptions of property, as follows:—

	£.	s.	d.
On land . . .	91,906	5	0
,, dwelling-houses . .	18,995	0	0
,, mills, factories, &c. . .	2,582	4	0
,, manorial profits, navigation, &c.	7,951	19	0
Total money levied by assessment .	121,435	8	0
The amount expended was:—			
For the relief of the poor .	100,318	18	0
In suits of law, removal of paupers, &c.	4,453	4	0
For other purposes . .	15,163	8	0
Total money expended .	£ 119,935	10	0

In the returns made up for the three succeeding years, the descriptions of property assessed for local purposes are not distinguished.

	1834.	1835.	1836.
The total money levied, was	£113,322 9 0	111,170 14 0	98,846 10 0
Expended for relief of poor .	93,036 11 0	84,534 15 0	74,856 3 0
,, in suits of law, removal, &c. . . .	4,182 6 0	3,450 13 0	3,233 1 0
Payments for or towards county rates . . .	.. ..	8,452 17 0	7,320 8 0
Expended for all other purposes	19,012 110	11,913 15 0	11,644 2 0
Total parochial rates expended	116,231 8 0	108,352 0 0	97,053 14 0

The difference of the sums expended for the relief of the poor in the respective years 1835 and 1836 is therefore 9678*l.* 12*s.*, which is rather less than 11½ per cent.; the difference of the total of parochial rates expended is 11,298*l.* 6*s.*, making the whole amount of saving rather more than 10⅓ per cent.

The number of turnpike trusts in Cornwall, as ascertained in 1834, was 13; the number of miles of road under their charge was 318; the annual income arising from the tolls and parish composition was 24,044*l.* 15*s.* 8*d.*; and the annual expenditure, 23,895*l.* 5*s.* 10*d.*

The amount of expenditure of county-rate, in the year 1834, was 8,024*l.* 9*s.* 7*d.*, disbursed as follows:—

	£.	s.	d.
Bridges, building, repairs, &c. .	555	7	3½
Gaols, houses of correction, &c., and maintaining prisoners, &c. .	2,637	0	9½
Lunatic asylums . . .	200	19	11
Prosecutions . . .	1,417	14	4
Clerk of the peace . . .	344	17	11
Conveyance of prisoners before trial .	548	3	2
,, of transports . .	97	17	6
Coroner	238	13	0
Debt—Payment of principal and interest	1,176	6	6
Miscellaneous . . .	807	9	2

The number of persons charged with criminal offences in the three septennial periods ending with 1820, 1827, and 1834, were respectively 646, 679, and 1144; making an average of 92 annually in the first period; of 97 in the second, and of 163 in the third.

The number of persons tried at quarter-sessions in respect of which any costs were paid out of the county rates in each of the years 1831, 1832, and 1833, were 161, 174, and 168, respectively:

	1831.	1832.	1833.
Total number of felonies so tried	93	130	118
„ misdemeanors	68	44	50

The total number of commitments to the quarter-sessions in each of the same years was 142, 145, and 146, respectively: of whom

	1831.	1832.	1833.
The number convicted was .	94	109	101
„ acquitted . .	18	19	14
Discharged by proclamation .	30	17	31

At the assizes and sessions (in 1835) 206 persons were charged with criminal offences in Cornwall; out of which number 22 were charged with offences against the person, 11 of which were common assaults; 3 persons were committed for housebreaking; 145 for offences against property committed without violence; of the remaining 36 one was committed for killing and maiming cattle, 3 for forging and coining, 9 for assembling armed, &c., to aid smugglers, and 23 for riot, &c. Of the whole committed 144 were convicted and 62 acquitted, or no bills found. Among those punished 1 was executed; 29 sentenced to transportation for various periods; 18 imprisoned for terms between 2 years and 6 months, and 73 for 6 months and under; 2 were whipped, 15 fined, 4 discharged on sureties and 2 pardoned. Of the offenders 175 were males and 31 females. Among the whole number 106 could read and write, 55 could read only, 40 could neither read nor write, and the degree of instruction could not be ascertained of the remaining 5. The proportion of the offenders to the population, in 1835, was 1 in 1461.

The number of persons qualified to vote for the county members of Cornwall were, in

	1834.	1835.
The eastern division . .	4392	4446
western „	3612	3504
	8004	7950

which is 1 in 32 of the whole population, and 1 in 6 of the male population above 20 years of age. The expenses of the last election to the inhabitants of the county were 385*l*. 4*s*. 8*d*., and were paid out of the general county rate.

There are eight savings-banks in this county. The number of depositors and amount of deposits on the 20th November were as follows:—

	1832.	1833.	1834.	1835.
Number of depositors	6245	6737	7181	7734
Amount of deposits	£252,776	269,885	85,075	306,676

The various sums placed in the savings-banks in 1834 and 1835 were distributed as under:—

		1834.		1835.	
		Depositors.	Deposits.	Depositors.	Deposits.
Not exceeding	£20	2915	£24,923	3019	£25,623
„	50	2428	74,681	2649	80,462
„	100	1149	77,425	1290	84,396
„	150	410	48,852	429	51,065
„	200	227	38,625	259	43,780
Above	200	82	20,569	88	21,360

Education.—The following particulars are taken from the parliamentary papers on education arising out of the inquiry on that subject made in the session of 1835:—

	Schools.	Scholars.	Total.
Infant Schools	116		
Number of infants at such schools; ages from 2 to 7 years:—			
Males		862	
Females . . .		1023	
Sex not specified		756	
			2641
Daily Schools	973		
Number of children at such schools, ages from 4 to 14 years:—			
Males . . .		13,021	
Females . .		10,396	
Sex not specified		5571	
			28,988
Schools	1089		
Total of children under daily instruction .			31,629
Sunday Schools	367		
Number of children at such schools, ages from 4 to 15 years:—			
Males . . .		14,674	
Females . .		13,393	
Sex not specified		6234	
			34,301

Maintenance of Schools.

Description of Schools.	By endowment.		By subscription.		By payments from scholars		Subscrip. and payment from scholars	
	Schls.	Scholars.	Schls.	Scholars.	Schls.	Scholars.	Schls.	Scholars.
Infant Schools	—	—	7	262	105	2007	4	382
Daily Schools	51	1544	52	2,206	795	21,024	75	4214
Sunday Schools	—	—	349	33,220	6	310	12	771
Total.....	51	1544	408	35,678	906	23,341	91	5367

Assuming that the population between 2 and 15 years, increased in the same ratio as the whole of the population between 1821 and 1831, and has continued to increase in the same ratio since, we find that there must have been living in Cornwall in 1834 (the time this education inquiry was made) 100,756 persons between those ages. A very large number of the persons receiving instruction attend both daily and Sunday schools. Only six schools are returned from places where no other school exists, and the few children (207 in number) who are instructed therein, cannot be supposed to attend any other school; at all other places Sunday-school children have opportunity of resorting to other schools also; but in what number or in what proportion duplicate entry of the same children is thus produced cannot be ascertained. Twenty-six schools, containing 1381 children, which are both daily and Sunday-schools, are returned from various places, and duplicate entry is therefore known to have been thus far created; we may therefore conclude that scarcely more than half, or, at most, two-thirds of the children receive instruction.

The schools established by Dissenters, included in the above statement, are:—

	Schools.	Scholars.
Infant Schools	2	29
Daily „	7	220
Sunday „	173	18,738

Schools established since 1818 are:—

Infant and other daily schools	483	18,128
Sunday Schools	244	23,775

Fourteen boarding schools are included in the number of daily schools as given above.

No school in this county appears to be confined to the children of the Established Church, or any other religious denomination; such exclusion is disclaimed in almost every instance, especially in schools established by Dissenters, with whom are here included Wesleyan Methodists and one school for Jewish children. Lending-libraries of books are attached to 35 schools in this county.

CORNWALLIS. Charles, second Earl and first Marquis of Cornwallis, was born December 31, 1738, and educated at Eton, and St. John's, Cambridge. In 1761, during the Seven Years' War, he served abroad under the title of Lord Broome, as aide-de-camp to the marquis of Granby. In 1762 he succeeded to the peerage on the death of his father, in 1766 he was made colonel of the 33rd regiment of foot, and in 1770 governor of the Tower. He was also aide-de-camp to the king, who held him in high favour; and it is recorded to his honour, that though a general supporter of the administration, he exercised an independent judgment, and voted against ministers on several important questions. More especially, he was opposed to the steps which led to the American war; but when his regiment was ordered abroad, in 1776, he declined to profit by the special leave of absence obtained from the king, and sailed with it, leaving a devotedly attached wife, who is said to have lost her life in consequence of her grief and anxiety at the separation.

He served actively and with distinction, with the rank of major-general, under generals Howe and Clinton, in the campaigns of 1776-77-78-79 in New York and the southern states, and in 1780 was left in the command of South Carolina with 1000 men. He gained a victory over General Gates at Camden, August 16, 1780, and a second, less decisive, over General Greene at Guilford, March 15, 1781—both against superior numbers. But the population of the country being unfriendly to the royal cause, these advantages were transient. In the course of the spring of 1781 Cornwallis invaded Virginia, where he obtained no decided success, but caused an immense amount of damage to private property. On receiving orders from Sir H. Clinton, then at New York, to embark part of his forces for New York, he moved to Portsmouth in Virginia; but here he received fresh instructions, under which he was ordered to Williamsburg, the colonial capital of Virginia, and directed to make Point Comfort his place of arms. But Point Comfort being found ill suited for this purpose, Cornwallis moved to York Town on York River, where he entrenched himself in the strongest way he could. He was there besieged by the French and American forces, assisted by the French fleet under De Grasse, and reduced to surrender himself and his troops prisoners of war, after an obstinate defence, October 19, 1781. More fortunate than Burgoyne, he escaped, owing perhaps to his favour with the king, such undeserved persecution as that general experienced. His capture however was a death-blow to the British cause, and principally led to that change of ministers and measures which resulted in the peace of 1782.

In 1786 lord Cornwallis was appointed governor-general and commander-in-chief of Bengal. His temper being mild and equitable, and his application to business constant and effective, he was honourably distinguished by a sincere desire to promote the welfare of our oppressed Indian subjects, and introduced a variety of internal changes, which were characterized by a great unfitness for the purpose they were intended to serve. His administration is chiefly remarkable for the war undertaken against Tippoo Saib [Tippoo]. The disasters experienced at first by the English caused the governor to take the field himself, in 1791; and by a change in the quarter of attack, he succeeded in penetrating to the heart of Tippoo's dominions, and captured Bungalore, in March. In the following February siege was laid to Seringapatam, and the capture of that city was averted only by a treaty, which stripped the sultan of one half of his dominions. In August, 1793, lord Cornwallis returned to England, where he was received with distinguished honours, raised to the rank of marquis, and appointed master-general of the ordnance. In 1798 (the æra of the rebellion) he was made lord-lieutenant of Ireland. In the distracted state of that country, a man of generous and conciliatory temper was even more needed than one of military skill. He put down the rebellion: but he also checked the disgraceful outrages practised by the supporters of government, restored tranquillity, and acquired the good-will of the Irish. In 1801 he was succeeded by lord Hardwicke; and in the same year, being appointed plenipotentiary to France, he negotiated the peace of Amiens. He was re-appointed governor-general of India in 1805, and arrived at Calcutta in August, in bad health. Proceeding immediately to assume the command of the army in the upper provinces, he was seized with illness, and died at Ghazapore, in the province of Benares, October 5, 1805. His character as a soldier and statesman was highly respectable; but he was more distinguished by diligence, humanity, and integrity, than by the higher mental qualities.

COROLLA, the name given by botanists to the innermost of the envelopes by which the organs of multiplication of many flowers are covered. Like the calyx [Calyx] it is composed of leaves changed from the ordinary state of those parts in consequence of an alteration in the office they have to perform, but liable to resume the state of common leaves if exposed to the effect of any disturbing cause. The corolla is usually thin, delicate, perishable, and both larger and more richly coloured than the calyx; hence the older botanists considered those qualities proper to the corolla, and applied the term to all cases in which they existed. But it is now known that the calyx is frequently in the same state, and hence the only distinction that is now made between calyx and corolla is to consider everything calyx which forms the exterior of two or more rows of floral envelopes, everything corolla that belongs to the inner rows, and when there is only one row, to refer that to the calyx, whatever the colour or texture of it may be.

There is little doubt that when a calyx is green and leafy, its business is principally to protect the corolla; and that a corolla, when large, thin, and brightly coloured, is intended to exercise some special influence upon the fertilizing organs of the flower; for while the respiratory action of the calyx when green is not distinguishable from that of common leaves, the corolla differs most essentially in the want of all power of decomposing carbonic acid; it absorbs oxygen from the air, but does not part with it again in a pure state, on the contrary, it combines it with its carbon, and throws off the carbonic acid thus formed. But although there is this difference between the calyx and corolla in ordinary cases, the functions of the corolla are performed by the calyx when it has the appearance of a corolla, and *vice versâ*. The peculiar functions of these parts are therefore performed indifferently by the one or the other according to their structure.

The leaves of which a corolla is composed are called petals; and the endless varieties of its form and structure depend principally upon the different manner in which those parts are united, or upon the proportions they bear to each other. A monopetalous corolla for instance, is composed of several petals joined more or less together by their edges; campanulate corollas originate from petals without a claw or unguis; tubular corollas from unguiculate petals. In a regular monopetalous corolla all the petals are of equal size, and are united in the same degree; in an irregular monopetalous corolla, the petals are unequal in size, and perhaps unequally united.

The corolla is generally the part of the flower in which grotesque forms are most frequently met with; such as horns or spurs projecting from the base; or a cowled figure, or dark hairy appearances resembling the bodies of insects, as in the bee larkspur, various orchidaceous plants, &c. The cause of these singular forms is entirely unknown; they appear to be specific cases, of which no explanation can be given.

For the theory of the structure of the corolla, the modification of its form, and other particulars, see De Candolle's *Organographie Végétale*, Mirbel's *Elémens*, Lindley's *Introduction to Botany*, and generally all elementary books of the higher kind written within the last five or six years.

COROLLARY (Corolla, 'a little crown') is frequently used for any necessary consequence of a proposition; but technically applied in geometry, it means a consequence which immediately follows from the demonstration of a proposition, without the necessity of introducing any other proposition. But all the corollaries in our editions of Euclid are annexed by editors, none of them being in the original. Those of book i., prop. 32, were added by Campanus; but the first use of the word which we know of is in the English translation of Billingsley. [Dee, John.]

A corollary of any proposition (which call A), should, in consistency with the majority of writers, mean a proposition which cannot be false, unless some part of the demonstration of A, or some notion which the existence of A implies, be false. In this sense all the propositions of the fifth book of Euclid are corollaries of the definition of proportion.

COROMANDEL COAST—originally Cholomandala, or according to Major Rennell, the Sora Mandalum of Ptolemy—is the sea board of the western side of the bay of Bengal, extending from Point Calimere on the south, in 10° 18′ N. lat. and 79° 56′ E. long., to the mouth of the river Krishna on the north, in 15° 45′ N. lat. and 80° 53′ E. long. Through its whole extent, about 350 miles, this coast does not afford any secure port or harbour; and owing to the prevalence of the surf, it is difficult to effect a landing except by means of boats peculiarly constructed for the purpose. [Cuddalore—Madras—Pondicherry.]

CORON, a town in the Morea, on the west coast of the gulf of Kalamata, the antient Messenian gulf. It appears to stand at or near the site of the antient Colonides, while the town of Corone, of which Pausanias speaks as having been built by the Messenians when they were restored to their country, by the help of the Thebans, would seem, by the description which that author gives of its locality, to have stood farther north on the same coast, near the spot where the village of Petalidhi now stands. The present Coron is a place of some trade, and exports oil and silk which are produced in the neighbouring district.

The town consists of a large castle in tolerably good repair, in which the Turkish inhabitants used to reside before the Greek revolution, the Greek population then occupying the suburb called Varusi The roadstead is open and exposed to the south winds, but the bottom of the shore being soft sand, vessels driven upon it often escape without much damage. The town stands on a promontory surrounded by a fertile plain, which is divided from the district of Modon, on the west coast of the Morea, by a barren ridge which runs north and south through the peninsula to Cape Gallo, antiently Acritas. (Leake's *Morea*, vol. i.)

CORO'NA. [Column.]

CORO'NA BOREA'LIS AND AUSTRA'LIS, the northern and southern crowns. The first is a northern constellation, found in Aratus, who says it was formed by Bacchus in memory of Ariadne. It is situated between Bootes and Hercules, and the bright star of its cluster (marked *a*) may be seen about an hour eastward of Arcturus, and about eight degrees nearer to the pole. Corona Australis is a southern constellation, first found in Ptolemy. It is situated between the front legs of Centaurus.

CORONA BOREALIS.			
Character.	No. in Catalogue of Flamsteed.	No. in Catalogue of Astron. Society.	Magnitude.
β	3	1753	4
θ	4	1765	4½
α	5	1770	2½
μ	6	1777	5
ζ	7	1782	4
γ	8	1790	4
δ	10	1805	4
κ	11	1813	5
ε	13	1825	4½
υ	18	1870	6
ξ	19	1879	5
ν^1	20	1880	5
ν^2	21	1881	5

CORONA AUSTRALIS.			
Character.	No. in Catalogue Piazzi ().	No. in Catalogue Astron. Society.	Magnitude.
γ	(280)	2206	5
δ	(291)	2210	5
α	(300)	2216	5
β	(305)	2218	5

CORONATION, the act of crowning or consecrating a king. This rite is of remote antiquity, as may be gathered from the notices which we have in Scripture, in the first and second books of Kings, of the coronations of Solomon, and of Joash the son of Ahaziah, of the latter of whom it is expressly said that Jehoiada the priest took him, put the crown upon his head, and gave him the testimony, and they made him king, and anointed him. The act of anointing seems to have originated with the Jews.

In England, after the kingdoms of the Heptarchy had become united, we find the ceremony of coronation continually alluded to in the Saxon Chronicle, under the term ȝehalgoꝺ, by which is expressed that the king was hallowed or consecrated. Kingston-upon-Thames was the place where the Saxon sovereigns were crowned during nearly the whole of the tenth century. (See Diceto and the other historians in the *Decem Scriptores.*) Edgar, who succeeded to the throne in 959, is said to have been crowned either at Kingston or at Bath. Edward the Confessor was crowned at Winchester in 1042. The copy of the Gospels upon which the Saxon kings were sworn at their coronations is believed to be still preserved amongst the Cottonian Manuscripts in the British Museum, in the volume Tib. A. ii. Harold and William the Conqueror were crowned at Westminster. It was customary with the Norman kings to be crowned more than once. Henry II. crowned his eldest son, and associated him with himself in the administration during his own life.

In one or two instances, in the Norman times, we find the regnal years of our kings dated from their coronations only; the previous time, between the predecessor's death and the performance of the inaugural ceremony, was considered as an interregnum. This is a fact of no small importance to those who would accurately fix the dates of public instruments and transactions in the reigns of Richard I., John, and their successors.

The first English coronation of which we have any detailed account is that of Richard I., in the Histories of Diceto and Bromton. (See Twysd., *Script.* x. coll. 647, 1157.) An account of all the formalities observed at that of Richard II., taken from the 'Close Rolls,' is to be found in Rymer's 'Fœdera,' the old edition, vol. vii. p. 157. Froissart has given a short but interesting narrative of the coronation of Henry IV., which the reader may see in the English edition of his 'Chronicle,' by Lord Berners, 4to., London, 1812, vol. ii., pp. 753, 754. The details of the English coronations of Henry V. and VI., and of the latter in France, are contained in the Cottonian Manuscripts, Tib. E. viii. and Nero C. ix. Hall and Grafton have described the ceremonies at the coronation of Richard III. The account of the coronation of Henry VIII., with the king's oath prefixed, interlined and altered with his own hand, is likewise preserved in the Cottonian Manuscript already mentioned, Tib. E. viii. The oath, with its interlineations, is engraved in fac-simile in the first volume of the second series of Ellis's 'Original Letters illustrative of English History.' Fuller, in his 'Church History,' and Ellis's 'Letters,' 1st Ser., vol. iii. p. 213, detail the particulars of the coronation of Charles I. Several editions of the Form and Order of Charles II.'s coronation at Scone in 1651 were published at the time in 4to. at Aberdeen; reprinted at London in folio, 1660; and the entertainment of Charles II. in his passage through London to his coronation, with a narrative of the ceremony at the coronation, by John Ogilby, with plates by Hollar, fol., London, 1662. Sandford's 'History of the Coronation of James II.,' fol., London, 1687, illustrated with very numerous engravings, is the most complete of all our works upon English coronations published by authority. That of George IV., of which two portions only appeared, was far more splendid, with coloured plates, but remains unfinished.

A very antient MS. of the ceremonial of crowning the emperors at Aix-la-Chapelle was purchased at the last of the sales of Prince Talleyrand's libraries, by the late Mrs. Banks, and is now among the additional manuscripts in the British Museum. Of foreign published coronations, that of Charles V. at Bologna as emperor, in 1530, is one of the most curious, engraved in a succession of plates upon a roll of considerable length. The 'Sacre de Louis XV., Roy de France et de Navarre, dans l' Eglise de Reims, 25 Oct. 1722,' is a work of pre-eminent splendour, full of finished engravings. The 'Description of the Ceremonies at the Coronation of Napoleon as Emperor of France, with his Consort Josephine, 2 Dec. 1804,' is a work of equal size, but the engravings are chiefly in outline: folio, Paris, 1807. There is a volume, with engravings, of the coronation of the empress Anne of Russia, fol. Petersburg, 1731; and many others might be enumerated.

The formulary which has served as the general model for the English coronations since the time of Edward III. is the 'Liber Regalis,' deposited in the archives of the dean and chapter of Westminster, and kept with a religious care. It is supposed to have been written for the particular instructions of the prelates who attended at the coronation of King Richard II. and his queen. Copies of this manuscript, without its illuminations, are preserved in one or two of our manuscript libraries. The substance of the ceremonial directed in it is abridged in Strutt's 'Manners and Customs,' vol. ii. p. 22-37.

The following is the form of and ceremonial in administering the *Coronation Oath* to our kings:—Sermon being ended, and the King having made and signed the declaration, the Archbishop goes to the King, and standing before him, administers the Coronation Oath, first asking the King 'Sir, is your Majesty willing to take the Oath?' and the King answering, 'I am willing;' the Archbishop ministereth these Questions; and the King, having a Copy of the printed Form and Order of the Coronation service in his hands, answers each Question severally as follows:—

Archb. 'Will you solemnly promise and swear to govern the People of this United Kingdom of *Great Britain and Ireland*, and the Dominions thereto belonging, according to the Statutes in Parliament agreed on, and the respective Laws and Customs of the same?'

King. 'I solemnly promise so to do.'

Archb. 'Will you to your Power cause Law and Justice, in Mercy, to be executed in all your Judgments?'

King. 'I will.'

Archb. 'Will you to the utmost of your Power maintain the Laws of God, the true Profession of the Gospel, and the Protestant Reformed Religion established by Law? And will you maintain and preserve inviolably the settlement of the United Church of *England* and *Ireland*, and the doctrine, worship, discipline, and government thereof, as by Law established within *England* and *Ireland*, and the territories thereunto belonging? And will you preserve unto the Bishops and Clergy of England and Ireland, and to the United Church committed to their charge, all such rights and privileges as by Law do or shall appertain to Them, or any of them?'

King. 'All this I promise to do.'

Then the King arising out of his Chair, supported as before, and assisted by the Lord Great Chamberlain, the Sword of State being carried before him, shall go to the Altar, and there being uncovered, make his solemn Oath in the sight of all the People to observe the premises: laying his right hand upon the Holy Gospel in the Great Bible, which was before carried in the Procession, and is now brought from the Altar by the Archbishop, and tendered to him as he kneels upon the steps, saying these words:

'The Things which I have here promised I will perform and keep, So help me God.'

Then the King kisseth the Book, and signeth the Oath. (See the *Form and Order observed in the Coronation of his Majesty King George IV.*, 4to., London, 1821.)

CORONER. The coroner (*coronator*) is an antient officer by the common law of England. The name is said by Lord Coke to be derived '*a coronâ*, because he is an officer of the crown, and hath conusance of some pleas which are called *placita coronæ*.' In this general sense the chief justice of the Court of King's Bench is by virtue of his office the supreme coroner of all England, and may, if he pleases, hold an inquest, or otherwise exercise the office of coroner, in any part of the kingdom. Lord Coke mentions an instance in which Chief Justice Fineux in the reign of Henry VII. held an inquest on the body of a man slain in open rebellion, 5 *Reports*, 51. In this sense also, the Master of the Crown Office in the Court of King's Bench, is styled the 'coroner or attorney for the king;' his business being confined to pleas of the crown discussed in that court. But the officers now usually understood by this term are the coroners of counties, who are of high antiquity, being said in one of the most antient treatises on the common law to have been ordained together with the sheriffs to keep the peace of counties when the earls gave up the wardship. (*Mirror*, c. i. § 3.) In early times too, the office appears to have been one of great estimation; for by the statute 3 Edw. I. c. 10, they are required to be knights, and by the 28 Edw. III. c. 6, they must be 'of the most meet and most lawful men of the county.' By the 14 Edw. III. st. 1. c. 8, 'no coroner shall be chosen unless he have land in fee sufficient in the county, whereof he may answer to all manner of people.' No peculiar qualification is now required, though Serjeant Hawkins seems to express an opinion that the persons chosen, though not knights, must be 'of good substance and credit.' (Hawkins's *Pleas of the Crown*, book ii., cap. 9.) Most commonly there are four coroners in each county; but the number varies according to the usage of different counties. There have been recent instances in which, upon a representation made to the lord chancellor by the magistrates, that the existing number of coroners was insufficient for the business of the county, writs have issued for the election of additional coroners. (See 3 Swanston's *Reports*, 181.)

Coroners of counties are elected under the direction of the stat. 28 Edw. III. c. 6, by the freeholders in the county court, in the same manner as sheriffs and conservators of the peace formerly were; the election takes place by virtue of an antient king's writ, *De Coronatore Eligendo*, returnable in chancery. A recent statute, the 58 Geo. III. c. 95, makes detailed provisions for conducting these elections. By that Act, the sheriff is to proceed to the election of a coroner at the usual place for such elections at the next county court, unless such court occurs within six days after the receipt of the writ; if it occurs within such six days, he is to adjourn the court for the purpose of the election to some convenient time, not exceeding fourteen days. If the election is not determined upon a view by the consent of the freeholders present, the sheriff shall take a poll, which may continue open for ten days (Sunday excepted). The reasonable expenses of the sheriff at the election are to be paid, in equal proportions, by the candidates. After his election is declared, the coroner takes an oath of office before the sheriff.

Coroners in counties are elected for life; but if they accept an office incompatible with the duties, such as that of sheriff, or dwell in a remote part of the county, or are incapacitated by age or infirmity, they are removable by means of the writ *De Coronatore Exonerando;* and by the stat. 25 Geo. II. c. 29, § 6 they may be removed upon conviction of extortion, wilful neglect of duty, or misdemeanor in their office. The great seal has authority however, independently of the above statute, to remove coroners for neglect of duty. (1 Jacob and Walker's *Reports*, 451.)

At common law the coroner had authority to hear and determine felonies; but his powers in this respect were expressly abrogated by Magna Charta, cap. 17. The most usual duty of a coroner is that of taking inquisitions of death; and though his duties, as well as his authority in this respect, are said to have existed at common law, they are declared by the 4 Edw. I. stat. 2, commonly called the statute *De Officio Coronatoris*. By the directions of that statute, 'the coroner, upon information, shall go to the places where any be slain, or suddenly dead or wounded, and shall forthwith command four of the next towns, or five or six, to appear before him in such a place; and when they are come thither, the coroner, upon the oath of them, shall inquire in this manner; that is to wit, if they know where the person was slain, whether it were in any house, field, bed, tavern, or company, and who were there; who are culpable, either of the act, or of the force; and who were present, either men or women, and of what age soever they be, if they can speak, or have any discretion; and how many soever be found culpable, they shall be taken and delivered to the sheriff, and shall be committed to the gaol; and such as be found and be not culpable, shall be attached until the coming of the judge of assize.' And it is declared by the same statute, that 'if it fortune any such man be slain, which is found in the fields or in woods, first it is to be inquired whether he were slain in the same place, or not; and if he were brought and laid there, they should do so much as they can to follow their steps that brought the body thither, whether he were brought upon a horse or in a cart. It shall also be inquired if the dead person were known, or else a stranger, and where he lay the night before.' It is declared also by the same statute, that 'all wounds ought to be viewed, the length, breadth and deepness; and with what weapons; and in what part of the body the wound or hurt is; and how many be culpable; and how many wounds there be; and who gave the wound.' In like manner it is to be inquired by the coroner 'of them that be drowned, or suddenly dead, whether they were so drowned or slain, or strangled by the sign of a cord tied straight about their necks, or about any of their members, or upon any other hurt found upon their bodies. And if they were not slain, then ought the coroner to attach the finders and all other in the company.' The provisions of this ancient statute are still in force, and are to be followed by coroners in all their particular directions as nearly as possible at the present day in inquisitions of death. In case of a death happening upon the high sea, inquisitions are taken before the Admiralty coroner, who is appointed by the king or the Lord Admiral; and the county coroners have in such a case no jurisdiction. The inquisitions taken before the Admiralty coroner are returned to the Commissioners of the Admiralty under stat. 28 Hen. VIII., c. 15.

The coroner has authority to assemble a jury by means of a precept to the constables of the hundred or adjoining township, and the names of jurors who make default may be returned by him to the judges of assize, who may fine them. When the jury are assembled, they are charged and sworn by the coroner to inquire, upon view of the body, how the party came by his death. The coroner has no authority to take an inquisition of death, except upon view of the body by himself and the jury; and if he does so, the inquisition is wholly void. (Rex v. Ferrand, 3 Barn. and Ald. *Reports*, 260.) If a body liable to an inquest has been buried before the coroner has notice of the circumstances of the death, he has authority to cause it to be disinterred for the purpose of holding the inquest, provided he does so within a reasonable time. By a recent statute (7 Geo. IV. c. 64, § 4), which repeals an antient enactment on this subject, it is provided that 'every coroner, upon any inquisition before him taken, whereby any person shall be indicted for manslaughter or murder, or as an accessary to murder before the fact, shall put in writing the evidence given to the jury before him, or as much thereof as shall be material; and shall have authority to bind by recognizance all such persons as know or declare anything material touching the said manslaughter or murder, or the said offence of being accessary to murder, to appear at the next court of oyer and terminer, or gaol delivery, or superior criminal court of a county palatine, or great sessions, at which the trial is to be, then and there to prosecute or give evidence against the party charged; and every such coroner shall certify and subscribe the same evidence, and all such recognizances, and also the inquisition before him taken, and shall deliver the same to the proper officer of the court in which the trial is to be, before or at the opening of the court.' And by a subsequent section, authority is given to the court to which the inquisition ought to be delivered to examine in a summary manner into any offence committed by the coroner against the act, and to punish him by fine. The coroner's inquisition may be removed into the Court of King's Bench, and the facts found may be traversed by the personal representative of the deceased; or the court may make it for any apparent defect.

For every inquisition taken in any place contributing to the county rates, the coroner is entitled to a fee of 20*s.*, and also to 9*d.* for every mile he is obliged to travel from his usual place of abode for the purpose of taking it, to be paid by order of sessions out of the county rates. By a recent act of parliament, 6 and 7 Will. IV., c. 89, the coroner is empowered to order the attendance of legally-qualified medical practitioners upon an inquisition of death, and to direct the performance of a *post mortem* examination; and if the majority of the jury are dissatisfied with the first examination, they may call upon the coroner to summon a second medical witness, to perform a *post mortem* examination, whether it has been performed before or not. The statute also authorizes the coroner to make an order for the payment of a fee of one guinea to such witness, if he has not performed a *post mortem* examination, and of two guineas if he has performed such examination. Medical practitioners are also liable to a penalty of 5*l.* if they neglect to attend.

The coroner has also occasionally to exercise a ministerial office, where the sheriff is incapable of acting. Thus where an exception is taken to the sheriff on the ground of partiality or interest, the king's writs are directed to the coroners. This incident to the office of coroners points distinctly to their antient character as ministerial officers of the crown.

By the Municipal Reform Act, 5 and 6 Will. IV. c. 76, § 62, the council of every borough, to which a separate court of quarter sessions has been granted, is empowered to appoint a fit person, not being an alderman or councillor, to be coroner of the borough, who is to hold his office during good behaviour. The fees and general duties of borough coroners are the same as those of county coroners; but the former are required by the statute to make an annual return to the secretary of state of all inquests of death taken by them. [DEODAND.] (See Hawkins's *Pleas of the Crown*, book ii., cap. 9; Burn's *Justice*, tit. 'Coroner;' and Jervis's *Practical Treatise on the Office and Duties of Coroners*.)

CORONET, an inferior kind of crown worn by the nobility. Of coronets worn by foreign nobility much may be seen in Selden's 'Titles of Honour,' and in Montfaucon; see also Gough's 'Sepulchral Monuments,' vol. i. pp. 133, 134. No coronets belonging to peers can be found in England earlier than the time of Henry III. The coronet seems at first to have been the distinctive mark of an earl. William de Valence, earl of Pembroke, who died in 1304, and is buried in Westminster Abbey, has only a plain fillet. Aymer de Valence, however, acknowledged by his treasurer the receipt of a coronet at his creation of earl in 1319. (See Gough, *Sep. Mon.*, i. p. 86, from Selden's *Tit. of Hon.*) John of Eltham, second son of Edward III., who died in 1334, and is also buried in Westminster Abbey, has a coronet on which are leaves; it is the most antient of the sort we meet with. Edward the Black Prince, who is buried at Canterbury, has his helmet adorned with a coronet of oak-leaves, formerly enriched with paste, or false stones, of which the collets only remain. (Ibid. i. 136.)

Of the coronets of the British nobility, as at present worn, all surround caps of crimson velvet turned up with ermine. That of a duke is a circle of gold, richly chased, having on the edge eight strawberry leaves of equal height: that of a marquess, a circle set round with four strawberry leaves and as many pearls on pyramidal points of equal height, alternately: the earl's coronet has eight pyramidal points (five only being seen at a time), with as many pearls on the tops, placed alternately with as many strawberry leaves, lower than the pearls. The viscount has only pearls, without any limited number, placed on the circle itself all round. A baron has only six pearls set at equal distance. Viscounts and barons had no coronets allowed them till after Queen Elizabeth's reign; the former had them granted by king James I., the latter by a grant from Charles II. in the thirteenth year of his reign. In Sir Symonds D'Ewes's letter, giving an account of the coronation of king Charles I. (already referred to under CORONATION), it is expressly said that when the higher order of the peerage put on their coronets, the barons sate bare.

The coronet of the kings of arms is a plain circle of gold, bearing sixteen leaves, eight of which are higher than the others: and on the band, the motto 'Miserere mei, Deus.'

CORO'NULA. [CIRRIPEDA.]

CORPORAL (in the French service *caporal*), a non-commissioned officer in a battalion of infantry. The word is derived from the Italian *capo*, signifying a head; and the title denotes that the person who bore it was the chief of a small squadron or party. During the reigns of Mary and Elizabeth, the corporal was a kind of brigade-major; he superintended the marches of the companies, and commanded the troops who were sent out on skirmishing parties. But at present he is immediately under the serjeant; he places and relieves the sentinels, and at drill he has charge of one of the squads. In the ranks he does the same duty as a private soldier, but his pay is rather higher.

Lance-corporal, originally *lance-spesata*, denoting a broken or spent lance, was a term applied to a cavalry soldier who had broken his lance or lost his horse in action, and was subsequently retained as a volunteer in the infantry till he could be remounted. He is now merely a soldier who does the duty of a corporal, but without the pay, previously to obtaining the full appointment to that grade.

CORPORATION. For the purpose of maintaining and perpetuating the uninterrupted enjoyment of certain powers, rights, property, or privileges, it has been found convenient to create a sort of artificial person, or body-politic, not liable to the ordinary casualties which affect the transmission of private rights, but capable, by its constitution, of indefinitely continuing its own existence. This artificial person is in our law called an *incorporation*, *corporation*, or *body-corporate*. The last of these names is the most correct, as well as the earliest, that occurs in our law. The former import rather the act of creating the body than the body itself, and do not appear to have been used in their modern sense till the fifteenth century. The institution of such bodies under similar or different names was common among the Romans [COLLEGIUM], and we believe we may venture to say that bodies possessing all the essential characteristics of modern corporations were known in the Greek polities.

Corporations are variously distinguished into aggregate and sole corporations, corporations ecclesiastical and lay, civil and eleemosynary, regular and secular. Again, they are divisible into corporations of a public character established for the purpose of general or local government, and those which have been created to facilitate the object of private associations.

The idea of a corporation *sole*, formed by a succession of single persons, occupying a particular office or station, and each in virtue of his character succeeding to the rights and powers of his predecessor, has been said to be peculiar to our law, and to be an improvement upon the original invention. (4 Blackstone's *Comment.* 469.) The king, a bishop, a parson, the chamberlain of London, &c. are usually referred to as examples of such corporations sole. It may be observed, however, with respect to the supposed novelty of the invention, that similar cases of official succession and representation probably occur in almost every system of laws, so that the claim of originality must be restricted to the mere name; and even in this respect, we incline to the opinion of Dr. Wooddesson, 'that as so little of the law of corporations in general applies to corporations-sole, it might have been better to have given them some other denomination.' (1 Wooddes. *Vin. Lect.* 471, 2.) The following notice will be chiefly confined to the law of corporations-aggregate.

The members of cathedral and collegiate chapters are examples of secular ecclesiastical corporations-aggregate. Before the reformation the law recognised a class of ecclesiastical corporations-*regular*, consisting of abbots or priors and their respective convents, and, as it should seem, the societies of friars or mendicant orders. (Brooks' *Abr. Corporations*, pl. 12.) The heads of these conventual bodies were often distinct corporations-sole, as is still the case in many of the modern secular ecclesiastical establishments.

Colleges, in or out of the universities, and incorporated schools and hospitals, are instances of eleemosynary corporations; being endowed and established for the purpose of perpetuating the bounty of their respective founders.

But the largest class of corporations, and those which are most varied in their object and character, are lay and civil incorporations. Among these may be reckoned the universities, the municipal governments of different cities and boroughs, the East India Company, the Bank of England, the Colleges of Physicians and of Surgeons, the Royal Society and Academy, the Society of Antiquaries, and an infinite variety of commercial and other companies erected by charter or by act of parliament.

A corporation cannot be created by any authority except that of the king or the parliament. Where any such body has existed from time beyond memory, it is presumed to have a legitimate origin in one or the other of the above sources. As a matter of curiosity it may be noticed here, that until the period of the Reformation the pope and the bishop of the diocese were considered necessary parties to the foundation of any new society of monks or *regular* clergy. The refusal of the former to confirm the foundation of Sion Monastery in the reign of Henry VI. is known to have caused an alteration in the original plan of that establishment. (Cotton's *Abridgment*, 589.)

The principal incidents and attributes of a corporation-aggregate are the following:—

1. It can purchase, convey, and hold land or goods in perpetual succession, notwithstanding the changes and fluctuations that occur among the members successively appointed to fill the vacancies which happen in it.

2. It can become a party to proceedings at law, or to contracts, by the corporate name given to it on its foundation.

3. The act or assent of the majority is binding on all the rest; such at least is the general rule, wherever the instrument of foundation does not otherwise provide.

4. It signifies its assent, and testifies its corporate acts, by a common seal, without which hardly any voluntary contract is binding on the body politic.

5. It is competent to enact regulations called bylaws, binding on the members of the corporation, and, in some cases, on strangers within the scope of their jurisdiction. [Bylaw.]

6. The particular members of the body are not in general personally responsible for the acts, contracts, or defaults of the corporation. This exemption from individual liability makes it very desirable for commercial and other trading companies to obtain charters of incorporation, by which the members escape the risk of ordinary partnerships.

7. The personal defaults or misconduct of its members cannot in general be visited on the corporate body.

With respect to some of these incidents, it should be observed that the capacity of holding land is restrained by the statutes of mortmain, which make it necessary to obtain an express license to that effect from the crown or the legislature. This is agreeable to the Roman law, which forbids aggregated bodies of this kind 'hereditatem capere sine speciali privilegio.' [Mortmain.]

So with regard to the exemption from personal responsibility in respect of corporate acts, it must not be supposed that the members of the body can directly authorize an injury to be done to another under the sanction of a corporate act, without incurring the usual personal consequences. Thus, if a corporation should by an instrument under the common seal direct a trespass to be committed on a third person, every member of the majority who was present, and actually assenting to the act, would be liable in his private capacity.

The mode of filling up vacancies which occur in the constituent members of the body politic, is in every case determined either by the express provisions of the charter of incorporation, or (in the case of immemorial corporations) by ancient usage. The most common and regular method of maintaining the succession is by election. Sometimes the successor is appointed by the crown, or by a patron or founder. In the case of ecclesiastical corporations the forms of election are in many instances preserved, but the substantial right of nomination has long been exercised either by the crown or by some authority or person independent of the chapter or other corporate body.

With a view to ensure the performance of those duties, and a strict adherence to those regulations which are imposed upon corporate bodies either by the will of their founders or the general tenor of their charters, the law has appointed certain persons and courts, whose office it is to exercise a coercive power of superintendence and correction.

In the instance of eleemosynary bodies, as colleges, schools, and hospitals, the person so appointed is called a *visitor;* and is either the heir of the original founder, or some person specially assigned by him, or (in the absence of either of these) the king. [College.]

In ecclesiastical corporations, the bishop of the diocese is, of common right, the visitor. His right of visitation formerly also extended over all the monastic establishments within the same district, unless the abbot or other head of the convent had purchased a papal bull of exemption, the effect of which was to subject him to the sole superintendence of the pope himself. With regard to other lay corporations, such as municipal corporations, trading companies, and similar bodies, their irregularities are left for correction to the ordinary courts of justice, which upon a proper application to them will be found to possess powers abundantly adequate to that end.

Having treated of the creation and incidents of corporations, let us now consider how they may be dissolved.

1. A corporation may be extinguished by the natural death of all the members of it.

2. Where a select body of definite number, constituting an integral part of the corporation, is so reduced by death, or other vacancy, that a majority cannot be present at corporate meetings, the whole body becomes incapable of doing any corporate act, and, according to the better opinion, the corporation is thereby extinguished. This is the result of a rule in corporation-law,—that every act must be sanctioned, not only by a majority of the number actually present at a meeting, but also at a meeting composed of a majority of each definite body into which the corporation has been subdivided by the charter. Thus, if a corporation consists of a mayor, twelve aldermen, and an indefinite number of burgesses, at least seven aldermen must be present at every meeting; nor can a legal meeting be convened in the absence of the mayor, except for the purpose of electing a new one. The tendency of the rule is to compel the elective body to fill up vacancies without delay, and to secure the attendance of a competent number when the public business is transacted. The rule is inapplicable to a body of *indefinite* number, such as the general body of freemen; and it is liable to be modified and controlled by the charter, or other fundamental constitution of the corporation. The rule of the civil law, requiring the actual presence of two-thirds of the corporation at elections, seems to have been dictated by a similar policy: but Sir W. Blackstone (*Commentaries*, vol. i. p. 478) is in error, when he supposes that a bare majority of the body so assembled could not bind the rest. (See Pancirollus, *de Magist. Municip. apud Grævium.*)

3rd. A dissolution may be effected by a formal surrender to the crown; at least where the incorporation is by charter, and where all persons interested in it are concurring and competent parties.

4th. A corporation may be forfeited, where the trust for which it was created is broken, and its institution perverted. Such a forfeiture can only be declared by judgment of the superior courts on process issued in the ordinary course of justice, in which the fact of misuser, if denied, must be submitted to a jury.

Having already alluded to the religious corporations of monks and other regular clergy formerly existing in this country, we may here observe that the validity of the surrenders obtained by the crown at their suppression was deemed sufficiently doubtful to require the confirmation of an express act of parliament. Even then, in the opinion of the canonists, the *spiritual* incorporations still continued until suppressed by competent spiritual authority, and were capable of perpetuation, although their possessions were lost, and their civil rights extinguished. Hence it was that the Brigettine nuns of Sion, suppressed by Henry VIII., restored by Queen Mary, and again ejected by her successor, continued to maintain a migratory existence for two centuries and a half in Holland, Belgium, France, and Portugal, and still claimed to be the same convent which Henry V. had founded on the banks of the Thames. (See letter of the Abbé Mann, 13 *Archæologia*.)

Under BOROUGHS OF ENGLAND AND WALES will be found a more particular description of that class of corporations which have been erected in this country for the purpose of local municipal government, and of the recent legislative changes which their constitution has undergone.

CORPORATION AND TEST ACTS. [BOROUGHS OF ENGLAND AND WALES, vol. v. p. 202.]

CORPORATIONS (MUNICIPAL) OF IRELAND. The borough system of Ireland may be described in general as an immediate branch from that of England, which, at the same time that it has amply shared the effects of the policy of the crown in latter ages towards municipal bodies in general, has also been modified by the very peculiar and often fluctuating political circumstances of that division of the British empire. The motives which actuated the executive government of England in the course which it so long and so steadily pursued towards the entire remodelling of the town constitutions, and the operation of that course of proceeding in undermining the independence and destroying the local benefit of the municipal governments, we have endeavoured to trace distinctly in a preceding article [BOROUGHS OF ENGLAND AND WALES]. In this place, therefore, the historical part of our notice must be limited chiefly to the marking, in the general course of Anglo-Irish history, the progress of the Irish corporation system in particular.

The whole system of boroughs, which holds so conspicuous and important a place in the history of the political and general civilization of the British Islands, is, in nature as well as name, of purely Teutonic original; that particular species of organization having ever been found repugnant to the habits and spirit of the Celtic nations in their independent state. Thus, in Great Britain itself, its local limits advanced with the growth and extension of the Germanic colonies both north and south of the Tweed; and in Ireland we find that the native race were strangers to it until the settlement on their eastern and southern coasts, about the ninth century, of some of those Danish, North-man, or, as they were called in Ireland, Ost-man (East-man) bands, in that great æra of the permanent migrations of those formidable sea-rovers. Of these maritime settlements, five, viz., Dublin, Wexford, Waterford, Cork, and Limerick, appear as places of note at the commencement of the Anglo-Norman conquests in the island, and as possessing that municipal organization which constantly attended all the branches of the Teutonic race. The Ost-man colonists of Ireland, too, though for a considerable time after their first settlement they adhered to their antient paganism, had at the period in question, owing undoubtedly to the amicable relations which had arisen between them and the Irish population, and to the exertions of the Irish clergy, been long in the profession of Christianity; so that, it should seem, the first Anglo-Norman invaders might have recognised in them some degree of national affinity. But being ignorant and brutal, though subtle and daring adventurers, their thirst for plunder and for territorial acquisition would not permit them, in their career of murderous rapine, to make any distinction in treatment between the Scandinavian and the Celtic blood, between the Ost-man and the Irishman.

This unsparing temper of the early private invaders perfectly coincided with the policy of the English crown; and so soon as Henry II. had found leisure to take the business of the invasion into his own hands, one of his principal measures for securing the footing of his government on the Irish soil was the colonization of the Ost man ports with English or Anglo-Norman settlers. Thus the Ost-men of Dublin were thrust without the walls of their city to inhabit the suburb thence called Ost-man town, and still, by corruption, Oxmantown, giving place to a band of mercantile settlers from Bristol, who became the English king's 'burgesses' of Dublin, with a charter of liberties modelled exactly upon that of Bristol. In like manner, during the various fluctuations of the territorial conquest, down to its completion at the close of the reign of Elizabeth, every permanent extension of the English frontier extended the English organization of the territory, of which the establishment of fortified towns, with inhabitants municipally organized and trained to arms, was a constant and a prominent feature. Of such of the municipalities established during that long period as still exist, or have left distinct traces, we give an enumeration from the report of the commissioners on the Irish branch of the late municipal inquiry. They are 45 in number, viz., Ardee, Ardfert, Athboy, Athenry, Bannow, Callan, Carlingford, Carlow, Carrickfergus, Cashel, Clonmel, Cork, Dingle, Donegal, Drogheda, Dublin, Duleek, Dundalk, Dungarvan, Feathard (county of Tipperary), Fore, Galway, Gowran, Inistiogue, Irishtown, Kells, Kildare, Kilkenny, Kilmallock, Kinsale, Knocktopher, Limerick, Maryborough, Naas, Navan, New Ross, Old Leighlin, Philipstown, Roscommon, Taghmon, Thomastown, Trim, Waterford, Wexford, Youghal.

The municipal commissioners could not help observing the 'marked distinction in the language of their charters, as to the constitutions of the municipal corporations in Ireland, according to the dates of those instruments,' that is, according as they were granted before or after the commencement of the reign of James I. The source of this remarkable difference will be found clearly explained on referring to the historical part of our account of the 'BOROUGHS OF ENGLAND AND WALES,' (vol. v., p. 202,) where it will be seen that this was precisely the period when the crown was most actively exerting itself to secure the power of moulding the borough constitutions at its pleasure; and that in the middle of James's reign was given the notable judicial decision in favour of the prerogative of establishing close boroughs by charter, upon which the crown ever afterwards acted. In the same historical summary it appears that, far as the exercise of this power was carried in England, yet, in the hands of the Stuarts at least, it failed of the complete attainment of its object. But in Ireland, which presented a much clearer field for its exertion, it was used both lavishly and effectually, not only in establishing new boroughs, but in reframing the constitutions of the old ones. In the 'plantation of Ulster,' as the settling of British inhabitants upon the lately-forfeited lands there was then denominated, by charters granted by James to various 'undertakers' of the plantation, a number of incorporations were made beforehand, on the new and approved plan of towns 'to be built' on the respective lands. Another and very similar mode of making boroughs in Ireland at this period was the incorporating of some village already existing, at the same time placing its corporation under the absolute control of the lord of the manor existing previously or newly erected. The whole number of boroughs thus created by James I. and his two immediate successors, a large proportion of which were originally of the class just described, though some of them have since risen to importance, is 61, viz., by James I., Agher, Armagh, Askeaton, Athlone, Athy, Ballinakill, Ballyshannon, Baltimore, Bandonbridge, Bangor, Belfast, Belturbet, Boyle, Carrick-on-Shannon, Castlebar, Cavan, Charlemont, Clogher, Cloghnakilty, Coleraine, Dungannon, Ennis, Enniscorthy, Enniskillen, Feathard (county of Wexford), Gorey, Hillsborough, Jamestown, Kilbeggan, Killileagh, Killybegs, Lifford, Lismore, Londonderry, Lymavady, Mallow, Monaghan, Newry, Newtownards, Sligo, St. Johnstown (county of Donegal), Strabane, Tallagh, Tralee, Tuam, Wicklow; by Charles I., Banagher; by Charles II., Baltinglass, Blessington, Cariesfort, Castlemartyr, Charleville, Dunleer, Granard, Harristown, Lanesborough, Longford, Middleton, Portarlington, St. Johnstowne (county of Longford), Tulske.

Each of the 106 corporations in the two lists given above, sent two members to the Irish House of Commons, and many of those in the latter list served scarcely any other purpose from the beginning, their incorporation having been little more than a cover for the nomination of the two members by the landed proprietor. Many had consequently fallen into virtual disuse long before the legislative union with England. All however seem to have exercised some municipal function within the last century, excepting these seven,—Baltimore, Clogher, Dungarvan, Lismore, Mallow, Newry, Tallagh. With respect to the five following, the existence in them either of a corporation or of burgage tenure is noticed in antient records, but no charter of incorporation has been discovered, viz., Clonmines, Downpatrick, Ratoath, Swords, Taghmon, each of which likewise sent two representatives to the Irish parliament.

The mode of incorporation adopted by the crown in erecting the modern boroughs, presents little more than a parallel to the course it was pursuing in England; but in order to explain how it was that the subversion which it effected in the *antient* borough constitutions of Ireland was so much more rapid and more complete than in those of England, we must advert to some very remarkable features in the politico-religious history of Ireland.

In the very first establishment of boroughs in that country, the Anglo-Norman crown had found itself under an absolute necessity of placing the new municipalities on the footing of the most favoured class of boroughs in England: the security of the English power upon the Irish soil required that the incorporated burgesses should be strong and prompt for defensive warfare; and, to be so, it was essential that they should be free. Not only therefore were the municipal and the parliamentary franchise enjoyed by the inhabitant householders at large, but their common exemption from burdensome duties and services, and from feudal jurisdictions, was rendered more effective than in England itself: and such, on the whole, did the civil condition of the Anglo-Irish boroughs continue to be until the completion of the territorial conquest. This completion, while it relieved the antient boroughs from the danger of external attack from the unsubdued native Irish population, rendered their internal freedom more liable to attack from the English crown, at length relieved from the risk and embarrassment of the old contest with 'the Irish enemy.' Another remarkable circumstance appeared just at the same period, which, while it commenced an entirely new æra in Anglo-Irish history, placed in the hands of the English government a weapon of sweeping efficiency for the prosecution in Ireland of its new policy towards antient boroughs in general. When Henry VIII. had abolished, to his own advantage, the papal supremacy in England, the new religious reformation, though received without difficulty by that small portion of the Anglo-Irish population which had close connexions with the English government, made little progress among that population at large: the great majority adhered as steadfastly to Catholicism as the native Irish themselves, and thus became involved with them in one and the same political proscription. To avoid giving a false colour to the whole subsequent tenor of Anglo-Irish history, it is most important to observe distinctly, that ever since the permanent establishment of the Church of England reformation, the great source of insolent political ascendency on the one hand, and indignant political exclusion on the other, has been the difference, not of *races*, but of *creeds;* and that of the *English* blood now existing on the Irish soil, far the greater portion circulates in the veins of those who are still subjected to political depression on *religious* grounds alone. In the reign of Elizabeth two statutes were passed relating to the crown's religious supremacy and to the uniformity of common prayer; but her government was too discreet to enforce either of them, except as to the clergy and the leading officers acting in civil capacities under the government. But James I. sent presidents or military governors through the Irish provinces for the immediate enforcement of the statutes in question, especially in the corporate towns; and from the language of the historians who panegyrize these presidents, we find that their threat was 'to cut with King James's sword King John's charters in pieces; to level the cities with the ground, and strew them with salt.' On arriving at these towns, they called before them the mayors and other principal corporate officers, and, after some further proceedings, deposed them, imprisoned them during his majesty's pleasure, imposed on them heavy pecuniary penalties, and for payment of these had their goods sold in the public streets. For a knowledge of these latter proceedings we are not indebted to historians, but the detail exists in reports exultingly made by the presidents themselves to the government of the day. The leading municipal officers being thus ejected, others, of known pliancy, were substituted in their places; and these persons readily resigned the rights and liberties of their towns into the king's hands, and took out new charters of incorporation. And here it was that the leading object of the crown was accomplished. To the several antient boroughs new charters were soon issued, so framed as to leave but a very small share of municipal power to the great body of the inhabitants. In these charters individuals were expressly nominated to fill the offices of mayor, sheriff, recorder, &c.: the members of the governing council of the corporations were in most instances nominated in like manner, with exclusive power to appoint their successors; so that the inhabitants at large were almost wholly deprived of that share in their local government which, under the original constitutions of these boroughs, they had enjoyed for upwards of four centuries.

The system of exclusion was closely pursued by the persons thus newly placed in corporate authority, who, by this means, gradually severed their interests from those of the inhabitants at large: still they were unable wholly to extinguish the municipal rights of the antient class of freemen, who, though excluded by test oaths from the higher corporate offices, continued pretty numerous until the year 1654, when the army of the Commonwealth obtained possession of all such towns. No sooner was Charles II. restored than the Lords Justices of Ireland issued a proclamation confirming to every one holding by grant or contract with 'the late usurped powers,' all their lands and possessions, as well in towns as elsewhere, during a given period. Under the authority of this proclamation, when the Irish legislature was called together for the general arrangement of landed property, and other public interests, which had been completely subverted by so many years of civil war, the Commonwealth soldiery, who, under Cromwell, had possessed themselves of the walled towns, were able to return an overwhelming majority of members to that parliament which passed the Acts of Settlement and Explanation. The permanence of their interest was thus provided for; and the estates, rights, and liberties of those corporate establishments were vested in a body of men but recently settled in the kingdom. The unjust exclusion consequently maintained, became, in the course of the same reign, a subject of inquiry with the Irish government; but, wavering as that government has so often been between justice and expediency, it procured no effectual change in that system, the evils of which it seemed to deplore.

One measure, however, was taken at this period, the tendency of which was to mitigate in some degree the spirit of absolute exclusion prevailing in the Irish municipalities. The Act of Explanation empowered the Lord Lieutenant and Council, within seven years, to make rules, orders, and directions, for the better regulation of all cities, walled towns, and corporations. By virtue of this power, the Lord Lieutenant and Council, in 1672, issued what are called the 'New Rules,' which ordained that thenceforward the elections of persons to serve the offices of mayor, sheriff, recorder, or town-clerk, of Dublin, Limerick, Galway, and the several other towns therein mentioned, should be subject to the approbation of the Lord Lieutenant and Council; and that no person should be capable of acting as mayor, recorder, sheriff, treasurer, alderman, town-clerk, common-councilman, or master or warden, until he should have taken the oath of supremacy, except such only with whose taking that oath the Lord Lieutenant should think fit, by name and in writing, to dispense. But that part of these New Rules which tended to restore the antient basis of the municipal franchise, was a provision that all 'foreigners, strangers, and aliens, being merchants, or skilled in any mystery, craft, or trade,' then or thereafter residing and inhabiting within those cities or towns, should, on paying down a fine to the mayor and common council, or other persons authorized to admit freemen, be admitted to the freedom of such city or town respectively, and if they desired it, into any guild, brotherhood, &c., therein; that any person refusing to admit them so applying for their freedom should, upon due proof before the Lord Lieutenant and Council, be for ever deprived of the freedom of such city or town; and further, that on such refusal of admission by the corporate authorities, such person so applying should, on tendering twenty shillings, and taking the oath of allegiance before any justice of peace in the adjoining county, be therefore deemed, to all intents and purposes, a freeman of such corporation, guild, &c. Thus, in spite of the exclusive system then in operation, every resident trader in the corporate towns of Ireland was enabled, under these rules and orders, to become a freeman; though still, except by special dispensation, he could not fill the higher municipal offices, unless by taking the oath of supremacy and giving the other tests then required.

But after the Revolution of 1688, the spirit and intention of this portion of these rules were wholly disregarded. Owing, indeed, in some degree to James II.'s unsuccessful attempts against his opponents in the corporate towns of Ireland, the system of absolute exclusion pursued in the early part of his brother's reign was revived with aggravated rigour; and under such circumstances little was to be expected from seeking the benefit of the rules and orders, or bringing in any other mode the rights of the excluded before such tribunals as then existed. From these causes, and from a sort of inviolability or sacredness of character which was thrown about corporate establishments in Ireland from the reign of William III. almost to the present time, the inhabitants at large of municipal towns have remained wholly unconnected in interests or feelings with the few individuals monopolizing all corporate authority.

The inquiry into the state of the municipal corporations of Ireland, commenced in 1833, was a branch of the general municipal inquiry which naturally followed the passing of the parliamentary Reform Acts. The Irish Commissioners took as the basis of their local investigations the 117 places which sent representatives to the Irish parliament; all of which have been enumerated in the several lists given above, except the six following, which, though they were empowered by charter to return each two members to parliament, appear never to have possessed a municipal character; viz., Antrim, Doneraile, Lisburn, Mullingar, Randalstown, and Rathcormac. And of the various municipal corporations above mentioned, only sixty appear to be now effectively existing and exercising corporate functions. These we shall here enumerate in the order of their respective magnitudes, commencing with the most populous, and descending regularly downwards: they are, of 100,000 inhabitants and upwards, Dublin, Cork; from 100,000 to 50,000, Limerick, Belfast; from 50,000 to 20,000, Galway, Waterford, Kilkenny, Londonderry; from 20,000 to 10,000, Drogheda, Sligo, Clonmel, Kinsale, Athlone, Youghal, Wexford, Dundalk; from 10,000 to 5000, Bandonbridge, Tralee, Armagh, Carlow, Carrickfergus, Ennis, Cashel, Tuam, Callan, Enniskillen, Enniscorthy, Coleraine, New Ross; from 5000 to 3000, Charleville, Strabane, Longford, Athy, Navan, Dingle, Kells, Ardee, Monaghan, Naas, Cloghnakilty, Dungannon, Boyle, Feathard (co. Tipperary), Trim, Maryborough, Portarlington, Gorey; from 3000 to 1000, Thomastown, Bangor, Wicklow, Middleton, Belturbet, Kilbeggan, Baltinglass, Hillsborough, Athenry, Kilmallock, Killileagh; from 1000 to 900, Inistioge, Castlemartyr. Of the extinct corporations, 30 have become so since the legislative Union with Great Britain; these vary in population from 6000 downwards; but the greater part of them are under 1000, and several are inconsiderable villages.

In Ireland, the total inadequacy of the present basis of municipal constituency is yet more universally glaring and more injuriously operative than it was in the unreformed system of England. 'The rights from birth, marriage, and apprenticeship,' say the Irish Commissioners, 'have, even where most liberally admitted, failed to supply in the body of the corporations, a general constituency comprising or representing sufficiently the various classes of the inhabitants. The two former qualifications are necessarily limited to persons related to, or connected with, the old members; and the last (apprenticeship) leaves to the old members complete control as to the class from which the new may be selected: thus, when a particular party has gained an ascendency, these rights operate to preserve the corporate privileges to that party exclusively. The modes of admission which have become established in most corporations have further contributed to limit the number of freemen, and prevent the foundation of a general and comprehensive commonalty.... Possessed of these powers, the governing bodies have too commonly used them, without scruple, not as trusts to be exercised for the benefit of the community, but as the means of attaining for themselves an exclusive dominion over the general inhabitancy, and political influence in the election of members of parliament. The course which they seem to have almost universally pursued for this object has been to concede with the utmost parsimony to the inhabitants the right to become members of the corporations as freemen. Where the recognised rights to freedom are not directly resisted, difficulties are interposed to its attainment; in some cases, by the establishment of peculiar forms of admission, as in Bandonbridge, Dublin, and Drogheda, which give to the governing body, or some of its members, a direct power of negativing or suppressing the claims. In others, as in Kilkenny and Limerick, unnecessary delays or technical obstacles have been interposed in the investigation and consideration of the title to admission; while the power of admission by especial grace may at all times be exercised without limit, to counteract any increase on title supposed to be dangerous to the prevailing influence. The policy of the governing bodies has induced some of them, in recent instances, to endeavour to retrace their steps, and extend more liberally the corporate franchise, with the view of encountering the enlarged leasehold and household constituency introduced by the Reform Bill. Thus, in Clonmel, rights to freedom not recognised for eighty years prior to that Act being passed, have been since admitted. In Dundalk it was attempted to introduce a right of admission by birth, but unsuccessfully. In Waterford the same policy has led to the relaxation of restrictions previously existing on the attainment of freedom as of right. In Kinsale and Athlone, freemen were admitted in large numbers in 1831 for the same purpose, but the attempt was defeated by the provision of the Reform Act excluding honorary freemen admitted subsequently to the 30th of March in that year.'

The excessive abuse of the unlimited power of admitting non-residents into the local constituency, is a feature still more strongly marked in the character of the Irish corporations than in that of the English. 'In counties of cities and counties of towns,' say the commissioners, 'the acknowledged rights of the *freeholders* to vote at elections for members of parliament, while it has served to maintain the general independence of the community, has a decided though indirect tendency to the depression of the freemen as a class. The freeholders, who thus possessed the most valuable civil right without control of the corporate authorities, had less motive to seek admission as freemen; while the existence of an independent body of electors led, for the purpose of counteracting their influence, to the creation of non-resident freemen—a practice on the part of the corporations for the correction of which the legislature has lately interposed by one of the provisions of the Reform Act. In many corporations (we may instance those of Galway, Limerick, Cork, and Drogheda), the creation of non-resident freemen has prevailed to an extent apparently only limited by the necessity of providing a sufficient number in the interest of the corporation to bear down the resident freehold constituency. As members of the corporations for general municipal purposes, the non-resident freemen do not appear to have interfered; but such rights as they may have in that respect remain unaffected by the provisions of the Reform Act; and if the subject of contest should be of sufficient importance, they might still be resorted to by the governing body on occasion of the exercise of the corporate powers, where vested in the freemen at large.

'The admission of non-residents to such an extent seems quite inconsistent with the principles of municipal government and incorporation, and with the spirit of the charters, which are addressed to the citizens, commons, inhabitants, or commonalty of the corporate city or town, and abound in provisions for the benefit and exclusive advantages, commercial and civil, of those residing in the incorporated districts. We find the legislature itself, at a very early period, sanctioning and enforcing the principle and policy of a resident municipality, by a statute of the Irish parliament, passed in the tenth year of Henry VII. (c. 7), which enacts "that no city or great town receive or admit any person to be alderman, juror, or freeman within any of the said cities or towns, but such persons as have been prentice or have been continually inhabitant in the said cities or towns:" and (after some other provisions), "that if any city or town offend the premises or any part thereof, the mayor and commons of any such city or town, by whatever name they be incorporated by, to forfeit an hundred marks of money to the king as often as they or any of them shall offend the premises or any part of them." In practice, however, the terms of the charters and the intention of the legislature have alike been disregarded, and the provisions of the act of parliament have been considered as penal, but not prohibitory; imposing the prescribed penalty on the corporation which violates them, but not invalidating the admission of the persons in whose favour they are infringed. Election committees of the House of Commons have, in the cases of Limerick, Wexford, and Waterford, decided that the rights of election there were limited to freemen resident at the time of admission; but these decisions, which asserted a principle theretofore habitually violated in modern practice, have proceeded on evidence of the antient bye-laws and usages of these corporations, and in the case of Wexford on the special terms of the charter. In the case of Limerick, the legislature has interposed by the act for the reguation of that corporation, 4 Geo. IV., c. 126; and made residence at the time of admission a necessary qualification for freedom. In Carrickfergus, also, the usage has been in conformity with this principle.

'That the existence of such control and influence in such a body over the admission of the members is a main defect in the constitution of the municipal corporations, the results, contrasted with the objects of the institutions, appear to us to demonstrate. We apprehend the term municipal corporation may, in reference to our present inquiry, and on a view of the several charters which have come under our notice, be fairly considered to mean an incorporation of persons, inhabitants of, or connected with, a particular place or district, enabling them to conduct its local civil government. Accordingly, the regulation of the municipal district and its inhabitants, the preservation of the public peace within it by a magistracy chosen by and from the incorporated body, and the administration of justice to the community in domestic tribunals, are among the principal objects for which provision is made in the various charters of incorporation appearing to have been granted from time to time to the corporate cities and towns in Ireland. Another important object of many incorporations was the election of members to represent their respective cities and towns in parliament. A farther, and one which appears to have engaged more attention in former times than at present, was the protection and regulation of the local trade by means of commercial societies, or guilds. It appears to have been always considered conducive, if not necessary, to the attainment of the first object above noticed—that of providing for the regulation of the municipal district and its inhabitants—that the corporate body should be invested with powers to make ordinances or bye-laws for the purpose, and that such ordinances would be the more binding on the inhabitants of the district, and suited to their interests, if made with their common assent. We find, therefore, that in nearly all the charters of municipal corporations in Ireland in which the power of making bye-laws is expressly given (even in those the most restricted in other particulars), this power is vested in the whole body, including the commonalty equally with the other members. All the other objects sought by their creation alike imply that those institutions were originally designed for the peculiar and common benefit of the *residents of the corporate district*, and were intended to be identified in interest with them, and entitled to their confidence and support.

'But the consequences of such exercise as we have described of the power of admission to the freedom of the municipal corporations in Ireland, have been to establish a very different condition of those bodies. It has followed, that in many towns there is no recognised commonalty; that in others, where existing in name, it is entirely disproportioned to the inhabitants, and consists of a very small portion, of an exclusive character, not comprising the mercantile interests, nor representing the wealth, intelligence, or respectability of the town. The corporations are, not without reason, looked on by the great body of the inhabitants of the corporate districts with suspicion and distrust, as having interests distinct from and adverse to those of the general community, whom they thus studiously exclude from a participation in the municipal government. Their members frequently consist entirely of the relatives and adherents of particular individuals or families, and the principles of their association and those which regulate admission or exclusion, have rarely any connexion with the common benefit of the district or the wishes of its inhabitants. In far the greater number of the close corporations, the persons composing them are the mere nominees of the "patron" or "proprietor" of the borough; while in those apparently more enlarged they are admitted and associated in support of some particular political interest, most frequently at variance with the majority of the resident inhabitancy.'

'This system,' they continue, 'deserves peculiar notice in reference to your majesty's Roman Catholic subjects. In one corporation alone, that of Tuam, the majority of the governing body is Roman Catholic.....The laws which for a series of years operated to exclude those professing the Roman Catholic religion from corporations were repealed in the year 1793 by the statute 33 Geo. III., c. 21; but the Roman Catholics have hitherto derived little practical advantage from the change. In the close boroughs they are almost universally excluded from all corporate privileges. In the more considerable towns they have rarely been admitted even as freemen; and, with few exceptions, they are altogether excluded from the governing bodies. In some—and among these is the most important corporation in Ireland, that of Dublin—their admission is still resisted on avowed principles of sectarian distinction. Even in those corporations whose rights to freedom are acknowledged and conceded, the long operation of the penal code having prevented the acquisition of freedom by the immediate ancestors of the present Roman Catholic population, very few have been enabled, since its repeal, to establish the requisite titles. The admissions which have taken place, whether upon a claim of right or by favour, have, for the most part, been either the result of personal influence with the members of the governing body, or compliments to individuals of wealth or popularity. With the exceptions of Tuam, Galway, Wexford, and Waterford, the rule is exclusion. In Londonderry, at the passing of the Reform Act, there were only three Roman Catholic freemen. Previously to the relaxation of the penal code, the number of opulent Roman Catholics residing in the corporate cities and towns was necessarily limited. But since those changes in the laws which have enabled them to share in the general diffusion of wealth and in the benefits of unrestricted industry, they have risen and multiplied in the middle and upper classes, so that in most of the cities and towns they constitute, not only a majority of the whole population, but a large proportion of the more opulent orders. We feel bound to submit to your majesty that a system of municipal polity which excludes such a class of your majesty's subjects from all substantial corporate privilege and power must be essentially defective in its structure. It fails to secure to the different classes of the local community participation in the regulation of their own concerns; and it operates far more widely and more mischievously than by the mere denial of equal privilege to persons possessing perfect equality of civil worth; for in places where the great mass of the population is Roman Catholic, and persons of that persuasion are, for all efficient purposes, excluded from corporate privilege, the necessary result is, that the municipal magistracy belongs entirely to the other religious persuasion; and the dispensation of local justice and the selection of juries being committed to the members of one class exclusively, it is not surprising that such administration of the laws should be regarded with distrust and suspicion by the other and more numerous body. The unpopular character of the municipal bodies is thus, in too many cases, aggravated by their being considered inimical, on the ground of sectarian feelings, to a great majority of the resident population, and they become instrumental to the continuance of the unhappy dissensions which it has so long been the policy of the legislature to allay.'

We proceed to notice the branch of our subject next in importance—the present constitution of the governing bodies of the Irish municipalities.

In some corporations the members of the legislative council are styled aldermen; in others, burgesses, or free burgesses; and in some there are two such classes, the one styled aldermen, the other burgesses. The number of each class is usually definite. In the numerous corporations created by James I. the corporate body was made to consist of a chief officer, twelve or more 'free burgesses,' and 'a commonalty;' but in the chief officer and free burgesses were exclusively vested the election of the principal officers, the filling of vacancies in the body of free burgesses, and the admission of freemen. Similar in effect, though not always with the same simplicity of form, are the constitutions of nearly all the Irish corporations; and the condition of those in which more popular principles are found affords generally but a seeming exception to the prevalent character of the governing bodies. Where a common council has been established to manage the whole or some portion of the corporate affairs, all the members of the superior classes are, with few exceptions, members of that assembly. In several corporations, representatives of the freemen at large are selected to act on their behalf in the common councils; but in few cases are they actually elected by the freemen; in most they are nominated by the superior classes of the corporation, or by the common councils themselves, without any interference whatever on the part of the general constituency. In some corporations the freemen have been altogether excluded from the governing bodies; while in the greater number of those of James I.'s creation the 'free burgesses' have assumed the entire government, to the exclusion of the freemen altogether. The legislative constitutions of Dublin and Cork require more particular notice. The Dublin corporation is the only one in which all the members of the governing body are not elected for life. The common council consists of two bodies sitting apart; the lord mayor and board of aldermen in one chamber, the sheriffs and commons in another. The commons are composed of the 'sheriffs' peers,' being those freemen who have served the office of sheriff, whose number in the council is not to exceed 48, and of 96 members elected triennially by the various guilds of trades of which the corporation is composed: the aldermen are elected by the commons from a certain number of sheriffs' peers returned to them by the lord mayor and board of aldermen. Both sheriffs' peers and aldermen are members of the common council for life. In Cork, a more direct power is vested in the body of freemen. The acts of the common council, which consists of the mayor, recorder, sheriffs, and aldermen, and as many elected burgesses as will make up the number 24, are subject to approval by the court of freemen, in which also the election of its members is vested: but this apparent freedom of choice is in practice entirely controlled by a self-constituted association of a certain class of the freemen, of exclusive political and religious opinions.

A very remarkable feature peculiar to the legislative constitution of the Irish boroughs must here be stated. In England, non-residence has been held, in the majority of cases, to be a necessary disqualification for the legislative functions; but in Ireland, in the year 1747, the political spirit of the time induced the legislature, by statute 21 Geo. II., chap. 10, sec. 8, of the Irish parliament, to dispense with this important condition in all but a very few of the Irish corporations. After reciting that 'many of the towns corporate and boroughs not being cities, which send members to parliament, had been obliged, for want of protestant inhabitants resident in the precincts of said towns corporate and boroughs, to elect into the offices of burgesses and other offices in the said corporations persons who did not inhabit, or could not be resident, in the precincts thereof; that it had been questioned whether persons not inhabitant within said corporation could, within the letter of their respective charters, or some of them, be elected into or act as burgesses within such towns corporate or boroughs; and that it still continued impracticable in most of the said towns corporate and boroughs to find protestant inhabitants who, on account of their circumstances, were fit to be trusted in such offices,' it enacted, 'that no person who had been or should be in all other respects duly elected and admitted into any of the said offices or franchises, in any town corporate or borough not being a city, should be ousted out of any such office or franchise as aforesaid, or be any ways sued, prosecuted, or molested, for or by reason only of his not being an inhabitant of, or resident within, said town corporate or borough at the time of his election, but should hold, exercise, and enjoy such office or franchise as fully and effectually, to all intents and purposes, as if such person or persons was or were inhabitants of, or resident within, such town corporate or borough at the time of election.' The effect of this enactment was to deprive a large proportion of the corporations of a resident governing body. In some cases, a few, very rarely a majority, of the municipal council, were inhabitants of the town; while in others, the whole chartered body of burgesses became composed of non-residents, some of whom attended, *pro formâ*, at elections of the corporate officers and of the parliamentary representatives, or on occasion of the disposing of corporate property, though taking no other part in the local government.

All the evils of an irresponsible monopoly of municipal legislation so lately existing in England, are thus found in Ireland, enhanced by the several circumstances of aggravation already stated. The principle which operates to the exclusion of the great body of Roman Catholics from the corporate constituencies, universally and yet more rigourously excludes them from the close and self-elected governing councils. The control exercised over the admissions to freedom by the most important of them, that of Dublin, notwithstanding its more popular constitution, 'being directed,' say the commissioners, 'by the avowed sectarian feeling of this corporation, has practically rendered its governing body, not the representatives of the general community of the metropolis, but the head of a limited portion of the inhabitants, comparatively few in number, and avowedly exclusive in opinion. In many corporations, too, the anomalous and injurious practice authorized by the act above quoted respecting non-residents, still continues; and the attending members, on occasion of election to corporate offices, are so few, that the validity of the corporate proceedings, and the very existence of the corporation, become subjects of doubt. In addition to so many other fertile sources of perversion, some charters gave a direct control in the corporate elections to the lord of the manor or landed proprietor of the town in which the corporation was established; while in others, the powers given to a small self-elected body become naturally centerd in its most influential member. With few exceptions, the influence once acquired by persons of rank or property in the corporations was easily perpetuated by the powers of self-election in the governing councils, until by degrees the corporate bodies became, as many of them have now long been, composed almost exclusively of the family or immediate dependents and nominees of the individual recognized as the 'patron,' or 'proprietor;' acting solely according to his dictation and for his purposes, in the election of the municipal officers, the administration of the corporate affairs and property, and the returning of the members of parliament for the borough. 'We cannot reconcile with any reasonable principles of municipal government,' say the commissioners, 'the condition to which so great a number of the Irish corporations have been thus reduced, the inhabitants excluded from participation in the election of the corporate authorities, or the management of the corporate affairs, and the whole power of local government vested in a non-resident body, exercising or neglecting it as suits the wishes or convenience of their patron.' The influence thus acquired came to be regarded as absolute property, and transmitted as part of the family inheritance: in some instances it was made the subject of pecuniary purchase; in some, as in the case of Waterford, partitioned, by agreement, between contending interests; and when the legislative union between Great Britain and Ireland deprived many of the corporate towns, or rather their patrons or proprietors, of the power of returning members to parliament, this species of property was formally recognized as a subject of national compensation. The list of towns given by the Irish Commissioners, in which since that period the municipal corporations have become extinct, shows at once the purposes to which their patrons looked in preserving their nominal constitution, and its inefficiency to secure the primary objects of a municipal establishment. Many of those which were then allowed the power of returning a member to the imperial parliament, still retain a municipal corporation under the same system of patronage; which also prevails in several of the other subsisting corporations, in which the administration of property and the emoluments of office are important enough, in profit or influence, to make their retention an object of consideration.

As the endeavours of the government and legislature of the United Kingdom to assimilate the municipal system of Ireland to the reformed practice of England, have hitherto been totally defeated by the persevering opposition of the hereditary branch of that legislature, we shall here enter into no detail of the particular schemes for its amelioration proposed and carried in the representative chamber of the imperial parliament. We have only to remark the glaring anomaly exhibited in this perpetuation of the old corporation system in that very portion of the empire, and that alone, wherein municipal institutions have been perverted in the degree the most shocking to common sense, the most wounding to liberal feeling, and the most pernicious to the peace and welfare of the several communities for whose good the institutions in question were ostensibly framed. We know, indeed, that the very parties who have been mainly instrumental to this perpetuation, give up the existing system as wholly indefensible; but what are we to think of their proposal to remedy the evil by depriving so important an integral part of the kingdom of all municipal institutions whatsoever? We have here to do with the subject only so far as historical fact and political science are concerned; and in this view it is that we are called upon to point out the grave inconsistency of such as, while professing the most ardent desire to maintain the parliamentary union of the two islands, would place the English beyond St. George's Channel out of the pale of that local organization which has ever been a vital prin ciple of the English commonwealth, and out of which, as we have shown elsewhere, the parliamentary representation itself has chiefly risen. We say, the English beyond St. George's Channel; for they who, at this day, affect to treat the inhabitants of Ireland as aliens, seem to lose sight of one or two very important considerations. Not only did the violent introduction of the Anglican Reformation into Ireland (as we have indicated in the early part of this article) permanently substitute the division of creeds for that of races, as the grand basis of political distinctions, but since that period, also, the general progress of civilization has given the social habits, the manners, the language, and the literature of England, such universal predominance in 'the sister island,' that it is one of the grossest of fallacies to talk of the 'the Irish,' at this day, in the same sense and spirit as a good Englishman of the days of Henry II., or even of James I., might have done. A thorough identification of language and literary ideas, in particular, is surely the process of all others most importantly conducive to that perfect social amalgamation upon which political assimilation should naturally attend.

CORPULENCE. [OBESITY.]

CORPUS CHRISTI or BENE'T COLLEGE, Cambridge, was founded about the year 1351. The founders were the brethren of two guilds, termed the guilds of Corpus Christi and the Virgin Mary, by which joint name the college was originally called; but soon after its foundation it acquired the name of Bene't College (by which it is still often distinguished) from the adjoining church of St. Benedict, the advowson of which was purchased for the college of Sir John Argentine and Sir John Maltravers. Henry, duke of Lancaster, who was alderman of the above-mentioned guilds, procured from the king a charter for ratifying the endowment of the college. The number of fellowships varied originally according to the revenues of the college; it is now twelve, two of which are appropriated to the city of Norwich, and four to the county of Norfolk; the remainder are open. Archbishop Parker, when master, by his exertions in supporting the rights of the college, and improving their estates, enabled them to add two fellowships to the number then existing (which was eight), and gave certain rent-charges to the college for the purpose of founding two other fellowships and eleven scholarships. The archbishop was a great benefactor to the college also by donations of money, plate, books, and a very valuable collection of manuscripts. One of the fellowships and a scholarship were founded by Elizabeth, duchess of Norfolk, wife of Thomas Mowbray, the first duke. There are sixty-two scholarships and exhibitions belonging to this society: eleven of these were founded as before mentioned by archbishop Parker, mostly for natives of Norfolk; six by Sir Nicholas Bacon, the preference to be given to students from Redgrave school; and twelve by bishop Mawson, to be given to such students as shall excel in the annual examinations. The stipends of these scholarships and exhibitions are various. The greater part are under 20*l.* per annum. There are eleven benefices in the patronage of this college. The number of members upon the boards at the close of 1835 was two hundred and fifteen.

The valuable manuscript library left by archbishop Parker to this college is under the following particular restrictions. Every year on the 6th of August, it is to be visited by the masters or locum-tenentes of Trinity Hall and Caius College, with two scholars on archbishop Parker's foundation, and if, on examination of the library, twenty-five books are missing, or cannot be found within six months, the whole collection devolves to Caius. In that case the master or locum-tenentes of Trinity Hall and Corpus Christi College, with two scholars on the same foundation, are the visitors; and if Caius College be guilty of the like neglect, the books are to be delivered up to Trinity Hall: then the master or locum-tenentes of Caius and Corpus-Christi, with two such scholars, become the inspectors; and in case of default on the part of Trinity Hall, the whole collection reverts back to its former order. Two catalogues of this library have been published, one in 1722, and the other by the Rev. James Nasmith, 4to., Cambridge, 1777.

This college, situated in Trumpington Street, formerly consisted principally of one court, and an antient chapel built in 1578 at the expense of Sir Nicholas Bacon. The college however, being very antient, and falling rapidly into decay, was renewed in the Gothic style from the designs of William Wilkins, Esq., the old court being suffered still to remain: the first stone of the new building was laid in 1823. The great west front in Trumpington Street is 222 feet in length. In the centre is an entrance gateway flanked by two towers leading into a quadrangle, 158 feet long by 129 broad, containing the chapel, library, hall, master's lodge, and forty-seven sets of apartments for the fellows and students.

Among the eminent persons educated in this college, were Hugh Latimer, bishop of Worcester, the archbishops Parker, Tennison, and Herring, Sir Nicholas Bacon, lord-keeper in the reign of queen Elizabeth, Thomas Tusser, Fletcher, the dramatic poet, Dr. John Spencer, author of the work 'De Legibus Hebræorum,' Dr. William Stukely, Robert Masters, the historian of the college, and Richard Gough, the antiquary.

The present master of this college is the Rev. John Lamb, D.D., elected in 1822. The visitors are the vice-chancellor of the university, and two senior doctors in divinity: in extraordinary cases, the king.

(Lysons' *Magna Britannia*, Cambridgesh., p. 107—109; Masters's *History of the College, with Additions*, by John Lamb, D.D., 4to., Camb. 1831; *Camb. Univ. Calendar* for 1836.)

CORPUS CHRISTI COLLEGE, Oxford, was founded in 1516, by Richard Fox, bishop of Winchester. The foundation was preceded two or three years before by the purchase of certain pieces of land in Oxford, belonging to Merton College, the nunnery of Godstow, and the priory of St. Frideswide; and the first design was to found a college for a warden and a certain number of monks and secular scholars belonging to the Priory of St. Swithin in Winchester, in the manner of Canterbury and Durham Colleges. The plan however was changed by the advice of Hugh Oldham, bishop of Exeter, who is said to have foreseen the fall of the monasteries, and whose arguments appear to have induced Fox to place his new foundation upon the general footing of the other colleges of the university. Accordingly, by license of Henry VIII., dated November 26, 1516, he obtained leave to found a college for the sciences of divinity, philosophy, and arts, for a president and thirty scholars, graduate and not graduate, more or less, according to the revenues of the society: the new college to be endowed with 350*l.* yearly. The statutes, dated February 13, 1527, show that the founder, in some degree, again changed his plan.

The society at present consists of a president, twenty fellows, twenty scholars, and two chaplains. The fellows are elected from the scholars, and the latter from the following dioceses and counties, viz. – four from the diocese of Winchester, of which two are to be of the county of Hants, and two of Surrey: two from the diocese of Bath and Wells; two from the diocese of Exeter; two from Lincolnshire; two from Gloucestershire; one from Wiltshire; two from Kent; one from Lancashire; one from Bedfordshire; one from Oxfordshire; one from the diocese of Durham; and one upon Frost's foundation. There are, besides, four exhibitioners not confined to counties.

What conferred an almost immediate superiority of reputation on this society, was the appointment in it of two lectures for Greek and Latin; a knowledge of the classics not having been considered, up to that time, as an essential branch of academic study. Ludovicus Vives, Crucher the mathematician, Thomas Lupset, Richard Pace, and other men of established reputation, were invited by the founder to his new college. Erasmus was then resident in Oxford, and assisted with his advice.

The principal benefactor to this college, in addition to the provision made by the founder, was Hugh Oldham, bishop of Exeter, already mentioned, who contributed six thousand marks besides lands. Other benefactors are enumerated in the histories of Oxford, of whom Dr. Turner, who had been president from 1688 to 1714, was one of the most liberal. Arthur Parsons, M.D., about the close of the seventeenth century, gave 3000*l.* for the purchase of advowsons. Cuthbert Ellison, who died in 1719, and lies buried in the chapel, gave 500*l.* for the same purpose, and was also a contributor to the library.

The main buildings of this college consist of the quadrangle, erected by the founder, including the hall, chapel, and library. An additional building, looking to Christ Church walks, was erected at the expense of Dr. Turner, just mentioned, in 1706. The altar-piece in the chapel is a painting of the 'Adoration,' by Rubens, presented to the college in 1804, by the late Sir Richard Worsley; it came from the collection of the Prince of Condé, at Chantilly.

The total number of benefices in the gift of this society, is twenty-two. The number of members on the books on December 31, 1835, was one hundred and thirty. The present president is Tho. Edw. Bridges, D.D., elected in 1823. The visitor is the bishop of Winchester.

Among the eminent and learned men who received their education in this college were Jewel, bishop of Salisbury, Nicholas Udall, Richard Hooker, Daniel Featley, Dr. Richard Pococke bishop of Meath, the learned orientalist Edmund Chishull, Fiddes the biographer of Wolsey, and Anstis the herald.

(Wood's *Hist. of the Coll. and Halls of Oxf.* by Gutch; Chalmer's *Hist. of the Colleges and Halls*, 8vo. Oxf., 1810; *Oxford Univ. Calendar*, 1836.)

CORPUS JURIS CIVILIS. The term corpus juris (literally a body of law) was introduced in the middle ages to signify a book which comprehends several collections of law. There are two principal collections to which that appellation is given, the Corpus Juris Civilis and the Corpus Juris Canonici. [Canon Law.] The term Corpus Juris Civilis designates the book in which the different parts of the legislation of the Emperor Justinian are collected, and which, being considered as one whole, contains the main body of the Civil or Roman law. According to this definition, the Corpus Juris Civilis consists of the compilations of the Codex, Pandects or Digests, Institutes, and Novels, which were made under the direction of the Emperor Justinian.

Justinian himself, regarding each part of his legislation as a separate collection only made for the purpose of completing former compilations, never thought of giving a common title to them all. Each part had its separate and appropriate name; for instance, the Codex was so called because it was the book in which the Roman emperors' Constitutions were collected; the Institutes were so called because they contained the first principles and rules of the law. In the middle ages, when the study of the Roman law began to flourish in the universities of Italy, the Jurists began to consider Justinian's separate collections as one entire legislation, to which a general title would be appropriate. Savigny, in his history of the Roman law in the middle ages, asserts that the term Corpus Juris Civilis was used in the twelfth century. However, Russardus, professor in Bourges (which, in the sixteenth century, was one of the most celebrated French universities for jurisprudence), who first edited the collections of Justinian under a common title, at Lyon, in the year 1561, chose only the term Jus Civile for that purpose; and Dionysius Gothofredus, likewise a French jurist of Paris, is commonly considered as the first who, in his edition in the year 1583, at Lyon, adopted the term Corpus Juris Civilis as a general title for the collections of Justinian. From that time this title has always been in use.

The Corpus Juris Civilis, as it is now composed, contains: 1. The Collections of the Emperor Justinian, viz., the Institutes, in 4 books; the Pandects or Digests, in 50 books; the Codex, in 12 books, together with the Authentica, *i. e.* short excerpts from the Novels, which are added to many passages of the Codex for the purpose of explaining or completing them; and the Novels, the number of which is 168. 2. An arbitrary appendix, joined to the Corpus Juris by different editors since the time of Russardus, viz., *a.* several Constitutions of the Emperor Justinian and his two successors Justinian II. and Tiberius II., called Justinian's 13 edicts, which were first received into the Corpus Juris by Russardus; *b.* several other Constitutions of the same three emperors, which were first added by Contius, in his edition of 1571; *c.* 114 Constitutions of the Emperor Leo, the philosopher, given by him for the purpose of amending and correcting Justinian's legislation, together with a Constitution of the Emperor Zeno, likewise first added by Contius in his edition; *d.* a series of Constitutions of the successors of the Emperor Justinian from the seventh to the fourteenth century, first added to the Corpus Juris in the edition of Charondas of 1575; *e.* a series of 84 (or 85 according to the older division) ecclesiastical Canons, called Canones Sanctorum et Reverendorum Apostolorum, first added to the Corpus Juris by Haloander, as to the origin of which there are different opinions, but they are probably private collection of decrees of councils and synods before the synod of Nicæa, A.D. 325; *f.* the Libri Feudorum, *i. e.*, the books which contain the usages and customs of the feudal system, and which were joined to the Corpus Juris by the Glossators; *g.* and, last of all, several Constitutions of the Emperor Frederic II. In several editions we find other appendages besides those here noticed.

The manuscripts of the Corpus Juris Civilis are numerous, but nearly all of them contain only a part of Justinian's legislation: manuscripts which contain the whole body of law are very rare. The best MS. of the latter is at Copenhagen. Of MSS. before the time of the Glossators (professors of law, in the twelfth and thirteenth centuries, in the universities of Italy, especially in Bologna, who taught the Roman law, and explained the different parts of the Corpus Juris), we have only one of the Pandects, the celebrated Florentine manuscript, which was first at Pisa, but was brought in 1406 to Florence; it probably belongs to the sixth or seventh cenury, and some even suppose that it may be the original copy of the Pandects which was sent by Justinian to the Western Empire. The other manuscripts are of the twelfth, thirteenth, and fourteenth centuries, and contain the versio vulgata, or text as settled by the Glossators according to older manuscripts. In Munich and Paris there are valuable manuscripts of the versio vulgata of the Codex. As to the manuscripts, see Beck, *Indicis Codicum et Editionum Juris Justinianei Prodromus*, Lips., 1823. As to the manuscripts in England, there is a valuable notice in the 5th vol. of the *German Magazine of Historical Jurisprudence.*

There are numerous editions of the Corpus Juris: it was printed very soon after the invention of the art, but at first only separate parts were published. The oldest edition that we know of is that of the Institutes, by Peter Schœffer, in Mentz, of the year 1468. There is a copy of this edition on vellum in the King's Library, British Museum. It has a small illumination of a presumed portrait of Justinian in the title-page. The larger capital letters throughout the book are illuminated, and some of them with gold. Till the year 1476 all the parts of the Corpus were printed separately. The first edition, which contained the whole, is that by Honate, at Milan, of the years 1482 and 1483, but still not under a general title, which, as already mentioned, was first used by Russardus. Till the year 1518 all the editions were printed with the glosses, but after that date the glosses were commonly omitted. The last edition with glosses is of the year 1627. For a complete list of the editions, see Beck's *Index*. The best known edition of the Corpus Juris is that of Dionysius Gothofredus. He edited the Corpus Juris several times, with notes, 1583, Lyon, without notes, Lugd., 1589. His editions are often counterfeited; the best is Francfort on the Mayn, 1663.

CORPUSCULAR THEORY. [Molecular Theory.]

CORRECTING PLATE. [Navigation.]

CORRECTION, HOUSES OF. [Reformation, Houses of.]

CORRE'GGIO, ANTO'NIO ALLE'GRI, or, as he has been known to write it, **LIETO**, one of the first of painters, was surnamed Correggio from the place of his birth, which probably took place towards the end of the year 1493, or early in 1494. Correggio's life is involved in the most impenetrable obscurity. The only authentic records which exist are certain registered documents, public and private, which are yet preserved; but they serve only to throw a very feeble light upon his domestic life, and all our knowledge of it remains of a negative character. Some of his biographers, at the head of whom is Vasari, describe him as of humble origin, indigent, and penurious in his way of living. But the documents existing, some of which relate to the transfer of estates in his own family, and the prices paid to himself for his pictures, utterly disprove such neediness. On the other hand the attempt of Mengs and his copyist Ratti to draw his descent from a noble family of Correggio, once feudal lords of Campagnola and its castle in the Corregese, seems quite without historical foundation. The Allegri family, from which Antonio descended, appears to have been a decent family of Correggio; but the only proof of relationship between that and the other family is the coincidence of name, a most uncertain one, though it cannot be entirely overlooked. The conveyance and bequest of considerable property, such as moderately large sums of money, houses, and small portions of land, are too frequent among Antonio's immediate relations, to leave any doubt of his having been at least in easy circumstances.

Among other legacies, for instance, Pelegrino, the father of Antonio, who survived his son, left 250 gold crowns to his granddaughter, making his grandson Pomponio his residuary legatee. The fact of Correggio's making liberal use of the most expensive colours is a good collateral proof of his easy circumstances: ultra-marine, which in Ratti's time was worth from forty to fifty crowns per ounce, is unsparingly employed in his paintings. But by itself this fact would prove nothing, since the colour might possibly, as Tiraboschi observes, have been charged to those who gave him commissions.

It is quite uncertain who was Correggio's first instructor. Francesco Bianchi has been named his master; and Pungileoni, one of his most recent biographers, affirms that a certain Lombardi, who afterwards abandoned painting to practise as a physician, was his first teacher. It seems however most likely that his uncle Lorenzo first taught him the elements of his art, and that he afterwards studied under the sons of Mantegna. Mantegna himself has been supposed to be his first master; and the fact of his having died in 1506, when Correggio was barely twelve years old, does not render it impossible, although very improbable. In Mantegna's works however, we may recognise the germ of that sweet and graceful style which Correggio carried to perfection. That he ever went to Rome is far from probable, since a continued series of documents prove him to have been habitually residing in Correggio at the time when some writers have supposed he visited Rome. If he ever went at all, of which there is no better proof than surmise and tradition, it must have been for a mere visit. The mastery with which he treats classical subjects, has given rise to the supposition that he received a liberal education, and there is no proof to the contrary. It is most certain, also, that his works display a considerable knowledge of architecture; but that he practised that art, or sculpture, as some of his biographers have asserted, is entirely without proof.

Correggio was married, and had a son and three daughters. The supposition that he married a second time probably arose from a mistake in a certain register, in which his wife's Christian name is misstated; for his first wife is known to have been alive after the period assigned to his second marriage. No one ever pretended to know the surname of the second wife; but a long story was invented, showing how she was very beautiful, but of low origin, and that therefore he was ashamed of his marriage; a tale evidently framed to meet the conjecture suggested by the mistake alluded to. He died on the 5th March, 1534, and was buried in the church of St. Francis at Correggio.

It is as uncertain as anything else in his life, whether Correggio formed his more perfect style entirely from his own natural taste, with no greater model than Mantegna, or whether he had access to the works of the great painters of his time, and the antique, and received his best lessons from them. It appears probable that a mean between the two positions is the truth; that casts of the antient sculptures, and an occasional view of some of the works of the great painters, besides copies, could be obtained in his native country; for the city of Correggio was not without a taste for the arts, and had some tolerably good painters before Correggio. At all events he formed a style completely his own, remarkable for masterly *chiaroscuro*, exquisite colouring, and the most graceful design. Less varied and decided in his outline than the painters of the Roman and Florentine schools, he is more anxious to dispose his lines in easy flowing curves than to display knowledge of anatomy or powerful drawing. Nevertheless his forms are sufficiently correct, and the consummate skill shown in his endless foreshortenings proves that his smoother style of drawing was dictated by no want of study or deficiency of ability. While Titian's colouring is bolder, more varied, and more powerful than Correggio's, it is not so full of beauty, and a certain mild and rich luxuriousness. There is the same difference between the two that there is between a bed of glowing flowers and a pulpy cluster of grapes laughing from under the vine-leaves. More studied in his use of light and shade than any of his brother painters, he gives to his pictures an air of space which mocks the limits of the frame; a depth and unity, the force of which Rembrandt alone has exceeded, and no one else approached: but the Flemish painter's sun never shines upon forms like the Italian's,—it is mostly a 'god kissing carrion.' The expression which Correggio infuses into the lovely creatures of his pencil is in harmony with the grace of his drawing, the pure sweet colouring, and the concordant tone of the picture. Avoiding harsh and unpleasant subjects, and delighting in the play of tender and voluptuous emotions, his mothers fondle their offspring, his children frolic and smile, his lovers pant and sigh, with all the extasy of unreproved nature. Annibal Caracci bursts out with a desire to join his infants in their sports, so real and living does he find them. If his beings are of a less mighty mould than Michel Angelo's, his colour less powerful in its tints than Titian's, and his expression less passionate than the Venetian's, and his design less perfect and less exalted than Raphael's, no artist has equalled him in gentleness and sweetness, and none calls forth the affections of the spectator in a more lively manner.

Correggio's pictures are not so numerous as those of some painters; but they are sufficiently spread over Europe for his style and fame to be universally recognised. The cupola of the cathedral at Parma is painted with an 'Assumption of the Virgin,' of which the numerous beauties, the masterly foreshortening, the grace, the colour, and the design, so excited Titian's admiration, that he is reported to have said, 'If I were not Titian, I would be Correggio.' In the gallery at Dresden are the 'Notte,' or rather dawn—a grand picture on the subject of the Nativity, and a masterpiece of chiaroscuro—and a little cabinet picture, the 'Penitent Magdalen,' in which the saint is represented lying on the ground reading. A blue mantle envelopes the form; the head, shoulders, bosom, and feet are bare: a shady nook enshrines the saint. Her brow rests upon one hand, and a tender melancholy trembles on her lips. The soft features, the dainty bosom, the gentle arms are of the rarest beauty. It is the most perfect woman ever painted. In the National Gallery in London are two of his best pictures, the 'Education of Cupid' (a duplicate) and an 'Ecce Homo.' The Madonna in the latter is painfully true to suffering nature, but redeemed by his usual beauty of form and expression. Two of his most celebrated pictures were destroyed, it has been said, by order of the Regent Duke of Orleans, for the too great freedom of the design—the 'Danaë' and the 'Io,'—a strange story for a man of his character. The former was pieced together again by Coypel; of the latter a duplicate still exists.

Correggio had many good pupils; among whom may be reckoned his son, who painted a fresco in the cathedral at Parma which has been much commended. He abandoned painting, however, before he died. Parmigiano may be reckoned among the followers and imitators of Correggio, though not among his pupils. The school of Bologna aimed at uniting his grace and sweetness to the drawing of the Romans and the colour of the Venetians; yet after all, Annibal Caracci, the chief of the eclectic school, seems inclined to reckon Correggio the first among painters.

It has been observed that all Correggio's pupils and immediate followers fell into affectation. This was a natural consequence of imitating a style which originated in a highly sensitive genius, constantly moved by intense and unrestrained emotions. Correggio himself has been accused of affectation; but the reproach has arisen in a cold misappreciation of his warm-hearted disposition.

(Tiraboschi; see also Mengs, Ratti, Lanzi, and *Sketches of the Lives of Correggio and Parmigiano.*)

CORRE'ZE, an inland department of France, deriving its name from the river Corrèze, which falls into the Vezère, a tributary of the great river Dordogne. The department is of irregular form, having it greatest length from north-east to south-west seventy miles, and its greatest breadth, at right-angles to the length, forty-eight to fifty miles. Its superficial extent is about 2088 square miles: its population 294,834, or 141 to a square mile. It is bounded on the north by the department of Creuse, on the north-east by that of Puy de Dôme, on the south-east by that of Cantal, on the south by that of Lot, on the south-west by that of Dordogne, and on the north-west by that of Haute Vienne. It is comprehended between 45° 38′ and 46° 26′ N. lat., and 1° 10′ and 2° 32′ E. long. Its capital Tulle is about 250 miles in a straight line south by west of Paris, or about 292 by the road through Orléans, Limoges, and Uzerche.

This department does not contain any lofty elevations: the northern and north-western parts are traversed by the heights which run from the central group of Auvergne to the mouth of the Loire. The slope of the surface, as indicated by the water shed, is to the south-west, in which di-section the principal streams flow. The chief rivers are, the Dordogne, which passes by the town of Bort, and bounds the department on the south-east, until its junction with the river Auze; after which the Dordogne quits the boundary, and flows by Argental through the interior of the department, which it quits a little below the town of Beaulieu: the Vezère, which rises in the northern part of the department, and flows south-west past Treignac, Uzerche, and Alassac; its junction with the Dordogne is after it quits the department: the Corrèze, which rises not far from the source of the Vezère, and flows south-west past the towns of Corrèze, Tulle, and Brive, a little below which it falls into the Vezère. These are the principal rivers, but not one of them is navigable within the confines of the department. Of the other streams an enumeration will suffice: the Soudenne, Bradascou, and Zoure, fall successively into the Vezère on the right bank; the Montanne falls into the Corrèze on the left bank; the Chavanoux (which forms for a short distance the eastern boundary of the department), the Diège, the Trioussone, the Luzège, the Doustre, the Souvigne, and the Mounion, fall into the Dordogne on the right bank (but the junction of the latter is not within the department); the Marone and the Cère on the left: the Cère forms the boundary of the department on the south side for a short distance; its junction with the Dordogne is beyond the limits of this department. The Haute Vezère, a tributary of the Isle, one of the principal feeders of the Dordogne, has its source in this department; but the chief part of its course is beyond it. The high road from Paris by Limoges to Cahors, Montauban, and Toulousè, passes through Uzerche, Donzenac, and Brive, in the western part of this department: a road from Clermont to Perigueux and Bordeaux crosses it from north-east to south-west, intersecting the former road at Brive. There are other roads from Uzerche to Tulle, and from Argentat on the Dordogne to Aurillac, in the department of Cantal: another road just passes through the south-east extremity of the department at Bort on the Dordogne. The other roads are merely cross roads (*routes départementales et vicinales*). Perhaps scarcely any other department is so wretchedly furnished with the means of intercourse and conveyance.

The soil of this department is on the whole the least fertile of any of the French departments. In the hilly districts of the north barren heaths predominate; the population is thin, and the aspect of the country wild. The lower grounds are better cultivated, but the produce in grain, chiefly barley, rye, and buck-wheat, would not suffice to maintain the population, were it not for the chestnut, which grows abundantly. A great part of the soil is occupied in pasturage, and in the spring many thousand head of cattle, which have been fattening during the winter, are sent to Paris to market. Bordeaux and Bayonne are furnished with salt pork for shipping; and walnut oil is sent into many of the departments. Some pretty good wine is produced; and horses and mules are reared. The peasantry live in a very wretched condition, as the following description quoted by Malte Brun shows:—'In his dwelling the peasant of the department (of Corrèze) is wretchedly off, and has much to complain of: his dwelling presents to view unwholesomeness, combined with dirt and misery. The greater part of the houses leaning against a moist soil, and on a level below that of the surrounding soil, are receptacles for the damp which trickles from the walls or rises from the ground. Placed without judgment, and having the apertures arranged without propriety, their houses have to sustain the cold moist winds of winter, and the concentrated and destructive heats of summer. The smoke of their fire-places, unable to escape by their ill-built chimneys, thickens in the room, and the air, charged with this irritating vapour, painfully affects the eyes: chronic ophthalmia of an obstinate character ensues, and often blindness. Add to this painful statement, that a filthy and disgusting animal, the pig, is kept close to the house, often in it, and you will have a tolerably correct idea of the situation of the peasant under his own roof.'

The department is divided into the three sub-prefectures or arrondissements, of Ussel in the north-east, population (in 1832) 57,278; Tulle in the centre, population 126,532; and Brives in the south-west, population 111,024. The towns are Tulle, the capital, on the Corrèze, population 6501 for the town, or 8689 for the whole commune; Brive or Brives, also on the Corrèze, population 5776 for the town, or 8031 for the whole commune [BRIVE, TULLE]; Ussel, Uzerche, Beaulieu, Argentat, Meymac, Donzenac, Treignac, Bort, Turenne, Alassac, Chamboulive, Lubersac, L'Arche, Corrèze, Meissac, Egletons, Neuvie, besides several smaller towns or bourgs. The department was divided at the publication of the *Dictionnaire Universel de la France*, by Prudhomme (1804), into twenty-nine cantons, or districts of a justice of peace, and 295 communes, or parishes. It is in the diocese of Tulle, and under the jurisdiction of the cour-royale of Limoges.

Ussel, the capital of a sub-prefecture, is on the rivers Sarsone and Diège above their junction. The road from Clermont to Tulle, Brive, and Perigueux, passes through this town. Some antiquities discovered by digging in a field in the neighbourhood indicate that Ussel is built on the site of an antient city, to which Malte Brun assigns Usellis as the probable name. No such place is however mentioned by D'Anville. There is a bridge over the Sarsone, distinguished by the boldness and elegance of its construction. The inhabitants amounted (1832) to 2813 for the town, or 3963 for the whole commune. They had formerly the reputation of being skilled in the manufacture of paste diamonds. The present trade consists in hides, hemp, linen cloth, and wax: some woollen stuffs are made. Granite of different kinds is found in the neighbourhood.

Uzerche is at the junction of the roads from Guéret (department of Creuse) and Tulle with the great road from Paris to Toulouse: it is seventeen miles from Tulle. It is a small antient town, and very picturesque. It is on the slope of a hill, at the foot of which flows the Vezère. The streets are not well laid out, but the houses are many of them turretted and covered with slates, attesting the importance of their original proprietors. It was a proverb formerly, that the proprietor of a house in Uzerche had his country seat in Limousin. The church, dedicated to St. Pierre (Peter), was formerly attached to a monastery established in the fifth century, to which it is likely the town owed its importance, if not its origin. The present church was built at the beginning of the fourteenth century, in place of the older one destroyed by fire. Pope Clement V., who rebuilt it, was interred here, but his tomb was destroyed by the Protestants in 1568. There were before the revolution three other parish churches. The inhabitants in 1832 were 2229 for the town, or 3214 for the whole commune. There is a glass-house at Uzerche. A few miles from Uzerche is Pompadour, the castle of which was given by Louis XV. to his mistress, the Marchioness of Pompadour.

Beaulieu is on the right bank of the river Dordogne, just above where it quits the department. This town owes its origin to a Benedictine monastery founded in the ninth century by Rodolph or Raoul de Turenne, Archbishop of Bourges. There were several religious establishments in the town before the revolution: there is at present an hospice, or almshouse. The population in 1832 was 2154 for the town, or 2415 for the whole commune.

Argentat is on the Dordogne, considerably above Beaulieu. It is in the neighbourhood of coal and lead mines, and the surrounding country produces tolerable wine. The population in 1832 was 1880 for the town, or 3121 for the whole commune.

Meymac is in the hilly country, in the north of the department, near Ussel. The population in 1832 was 1850 for the town, or 3130 for the whole commune. There is coal in the neighbourhood, but we are not aware that it is worked. *Donzenac* is on the high road from Paris to Toulouse, between Uzerche and Brive. There are slate quarries near. Population in 1832, 1820 for the town, or 3219 for the whole commune. *Treignac* is in the northern part of the department, on the Vezère, in the upper part of its course. Population in 1832, 1733 for the town, 2704 for the whole commune. *Bort* on the Dordogne, in the eastern part of the department, was the birth-place of Marmontel. It is in a pleasant situation, and near it is the picturesque fall of the little river Rue, called *Le Saut de la Saule*. Population in 1832, 1705 for the town, 2291 for the whole commune. *Turenne*, a few miles south-east of Brive, has a ruined castle on the summit of a steep rock. There is a lofty tower of this castle 100 feet high yet standing, which is popularly called Cæsar's tower. Turenne has a population of 1600 persons: it was the capital of a viscounty held by the dukes of Bouillon, until it was sold to Louis XV. in 1738. *Alassac* is on the Vezère; *Chamboulive* is between Treignac and Uzerche; *Lubersac* on the

Haute (Upper) Vezère; L'Arche on the Vezère; Corrèze on the Corrèze; *Meissac* between Turenne and Beaulieu; and *Egletons* and *Neuvic* in the country between Tulle and Ussel. We have no late return of the population of these towns, but they may be taken as under 1500: the population of the communes of Alassac, Chamboulive, and Lubersac, was (in 1832) 4049, 3036, and 3502 respectively. Lubersac was the birth-place of General Souham, an officer of considerable note under Napoleon

The department of Corrèze sends three members to the Chamber of Deputies. (Malte Brun, Balbi; Prudhomme, *Dict. Universelle de la France*.)

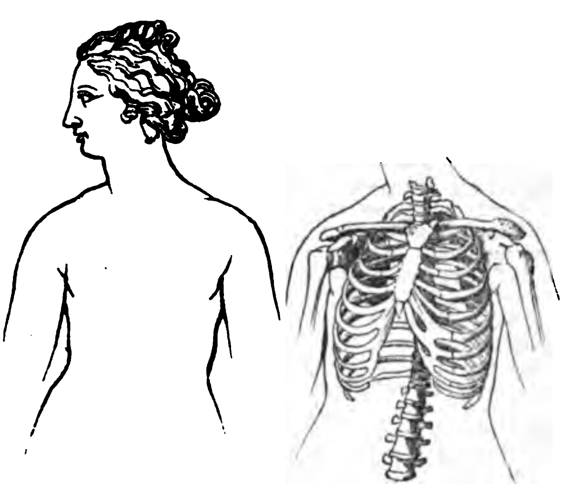
CORRIB, LOCH, a large lake in the county of Galway, the second in extent in Ireland, 14 feet above the sea at Galway, from which it is distant 3 miles. It is 22 miles in length, and varies from 2 to 12 in breadth. It is separated by a narrow isthmus, through which there is a subterraneous channel, from Loch Mask and Loch Carra, the first 50 and the second 64 feet above the level of the sea. The united area of these three lakes presents a surface of 64,000 acres, and has a coast-line of nearly 200 miles. They are at present navigable throughout for boats drawing four feet of water, but could easily be rendered navigable for vessels of a much larger draught. Loch Corrib alone has 40 miles of navigation, covers 30,000 acres, and has upwards of 1000 acres of excellent land on its islands. *(Report on Connaught Lakes.)*

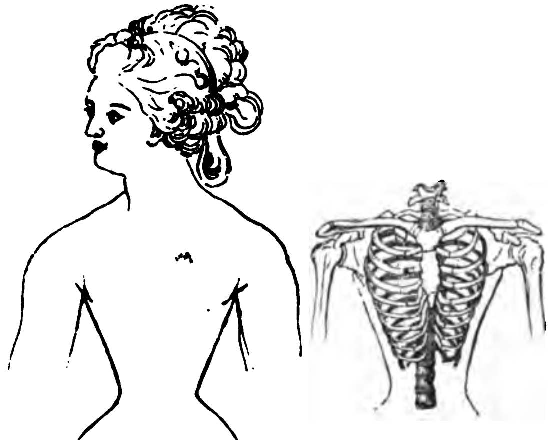
CORRIDOR, from the Italian coridore, signifies a gallery or passage-way leading to apartments independent of each other. In all large buildings containing numerous apartments corridors are necessary, either closed or open. The corridor round the great cortile or open court of the Cancellaria at Rome, designed by Bramante, consists of an open gallery supported by columns.

CORRUPTION OF BLOOD. [ATTAINDER.]

CORSET, an article of dress for compressing, under the pretext of supporting, the chest and waist, worn chiefly by females, but also sometimes by effeminate individuals of the other sex. It consists of cloth made to surround the body, stiffened by whalebone or other means, and tightened by a lace. It seems a remnant of the old practice of enveloping the whole frame in swaddling bands; a practice which has been generally discarded in rearing male children, but which still lingers as a part of the attire of female children, in defiance of nature, reason, and experience. The advantages arising from its use are trifling, if any; the disadvantages manifold and serious. Nature has formed the chest (in which are lodged the lungs for respiration and the heart for circulation, two out of three of the vital functions) in the shape of a truncated cone, the base of which is capable of being alternately widened and contracted during inspiration and expiration. The wonderful and perfect mechanism for carrying on respiration cannot come into full play if any compression be applied to the lower part of the chest, which is however the part commonly selected, from yielding most easily, to endure the hurtful restraint of tight lacing. The chest never being allowed to expand to the extent which is necessary, the defect in each respiration is attempted to be compensated for by their greater frequency, and thus a hurried circulation is produced. The heart is also hindered in its action, and an imperfectly aërated blood is circulated by it, by which nutrition is inadequately accomplished: unhealthy secretions are likewise formed out of this vitiated blood, and prove a further source of disease. The muscles of the chest, spine, and abdomen, being deprived of their proper exercise, become attenuated and feeble, and incapable of giving due support, whence result distortions of the spine and chest, and much of that constipation which so frequently afflicts females. The viscera of the abdomen, especially the liver, suffer greatly, both by displacement—being forced downwards—and by being actually indented by the edges of the compressed ribs. 'In examining,' says Dr. Hodgkin, whose connexion with Guy's Hospital gives him extensive opportunities of observation, 'the bodies of the dead, I have frequently found the lower ribs of females greatly compressed and deformed. I have repeatedly seen the liver greatly misshapened by the unnatural pressure to which it had been subjected, and the diaphragm or midriff very much displaced.' The diseases which result from this interference with nature are various; and though they do not all occur in every female who adopts this mischievous practice, yet on inquiry too many may be traced to this source. Of these diseases consumption is the most frequent and fatal. Nor is the real object of all this painful and irksome compression in any instance attained. The figure of the female bust may be altered by it, but not improved. Sculptors, who are the closest observers of nature, and who transfer to their statues every beauty presented to their eye, have invariably given ample dimensions to the lower part of the chest. The more therefore any female, not of unnatural proportions, compresses her waist, the more does she depart from resemblance to 'the statue which enchants the world.'

The accompanying figures, taken from Professor Sœmmering, 'On the Effects of Stays,' will illustrate this.





(See *Penny Magazine*, vol. ii. p. 78.)

CORSICA or **CORSE**, an island in the Mediterranean, situated between the island of Sardinia and the Genoese coast. It is now incorporated with France, and forms one of the departments of that monarchy. It is of irregular form, having its greatest length in a direction very nearly north and south. The eastern coast has no remarkable indentations throughout its extent (which, following the coast line, is about 130 miles), except the small gulfs or harbours of Porto Vecchio and Santa Maria, and the étang or lake of Biguglia; but the western side of the island is indented by many deep bays, as those of St. Florent or Fiorenzo, Calvi, Porto, Sagone, Ajaccio, and Valinco. The island narrows towards its northern and southern extremities: in the north part it forms the promontory of Cape Corso beyond the towns of St. Florent and Bastia. The greatest length of the island is 116 miles; the greatest breadth about 51; and the area 3380 square miles.* There were, in 1831, 197,967 inhabitants, of whom 99,839 were males. It lies between 41° 20′ and 43° 0′ N. lat. and 8° 32 and 9° 33′ E. long. There are round Corsica several small islands, as Girajlia and Finocchiarolo on the north; Capraja on the north-east; l'ile Rousse or Isola Rossa, Gargalo, and les Iles Sanguinaires (Bloody Islands), on the west; les Iles Cervicales and du Taureau (Bull Island) on the east; and Perdutto, Cavallo, Lavessi, Santa Maria, Berettini, and Budella, in the narrow straits of Bonifacio, which separate Corsica on the south from the island of Sardinia. There are some other islands, the names of which are not given in Brué's 'Map of France,' from which we have given the above particulars.

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* According to a statement quoted by Mr. Benson (*Sketches of Corsica* p. 159), the area of the island is 2.163,110 acres, of which 648.590 are cultivated, 601,644 capable of cultivation, and 912,876 neither cultivated nor capable of cultivation.

The island is covered by a group of mountains belonging to what some geographers have entitled the Sardo-Corsican System, from its extending through both Corsica and Sardinia. The Corsican group consists of the chain of Mount Caona in the south, of the mountains of La Cagnone in the centre, those of Frontogna in the north-west, and the chain of Le Titime in the north. This line, formed by the chains of highest elevation, is nearly parallel to the line of the western coast, but at some distance inland: to the north-east and to the east of this is a second range of lower height; and the branches which extend from these ridges so nearly overspread the whole island as to leave but little country which can be called plain. Several of the peaks are very lofty, and retain the snow during the greater part of the year: the principal are Monte Rotondo, south-west of Corte and nearly in the centre of the island, 9069 feet high; Monte d'Oro, 8701 feet; Monte Paglia Orba, south-east of Calvi, 8695 feet; Punta della Capella, south-south-east of Monte Rotondo, 6723 feet; Monte de l'Incudine, south of the Punta della Capella, 6746 feet; Punta della Calva, near Punta d'Incudine, 5138 feet; Punta d'Ovace, near Sartène, 4900 feet; and Monte Stello, north-west of Bastia, 4540 feet. On the summit of Monte Rotondo is a lake, the larger diameter of which is about 1000 feet, the smaller diameter more than half that extent. On the north side of the same mountain are several small lakes, which are replenished by the melting of the surrounding snows: these lakes are always frozen.

On the sides of these mountains rise a number of streams, forming beautiful cascades, and flowing through valleys narrow, crooked, and of rapid descent: these valleys open into wider basins, in which the streams unite, and, forming rivers, flow into the sea. The rivers are the Bevinco, the Golo, the Fiumalta, the Dalesani, the Tavignano, and the Fiumorbo, on the east coast; on the west coast are the Cigno, which flows into the gulf of St. Florent or Fiorenzo; the Dostriconi, and the Regino; the Cecco and the Ficarella, which flow into the gulf of Calvi; the Sponza; the Liamone, which flows into the gulf of Sagone; the Gravone and the Prunelli, which flow into the gulf of Ajaccio; and the Talavo and the Valinco, which flow into the gulf of Valinco. None of these rivers is navigable: the longest are the Golo, about 46 miles; the Tavignano, about 43 miles; the Talavo, about 31 miles; the Valinco, about 30 miles; and the Gravone and Liamone, about 25. On the eastern coast are some salt lakes or inlets of the sea, abounding with fish, as that of Biguglia, which is nearly 8 miles long.

The mass of the Corsican mountains consists of granite, intersected by veins of serpentine, jasper, porphyry, and other stones. The granitic range extends from near the Dostriconi river to the strait of Bonifacio. To the eastward of this, extending from Cape Corso to the south-east of Corte, the mountains, which are less elevated than those of the granite range, consist of limestone, which occupies the highest part of the range, and appears to rest upon the granite; of a grey micaceous schistus, the strata of which have experienced singular contortions; and of sandstone, the strata of which are for the most part horizontal, and which seems to consist of the debris of granite. A portion of the east coast, the parts about Bonifacio in the south, and St. Fiorenzo in the north, are occupied by limestone rocks of more recent marine formation, which contain the fossil remains of shell-fish and other marine animals. In the neighbourhood of Bonifacio these deposits rest on the granite, as do the rocks of similar formation on the opposite coast of Sardinia: the islets in the strait of Bonifacio are also of granite, which seems to have occupied both the upper and lower parts of Corsica. This recent limestone is not so fine grained as that which forms the range of mountains adjacent to the great granite range. On the east coast the sea has receded; Aleria, a Roman sea-port, is half a mile from the water.

The climate of Corsica is generally described as unhealthy. Seneca, who was exiled here, speaks of it in an epigram, as

> Corsica, terribilis quum primum incanduit æstas,
> Sævior ostendit quum ferus ora canis.

Thus Englished in Boswell's 'Corsica'—

> O Corsica, whose raging heats dismay,
> When first returning summer pours her ray:
> Yet fiercer plagues thy scorching shores dispense
> When Sirius sheds his baleful influence.

The 'Encyclopédie Méthodique' contains a similar testimony to the insalubrity of the climate; but Boswell, whose enthusiastic admiration of every thing connected with the island has, however, diminished the value of his testimony, affirms that its insular situation renders it one of the most temperate countries in that part of Europe; that the air is 'fresh and healthful, except in one or two places, where it is moist, and where the air, especially in summer, is suffocating and sickly.' The soil is, in many places, very fertile, and capable of producing many things for which France has now to resort to distant colonies. But cultivation is very backward, and the disposition of the people indolent and careless to an unusual degree. There are large tracts of woodland in the interior, amounting to 225,000 hectares, above 560,000 acres. There are forest trees of almost every kind, especially pines, oaks, and chestnut-trees; the latter of prodigious size. The ilex or evergreen oak is common, and the mountains are covered with the arbutus or strawberry-tree. The timber which the forests yield is excellent, and would be a source of certain profit to the inhabitants, if brought down to the coast; but so great is their apathy, that the felling and transport of timber is left to the people of Lucca and Parma, who resort to the island in crowds every year, or to the agents of the French government, which procures here the finest masts for the navy. The box-tree grows to a great size. The cork oak is abundant, and the produce sent in great quantity to Marseilles. Of fruit-trees, the lemon, the orange, the fig, and the almond, are frequent; the pomegranate and the Indian fig grow to great perfection; but there are few walnut-trees, and the apples, pears, cherries, and plums are not good. The olive is found in a wild state; the industry or skill of the inhabitants not sufficing even for the simple operation of grafting. The vine is cultivated to some extent, but its culture is managed rather by the Parmesans and Luccans than by the Corsicans themselves. The wines are both red and white; that of Cape Corse resembles Malaga, that of Faviani resembles Syracuse; other wines are like Port. The mulberry was propagated by the Marquis de Marbœuf, the first governor of the island after it was ceded to France; it grows well, and it is not so much in danger from blights and thunder-storms as in Italy and the south of France; but the greater part of those propagated by M. de Marbœuf have disappeared from neglect. Wheat, rye, barley, and millet are produced, but no oats; the inhabitants feed their horses on barley instead. Chestnuts form an important article of food; and the peasants look to them, with the milk of their herds, as a sure subsistence. They resort in summer to the woods and other uncultivated lands to obtain pasturage for their cattle and chestnuts for their own subsistence at these times they make little sheds for themselves to lie under. Flax is grown in great quantity: a coarse linen is made from it. Some tobacco is raised. Much honey and wax are produced: the honey is bitter, a fact commemorated by the Roman poets.

The animals of Corsica are much the same as those of surrounding countries: there are however no wolves, and few venomous animals. The horses are small, but vigorous; they resemble the Welsh ponies or the Highland shelties. The asses and mules are also small, but active. The black cattle are larger in proportion than the horses; but the beef is lean and tough; and the quantity of milk small. Some cheese is made, but little butter: oil serving, as in Italy, for a substitute. Sheep and goats are numerous: the mutton is excellent, but the wool is coarse and hairy. Game is abundant; there is the deer, the muffoli, an animal resembling the sheep in form, but with the skin hairy, and fine-grained like that of the deer, and the wild boar, which last the Corsicans are fond of hunting; there are foxes, which are very destructive, and hares, but no rabbits. There are many kinds of birds; among them the eagle and the vulture.

The mineral productions include iron of the best quality, but the value of the iron produced in 1834 was only 36,325 francs; lead, copper, and silver are not at present worked; there is also statuary marble, jasper, porphyry, granite, including the *diorite* or orbicular granite, of which handsome vases are made, limestone for building, talc, and asbestus. The coast yields black, white, and red coral; and there is abundance of fish, especially the tunny and the sardinia. There are large beds of oysters, of which many are exported to Italy. The lakes and rivers yield fine trouts and eels. (Malte Brun; *Encyclopédie Méthodique;* Boswell, *Account of Corsica;* Benson, *Sketches of Corsica.*)

There is no manufacture in the island carried on to such an extent as to demand particular notice: some coarse woollens are woven, but finer woollens are imported; the manufacture of coarse linen has been already noticed. Neither is the commerce of Corsica extensive; the internal trade of the natives is carried on chiefly by barter: money as the medium of traffic is used only in the towns: rents are paid in produce. Indeed the capabilities of the island have not been developed; nor do the energies of the people appear to have been called forth to any extent, except in the resistance which they made to the oppressive government of the Genoese. There are good harbours at Ajaccio, Calvi, Porto Vecchio, and Bonifacio, and a small one at St. Florent or Fiorenzo. The harbour of Bastia is adapted only for small vessels; Bastia is however the busiest place in Corsica, and manufactures of soap, wax, and liqueurs are carried on. The island is wretchedly off for roads: there are only the following government roads: from Bastia to St. Florent; from Bastia across the island through Corte to Ajaccio; and from the east coast to the woodland, for the transport of timber for the navy; and these roads are of the third or lowest class. The other roads are merely bye roads; and all correspondence is conveyed by a messenger on foot guarded by soldiery.

The Corsican is frugal, but his frugality produces little other result than to reconcile him to the privations which his indolence obliges him to suffer. The peasant labours little; the listlessness of the herdsman's employment seems preferable to a calling which would render more exertion necessary; and of such labour as there is the burden is thrown upon the women. 'The Corsican wife,' says Mr. Benson, 'is little more than the slave and drudge of her haughty master. He rides on his mule while she paces along at his side. To the cultivation of the plot of ground that surrounds his hut the wife has to attend, while he smokes his pipe beneath the shady chestnut, or roams about the mountains with his gun and his dog. But with this dreadful disparity of condition between the husband and wife, the latter is seldom cruelly treated, and infidelity to the marriage contract is very rare. Children do not meet with equal attention from their parents; the sons engrossing nearly all the little property possessed by the family, whilst a daughter has nothing to look forward to in leaving the house of her father but to become the slave of her husband.' One predominant characteristic of the islanders is the spirit of jealousy and revenge which divides the inhabitants of most of the villages of the interior into hostile parties or tribes. The love of personal independence makes the Corsican prefer to be the executioner of vengeance for his own wrongs, and assassination is of frequent occurrence. Robbery is also common, the central part of the island being infested with brigands; and the freedom with which they mingle in private society testifies at once the inefficiency of the police and the low state of moral feeling in the community. Gendarmerie and troops are posted in detachments over the island, for the purpose of preventing these outrages. Against the gendarmerie the Corsican bandits wage perpetual war; yet with their lawless occupation the brigands sometimes unite a courteous demeanour, and considerable moral feeling, however partial or misdirected. Rape and false witness are common crimes among the lowest class; but the spirit of revenge pervades all classes, even the wealthy and more educated. Perhaps the state of Corsica cannot be better illustrated than by saying that, except with respect to the crimes of rape and false witness, it is similar to the state of the Highlands of Scotland a century ago. It should in justice be added that the Corsicans are anxious for instruction; the gentleman who had the direction of public instruction could traverse the isle in perfect safety. The French government, even under Napoléon, himself a Corsican, seems to have done little for the substantial improvement of the inhabitants. Some institutions exist in the towns for the advancement of literature or science or the arts; but there is little to improve the moral condition or promote the physical comfort of the bulk of the people. The dress of the peasantry of the interior is simple: it consists, for the men, of a short jacket, breeches, and gaiters, all of chocolate-coloured cloth; a neat pointed black velvet cap, or a coarse woven cap of the same colour as the rest of their dress, with perhaps a sort of cowl which goes over the head, or is allowed to hang at the back of the neck. They generally carry a loaded musket, and have commonly a stiletto concealed about them, though this is prohibited by the French authorities. There are few peculiarities in the dress of the women: those in the neighbourhood of Ajaccio frequently wear a large round straw hat, the rest of their dress being little more than a shift reaching just below the knee: those near Bastia have the head covered with a sort of veil, like the Italian peasantry.

The villages are chiefly built on eminences: the houses are mere huts of four walls covered with a rude roof, and many of them have only one opening, serving for door, window, and chimney. Some are built of unwrought stone, and have a second story, the ascent to which is not by a staircase, but by a ladder, as in an English hay-loft. The fire, when one is lighted, is in the centre of the room. The furniture consists of stools, benches, and tables of the rudest construction. They use a pine stick for a flambeau or candle. These particulars apply only to the villages of the interior.

The religion is Roman Catholic. The fête-days of the patron saints of the villages are respectively observed with great devotion; a very imposing religious festival is observed in Rogation week in most of the villages. At the saints' festivals the Corsicans arrange the marriage of their daughters, and other family matters, and talk over the politics of the village or of the island. They are inquisitive, and readily enter into conversation with strangers, asking questions of them as to their business, and sometimes inquiring about the general politics of Europe.

The island constitutes the diocese of Ajaccio, the bishop of which is a suffragan of the archbishop of Aix, Arles, and Vienne: it is subject to the jurisdiction of a Cour Royale which sits at Bastia; but the power of the law is very imperfect. It forms the seventeenth military division, of which Bastia is the head quarters. Corsica sends two members to the Chamber of Deputies.

There are five arrondissements, or sub-prefectures. Bastia in the north and north-east, population in 1831, 60,209; Calvi, in the north-west, population, 20,441; Ajaccio, in the west, population 45,235; Corte, in the east, population 47,838; and Sartène in the south, population 24,244. The arrondissements of Ajaccio and Corte extend into the centre of the island, which is divided between them, the common boundary being the range of the granite mountains. The local revenues in 1833 were 235,571 francs, and the expences 176,637 francs.

Upon the first division of France into departments, Bastia was the capital of Corsica; and Bastia, Oletta, Ile-Rousse, or Isola Rossa, La Porta d'Ampugnani, Corté, Cervione, Ajaccio, Vico, and Tallano, were the chief places of arrondissements, or districts. Subsequently the island was divided into the two departments of Golo in the north, capital Bastia, and Calvi and Corte, capitals of arrondissements; and Liamone in the south, capital Ajaccio, and Vico and Sartène, chief places of arrondissements. Upon the reunion of these departments Ajaccio became the capital, perhaps by the favour of Napoléon, whose birth-place it was.

Ajaccio is the capital of the department, and the seat of the bishop's see: it is on the gulf of Ajaccio on the west side of the island; population in 1832, 8920 for the town, or 9531 for the whole commune. Bastia, on the north-east side of the island, is the seat of the Cour Royale, and the head quarters of the military division: population in 1832 9531. [Ajaccio. Bastia.]

Corté, the capital of an arrondissement, and, during the short period of Corsican independence the seat of the native government and legislature, is on the road from Bastia to Ajaccio, and nearly in the centre of the island. It is partly at the foot, partly on the declivity, of a precipitous mountain, which is crowned by a castle or citadel. This rock is of green micaceous schistus, and rises in the midst of a valley which is surrounded by primitive (granite) mountains. The

Tavignano, and its tributary the Restonica, run near the town and unite a short distance below it. The citadel is strong by its position, with one winding path up to it; the streets of the town are steep, and there are but few really good houses.

During the period of independence there was a university here, established by Paoli: but it appears to be no longer in existence. It is mentioned however in the 'Dictionnaire Universel de la France,' by Prudhomme, published in 1804. We are not aware whether anything had been done in consequence of the legacies left by General Paoli for the instruction of his countrymen, and which it was intended to appropriate to the foundation of a college near Corté. The trade of Corté consists only in agricultural produce: indeed its situation in the midst of mountains and far from the coast, without any advantage or opportunity of inland navigation, preclude the extension of its commerce: though Boswell's enthusiasm led him confidently to pronounce that it would 'undoubtedly be one day a city of eminence.' The population, in 1832, was 3282.

Calvi is on a small peninsula projecting into the gulf of Calvi, which is on the north-west side of the island. It is a small town, defended by a fortress; but the harbour or road is capable of holding a considerable fleet. The population by the return previous to that of 1832 (we believe made in 1826) was 1175 for the commune.

Sartène is in the south part of the island, a few miles inland from the gulf of Valinco, and about two or three miles from the left or south bank of the river Valinco. The population in 1832 was 1715 for the town, or 2715 for the whole commune.

Bonifacio, in the arrondissement of Sartène, is on the straits of Bonifacio, which separate Corsica on the south from Sardinia. It is well fortified, and has a tolerably good harbour. The inhabitants, who amounted to 2944 in 1832, trade in wine and oil, and fish up coral.

St. Florent, or St. Fiorenzo, is in the arrondissement of Bastia, on the north-west side of the island, on the bay of St. Florent, close to the mouth of the little river Cigno. It is a handsome town with a small harbour. The population, by the return before the last, amounted to 500. The place is accounted very unhealthy. There is in the neighbourhood a lead mine, much vaunted by the Corsicans as yielding silver also, but the proportion is very small.

Porto Vecchio, in the arrondissement of Sartene, on the east side of the island, has the best harbour in Corsica, five miles long, and one and a half broad, with deep water and a good bottom. The town is rendered unhealthy by the neighbouring marshes, especially during the heats of summer. The inhabitants amounted, in 1823, to 1738; they trade in excellent wine. Granite is quarried in the neighbourhood.

Vico, a town the population of which may be probably estimated at 1000, near the gulf of Sagone, trades in wine and oil. Ile Rousse, or Isola Rossa, on the coast between Calvi and St. Florent, has a small but deep harbour. Cervione, near the east coast, has probably about 1000 inhabitants. Bastelica, near the source of the Prunella, had, in 1833, a population of 2314.

The first notice of Corsica is in Herodotus, under the name Cyrnus (Κύρνος). The people of Phocæa (Φωκαίη), a city in Asia Minor, unable to resist the Persian Cyrus, determined to desert their native town. In the year 544, B. C., they embarked with their wives and children, first for Chios, and afterwards for Corsica, in which they had twenty years before founded the town of Alalia (Ἀλαλίη). Half the number, however, returned to Phocæa, but the remainder pursued their voyage and joined the people of Alalia, with whom they continued five years, plundering the surrounding nations, until having suffered dreadful loss in a sea fight against the allied fleet of the Tyrrhenians (Τυρσηνοί), and Carthaginians (Καρχηδόνιοι,) they abandoned Corsica to seek another settlement. (Herodot. I. 165, &c.) In the time of Gelon of Syracuse (B. C. 480) we find mention of Corsicans (Κύρνιοι) among the troops with which the Carthaginian Hamilcar came to the aid of Terillus, tyrant of Himera (Ἱμέρη). (Herod. vii., 165.) The Carthaginians had probably possessed themselves of Corsica, at least of the coast, and on their downfall it came under the power of the Romans. It was ravaged by these B. C. 259, but not subdued till long after. A tribute of 200,000 lbs. of wax imposed on them deserves notice, as indicating one of the chief products of the island at that time. The Romans founded two colonies, both on the east coast: Mariana, at the mouth of the Golo, founded by Marius, and Aleria, at the mouth of the Tavignano, by the Dictator Sylla. The Romans used the island as a place of banishment. Seneca was sent to it as an exile. On the downfall of the Roman empire Corsica came into the hands of the Vandals, and subsequently of the Goths; but the successes of Belisarius forced them to abandon the island, which was then included in the exarchate of Ravenna, a dependency of the Eastern Empire. Early in the eighth century, the Saracens, then masters of Spain, possessed themselves of Corsica; but the decline of their power and the attacks of the kings of France and Aragon, and ultimately of the Pope, led them to abandon the island, which became the subject of contention between the papal see and the maritime republics of Pisa and Genoa.

The Genoese, who at length crushed the maritime power of Pisa, and succeeded in possessing themselves of Corsica, governed it with a rod of iron for several centuries. In 1553 the French, under the Marquis de Thermes, assisted by some malcontent Corsicans, and supported by a considerable Turkish fleet, attempted to conquer the island, and met at first with great success, subduing all the isle except Bastia and Calvi; but the Genoese, under the command of the veteran Andrew Doria, and supported by the emperor Charles V., at length recovered the island; and though they had by treaty granted many immunities and privileges to the natives, they soon resumed their oppressive course of government. A revolt soon took place (in. 1564) under Sampiero de Bastelica or Ornano, who had instigated the French in their attempt to wrest the island from the Genoese; but he was assassinated in 1567, and the revolt quelled shortly after. The oppressions of the Genoese became after this greater and more systematic. Commercial restrictions imposed by them, checked the development of the resources of the island; while the internal commotions of the islanders themselves, which led to continual assassinations, prevented their uniting for the common good: the legal authorities converted these assassinations and disturbances into grounds for confiscation, or exacted large sums as the price of the offender's escape. In 1676 the Genoese settled here a colony of Mainote Greeks, who had fled from the oppressions of their Turkish conquerors: their descendants still continue at or near Ajaccio. Between these settlers and the natives great jealousies and feuds arose; and when the island at last revolted, the Genoese found in these Greeks their staunchest supporters.

In 1729 the long-smothered discontent broke out. A tax collector seized some of the goods of a poor woman of the village of Bozzo, near Corte, for the amount of taxes due from her, amounting to about five-pence English. The remonstrances of the neighbours drew forth threats from the collector, and they, irritated by his conduct, drove him away with stones. The Genoese sent troops to quell the commotion, and the natives assembled to repel them: the revolt became general, and the natives placing at their head three of their countrymen, Andrew Ceccaldi, a noble, Luigi Giafferi, a man of less elevated origin but large family connexion, and Domenico Raffaeli, an ecclesiastic, possessed themselves of the town of Bastia, though they failed in their attempt on the castle. The Genoese tried at first to subdue the revolters by their own forces alone, but finding these insufficient, applied to the emperor Charles VI., who sent first in 1731 a small body of forces, which proved inadequate, and then a large army under the Prince of Wirtemberg (A.D. 1732), which compelled the islanders to submit upon terms, the observance of which the emperor guaranteed. The three chiefs, with another Corsican of note, went to Genoa as hostages, and the Genoese would have put them to death with the emperor's consent, but for the interference of the Prince of Wirtemberg and Prince Eugene of Savoy The Genoese violated the terms, and in 1734 the revolt broke out anew: the Corsicans chose for their leaders Giafferi, the only one of their three chiefs who had returned to the island, and Giacinto Paoli.

In the year 1736 there came a vessel under the English flag from Tunis, laden with artillery and warlike stores, clothing, and money, and bringing a person of noble exterior, richly dressed in the Turkish fashion, who landed for the assistance of the islanders, claimed to be a grandee of various countries, and made the most magnificent promises of foreign aid. This was Theodore, by descent Baron of Neuhof in Westphalia, but by birth a Frenchman, who, after a life of romantic adventure, aspired to become king of Corsica, and had secretly negotiated with some of the chiefs for the purpose. The Corsicans, struck with his personal appearance, dazzled by his promises, and looking upon his opportune arrival as little less than miraculous, willingly chose him as their king. He exercised the regal power for some months, coined money, distributed patents of nobility, instituted an order of knighthood, and, to evince his firmness, put to death three persons, members of distinguished families. He undertook many enterprises against the towns still held by the Genoese, took Porto Vecchio, but failed before Bastia. Before long however, through the failure of his promises, his popularity diminished, and he determined to leave the island, to solicit, as he said, the succours of which he had been disappointed. He arranged for conducting the government during his absence, quitted Corsica, and visited successively Italy, France, and Holland. Being arrested for debt at Amsterdam, he was released by a Jew and his associates, who furnished him with funds to fit out three merchant vessels and a frigate, with which he appeared off the island in 1738: but the Genoese had by this time called in the aid of the French, who had under M. de Boisseux made great progress in putting down the insurgents; and Theodore was afraid to land, though he put on shore some warlike stores. The next year the French, under the Marquis de Maillebois, a man of great promptitude and severity, forced the insurgents to lay down their arms. Theodore again appeared off the island in 1742; but the natives did not show any inclination to receive him. He afterwards went to London, where he was imprisoned for debt, but obtained his release through the kind interference of Horace Walpole, and made over his kingdom of Corsica as a security to his creditors. He died in London in 1756, and is buried in St. Ann's Churchyard, Westminster, where his epitaph records the strange vicissitudes of his life. Giafferi and Paoli went to Naples, in the service of which kingdom they continued till they died.

Upon the departure of the French, A.D. 1742, the revolt broke out again, Gaffori and Matra being the leaders of the Corsicans. In the year 1745 a British fleet gave assistance to the Corsicans, and by bombarding Bastia and St. Fiorenzo, obliged the Genoese in those towns to surrender. But the dissensions among the islanders, which resulted from the jealousy of Matra and Gaffori at the appointment of Count Rivarola to be generalissimo, disgusted the British, who withdrew, and the Genoese soon after recovered Bastia and St. Fiorenzo. The jealousy subsided, and the three chiefs shared the government between them, until the departure of Rivaroli on a foreign mission, on which he died in 1748, and the entrance of Matra into the Piedmontese service, left the sole power to Gaffori. Gaffori was assassinated in 1753, as was supposed by the contrivance of the Genoese: and the island continued for two years without a chief, until the appointment in 1755 of Pasquale or Pascal Paoli, son of Giacinto Paoli already mentioned, to the office of General of Corsica. Paoli defeated the Genoese and those of his countrymen who opposed him, settled the government of Corsica, and provided for the improvement of his countrymen. The cessation of those internal discords among the Corsicans, which had enabled the Genoese to maintain their footing in the island, alarmed the latter, who again implored the aid of France, which being in debt to the republic of Genoa, furnished auxiliary troops by way of payment. In 1764 the auxiliaries arrived, and were put in garrison in Bastia, Calvi, Ajaccio, St. Fiorenzo, and Algagliola, near Calvi. Their instructions were to secure these points without undertaking offensive operations against the natives. From the attack of these therefore the Corsicans prudently abstained, and directed their efforts elsewhere. One of our authorities indeed (*L'Art de vérifier les Dates*, tom. xviii., p. 38), speaks of an unsuccessful attack on Bastia, made by Paoli in 1765.

In the year 1768 Genoa ceded the island to France, reserving only the right to reclaim it upon payment to the French government of the expenses they had incurred or might incur in the subjugation of it. This cession quite changed the face of affairs. A large French army was employed in active operations under the Marquis de Chauvelin, the Count de Marbœuf, and the Count de Vaux. The natives fought desperately; but they had not adequate means of resistance. Corté, which they had made their capital, was taken without resistance; and Paoli, retiring with a reduced force, was beset by a body of the enemy too powerful to be resisted. He addressed his adherents in a pathetic speech, and embarking in an English vessel at Porto Vecchio, passed over to Leghorn in 1769, and afterwards went to England, where he resided many years. The islanders continued to struggle for a time, but it was in vain: France obtained full possession.

The French Revolution revived the hopes of the Corsican patriots, and Paoli went over to Paris to thank the Constituent Assembly for having admitted Corsica to the benefit of the French laws, and recalled those who had been exiled for having sustained its independence. He was appointed military commander in Corsica; but having observed with alarm a proposition made in the French legislature to cede Corsica to the Duke of Placentia, and lamenting the course which the Revolution subsequently took, having been accused also of treason to the French government, he put himself at the head of a party of malcontents, by whom he was elected generalissimo and president of an assembly held at Corté. He now sought the aid of the English admiral Lord Hood, who commanded the Mediterranean fleet; and after some negotiations and warlike operations on a small scale, General Dundas landed on the island A.D. 1794, with five regiments. The French troops evacuated St. Fiorenzo, and shortly after Bastia surrendered with a garrison of 4000 men. Calvi also surrendered: and by negotiation between the British government and the Corsicans, the island became part of the British empire. A constitution was drawn up by an assembly of the nation at Corte, and agreed to by Sir Gilbert Eliot (afterwards Lord Minto), as viceroy of the king of Great Britain. But though it is said that the mass of the people were favourable to these proceedings, the French had still a strong party, and this was increased by disgusts which arose between the Corsicans and the English functionaries. Various incidents, trivial in themselves, increased the alienation; and the English government, jealous of Paoli's well-earned influence over his countrymen, directed him to leave the island and proceed to England. Upon his departure things assumed a more serious aspect, and the English at last determined on abandoning Corsica, which they did in 1796. The French soon repossessed themselves of it, and exiled the leaders of the revolt. Since this time Corsica has been united to France.

Bonaparte never showed much favour to Corsica: he was not popular there, nor is his memory cherished. On his downfall, owing to the oppression of the military commandant discontents broke out in Corsica, and a small British force landed on the island at the invitation of the islanders; but they held the posts which they occupied merely for the purpose of transferring them to the restored government of the Bourbons.

CORTE'. [CORSICA.]

CORTES, HERNAN, was born in 1485 at Medellin, a village of Estremadura, in Spain. He was sent to study law at Salamanca; but being of a turbulent and dissipated disposition, his father wished him to go to Italy as a military adventurer under the Great Captain. Not succeeding in this, in 1502 he obtained permission to follow his kinsman Ovando, who was appointed governor of Hispaniola; but an accident which befell him in scaling a lady's window prevented his joining Ovando till 1504. In 1511 he distinguished himself under Velasquez in the conquest of Cuba, and in 1518 was selected by this governor to undertake the conquest of Mexico, then just discovered by Grijalva. Accordingly, Cortes set sail from St. Jago de Cuba the 18th of November, 1518, with ten vessels, ten pieces of cannon, eighteen horsemen, 600 infantry, thirteen only of whom were musketeers, and the rest cross-bowmen. He touched at various places, and among them at Havannah in search of more adventurers; and setting out again February 10th, 1519, bent his course to Cozumel, left this island on the 4th of March, and proceeded up the river Grijalva, or Tabasco. Velasquez, soon after he had dispatched his lieutenant with the brilliant prospects of conquest, revoked his commission, and attempted to get him brought back under arrest; but the vigilance of Cortes frustrated all the schemes of the governor.

Having taken the town of Tabasco, with much slaughter, he received from its cacique gold and provisions, and twenty female slaves. One of these, who makes a great figure in the history of the conquest, under the name of Doña Marina, being a native of Mexico, became highly useful as interpreter, in conjunction with Jerome de Aguilar, who had been eight years prisoner in the island of Cozumel. Advancing into the interior, Cortes met at San Juan de Ulua some Mexican chiefs, who were anxious to know his intentions. Cortes laid great stress upon the importance of his mission from the great monarch of the east, and the necessity of his waiting upon their king. Native painters in the mean time were delineating on cotton cloth the ships, horses, artillery, &c. of the ominous visiters, in order to acquaint their sovereign with the wonders which words could not describe. To awe them still more, Cortes displayed the evolutions of his men and horses, and the havoc made on trees by the terrific thunder and discharge of cannon-balls. Several of the terrified Indians fell to the ground, and so many ran away, that it was difficult to subdue their alarm and regain their confidence.

During the negotiations for his progress to the capital, Cortes founded the colony of *Villa Rica de Vera Cruz*, and defeated the faction of the partizans of Velasquez, who, in the midst of the expedition, were in full readiness to revolt. Not satisfied with this, to prevent all farther hesitation and division among his followers, by leaving them no other chance of safety than in union and the conquest of a hostile country in which he shut them up with himself, he deliberately broke his ships to pieces. Cortés, moreover, gained over the caciques who were impatient of the Mexican yoke. The cacique of Zempoalla implored his assistance, and furnished him with provisions and 200 Indians to carry burdens, an invaluable service in a country where beasts of burden were unknown. On arriving at the confines of the Tlascalans, Cortes was attacked by them, under suspicion of his seeking the friendship of the Mexicans, their implacable enemies; but after an incredible slaughter, 6000 of them joined the conquerors. With this reinforcement Cortes reached the territory of the Cholulans, who, being the antient enemies of his new auxiliaries, refused to admit them into their holy city of Cholula. However, in obedience to Montezuma's injunction, they received the Spaniards, but at the same time formed a plot against them. Cortes, anticipating their treachery, destroyed 6000 of them without the loss of a single soldier. The perplexity of the Mexican councils increased with the boldness of the invaders, who were now regarded as those descendants of the sun, destined by prophetic tradition to come from the east, and subvert the Aztec empire. Accordingly, on the 8th of November, 1519, they were received at Tenochtitlan, the Mexican capital, as *Teules*, or divinities. Soon after, however, an attack was made by the natives, acting under secret orders, upon Vera Cruz, and the head of a prisoner was carried in triumph through the country up to the court, to disprove the immortality of the Spaniards. Cortes, on learning this treachery, carried off the emperor Muteczuma, or Montezuma, to his quarters, although he asserted his innocence, and offered to deliver up the chief aggressor. But Cortes demanding also the son of this officer and five officers more, had them all burnt alive in front of the imperial palace, on a pile made of the weapons which were kept in store for the defence of the state. During the execution, the emperor was loaded with irons. Subsequently he acknowledged Charles V. as his lord, but he constantly refused to embrace Christianity; and when Cortes led his soldiers to stop the human sacrifices and throw down the idols in the grand temple, both priests and people rose in arms and forced him to desist. After this provocation, the Mexicans became resolved to expel the Spaniards, and Montezuma, though a prisoner, assumed the tone of a sovereign, and ordered Cortes to depart.

After six months' occupation of Mexico, when the danger of the Spaniards had increased, 18 ships with 80 horsemen, 800 infantry, 120 cross-bowmen, and 12 pieces of artillery, were sent under Pamphilo de Narvaez by Velasquez against Cortes. Cortes, deriving fresh courage from his disappointment and indignation, persuaded Montezuma that he was going to meet his friends. Leaving him and the capital in charge of Pedro de Alvarado, with only 150 men, he marched with 250 against Narvaez, attacked him in the dead of night near Zempoalla, made him prisoner, and with the new army hastened back to Mexico, which had revolted in his absence. Although he resumed his former position there, he had soon to maintain a desperate conflict, and to retreat for safety after Montezuma had perished in attempting to appease his subjects. This success of the Mexicans led to their total defeat in the battle which they fought and lost in the plain of Otompan or Otumba, July 7th, 1520. This victory enabled Cortes to subdue some of the neighbouring territories with the assistance of the Tlascalans, to attach 10,000 more of them to his service, to attack Mexico again six months after his retreat, and to retake it the 13th of August, 1521, after seventy-five days of fierce and almost daily fighting. The natives once more reduced to despair rose again, and again they yielded to superior discipline, though on no occasion did native Americans so bravely oppose European troops. Thus a daring adventurer, regarded and treated by his countrymen as a rebel, after a bloody struggle, gained possession of a country which for more than three centuries formed one of the brightest gems in the Castilian crown. The atrocities of Cortes have been the subject of much declamation, but he was a soldier by profession, and while the Inquisition burnt Jews and Protestants in Spain, he could learn from his chaplains no other or better means of converting heathens than by fire and the sword.

Indignant at the ingratitude of Charles V., who listened to his enemies, Cortes returned to Spain in 1528 to face his accusers. He was received with much respect, and made Marquis of the rich valle de Oajaca, but in 1530 had to return to Mexico divested of civil power.

Being anxious, after his military exploits, to extend his fame by maritime discovery, particularly in the opening of a passage from the Atlantic to the Pacific, he fitted out at his own expense different expeditions, one of which discovered California in 1535, and he himself coasted next year both sides of the gulf of that name, then called the Sea of Cortes. He returned to Spain in 1540, when he was received by Charles V. with cold civility, and by his ministers with insolent neglect. He accompanied however this prince in 1541 as a volunteer in the disastrous expedition to Algiers, and his advice, had it been listened to, would have saved the Spanish arms from disgrace, and delivered Europe three centuries earlier from maritime barbarians. Envied and ill requited by the court, Cortes withdrew from it, leaving sycophants and detractors to reap the fruits of his labours and his genius. He died however in affluence near Seville, the 2nd of December, 1547, in the 63rd year of his age. The destruction of his fleet at Vera Cruz, with the object of compelling his followers to conquer or die—his fearless entry into Mexico—the still bolder seizure of Montezuma in his own palace—his defeat of Narvaez—his victory of Otumba—and his magnanimity in the siege of Mexico, are deeds almost unparalleled, and more like romance than reality.

Robertson has estimated the character of Cortes at least as highly as his own countrymen Bernal Dias del Castillo, Gomara, Herrera, Solis, Lorenzana (who published, in 1770, a History of New Spain, founded on the only writings of Cortes, which consist of four letters to Charles V.), and Trueba.

CO'RTES, the name of the assembly of representatives of the Spanish nation. These assemblies have been variously constituted in different ages, and in the different kingdoms into which Spain was divided till the time of Ferdinand and Isabella. The cortes of Castile and Leon and those of Aragon were the principal. Considerable obscurity prevails as to the origin and the formation of both. The earliest national assemblies under the Visigothic kings met generally at Toledo; they consisted chiefly of the dignitaries of the church, and were called councils. After deciding all questions of church discipline, they concerned themselves with temporal affairs, and in this stage of the discussion the lay lords or barons took an active part, and the king presented his requests. In the acts of the council of Leon, A.D. 1020, ch. vi., the transition from ecclesiastical to temporal affairs is clearly pointed out:—'Judicato ergo ecclesiæ judicio, adeptaque justitia, agatur causa regis, deinde populorum.' In the acts of the council of Jaca, 1063, we find that several points of discipline were reformed 'with the consent of the nobles and prelates;' and the signatures are those of the king, the infantes, nine bishops, three abbots, and three magnates; but it is added in a note that 'all the other magnates had subscribed to the same acts.' It is now generally acknowledged, that in that age, and down to the end of the twelfth century, there was no popular representation from the towns or commons of Castile and Leon in those assemblies. (Marina, *Teoria de las Cortes*; Sempere, *Histoire des Cortes*; Dunham, *History of Spain and Portugal.*) The people are said to have occasionally attended these national councils on some solemn occasions, as in the council held at Toledo in 1135, but only as spectators and witnesses, 'to see, to hear, and to praise God.' By degrees, as the towns rose into importance, and obtained local fueros, or charters, from the kings for their own security, or formed themselves into fraternities for their mutual protection against the Moors or against the violence of their own nobles, some of them obtained at last the privilege of sending deputies to the national councils, which were now styled cortes, because, according to some etymologists, they were held at the place where the king had his court. The cortes held at Salamanca by Ferdinand II., in 1178, consisted only of the nobility and clergy; but at the cortes of Leon, A.D. 1188, we first hear that there were present deputies 'of towns chosen by lot;' and in the same year the cortes of Castile assembled at Burgos, where deputies from about fifty towns or villages, the names of which are mentioned, were present. How these places came to obtain this privilege is not known, although it is probable that it was by the king's writ or by charter. The cortes were henceforth composed of three estamentos or states, clergy, lords, and procuradores, or deputies from the enfranchised towns, forming together one chamber, but voting as separate states. It was a standing rule that general laws must have in their favour the majority of each estamento. This was the principle of the cortes of the united kingdom of Castile and Leon. The same principle existed in the kingdom of Aragon; only there the cortes were composed of four brazos or states, namely, the prelates, including the commanders of the military orders, the ricos hombres, or barons, the infanzones, or caballeros, who held their estates of the great barons, and lastly, the universidades, or deputies of the royal towns. These last are first mentioned at the cortes of Monzon, in 1131. The towns and boroughs in Aragon which returned deputies were thirty-one; but the number of deputies returned by each is not defined by the historians, any more than those for the cortes of Castile. We find the same town returning sometimes a greater, sometimes a smaller number, and at other times none at all, and a small town or village sending more deputies than a large one; while many considerable towns never returned any, independently of the seignorial towns, which of course had no representative privilege. How all this was made to agree with the manner of voting, in order to ascertain the opinion of the majority, is not clearly stated. Under the head **ARAGON** the reader will find an account of the peculiar institutions of that kingdom, which have been much extolled by some writers, and which appear to have been better defined than those of Castile, as the Aragonese, with the exception of the peasant serfs of the nobility, certainly enjoyed a greater share of individual liberty than the rest of the Peninsula.

In Castile, from the end of the thirteenth century, the popular estamento made rapid strides towards increasing its influence, being favoured in this by some kings or pretenders to the crown, such as Sancho IV. and Enrique II., or taking advantage of disputed successions and stormy minorities, to obtain from one of the contending parties an extension of their privileges. In 1295 the deputies of thirty-two towns and boroughs of Castile and Leon assembled at Valladolid, and entered into a confederacy to defend their mutual rights against both the crown and the nobles. Among many other resolutions, one was, that each of the thirty-two constituencies should send two deputies every two years to meet about Pentecost at Leon or some other place, in order to enforce the observance of their stipulations. In 1315, during the frightful confusion which attended the minority of Alonso XI., we find another confederacy between the nobles and the procuradores of 100 communities, with a similar clause as to deputies meeting once or twice every year. These meetings of deputies for special purposes ought not to be confounded with the general cortes of the kingdom, which were always convoked by the king, though at no fixed times. Enrique II. having revolted against his brother Pedro the Cruel, courted the support of the municipal towns, which at the cortes of 1367 demanded the admission de jure of twelve deputies into the royal council, which had till then consisted of hereditary nobles and prelates, with occasionally some civilian called in by the king. Enrique promised to comply with their request; but his brother's death having insured his seat on the throne, he evaded the fulfilment of his promise by creating an Audiencia real, or high court of appeal, consisting of prelates and civilians, and a criminal court of eight alcaldes, chosen from different provinces of the kingdom. Juan I. who succeeded him, after the loss of the battle of Aljubarrota, created a new council in 1385, consisting of four bishops, four nobles, and four citizens, with extensive executive powers. The towns next solicited the dismissal of the bishops and nobles from the council, in order that it should consist entirely of citizens; but Juan rejected the demand. They also contrived at times to exclude the privileged orders from the cortes. Marina says that the privileged orders themselves having lost much of their influence, abstained from attending the cortes; yet it is certain that although money might be voted without them, for the simple reason that they were exempt from taxation, the third estate alone paying all direct taxes, yet nothing else of importance could be decided without their concurrence. Although members of the privileged orders should not attend, they might be represented by proxy, as was the case in Aragon. Besides, the cortes were not all of one sort; there were general or solemn cortes, and especial cortes for some particular purpose. Juan appointed by his testament six prelates and nobles as guardians of his infant son Enrique III., who were not, however, to decide in any important affair without the concurrence of six deputies, one from each of the cities of Burgos, Toledo, Leon, Seville, Cordova, and Murcia. 'The fourteenth century seems to have been the brightest period of popular or more properly municipal representation in Spain. The cortes were frequent, and the subject of their deliberations of the most important nature. But Spain had never a definite representation; to no meeting of this period did all or half the great towns send deputies; and those which did return them appear to have observed little proportion in the numbers. There can be no doubt that two should be returned from each; yet in the cortes of Madrid, in 1390, we find that Burgos and Salamanca sent eight each, while the more important cities of Seville and Cordova sent only three; Cadiz only two; Oviedo and Badajoz one; Santiago, Orense, Mondonedo, and other great cities of Galicia sent none at all. In fact, only forty-eight places returned deputies to these cortes, and the number, at the most, was inconsiderable. Incidentally, we learn that in the assemblies of this period the archbishop of Toledo spoke for the ecclesiastical state, and the chief of the house of Lara for the nobles. Some of the deputies contended for the precedence in voting, as well as for that of seats. This rivalry was more conspicuous between Burgos and Toledo, until Alonso XI. found the means to appease it. "The deputies of Toledo," said the monarch in the midst of the assembly, "will do whatever I order them, and in their name, I say, let those of Burgos speak." The municipal corporations could boast of something more than the honour of returning deputies, an honour to which many of them were perfectly indifferent. Their condition was far superior to that of the seignorial towns, which, for the most part, groaned under the oppressions of the nobles.' (Dunham, *History of Spain and Portugal*, b. iii. sect. 3, ch. ii.)

The remonstrances or petitions of the general cortes to the king generally began as follows:—'The prelates, lords, and caballeros of the kingdoms of Castile and Leon, in the name of the three estates of the kingdom,' &c. Remonstrances from the deputies of the towns began:—'Most high and powerful prince! your very humble vassals, subjects, and servants, the deputies of the towns and boroughs of your kingdoms, who are assembled in your presence by your order,' &c. (Cortes of Valladolid, June, 1420.)

In the cortes of 1402, Enrique III. demanded for his wars with the Moors a supply of 60,000,000 of maravedis, but the deputies granted only 45,000,000. The king then proposed that if the money should be found insufficient, he might be allowed to raise the deficiency by a loan without convoking the cortes afresh for the purpose. To this the majority of the deputies assented. By his testament Enrique excluded the citizens from the Council of Regency during the minority of his son Juan II., and after this they were no longer admitted into the royal council. Thus the municipal towns lost a great advantage they had gained 30 years before under Juan I. They soon after sacrificed, of their own accord, their elective franchises. The expenses of the deputies to the cortes had been till then defrayed by the towns, but now having lost their influence at court by their exclusion from the royal council, the towns began to complain of the burthen. Juan II. listened attentively to their complaints, and, in the cortes of Ocaña, 1422, he proposed that the future expenses of the deputies should be defrayed out of the royal treasury, a proposal which was willingly accepted. Accordingly, in the next cortes, 12 cities only, Burgos, Toledo, Leon, Zamora, Seville, Cordova, Murcia, Jaen, Segovia, Avila, Salamanca, and Cuença, were summoned to send their deputation; some other towns were informed that they might entrust their powers to any deputy from the above. The privilege was subsequently extended to six more cities: Valladolid, Toro, Soria, Madrid, Guadalaxara, and Granada. These 18 places constituted henceforth the whole representation of the kingdoms of Castile, Leon, Galicia, and Andalusia. The other communities at last perceiving the advantage they had lost, petitioned to be restored to their right, but found themselves strenuously opposed by the 18 privileged towns. The influence of the court was openly exercised in the elections of these towns, and although the cortes of Valladolid in 1442, and those of Cordova in 1445, requested the king to abstain from such interference, yet the practice became more barefaced than ever. In 1457 Enrique IV. wrote to the municipal council of Seville, pointing out two individuals fit to be deputies in the next session, and requesting they might be elected. The municipal councils, which elected their own officers as well as the deputies to the cortes, were composed of all the heads of families, but by degrees the crown interfered in the appointment of the municipal officers. [AYUNTAMIENTO.]

Thus long before Charles I. (the emperor Charles V.), who has been generally accused of having destroyed the liberties of Spain, the popular branch of the representation was already reduced to a shadow, for the deputies of the 18 cities, elected by court influence, were mere registrars of the royal decrees, and ready voters of the supplies demanded of them. Under Ferdinand and Isabella the royal authority became more extended and firmly established by the subjection of the privileged orders; the turbulent nobles were attacked in their castles, which were razed by hundreds, and the Santa Hermandad hunted the proprietors throughout the country. Many of the grants by former kings were revoked and the proud feudatories were tamed into submissive courtiers.

Charles only finished the work by excluding the privileged orders from the cortes altogether, he and his successors contenting themselves with convoking the deputies of the 18 royal cities of the crown of Castile on certain solemn occasions, to register their decrees, to acknowledge the prince of Asturias as heir apparent to the throne, to swear allegiance to a new sovereign, &c. The policy of absolutism has been the same in all countries of Europe, using the popular power against the aristocracy, in order to reduce and destroy both in the end.

In Aragon, Valencia, and Catalonia, which formed the dominions of the crown of Aragon, the cortes of each o these three states continued to assemble under Charles I. and his successors of the Austrian dynasty, who convoked them in their accustomed manner by brazos or orders, and they maintained some show of independence, although in reality much reduced in importance, after Philip II. had abolished the office of the Justiza. [ARAGON.] But, after the War of the Succession, Philip V. of Bourbon formally abolished the cortes of these states by right of conquest, as he expressed it, because they had taken part with his rival the Archduke Charles.

When, in 1808, the Spanish people rose in every province against the invasion of Napoleon, the king was a prisoner in France after having been obliged by threats to abdicate the crown, and the nation found itself without a government. Municipal juntas were formed in every province, consisting of deputies taken from the various orders or classes of society, nobles, clergymen, proprietors, merchants, &c. These juntas sent deputies to form a central junta, with executive powers for the general affairs of the country, but a legislature was still wanting. The central junta was called upon to assemble the cortes for all Spain. They at first thought of reviving the antient cortes by estamentos or brazos, but many difficulties presented themselves. The difference of formation between the old cortes of Aragon and those of Castile; the difficulty of applying those forms to the American possessions of Spain, which were now, for the first time, admitted to equal rights with the mother country, but where the same elements of society did not exist, at least not in the same proportion; the difficulty even in Spain of collecting a legitimate representation of the various orders, while most of the provinces were occupied or overrun by French armies, and while many of the nobility and the higher clergy had acknowledged the intrusive king Joseph Napoleon; all these, added to the altered state of public opinion, to the long discontinuance of the old cortes by orders or states, to the diminished influence of the old nobility, and the creation of a new nobility during the latter reigns merely through court favour, made the original plan appear impracticable. The situation of the country was in fact without a parallel in history. The central junta consulted the consejo (reunido) or commission of magistrates, from the old higher courts of the monarchy, who proposed to assemble deputies of the various brazos or estamentos, all to form one house, a proposal extremely vague and apparently impracticable, which looks as if made to elude the question. Jovellanos and others then proposed two houses, constituted as in England; but this would also have been a new creation without precedent in Spain, and surrounded by many difficulties, the state of society being greatly different in the two countries. Meantime the central junta being driven away by the French, first from Madrid, and afterwards from Seville in January, 1810, took refuge at Cadiz, which became the capital of the Spanish patriots, whither a number of persons from the various provinces and classes had flocked. Before leaving Seville, the central junta issued regulations addressed to the provincial juntas about the manner of electing the deputies to the cortes, stating at the end that 'similar letters of convocation would be addressed to the representatives of the ecclesiastical brazo and of the nobility.' This, however, was never done.

The central junta soon after arriving at Cadiz resigned its powers into the hands of a council of regency composed of five individuals, but before its resignation it issued a decree approving of the plan of Jovellanos for two chambers, and recommending it to the regency. The regency however paid little attention to this recommendation; it seemed to hesitate during several months about convoking any cortes at all, for there was at Cadiz a party of pure absolutists opposed to any representation whatever. The regency again consulted the consejo reunido, the majority of which, departing from its former opinion, gave up the idea of cortes by estamentos, and proposed the election of deputies without distinction of classes. The council of state being likewise consulted by the regency, decided that, owing to the actual state of affairs, it was best to elect the deputies without estamentos, reserving to the 'representatives of the nation once assembled to decide whether the cortes should be divided by brazos or into two chambers, after listening to the claims of the nobility and clergy.' The regency at length issued letters of convocation for the deputies of all the provinces to assemble in cortes at the Isla de Leon on the 24th September, 1810. The elections for those provinces which were entirely occupied by the French, were made at Cadiz by electoral juntas, composed of individuals of those provinces who had taken refuge there. A similar process was adopted with regard to the American provinces. (Arguelles, *Examen historico de la Reforma Constitucional*; Jovellanos, *Memoria a sus Compatriotas*, with *appendix* and *notes* to the same.)

The cortes, styled 'extraordinary,' sat at Cadiz from September, 1810, till September, 1813. During this time, amidst numerous enactments which they passed, they framed a totally new constitution for Spain, which has become known by the name of 'the Constitution of 1812,' the year in which it was proclaimed. This constitution established the representative system with a single popular chamber, elected in a numerical proportion of one deputy for every 70,000 individuals. The elections are not direct, but by means of electoral juntas or colleges, as in France: assembled citizens of every parish appoint, by open written votes, a certain number of delegates, who choose, by conference among themselves, one or more parish electors, in proportion to the population. All the parish electors, of every district, assemble together at the head town or village of the same, and there proceed to elect by ballot the electors for the district. All the district electors of one province form the electoral junta which assembles in the chief town of that province to appoint the deputies to the cortes, either from among themselves or from among the citizens who are not district electors, provided they are Spanish citizens born, in the full exercise of their civil rights, are more than 25 years of age, and have had their domicile in the province for at least seven years past. By Art. 92, a qualification was inserted of a yearly income, the amount and nature of which were left to the discretion of future cortes to determine. Every district elector, in succession, steps up to the table where the president and secretary are, and tells the name of his candidate, which the secretary writes down. The scrutiny then takes place, and the majority of votes decides the election. The deputies elected receive full powers, in writing, from their electors, 'to act as they think best for the general welfare, within the limits prescribed by the constitution, and without derogating from any of its articles.' The deputies are allowed by the respective provinces a fixed emolument during the time of the sessions. The ordinary cortes assemble once every year, in the month of March, and the session lasts three or at the utmost four months. The deputies are renewed every two years.

These are the principles of the formation of the cortes, which, whatever may be their merits, have evidently little in common, except the name, with the old cortes of Castile or Aragon. With regard to the legislative powers of the cortes, their influence over the administration, and the authority which is left to the executive, we must refer the reader to the text of the Constitution. The king has a veto for two years following; but if the resolution be persisted in the third year his veto ceases. While we are writing this article, the cortes assembled at Madrid, December, 1836, are occupied in making modifications in the Constitution, especially by the establishment of a second chamber, but it is not yet known how it will be constituted.

The extraordinary cortes of Cadiz were succeeded in October, 1813, by the ordinary cortes, elected according to the principle of the Constitution. In January, 1814, they transferred their sittings to Madrid, which had been freed from the French. In March, of that year, King Ferdinand returned to Spain, and soon after dissolved the cortes, abrogated the Constitution, and punished its supporters. In 1820 the Constitution was proclaimed again through a military insurrection; the king accepted it, and the cortes assembled again. The king and the cortes however did not remain long in harmony. In 1823 a French army, under the duke of Angoulême, entered Spain; the cortes left Madrid, taking the king with them to Seville, and thence transferred him by force to Cadiz. Cadiz having surrendered to the French, the cortes were again dispersed, the Constitution was again abolished, and the liberals were again punished. This name of 'liberal,' which has become of such general use in our days, originated in the first cortes of Cadiz, where it was used to designate those deputies who were favourable to reform, whilst the opposite party were styled 'serviles.' (Arguelles, end of chap. v.)

The history of the first cortes of Cadiz has been eloquently written by Arguelles; that of the cortes of 1820-3 and of the subsequent royalist reaction, is found in numerous works and pamphlets of contemporary history, written with more or less party spirit, among which the least partial is perhaps the *Revolution d'Espagne, Examen Critique*, 8vo., Paris, 1836: it professes to be written by a Spanish emigrant, who, though no great admirer of the Constitution of 1812, speaks with equal freedom of the guilt and blunders of the violent men of both parties.

Ferdinand VII., before his death, in 1833, assembled the deputies of the royal towns, according to the antient form, not to deliberate, but to acknowledge as his successor his infant daughter Isabella. Some time after his death the queen regent proclaimed a charter for the Spanish nation, which was called Estatuto Real. It established the convocation of the cortes and its division into two houses, the procuradores, or deputies from the provinces, and the proceres, or upper house, consisting of certain nobles, prelates, and also of citizens distinguished by their merit. The power of the cortes however was very limited, the initiative of all laws belonging exclusively to the crown. This charter did not last above two years. In the summer of 1836 insurrections broke out at Malaga and other places, where the Constitution of 1812 was again proclaimed; and at last the insurrection spread among the troops which were doing duty at the queen's residence, at La Granja, in consequence of which the queen accepted the Constitution 'subject to the revision of the cortes.' The cortes were therefore convoked according to the plan of 1812, and assembled at Madrid in November, 1836.

The history of the cortes of Portugal is nearly the same as that of those of Spain, only that the towns which sent deputies were comparatively fewer, seldom more than ten or twelve at a time, and the influence of the privileged orders greater in proportion. The nobles having by degrees become courtiers, as in Spain, the kings reigned in fact absolute. In latter times there were less remains of popular freedom observable in Portugal than in Spain. In 1820, while King João VI. was in Brazil, a military insurrection broke out in Portugal, and a Constitution was framed in imitation of the Spanish one of 1812, but it was soon after upset. For an account of these transactions see Kinsey's *Portugal Illustrated*, 1828. After the death of King João, his son, Don Pedro, gave a charter to Portugal, establishing a system of popular representation with two houses; this charter was afterwards abolished by Don Miguel, and again re-established by Don Pedro. In 1836, soon after the affair of La Granja above mentioned, a fresh insurrection broke out at Lisbon, the charter was abrogated, and the Constitution of 1820 was again proclaimed.

The Aragonese, during their period of splendour, extended their representative system by brazos or estamentos to the island of Sardinia, then subject to the crown of Aragon, and the institution remains to this day under the name of Stamenti. They are convoked by the crown on particular occasions, chiefly to grant extraordinary supplies. [SARDINIA.]

CORTO'NA, a city and bishop's see in Tuscany, in the province of Arezzo, from which town it is fifteen miles distant south by east. It is built on the slope of a steep hill facing the south, and commands a splendid view of the fertile Val di Chiana, and of the Thrasymenian lake. Its origin is lost in the remotest antiquity. Under the name of Corytum, it was one of the principal cities of the Etruscans. Its walls which still remain are of the structure called Cyclopean or Pelasgic, consisting of large polygonal stones put together without cement. About the middle of the fifth century of Rome we find Corytum allied to the latter, and it remained faithful to its alliance during the second Punic war, when Hannibal ravaged its territory before the battle of the Thrasymene lake. Little is known of its subsequent history, except that according to Dionysius and Pliny the elder, it received a Roman colony. History is likewise silent about Cortona, after the fall of the empire, until the end of the 12th century, when it appears as an independent municipal community, like most other Italian cities at that time, having its consuls, and its council composed of the majores milites, or nobles, and the capi d'arti e mestieri, or head tradesmen. It was repeatedly at war with its neighbours of Arezzo, whose bishop claimed temporal as well as spiritual jurisdiction over Cortona. Having taken the part of Frederic II., the people of Cortona were excommunicated by the Pope; but after the death of that emperor, they made their peace with Rome and became allied to the Florentines, when, in February 1258, they were suddenly assailed in the night by the people of Arezzo, who, at the instigation of their bishop Ubertini, scaled their walls, plundered the town, and razed their castle. Many of the citizens escaped to Perugia, but returned in 1261, by an agreement made with the bishop, who however continued to annoy them, till he was killed at the defeat of Campaldino by the Florentines in 1289. In 1325 Cortona was erected into a separate see by Pope John XXII. It then became subject to a powerful family called Casali, who assumed the title of Vicars Generals and Lords of Cortona for nearly a century. In 1409 the citizens being dissatisfied with their lord, called in the Neapolitan troops of King Ladislaus, who put to death Casali, took possession of Cortona, and then sold it two years after to the Florentines for 60,000 golden florins. From that time Cortona remained subject to Florence.

The city with its suburbs contains 5,000 inhabitants. Its territory is very fertile, especially in wine, corn, olive and mulberry trees. The high road from Florence to Perugia passes near Cortona.

The cathedral, built in the eleventh century, has some good paintings, and a fine basso rilievo of the Roman time. Several other churches and convents are also rich in paintings, especially by Luca Signorelli, a native of the place. There is a diocesan seminary for clerical students, a college kept by the fathers Scolopj, a conservatorio, or female house of education, kept by the nuns of Frances de Salis, and a school of drawing. The Accademia Etrusca, founded in 1726, has published several volumes of memoirs on Etruscan antiquities, and has a library with some valuable MSS., and a museum. Cortona has produced several distinguished artists and philologists. There is in the suburbs a remarkable Etruscan monument, supposed to have been a sepulchre, of the same construction as the city walls; it has been named strangely enough La Grotta di Pittagore some one having chosen to misplace the r in Cortona thus making it into Crotona, the residence of that philosopher. (Repetti, *Dizionario Geografico Storico della Toscana;* Valéry, *Voyages Littéraires en Italie.*)

CORTO'NA, PIE'TRO BERRETTI'NI, called Pietro da Cortona, was born November 1, 1596, at Cortona. His first master was Antonio Commodi, but he afterwards studied under Ciarpi, at Rome. Being employed by a gilder to make some little figures, his skill attracted the notice of the Marquis of Sacchetti, who visited the workshop, and Pietro was induced to show some of his paintings. The marquis took him at once under his protection, and procured him numerous commissions, and among them an order to paint some rooms in the palace of the reigning Pope Urban, in the Piazza Barberini. Cortona afterwards travelled, and executed various pictures by the way. He was employed by Ferdinand II. to paint some pictures in the Pitti palace, and stayed some time in Florence; but he left it in disgust, because the grand duke had listened to certain detractors, who had accused Cortona of palming his own pictures upon the prince in place of some of Titian's which Ferdinand desired to purchase of him. He settled finally in Rome, and enjoyed the patronage of successive pontiffs, until Alexander III. made him a knight. He died, oppressed with years and the gout, May 16, 1669, full of wealth and honour.

Pietro da Cortona studied the works of Raphael, Michel Angelo, and especially those of Polidoro da Caravaggio, from whom he learned to imitate the style of the later antiques, taking for his immediate model the sculpture of Trajan's column. His style of drawing is free, bold, and vigorous, and even coarse; seldom finished in any except the most conspicuous parts. In design he is learned and masterly, though somewhat mannered and overcharged. His colour is sober and harmonious. His principal works are at Rome, in the Barberini and in the Sacchetti palaces, and at Florence, in the Pitti palace.

Cortona practised architecture as well as painting. He was buried in the church of S. Martin at Rome, which is considered his best architectural work; and at his death he bequeathed to it a hundred thousand crowns.

Cortona had many famous pupils; among them were Ciro Ferri, Romanelli, Giordani, Borgognone, and Testa: the last was expelled from his school because he indulged in unworthy reflections upon his teacher's style, from which he nevertheless could never detach himself in after life. (Pascoli.)

CORUNDUM. Several substances differing considerably in colour, and sometimes in form, but nearly agreeing in composition, are classed together under the name of corundum, which is that given to the common variety by the natives of India.

1st. *Sapphire*, of which there are several varieties, the names of which are dependent chiefly upon their colour: the *white sapphire*, which is transparent or translucent; the *oriental sapphire*, which is blue; *oriental amethyst*, which is purple; the *oriental topaz*, yellow; the *oriental emerald*, green; and some other varieties occur, as the chatoyant and the opalescent sapphire. The sapphire occurs in rolled masses and crystallized, and the primary form of this and every variety of crystallized corundum is a slightly acute rhomboid, presenting a great variety of secondary forms; it usually occurs in the form of six-sided prisms variously terminated. Its specific gravity is 3·975 to 4·161; it possesses double refraction, and is inferior in hardness only to the diamond. Alone, before the blow-pipe it suffers no change; with borax it fuses slowly but perfectly, into a colourless glass; in one direction only the crystals cleave readily parallel with the faces of the primary rhomboid, and present a very brilliant surface; the cross fracture is conchoidal. The finest are found in Ceylon. According to the analysis of Chenevix, the sapphire consists of—

Alumina . . .	92
Silica . . .	5·25
Oxide of iron . .	1
	98·25

According, however, to Dr. Thomas Muir, this substance is pure alumina; containing no silica but what is abraded from the mortar. (Thomson's *Mineralogy, &c.*, vol. i. p. 217.)

2nd. *Ruby*. Colour blood-red or rose-red, sometimes a tinge of violet; primary form as above, and generally occurs in six-sided prisms: it is not so hard as the sapphire, and is more readily cleaved. Chenevix's analysis gives—

Alumina . . .	90
Silica . . .	7
Oxide of iron . .	1·2
	98·2

But if the silica was derived from the mortar, as supposed in the case of the sapphire, then this substance, like it, must be regarded as alumina, nearly or quite pure.

Common corundum, the variety usually called *adamantine spar*, occurs like the sapphire and ruby, commonly in the secondary form of six-sided prisms, but usually much larger. It is sometimes nearly colourless, and rather translucent; it presents great variety of colour, but is most commonly greenish or greyish; occasionally brown or red, rarely blue. Although its most common form is the six-sided prism, it occurs, though rarely, also in acute and obtuse double six-sided pyramids. On account of its extreme hardness, it received the name of adamantine spar. It occurs in China, Bengal, Malabar, Tibet, the Carnatic, &c. It is used in the East Indies for cutting and polishing precious stones, and also granite and other hard rocks that are employed in the temples and other public monuments. According to Chenevix, the Carnatic corundum—and the other varieties differ but little,—yielded

Alumina . . .	91
Silica . . .	5
Oxide of iron . .	1·5
	97·5

Emery. This substance, which, when reduced to powder, is much used for polishing hard bodies, though very different in appearance from the preceding, is, on account of its hardness and analysis, regarded as amorphous corundum. Its colour is usually grey; its lustre is somewhat glistening. Its specific gravity is about 3·66 to 4; it occurs massive, and is granular. It is principally imported from the island of Naxos in the Archipelago, and was found by Mr. Smithson Tennant to consist of—

Alumina . . .	86
Silica . . .	3
Oxide of iron . . .	4
	93

It occurs also in Italy, Spain, and Saxony; and it is said, in small quantities, also in Wicklow.

CORUNNA, or, more properly, **CORUÑA** (*Adrobicum* and *Coronium*), so named from *columna*, or the tower of Hercules, which still exists, and the origin of which has been referred as far back as the Carthaginians, but the learned Cornide brings it down to the reign of Trajan. It was converted, in 1791, at an expense of 40,000 dollars, into a lighthouse. This city stands on the neck of a peninsula, defended by a chain of bastions, at the entrance of the bay of Betanzos (the true Flavium Brigantium), and at the head of a spacious harbour, which is secure against all winds, except those blowing from the south and the east. It is further protected by two forts, one of which, that of St. Anthony, commands part of the road. Though not the capital of Galicia, it is the head-quarters of the military and naval force, and a considerable portion of the Spanish navy was formerly stationed here. Its commerce increased considerably by the opening of the American trade. It has still extensive manufactures of linen and baizes, and carries on considerable fisheries, especially of *sardinas*. Its population is about 22,000.

On the ramparts of the city the inhabitants have erected a monument to General Sir John Moore, who fell before the city, January 16th, 1809.

It is 28 miles north of Compostela, 30 miles north-west of Lugo; 43° 23′ N. lat., 30° 20′ W. long.

(*Descripcion del Reino de Galicia publicada de orden de la Junta de Gobierno*, por Don José Lucas Labrada.)

CO'RVIDÆ, crows, a family of *Conirostres*. The *bill* is strong, slightly cultrirostral, or more or less compressed; the gape or commissure straight. The *nostrils* are covered with stiff bristle-like feathers directed forwards.

'The Nucifraga, Briss., our British nutcracker,' says Mr. Vigors, in his paper 'on the Natural Affinities that connect the Orders and Families of Birds,' Linn. Trans., vol. xiv.,

p. 447, 'closely resembling the preceding groups' (fam. *Sturnidæ*) 'in the form of its bill, in conjunction with *Barita*, Cuv., introduces us into the family of *Corvidæ*. From that genus we may trace a line of affinities, through some intervening forms, to the *Jays* and *Rollers*, *Garrulus*, Briss., and *Coracias*, Linn., until we arrive at the *Corvus* of Linnæus, which again branches out into several groups closely allied to each other, but differing considerably in the structure of the bill. Hence we proceed by means of *Glaucopis*, Forst., to some genera, among which we may particularize *Ptilonorhynchus*, Kuhl, *Crypsirina*, Vieill., *Eulabes*, Cuv., and *Fregilus*, Cuv., which, in the metallic lustre of their plumage and the velvet-like process that in some species ornaments the face, indicate our approach to the *Birds of Paradise*. The last-mentioned genus *Fregilus*, in particular, by its curved and slender bill, brings us immediately into this group, the *Paradisea*, Linn., which, in conjunction with the *Epimachus* of M. Cuvier, terminates the family of *Corvidæ*. Here we shall probably find the passage from the present to the succeeding family. The *Epimachus*, more united in its front toes than the *Corvidæ* in general, holds a middle station in respect to that character between the two groups; while in the length and curvature of its bill it approaches, in conjunction with many of the *Paradiseæ*, to some of the extreme species of the *Buceridæ*, among which the *Buceros nasutus* of Dr. Latham may be instanced.' Mr. Vigors, in a note, says that he speaks with considerable hesitation as to the situation of *Epimachus*, which bears too strong a resemblance to the *Promerops* of M. Brisson, a group feeding on vegetable juices, with an extensile tongue, to permit him to separate it without some expression of doubt.

Mr. Swainson, in 'Fauna Boreali-Americana' (vol. ii.), thus writes on the *Corvidæ*: 'There are some singular and highly interesting peculiarities exclusively belonging to groups pre-eminently typical, which demand the deepest attention of the philosophic naturalist. One of the most striking of these is the great difference between those forms which belong to perfect and natural genera, *strictly so termed*. We might cite the restricted genera, *Tanagra*, *Cashmorhynchus* (Casmarhynchos), and *Coccothraustes*, as remarkable examples of this fact, and as groups which would repay the most minute analysis. This peculiarity sometimes extends to higher groups; and in the present family, the most pre-eminently typical in the whole circle of ornithology, it is more striking than in any other. It is perhaps to this circumstance that we must attribute the very imperfect manner in which the internal relations of the *Corvidæ* have been illustrated, and the artificial distribution that has been made of the groups it contains. Our space indeed will not permit us at present to throw much light upon the subject, further than what may be gained by studying the following table of sub-families.

Analogies.		Sub-families.
	1. Typical Group.	
CONIROSTRES.	Wings lengthened, obliquely pointed; lateral toes equal.	*Corvidæ*.
	2. Sub-typical Group.	
DENTIROSTRES.	Wings shorter, rounded, convex; lateral toes unequal.	*Garrulinæ*.
	3. Aberrant Group.	
SCANSORES.	Bill short, entire, light; feet short.	*Crypsirinæ*.
TENUIROSTRES.	* * * * * * * *	?
FISSIROSTRES.	Bill slender, lengthened; feet short.	*Fregilinæ*.

A glance at the modern arrangements will show how essentially we differ from all ornithologists who, like us, have attempted to elucidate this very intricate family. The tests, however, by which every series of animals thought to be natural must be tried will bring to light many remarkable peculiarities which belong only to the foregoing arrangement. Yet, however confident we feel on the general accuracy of this sketch, we are unprepared either to show in what manner the sub-families are connected, or to refer many of the modern genera to their natural divisions. The Jays (*Garrulinæ*) unquestionably represent the Bush-shrikes (*Thamnophilinæ*); while the genus *Crypsirinæ* and the short-legged *Glaucopinæ* of M. Temminck form part of a group typifying the Drongo Shrikes. The slender bill of the *Fregelinæ*, at the opposite side of the circle, indicates the position of the Fissirostral group, corresponding to the *Buceridæ*. But we have many doubts on the true nature of the Tenuirostral type, since it must not only represent the Hang-nest Starlings (*Icterinæ*), but also the Caterpillar-catchers (*Ceblepyrinæ*) and the typical *Ampelidæ* or Chatterers. Now it will strike every ornithologist who has the means of examining the *Gracula calva* of authors, that notwithstanding its general resemblance to the *Chauve* of Le Vaillant (*Ois. de l'Amérique*, pl. 49), it is decidedly a crow; while the latter is considered by Le Vaillant as unquestionably belonging to the *Ampelidæ*. We have, therefore, good reason to suspect the *Gracula calva* to be one of the tenuirostral types of the *Corvidæ*. In all probability it will prove to be the sub-family type representing that tribe, although at present we choose to omit its designation in the foregoing table.

On the situation of such singular or apparently isolated genera as *Picathartes*, Less., *Podoces*, Fisher, and more particularly *Barita*, Cuv., we cannot at present give any opinion worth recording. [BARITA.] We suspect that *Nucifraga* is the scansorial subgenus of *Corvus*; and notwithstanding the confidence with which the genus *Coracias* has been referred, in the natural system, to this family, we have not the least hesitation in placing it with the *Fissirostres*. It is indeed almost inconceivable that the strongest prejudice in favour of any theory, professing to follow *natural* affinities, could so far have blinded the judgment of a naturalist as to make him separate *Colaris* from *Coracias*, and to violate nature by placing these two forms (so intimately allied that we scarcely know how to distinguish them), not only in two distinct families, but actually in two widely situated tribes. Setting aside every other consideration, and looking merely to the wide gape, which has been so much insisted upon as a peculiarity of the genus *Colaris*, we find that this character is incontestably as much developed in *Coracias*. although a superficial observer, deceived by the length of the bill in the latter, will be led to think quite differently. Both genera, in fact, would be correctly described as having the *rictus wide, opening half way beneath the eye*. A passage in Mr. Vigors's and Dr. Horsfield's 'Description of the Australian Birds in the Collection of the Linnean Society' (*Linn. Trans.*, vol. xv.), is referred to in the observations above quoted. In a note to the word tribes, the following words are quoted: 'Judging however from external characters, *we have no hesitation* in stating our opinion that these relations (between *Colaris* and *Coracias*) are merely analogical.' (*Linn. Trans.*, xv. p. 203.) The following is the part of the paper alluded to—'This bird (*Eurystomus*, Vieill., *Colaris*, Cuv., *Coracias Orientalis*, Linn.), which seems to spread itself very generally over the eastern world, was originally placed by Linnæus among the *Rollers*, or his genus *Coracias*; and although it has latterly been formed into a distinct genus from that group, it has still been arranged next to it by the greater number of systematic writers. M. Vieillot, observing the extreme width of the base of the bill, grouped it among the *Berry-eaters* (Baccivori), a family which he formed out of the genus *Ampelis*, Linn., and some conterminous birds. He however still assigned it a station in the series of his genera, immediately subsequent to the Linnean genus *Coracias*. The bird evidently exhibits strong relations to both these groups. In its colours, its size and strength, and its general form, it bears a resemblance to the *Rollers*; while in the wide gape of the bill it equally seems to approach the broad-billed *Berry-eaters*. Judging however even from external characters, we have no hesitation in stating our opinion that these relations are merely analogical, and that the natural station of the bird is in the tribe of *Fissirostres*, but at that extremity of the group where it joins the *Dentirostres*. The shape of the wing, evidently formed for a rapid flight—the comparative shortness and weakness of the legs, indicating the pursuit of an aërial rather than of a terrestrial prey—and the notched apex of the bill, denoting its food to be rather animal than vegetable—all are characters which point out its affinity to the *Fissirostral* group, whose perfection consists in their powers of flight, and of inclosing their prey within their gape, as they pursue it on the wing. The brilliant colours of this bird, which have hitherto led to its being placed among the *Rollers*, equally associate it with the present family of *Todidæ*[*] and with the neighbouring *Halcyonidæ*, while the bill appears decidedly formed according to the same model as that of *Eurylaimus* and the conterminous group of *Podargus*. We had much pleasure in finding that our conjectures respecting the affinities of this group, which we had drawn merely from its external characters, were confirmed by the account of its habits and mode of life, which we have extracted above from Mr. Caley's manuscripts. We must observe, in addition, that this naturalist, arranging his birds without any predilection for systems, and in consonance merely with what appeared to him to be their natural affinities, of which he formed his judgment by actual observation of their manners, has grouped these birds in the same case with the *Caprimulgi*, *Podargi*, *Hirundines*, and *Artami*, in which situation they may still be seen.'

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[*] Under which it is placed by MM. Vigors and Horsfield.

Lesson, in his 'Manual,' divides the Corvidæ into two sections. 1. The *true Crows;* and 2. The Birds of Paradise (Les Paradisiers).

Genera. Corvus.

Bill straight, large, compressed, and a little swollen on the sides; convex and curved towards the point, its edges cutting. *Nostrils* open. Fourth *quill* the longest. *Tail* even, rounded, or rectilinear.

'The genus Corvus,' says M. Lesson, 'is very numerous in its species. Birds which differ in their characters and habits from the crows, properly so called—which are the largest of the Passeres, whose way of life is carnivorous, and their food composed of all sorts of substances, especially carrion—have been joined to the genus. The crows possess much intelligence, are easily tamed, and become very familiar. They are very voracious and live in numerous bands, and their harsh cry has been called *croaking*. They often commit such havoc, that a price is set on their head in some countries. They have at all times been objects of superstition to the people. Some of the crows are sedentary, others again are travellers, and migrate annually. They moult but once a year.'

Geographical Distribution. The genus is found in all the four quarters of the globe.

Example. *Corvus Corax.* This well-known bird is the Κόραξ of the Greeks, *Corvus* of the Latins, *Corvo*, *Corbo*, and *Corvo grosso* of the modern Italians, *El Cuervo* of the Spaniards, *Corbeau* of the French, *Der Rabe* and *Der Kolkrabe* of the Germans, *Korp* of the Swedes, *Raun* of the Danes, *Raven* of the English, *Corbie* of the Scotch, *Cigfran* of the antient British, *Kaw-kaw-gew* of the Cree Indians, and *Toolloo-ak* of the Esquimaux. Dr. Richardson says that it abounds in the fur countries, and visits the remotest islands of the Polar seas. 'It frequents the barren grounds even in the most intense winter colds, its movements being directed in a great measure by those of the herds of rein-deer, musk-oxen, and bison, which it follows, ready to assist in devouring such as are killed by beasts of prey or by accident. No sooner has a hunter slaughtered an animal than these birds are seen coming from various quarters to feast on the offal; and considerable numbers constantly attend the fishing stations, where they show equal boldness and rapacity. The experienced native, when he sees from afar a flock of ravens wheeling in small circles, knows that a party of his countrymen, well provided with venison, are encamped on the spot, or that a band of wolves are preying upon the carcase of some of the larger quadrupeds, and pushes on briskly in the certain prospect of having his wants supplied. The thievish habits of a tame raven are well known; but it is remarkable that, inhabiting in a wild state the most secluded and worst peopled districts of America, it should exhibit the same disposition to carry off shining metallic bodies, and other articles, totally unfit either for food or to be used in the construction of its nest. Mr. Kendall, in crossing the height of land which divides the waters that flow towards Hudson's Bay from those which fall into the Arctic sea, saw a raven flying off with something in his claws, pursued by a number of his clamorous companions. The bird being fired at dropped the object of contention, which proved to be the lock of a chest.'

The aptitude of the raven for articulating clearly is generally admitted. Mr. Swainson says, 'One belonging to Mr. Henslow, of St. Alban's, speaks so distinctly, that when first we heard it we were actually deceived in thinking it was a human voice: and there is another at Chatham which has made equal proficiency; for, living in the vicinity of a guard-house, it has more than once turned out the guard, who thought they were called by the sentinel on duty.'

Variety.—Dr. Richardson (*Fauna Boreali-Americana*), states that a pied individual was killed on the south branch of the Mackenzie, from a flock of the common sort. Its neck, fore part of the back, and part of the wings were grey: the rest of its plumage black.

Locality.—'This,' writes Dr. Latham, 'is a universal species, found both in the old and new continents; from Greenland to the Cape of Good Hope in the one and from Hudson's Bay to Mexico in the other. It was also met with by our circumnavigators in the Sandwich Isles, and at Owhyhee was held in great estimation.' Its appearance is recorded in the first and second voyage of Parry as occurring within the Arctic circle, and in Franklin's Journal. Several pairs were seen at Melville Island, and Dr. Richardson gives a description of one killed at Fort Franklin in March, 1826.

Captain James Ross (Appendix to Sir John Ross's second voyage, p. 28), speaking of the raven, says, 'This is one of the few birds that are capable of braving the severity of an Arctic winter and of enduring the scorching rays of a tropical sun without any change being produced in its plumage by the extremes of climate. Cuvier and other authors mention that in the north it is frequently found more or less white: we never saw anything corroborative of such an observation. It preserves its plumage and peculiar characteristics unchanged in every quarter of the globe*.'

There are several other European and foreign species. Most of the former are known to every countryman, and the student will find both in the ornithological manuals.

Pica.

Bill entire, with cutting edges, straight or curved, furnished at the base with setaceous feathers, lying forwards. *Tail* very long, graduated. (Vieillot).

The *Picæ*, magpies, feed much in the same manner as the true crows, build their nests in trees, advance on the ground by hopping, are clamorous, learn to articulate words easily, and the European species is renowned for hiding anything shining and portable that pleases its eye. This bird also has been always an object of superstition with the vulgar; and as it may be considered a typical form, we take it as an example.

Pica caudata of Ray, *Corvus Pica* of Linnæus, our common *Magpie*, or *Pianet*, is, there is hardly any doubt, the κίττα of the Greeks, the *Pica* of the Latins, *Gazza*, *Regazza*, *Putta*, *Picha*, *Gazuola*, *Gazzara*, *Ghiandara*, *Gaggia*, and *Gaggia domenicana* of the modern Italians, *Pie*, *Jaguette*, *Dame*, and *Agasse* of the French, *Die Elster*, *Die Aelster*, or *Aglaster* of the Germans, *Skade* and *Huus Skade* of the Danes, *Skior* and *Tunfugl* of the Norwegians, *Piogen* of the antient British, *Ootawa-kee-askee* of the Cree Indians, and *Shepecum-meeuuck* of the Maskegons.

The magpie is too well known to need description. It is omnivorous, and lays six or seven oblong eggs of a yellowish white, spotted with brown, and cinereous: its nest, well fortified with blackthorn twigs, is a curiosity. The female is rather less than the male, and her tail is shorter.

'This bird,' says Dr. Richardson (*Fauna Boreali-Americana*), so common in Europe, is equally plentiful in the interior prairie lands of America; but it is singular that though it abounds on the shores of Sweden and other maritime parts of the Old World, it is very rare on the Atlantic coasts of America, or near Hudson's Bay: only stray individuals passing to the eastward of the Mississippi or of Lake Winipeg. Mr. Say informs us that it winters on the Missouri, and takes its departure northwards on the 23rd of March. It does not entirely quit the banks of the Saskatchewan even in winter, but is much more frequent in summer. On comparing its eggs with those of the European bird, they are found to be longer and narrower; and though the colours are the same, the blotches are larger and more diffused. The manners of the American bird are precisely the same that we are accustomed to observe in the English one.' Mr. Swainson adds, that he has been able to compare English and Arctic specimens with one from the interior of China, communicated to him by Mr. Gray, and that he cannot perceive the slightest difference whereon to build even the character of a variety, much less of a species. The tails of the Arctic specimens, he observes, are very beautiful.

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* The reader is desired to add the following information to the account of the geographical distribution of the passenger pigeon, *Ectopistes migratoria*, *Columba migratoria* of authors, in the article *Columbidæ*. 'A young male bird flew on board the Victory during a storm, while crossing Baffin's Bay, in lat. 73¼ N., on the 31st July, 1829. It has never before been seen beyond the sixty-second degree of latitude; and the circumstance of our having met with it so far to the northward is a singular and interesting fact.' (Captain James Ross, *Appendix*, p. 29.)

Variety.—White.

There are several foreign species. They occur both in the Old and New World.

Dendrocitta.

A genus founded by Mr. Gould, and comprehending *Pica Vagabunda* of Wagler, *Pica Sinensis* of Hardwicke and Gray, and a third species, which Mr. Gould believes to have been hitherto unnoticed.

Generic Character.—*Bill* shorter than the head, cultrated, broad at the base, culmen arched, sides subtumid; *nostrils* basal, partly covered with setaceous feathers. *Wings* moderate: fifth and sixth quills longest. *Tail* elongated, cuneated, the tail-feathers spatulate. *Feet* (tarsi) short and weak; *toes* moderate; *hallux* strong, with a strong incurvated claw.

Generic Type.

Dendrocitta leucogastra. Black; occiput, neck, transverse stripe at the base of the quills, and abdomen white; scapulars, interscapular region *(interscapulio)*, and lower tail-coverts tinged with chestnut *(dilute castaneis)*; two internal tail-feathers ash-coloured, except at their tips.

'The shortness and comparative feebleness of the tarsi in *Dendrocitta*, and its more elongated tail, the feathers of which are equally graduated, except the two middle ones, which are much longer than the others, distinguish it from the typical *Picæ*, the common *magpie*, for example. These characters are in accordance with its habit of wandering from tree to tree in search of its food. It is farther distinguished by the form of its bill.'

'All the species yet known are natives of Eastern Asia.' (Gould, *Zool. Proc.*, May 14, 1833.)

Example. *Dendrocitta vagabunda*, *Pica vagabunda*, Wagler. Head, neck, and crest of a smoke colour, or blackish grey; the back light cinnamon; the centre of the wings grey; the quills black; the tail grey, each feather being tipped largely with black; under surface pale tawny; beak and tarsi black. Length 16½ inches; beak 1¼; tarsi 1¼; tail 10. The species is more widely diffused than any of its congeners, being found in considerable abundance all over India. (Gould, *Century of Birds from the Himalaya Mountains.*)

Garrulus.

Bill moderate, straight, with cutting edges, inclined, and with obscure notches near the point. *Tail* even, sometimes rounded. (Vieillot).

The jays are inhabitants of the wooded districts, and live chiefly upon fruits, principally acorns and such vegetable productions. They rarely come into the open country, but make great havoc in gardens and cultivated grounds in the neighbourhood of woodlands. Their food is much less varied than that of the true crows; but they may still be styled omnivorous. Their plumage is generally gay, and even brilliant: the beautiful speculum on the wing is a leading character. The manners of the foreign species are analogous to those of the foreign magpies. Those of the common jay and its aptness at imitation are well known.

Example, *Garrulus glandarius*, the common jay, which is supposed by Belon to be the Μαλακοκρανεὺς (Malacocraneus) of Aristotle; and we may observe, in confirmation of this opinion, that the editor of the last edition of Pennant says, that the bird is very common in Greece, where it still retains its antient name, Μαλακοκρανεὺς. Belon states it to be the *Gaza Ghiandaia*, or *Ghiandara*, the *Gaza verla* and the *Berta* of the modern Italians; and C. Bonaparte gives *Ghiandaja*, *Pica*, *Pica ghiandaja*, and *Pica palombina* as its Italian appellations. It is the *Jay* and *Geai* of the French, the *Eichen-heher* (oak-jay), *Holtzschryer* (wood-cryer), or *Holzeher* of the Germans, and *Screch y Coed* of the antient British.

The jay is too well known to require description. It builds its basket-like nest in trees or high coppice wood and hedges, and lays five or six eggs of a dull whitish olive, mottled very obscurely with pale brown; towards the large end there are usually two or three black lines. It is a sad enemy to gardeners; fruits, especially cherries, and peas, are its great favourites, and it is frequently taken by springes set upon the rows of peas when in bearing. Dr. Kramer says that it will kill small birds. With regard to their imitative powers, Bewick says, 'We have heard one imitate the sound made by the action of a saw so exactly, that though it was on a Sunday, we could hardly be persuaded that the person who kept it had not a carpenter at work in the house. Another, at the approach of cattle, had learned to hound a cur dog upon them, by whistling and calling upon him by his name. At last, during a severe frost, the dog was, by that means, excited to attack a cow big with calf, when the poor animal fell on the ice, and was much hurt; the jay was complained of as a nuisance, and its owner was obliged to destroy it.'

Varieties.—Dr. Latham says he has seen two varieties; the one pure white, the other as in the common jay, but having the whole of the quills white.

Locality.—The author last quoted states that this species, though not nearly so far spread as the magpie, exists in various parts of the continent of Europe, and that he has observed it among drawings done in China.

There are several foreign species, both of the New and Old World. Mr. Gould, who figures three species in his 'Century of Birds,' well observes that, 'The close affinity which the *Garrulus lanceolatus* bears to some species inhabiting the United States and Mexico is worthy of remark, as a corroboration of the fact so often insisted on, that similar forms of ornithology are found in countries widely separated from each other, whose temperatures are alike.' Indeed, the last-mentioned bird immediately reminds the observer of the *blue jay* (*Garrulus cristatus*) of America, while *Garrulus bispecularis* recalls the common jay to his recollection.

Picathartes.

A genus founded by M. Lesson, who takes for the type the *Pie chauve* (*Corvus gymnocephalus*) of Temminck.

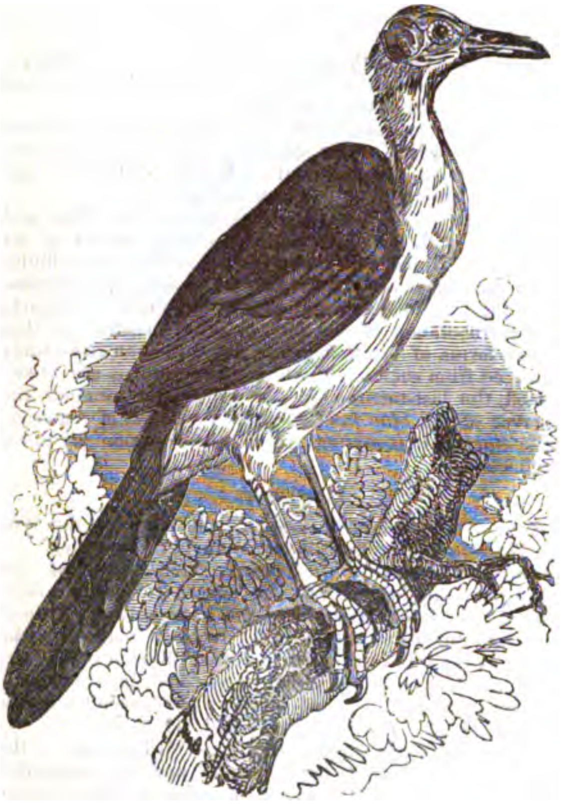
Generic character.—*Bill* convex, not very robust, the upper mandible higher than the lower; the latter a little swollen towards its extremity; the base entirely without hairs and furnished with a cere. *Nostrils* placed on the middle of the bill, oval, open, hollowed into an oblong excavation. *Head* entirely naked. *Feet* (tarsi) long, but little scutellated in front, naked behind; *claws* feeble; *wings* rounded, short. *Tail* long, graduated. (Lesson.)

'The form of this singular bird,' says M. Temminck, 'the cut of its wings, and its long, conical, and very graduated tail, serve me as indicia to judge by analogy of what country it may be a native, its locality being unknown. In fact, on comparing our new species with the *Piapic* of Le Vaillant (*Corvus Senegalensis*), one is inclined, from the marked analogy, to conclude Africa to be its country. Some data, which it is nevertheless not prudent to trust, lead me to believe that the only individual known, which is in the collection of Mr. Leadbeater of London, was brought from the English possessions on the coast of Guinea.'

'Proportions (taille) a little stronger, tarsi much longer, and a tail less in proportion distinguish our bird from the *Piapic*. The head in certain points offers some resemblance to that of the *Gracula calva* of the Philippines, and this approximation is so strong that it would produce doubts as to its African origin, if it did not bear a greater resemblance in its general contour to the *Piapic* of Africa. In fine, if this bird is not African, it can only be a native of the Philippine islands.'

Upon this passage M. Lesson remarks, that he does not find the least analogy between the figure of the Enlum, 538, which is the *Corvus Senegalensis*, and the *Pie chauve*, which more resembles a *Cathartes*. The conclusion stated in M. Temminck's last sentence M. Lesson is far from admitting.

The following is Temminck's description of the species: 'The naked parts of the head offer a particular character. The whole of the auditory meatus is completely destitute of feathers and even of hairs. A small border, or rudiment of membrane, forms, below the orifice of the ear, a sort of external concha, but little apparent, it is true, in the stuffed specimen, but the extent of which must be remarkable in the living bird. All this part of the organ of hearing, as well as a part of each side of the occiput, are covered by a black skin with a slightly-projecting orbicular border, and forming a rounded *plaque*. The cere which envelopes the base of the bill is also black. All the rest of the naked parts of the head, the mesial line of the occiput which separates the black *plaques* of the temples, and the upper part of the top of the neck, appear to me to have been red or rosy in the living subject; a slight tint of rosy-yellow covers these parts in that before us. The whole of the nape is covered, clearly, by a whitish and very short down. The front of the neck and all the other parts are white. The back, well covered with thick-set feathers, is of an ashy-black; all the rest of the plumage is bistre brown. The feet are yellow, and the bill is black. Length 15 inches.' (Temm.)



[Picathartes gymnocephalus.]

Podoces.

This genus was founded by M. Fischer, for a bird discovered by Dr. Pander, in the country of the Kirguis beyond Oremburg, whose habits of life are analogous to those of the crows, among which M. Lesson thinks it ought to be placed.

Generic character.—*Bill* moderate, of the length of the head, bending downwards at its point, without a notch and slightly angular, the upper mandible shorter than the lower, receiving and covering the edges of it. *Nostrils* basal, rounded, large, covered with setaceous overhanging feathers (plumes setacées retombantes). *Feet* robust and long; *claws* triangular, very much pointed, and but little curved; a warty membrane bordering the thickness of the phalanges. *First quill* short, *second* long, the *three next* equal. *Tail* rectilinear. (Fischer.)

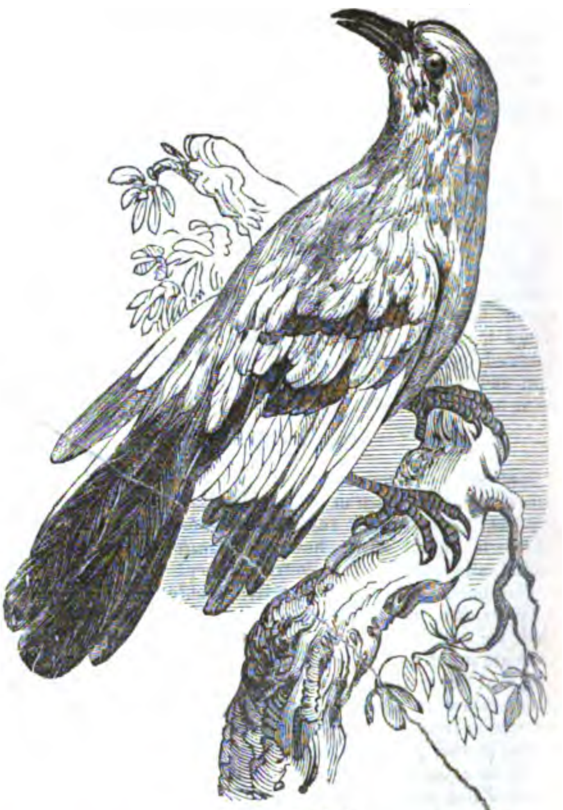
Example, *Podoces Panderi.* Greenish glaucous above; eyebrows white; bill and claws blackish; feet greenish.

The bird flies badly but walks very well. It lives in flocks.

Myophonus.

Bill very large, strong and hard, furnished at its opening with some stiff bristles and small feathers turned forwards. *Nasal fossæ* sub-oval, closed by a large membrane. *Wings* rounded, moderate. *Quills* nearly equal, the third longest. *Feet* very long, demiscutellated. *Tail* rounded.

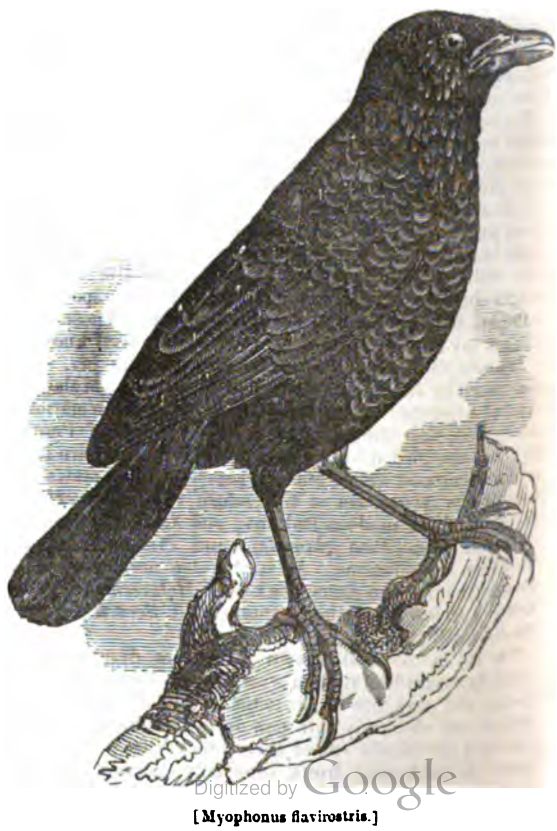
There are several species, all oriental. Mr. Gould, who has published two, viz.: *Myophonus Horsfieldii* and *M. Temminckii*, in his 'Century,' states that, as regards the habits of these birds, little can be said with certainty, but that from their lengthened tarsi and general structure they may be considered as depending in a great measure for their subsistence upon worms, insects, and larvæ. The



[Podoces Panderi.]

manners of *M. Temminckii*, when on the ground, are said much to resemble those of the English blackbird. It may be questionable whether this group is properly placed among the *Corvidæ*.

Example, *Myophonus flavirostris* (*metallicus*, Temm Entirely of a deep blue-black with metallic tints. *Bill* a beautiful yellow. *Feet* black. Locality, Java.



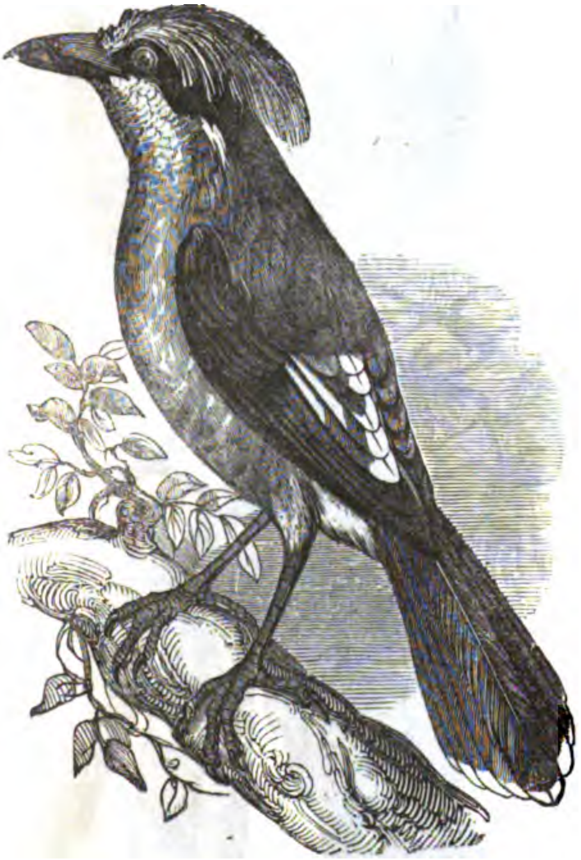
[Myophonus flavirostris.]

Ptilonorhynchus.

Bill strong, robust, widened, rather long, upper basal termination convex but little marked; point recurved; upper mandible presenting two small notches at its extremity; edges a little swollen; lower mandible slightly convex; commissure of the mouth straight, simple. *Nostrils* basal, lateral, furnished with short bristles. *Wings* short, rounded. *Tail* moderate, graduated. *Feet* slender. (Lesson).

The genus, as modified by Lesson, contains but two species. He thinks that it would be better placed among the *Dentirostres* at the side of the *Choucaris* (Graucalus, Cuv.), but he allows that it has all the forms of the *Rolliers* (Coracias) and of the *crows*. Locality, the warmest islands of the West Indian Archipelago.

Example, *Ptilonorhynchus Sinensis, Coracias Sinensis*, Lath. Body above pale aqua-marine green clouded with yellowish-green. Forehead furnished with silky round feathers, turned in different directions; feathers of the nape long, unravelled as it were, and capable of being erected into a tuft—both of a yellowish-green. A black band taking its rise from the angle of the bill surrounds the eye and nape. Throat and cheeks of a yellowish-green. Lesser wing coverts brown. Quills brown, inclining to olive externally, and chestnut internally; the three last progressively terminated with greenish white. Bill red, surrounded by a few black bristles; feet reddish. Size eleven inches. Locality, the Philippine islands.



[Ptilonorhynchus Sinensis.]

The other species, according to Lesson, is *Kitta thalassina*, Temm.

Kitta.

Bill short, convex, compressed on the sides; upper mandible with the basal termination recurved, and depressed sides; the point sharp and furnished on each side with a small projecting tooth, borders of the mandibles thick, recurved, and covered at the commissure. *Nostrils* basal, transversal, hidden by the silky feathers of the forehead, and by a row of small bristles. *Wings* pointed. *Tail* equal, rounded. *Feet* robust; toes equal; *hallux* strong. (Lesson.)

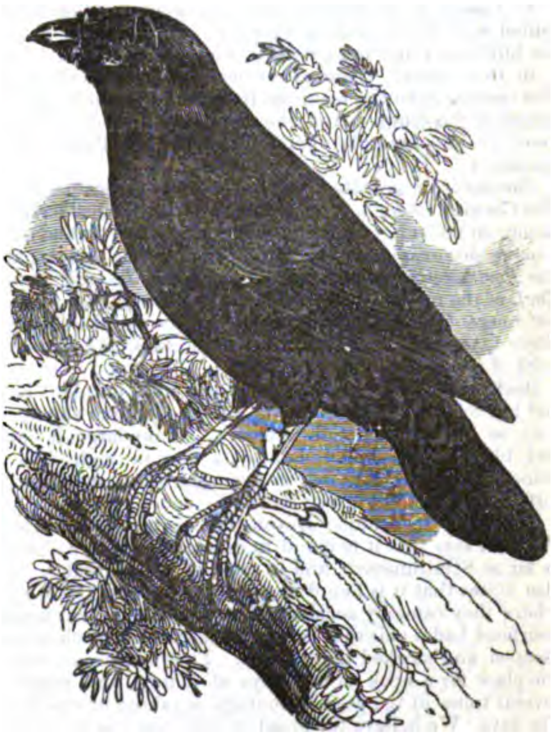
Lesson, who places in this genus *Kitta holosericea, Ptilonorhynchus Smithii* and *Kitta virescens*, says that what was observed as to the last-mentioned genus is applicable to this, which has the general characters of the *Rolliers* and *Rolles* (Colaris).

The birds composing the genus are exclusively peculiar to New Holland and the temperate zone. (Lesson.)

Example, *Kitta holosericea*, Temm.; *Ptilonorhynchus holosericeus*, Kuhl; *Satin Grakle*, Latham; *Ptilonorhynchus Mac-Leayii*, Latham MSS., Vigors and Horsfield.

Male, very brilliant blackish-blue. Quills and tail-feathers dead black. Bill and feet yellow. A double row of silky and velvety bluish-black feathers at the base of the bill. Length thirteen inches. The *female* has the upper parts of an olive-green. The quills and tail feathers of a red-brown; wing coverts varied with brown and a colour inclining to olive; lower parts greenish, barred with black. There are whitish horizontal spots, lanceolated and bordered with black, on the front of the neck.

Mr. Caley says (Vigors and Horsfield, *Linn. Trans.*, vol. xv., p. 264) that 'the male of this species is reckoned a very scarce bird, and is highly valued. The natives call it *Cowry*, the colonists *Satin Bird*. I have now and then met with a solitary bird of this species: but I once saw large flocks of them on some newly-sown wheat, from whence they fled, on being scared, into a neighbouring brush; when all was again quiet they soon returned to the wheat. They did not leave the brush above a few yards. There were no black ones among them, nor can I affirm that they were feeding on the wheat.



[Kitta holosericea.]

Nucifraga.

Bill long, thick, with cutting edges terminating in a blunt point, furnished with setaceous feathers at the base, the upper mandible longer than the lower. *Nostrils* round, open. *Wings* pointed; fourth quill longest.

Till the publication of Mr. Gould's *Nucifraga hemispila*, (see 'Century of Birds,') but one species was known, viz., that which we select as the example.

The *Nutcracker, Nucifraga Caryocatactes*, Brisson; *Caryocatactes nucifraga*, Nils. *Corvus Caryocatactes*, Lin., is the *Casse-noix* of the French, the *Tannenheher* of the Germans, the *Noddekrige* of the Danes, the *Not-kraake* of the Norwegians, and the *Aderyn y cnau* of the antient British.

Description.—Somewhat less than the jackdaw: the bill straight, strong, and black. Head, neck, breast and body, rusty brown. Crown of the head and rump plain, the other parts marked with triangular white spots. Wings black. Coverts spotted like the body. Tail rounded at the end, black, tipped with white. Legs dusky. Locality, most parts of Europe: but C. Bonaparte does not notice it in his 'Specchio Comparativo.'

Pyrrhocorax.

Bill moderate, compressed, subulate, rather slender, furnished at the base with feathers directed forwards, and at the extremity of the upper mandible with two small teeth which are often wanting. *Nostrils*, basal, ovöid, open, hidden by bristles. *Feet* robust, claws strong and recurved. *Fourth* and *fifth quills* longest.

These birds, the *Choquards* of the French, live in troops like the jackdaws, which they resemble in their manners. They inhabit the high mountains of Europe, and especially the snowy regions of the Alps. They are omnivorous, feeding on insects, worms, soft fruits and seeds. They moult once a year, and the sexes are alike externally.

Example. *Pyrrhocorax Pyrrhocorax*. Brilliant black, but the colour is dull in youth, and the bill and feet are black. In the adult bird the black presents iridescent and changeable tints varying to greenish, the bill is yellowish, and the feet bright red. The female lays four white eggs, spotted with dirty yellow; the nest is in holes of the rocks. Locality, Alps of Switzerland. C. Bonaparte ('Specchio Comparativo') notes it as rare, and as only occurring in the Apennines.

Fregilus.

Bill longer than the head, slender, entire, arched, pointed. *Nostrils* covered with feathers directed forwards.

M. Lesson is of opinion that this genus ought to be united with the last, from which it only differs in having the bill longer and more curved, which made Cuvier place it in the tribe of *Tenuirostres* near the *Hoopoes* (Upupa). The species have the manners, habits, and general organization of the crows. And the European species (selected here as an example) perfectly resembles Pyrrhocorax. (Lesson.)

Pyrrhocorax graculus, Temm. *Corvus graculus*, Linn. The *Cornish Chough*, or *Red-legged Crow*, is considered by Belon, on no bad grounds, to be the Κορακίας (Corakias), the Κορώνη φοινικόρυγκος (Red-billed Crow) of the Greeks, and the *Pyrrhocorax* of the Latins; *Spelvier*, *Taccola*, *Pason*, *Zorl*, of the modern Italians (Belon); *Choucas aux pieds et bec rouge*, *Choquar*, *Choüette rouge* of the French (Belon); *Stein-tahen* and *Stein-frae* of the Germans, and *Brân big gôch* of the antient British.

Back beautifully glossed with blue and purple. Legs and bill bright orange, inclining to red. Tongue almost as long as the bill, and a little cloven. Claws large, hooked, and black. The chough builds its nest in high cliffs or ruined towers, and lays four or five eggs, white, spotted with dirty yellow or light brown and ash colour.

Locality.—In Britain: Devonshire, Cornwall, and Wales. Pennant says that it is found in different parts of Scotland, as far as Straithnavern, and in some of the Hebrides. He also states that it is found in small numbers on Dover cliff, where they came by accident; a gentleman in that neighbourhood had a pair sent as a present from Cornwall, which escaped and stocked those rocks. They sometimes desert the place for a week or ten days at a time, and repeat it several times in the year. Montagu, speaking of this locality, says, 'We believe the breed in those parts is again lost.' Dr. Latham states that it is also said to frequent the South Downs about Beachy Head and Eastbourne, where it is called the Red-billed Jackdaw. With regard to its general geographical distribution, Pennant observes that we do not find it in other parts of Europe except England and the Alps. In Asia the island of Candia produces it. In Africa, Egypt; which last place it visits towards the end of the inundations of the Nile. He quotes Pliny, Brisson, Belon, and Hasselquist, for these statements. The editor of the last edition of Pennant says that the chough inhabits the lofty cliffs about the mid region of the highest mountains of Greece, but never the maritime parts as with us. Scopoli speaks of it in Carniola, and says that the feet of some during autumn turn black. These were probably young birds.

The Cornish chough is easily tamed, and may be taught to speak. One in Colonel Montagu's possession would stand quietly for hours to be soothed and caressed, but would resent an affront both with bill and claws. 'It is,' says Pennant, 'active, restless, and thieving; much taken with glitter, and so meddling as not to be trusted where things of consequence lie. It is very apt to catch up bits of lighted sticks, so that there are instances of houses being set on fire by its means; which is the reason that Camden calls it *incendiaria avis*.' Several of the Welsh and Cornish families bear this bird in their coat of arms.

There are foreign species, *Fregilus leucopterus*, Vigors and Horsfield, *Pyrrhocorax leucopterus*, Temm., from New Holland, where it is called by the natives Waybung, according to Mr. Caley, and *Fregilus Enca*, of Horsfield, from Java, for instance.

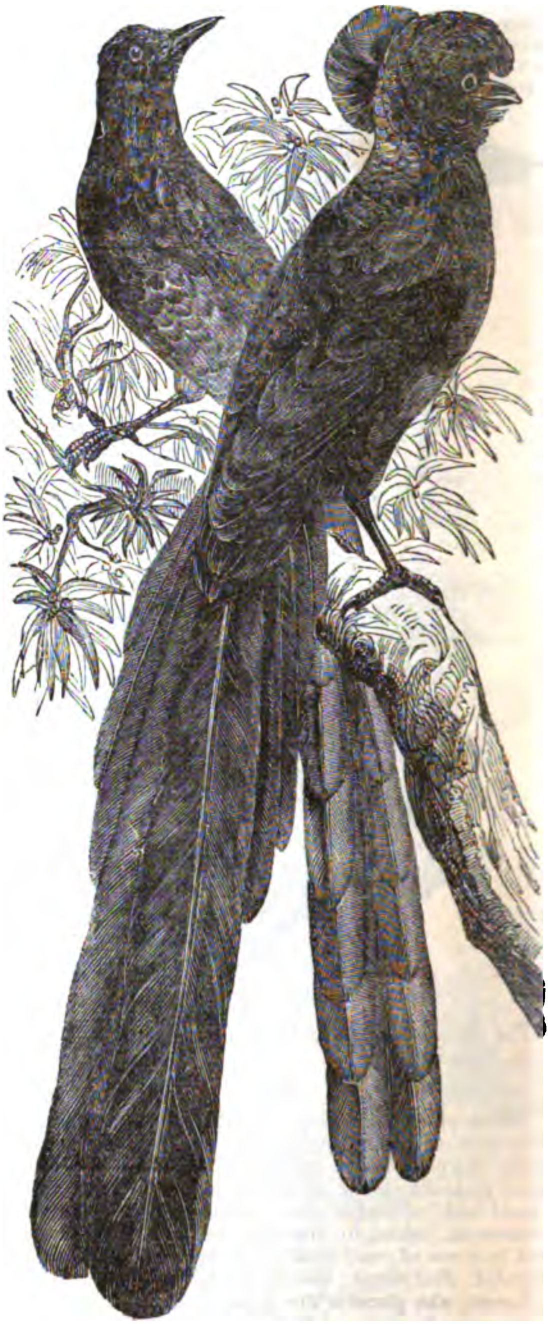
Paradisea.

[See Bird of Paradise.]

Astrapia.

Bill smooth at the base, compressed laterally, straight above, pointed, notched and bent towards the extremity. *Tail* very long and very graduated.

A genus founded by M. Vieillot for a bird of the most brilliant plumage, which, with other characters, places it near the *Birds of Paradise*, while it has several points which would lead to arranging it among the *Thrushes*. Thus Gmelin gave it the name of *Paradisea nigra*, and Latham that of *Paradisea gularis*, while Cuvier considered it to



[Pie de Paradis.]

come under the genus *Turdus* (*Merle de la Nouvelle Guinée*). This beautiful bird is the *Pie de Paradis* or *Incomparable* of the French. M. Lesson says, 'I brought from New Guinea two individuals of this magnificent bird, the value of which is sufficiently considerable in France, and which seems to be very rare even in its native country; for during our sojourn at the Moluccas and the land of the Papous, I only saw there two birds, and one of these now embellishes the galleries of the museum where I deposited it.'

No description can convey any idea of the brilliancy of this bird. The metallic tints of almost every hue, varying with the play of the light on the plumage, almost surpass belief. It is well figured in Le Vaillant's 'Oiseaux de Paradis,' pl. 20 and 21; but no colouring can give the slightest notion of its splendid intensity and variety. The form may be imagined from the annexed cut taken from the plates above mentioned.

Fossil Corvidæ.

Dr. Buckland mentions the remains of the raven as occurring in the cave at Kirkdale, and figures the right ulna of one of those birds in 'Reliquiæ Diluvianæ,' plate xi.

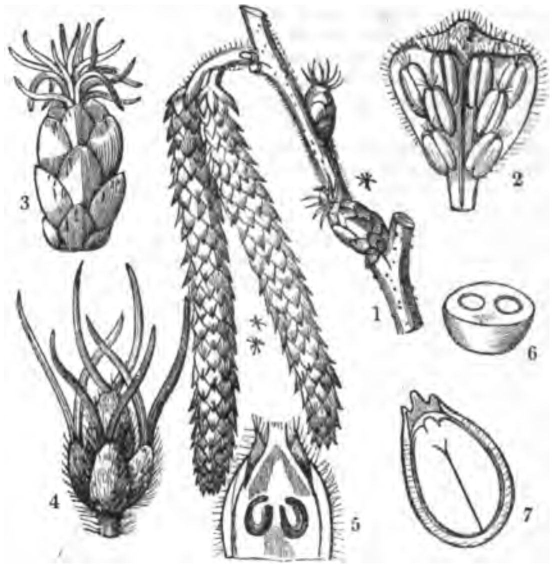
The other allied forms alluded to in this article, viz. *Crypsirina*, *Epimachus*, *Eulabes*, &c., will be adverted to under those titles.

CORVO, one of the Azores, or Western Islands, and the northernmost of the whole group, lying 10 miles N. of Flores. It is high to the north, and slopes gradually to the south; it contains about 750 inhabitants, and produces the best wheat of all the Azores; cattle, sheep, and hogs are abundant, but wood and water are scanty. It has only a small port for the boats trading among the islands. It is three miles long and two broad. The north point is in 39° 44′ N. lat., and 31° 0′ W. long.

CORVUS, the Crow, sometimes *Hydra et Corvus*, because this constellation, in fact, contains a part of the body of Hydra, on which the bird rests. In Aratus, Hydra, Crater, and Corvus form one constellation. There are mythological stories, apparently not very antient, in Hyginus.

Character.	No. in Catalogue of		Magnitude.
	Flamsteed. Piazzi ()	Astron. Society.	
α	1	1396	4
ε	2	1398	4
	3	1400	6
γ	4	1408	3
ζ	5	1418	5
(ι)	6	1424	6
δ	7	1437	3
η	8	1444	5
β	9	1448	3
	(54)	1420	6

CORYLA′CEÆ, a highly important natural order of apetalous or incomplete exogens, consisting of trees or shrubs, chiefly natives of the colder parts of the world, and valuable either for the nuts they bear or the timber they produce. The oak, the beech, the hazel, the hornbeam, and the sweet chestnut, all belong to this order, the general character of which is briefly this: leaves alternate, usually serrated, often with veins running straight from the midrib to the margin, beyond which they slightly project; at the base of each leaf a pair of membranous stipules. Flowers monœcious. The males in catkins; the females in bud-like clusters. Stamens from five to twenty, arising from the scales of the catkin. Ovary inferior, crowned by a toothed obsolete calyx, seated in a membranous cup or involucre, with more cells than one, and as many styles as cells; ovules solitary or in pairs, pendulous; all the ovules except one, and all the cells, disappear after the flowering is over, and when the fruit is ripe there is but one cell and one seed, whatever their number may originally have been. Fruit, a nut (called also acorn, mast, &c.), enclosed within a peculiar kind of involucre or *cupule*, composed of bracts more or less united together, and forming a cup in the oak, a husk in the filbert, and a spiny case in the chestnut and beech. The seed consists of a roundish embryo, with thick fleshy cotyledons, and no albumen. For particulars concerning the important genera of this order, see Quercus, Fagus, Carpinus, Castanea, Ostrya, Corylus. This order is also called Cupuliferæ.



[Flowers of the Hazel Nut.]

1, a branch, with the male flowers ** in drooping catkins; the females * in bud-like clusters. 2, one of the scales of the male catkin, with the stamens attached to it. 3, a female bud, with the styles projecting beyond the bracts. 4, the young ovaries with the bracts removed. 5, a section of the ovary, exhibiting the ovules, the toothed calyx, and the base of the style. 6, a cross section of the ovary. 7, a longitudinal section of a nut.

CO′RYLUS, the genus of plants after which the natural order Corylaceæ receives its name. It consists of the different species of hazel-nut, and is distinguished from the genera associated with it by its cupule being a two-leaved lacerated husk, and its ovary having but two cells, in each of which is one ovule. The species are the following:—

1. *C. avellana*, the common hazel-nut. This plant, which is a native of all the cooler parts of Europe, Northern Asia, and North America, is the parent of the many varieties of nuts and filberts now cultivated for their fruit. [Hazel-Nut, Filbert.] It is specifically known by its husks being hispid with glands, leafy, broad, much lacerated, and rather spreading at the point; never contracted into a long tube, nor divided into narrow rigid segments; by its roundish, heart-shaped, very rugose, angular, toothed, cuspidate leaves, glandular-hispid branches, and shrubby habit. It varies very much in the form of its husks, in the degree of their hispidity, some being nearly smooth, in the shape of the nuts, and in the height to which it grows. In the hazel-nut the husk is open at the point, shorter, or at least but little longer than the nut, and nearly smooth; while in the filbert (*Corylus tubulosa* of some writers), it is lengthened considerably beyond the nut, and covered more or less with glandular hairs; all degrees of intermediate structure may be found in the cultivated varieties. The *C. Americana* of botanists is not distinguishable even as a variety. There is a pretty purple-leaved kind in shrubberies.

2. *C. rostrata*, the horned hazel-nut. In this the branches are quite free from glandular hispidity, the leaves are oblong, not cordate, doubly toothed, and acuminate, and the husks globular over the nuts, where they are extremely hispid, without ever being glandular; beyond the nuts the husks are contracted into a tube an inch or more long, and irregularly lacerated at the point. A very distinct species inhabiting the mountains of the Carolinas, where it rarely exceeds three or four feet in height. In gardens it is scarcely larger.

3. *C. colurna*, the Constantinople nut. A white-barked tree, twenty feet and more high, with an erect trunk and a dense spreading head. The leaves are shining, much less rugose than in the the hazel-nut, cordate, angular, serrated, acute or acuminate, slightly hairy on the under surface. The branches and all the other parts are destitute of glands; the husks are campanulate, deeply cut into narrow hairy rather falcate segments. The nuts are roundish and very

hard. A native of Asia Minor, and known from all the other garden species by its becoming a tree. It seldom produces its nuts in this climate.

Besides these, there are the *C. lacera* and *C. ferox*, two species found in the Himalaya mountains. Of these, the former, gathered in Kumaon, is hardly different from *C. colurna;* the other, from Mount Sheopore, has narrow taper-pointed leaves, and excessively hard nuts, enclosed in a husk, with divaricating narrow spiny divisions.

CORYMB, a form of inflorescence approaching very nearly to the raceme. The raceme consists of an axis, upon which all the flowers are disposed upon footstalks of the same length; and hence its figure is more or less cylindrical. A corymb consists of an axis, the lowermost flowers on which have very long stalks, and the uppermost very short ones, so that the mass of inflorescence is an inverted cone, as in candytuft and many other cruciferous plants. The corymb is, in fact, an umbel with a lengthened axis.

From this word is derived the term *corymbose*, which is applied not only to flowers, but to any kind of branching in which the lowermost parts are very long and the uppermost very short, as is the case in most species of Aster.

CORYMBI'FERÆ. [Compositæ.]

CO'RYPHA, a genus of East India palms, with gigantic fan-shaped leaves. Their flowers consist of a three-toothed calyx, three petals, six stamens, and a three-celled ovary. The fruit is composed of round one-seeded berries. Of the species two in particular deserve mention.

One, the Tara or Talliera, *Corypha talliera*, is an elegant stately species inhabiting Bengal. Its trunk is about thirty feet high, and as nearly as possible of equal thickness throughout. The leaves are in about eighty divisions, each six feet long by four inches broad, radiating from the point of a leaf-stalk from five to ten feet long, and covered with strong spines at its edge. Roxburgh describes the spadix as decompound, issuing in the month of February from the apex of the tree and centre of the leaves, forming an immense diffuse ovate panicle, of about twenty or more feet in height. The fruit is the size of a crab-apple, wrinkled, dark olive, or greenish-yellow. The leaves are used by the natives of India to write upon with their steel stiles, and for other purposes.

The other, the Tala or Talipat palm, *Corypha umbraculifera*, is a native of Ceylon, and similar in appearance; but its leaves are not so round as those of the Talliera, the divisions in the centre being shorter than those at the sides. The trunk grows sixty or seventy feet high; the leaves are fourteen feet broad and eighteen long, exclusive of this stalk, and they form a head about forty feet in diameter. Fans of enormous size are manufactured from this plant in Ceylon; the pith of its trunk furnishes a sort of flour from which bread is made; the leaves make excellent thatch, and are used for writing on like those of the Talliera.

CORYPHÆNA (Linnæus), a genus of fishes of the section Acanthopterygii and family Scombridæ.

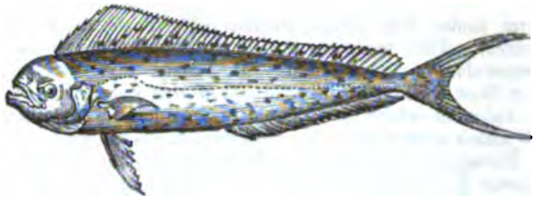
The group of fishes formerly included under the head Coryphæna is now subdivided, and the subdivisions may be either termed subgenera of the genus Coryphæna, or the group may be looked upon as a sub-family, and the subdivisions as genera. The principal characters of this group are as follows:—Body elongated, compressed, covered with small scales; dorsal fin extending the whole length of the back (or nearly so); branchiostegous rays generally seven in number. These fishes have commonly a long anal fin, in some extending from the tail almost to the ventral. The tail is more or less forked, and the pectoral fin is usually arched above and pointed.

Considering Coryphæna as a genus, the following are the subgenera:—*Coryphæna* (proper), *Caranxomorus*, *Centrolophus*, *Astrodermus*, and *Pteraclis*.

The species to which the name Coryphæna is now restricted have the head much elevated, and the palate and jaws both furnished with teeth.

These fishes are very rapid in their motions, usually of large size, and they prey upon the flying-fish.

Coryphæna hippurus (Linn.), a species not uncommon in the Mediterranean, is about two feet in length, of a blueish lead colour above and pale yellow beneath. There are dark blue spots on the back and dorsal fin, and the under parts of the body are furnished with spots of a paler colour. The ventral fins are yellowish beneath and black above, and the anal fin is yellowish. The greatest depth of the body is about one-sixth of the whole length.



[Coryphæna hippurus.]

There are several other species of this genus, some of which are found in the Mediterranean, and very closely resemble the one just described.

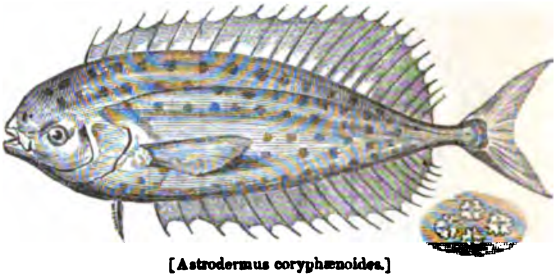
The genus *Caranxomorus* (Lacépède) is closely allied to Coryphæna (proper); the species, however, may be distinguished by their having the head less elevated and the eye in a medial position; the dorsal fin is shallow and of equal height throughout: the tail is much forked.

Caranxomorus pelagicus is about nine or ten inches in length, of a blueish colour above and yellowish beneath; the dorsal and anal fins are of the same colour as the back of the fish, and have a whitish margin. It inhabits the Mediterranean.

The subgenus *Centrolophus* has already been noticed under the proper head. We will merely remark that the species of this genus which we have seen have the body shorter in proportion than in either of the two preceding genera, and of a somewhat elongate-oval form, the tail less forked, &c.

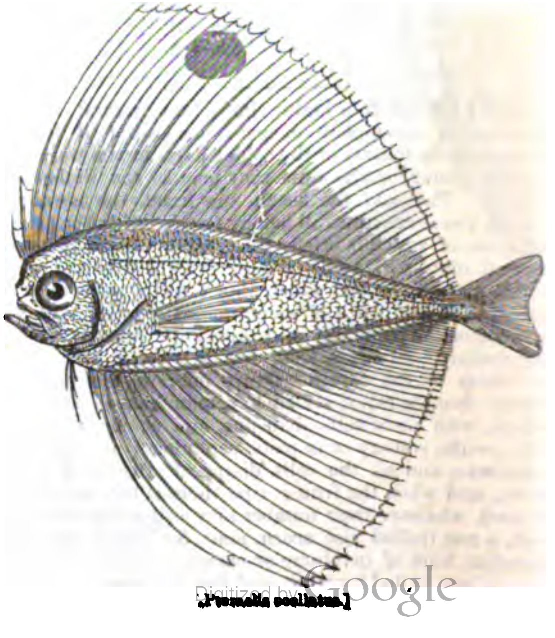
Subgenus *Astrodermus* (Bonnelli). But one species of this subgenus is known. The generic characters are:—head elevated, mouth but slightly cleft; dorsal fin extending nearly the whole length of the body; ventral fins very small, and placed on the throat; branchiostegous rays four.

Astrodermus Coryphænoides (Cuv.) is from twelve to fifteen inches in length, and of a pale rose colour, with five or six longitudinal rows of round black spots; the dorsal and anal fins are blackish, and the pectoral and caudal fins are of a red hue. The most remarkable character of this fish, however, consists in the scales, which, instead of folding over each other in the usual way, are scattered over the body and head; they are very minute and serrated, and, under a lens resemble small stars. It inhabits the Mediterranean.



[Astrodermus coryphænoides.]

Subgenus *Pteraclis* (Cuv.) The species of this group are



[Pteraclis ocellatus.]

remarkable for the immense size of the dorsal and anal fins, each of which springs from between two tiers of scales, which form a protection, and probably give strength to the basal portion of the fin-rays. These fins extend the whole length of the body; the head and teeth are nearly the same as in the true Coryphænæ; the scales are large.

Pteraclis ocellatus (Cuv.), is about four inches in length, and of a silvery hue; the pectoral and caudal fins are yellowish; the others are blueish grey, and the dorsal fin has a large blue spot near its highest part.

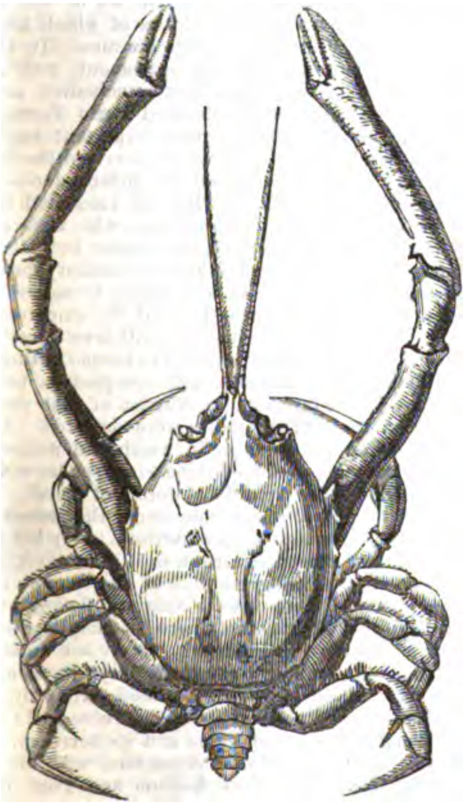
CORYPHÆUS. [CHORUS.]

CORYSTES, a genus of brachyurous or short-tailed crustaceans. Exterior *antennæ* longer than the body, setaceous, with two rows of cilia. *Jaw-feet* (pieds-machoires) having their third joint longer than the second, straight, terminated by an obtuse point, with a notch upon its internal border. *Eyes* rather distant, borne upon large peduncles, which are nearly cylindrical, and somewhat short. *Anterior feet* (chelæ) large, equal, twice as long as the body, and nearly cylindrical in the males; in the females, of about the length of the body, and compressed, especially towards the *hand* (manus). *The other feet* terminated by an elongated nail or claw, which is straight, pointed, and channelled longitudinally. *Carapace* oblong-oval, terminated by a rostrum anteriorly truncated and bordered posteriorly. The *regions* but slightly indicated, with the exception of the *cordial region*, the *branchial* or *lateral regions* being very much elongated.

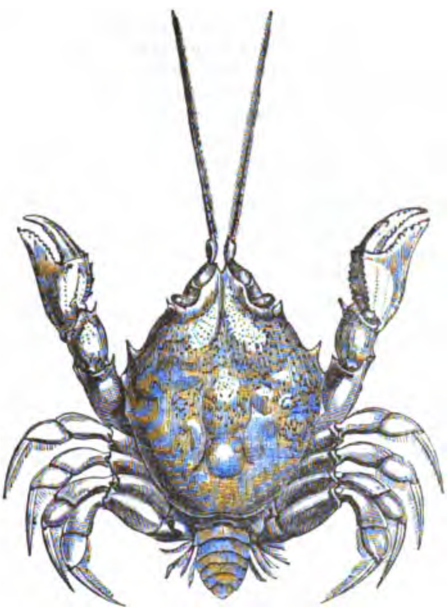
M. Desmarest is of opinion that the natural relations of this crustacean approximate it to *Atelecyclus*, *Thia*, and *Leucosia*, of which M. Latreille forms his orbicular tribe (*Les Orbiculaires*). Dr. Leach, he adds, in his method, placed them near the first two of the above-mentioned genera, solely because they have the same number of abdominal articulations. The *Leucosiæ*, in which the number of those articulations is less considerable, are removed to a distance.

Example, *Corystes Cassivelaunus*, Leach; *Corystes dentata*, *Corystes dentatus*, *Corystes longimanus* of Latreille, *Cancer Cassivelaunus*, *Long-clawed Crab* of Pennant, *Cancer personatus* of Herbst, *Albunea dentata* of Fabricius.

Description.—Surface of carapace somewhat granulous, with two denticles between the eyes and three sharp points directed forwards on each side. The male has but five abdominal pieces; but, as M. Latreille observes, the vestiges of the separation of the two others may be clearly remarked upon the intermediate or third piece, which is the largest of all.



[Corystes Cassivelaunus, male.]



[Corystes Cassivelaunus, female.]

Locality.—The coasts of England and France. The specimens figured by Pennant were dredged up from the deep near Holyhead and Red Wharf, Anglesey.

CORYTHAIX. [TOURACO.]

COS (Κῶς), an island in the Archipelago, the modern name of which is Stanco. It lies in the mouth of the gulf of Ceramus; its principal city, which was immediately opposite to Halicarnassus, was destroyed by a great earthquake in the Peloponnesian war. (Thucyd., viii., 41.) This city was, in very antient times, built on the other side of Cape Scandarium, which points up the gulf, and was called Astypalæa (Old-town). The new capital was not large, but well built and picturesquely situated. (Strabo, p. 657.)

Cos must have been colonized from Greece at a very early date. The inhabitants were Greeks even before Homer's time (*Iliad*, ii., 655 and 677; xiv., 2, 6, compare Strabo, pp. 573, 653); the mother-city of this Dorian colony was Epidaurus (Herod. vii., 99), as is indeed sufficiently shewn by the worship of Æsculapius, which prevailed in such a remarkable degree both at Epidaurus and in Cos. (Pausan., iii., 23, § 6.) There was a house of Asclepiadæ at Cos, to which Hippocrates was related, and we are told that he compiled his system of medicine from the tables of cures suspended in the Coan temple of Æsculapius, which was as celebrated in its way as the corresponding one at Epidaurus. (Strabo, pp. 373, 657.) A similarity of origin and religion induced the Coans to form a league with Halicarnassus, Cnidos, and the Rhodian Tripolis; and the confederacy celebrated the Triopian rites on a promontory of that name near Cnidos. (Herod., i., 144.) The constitution of Cos was in all probability originally the same with that of Epidaurus, namely, an aristocracy.

About the year 486 B.C. we find Cadmus, from Messana, reigning in this island by the appointment of the king of Persia; but after ruling a few years he restored the former constitution, and went with Epicharmus, the comic poet, who was a native of Cos, to Messana. (Müller, *Dorians*, i., 8, § 5, note 9.) It seems, however, that the island did not long enjoy the old form of government, for we find it just about this time under the authority of Artemisia. (Herod., vii., 99.) In later times a democracy was established, but it did not last long, for the violence of the demagogues forced those of the better sort to conspire together against them, and put down the republican constitution to which they owed their power. (Aristot. *Pol.*, v., 5.) The wines of Cos were famous throughout Greece. The climate is said to be delightful. (Leake's *Morea*, ii., 429.)

COSECANT, COSINE, &c. [TRIGONOMETRY.]

COSENZA. [CALABRIA.]

COSI, RIVER, rises in the Nepaul hills, near Catman doo. At first it flows in a south-east direction to the town of Chattra, in 26° 53′ N. lat., and 87° 4′ E. long.; turning then more to the south, it enters the district of Purneah, twenty miles to the north of Nauthpore. Its channel is in this part nearly two miles wide, but, except in the rainy season, presents little else than sand-banks and a succession of small islands. It passes the town of Nauthpore, still running nearly due south, and continues this course until at about 300 miles from its source it joins the Ganges in 25° 25′ N. lat., and 87° 18′ E. long.

CÖSLIN, COESLIN, or KOESLIN, a government circle in the eastern part of the Prussian province of Pomerania. It is bounded on the north by the Baltic, along whose shore it extends for above 100 miles; and on the east by West Prussia. It has an area of about 5428 miles (nearly twice the surface of Lincolnshire); is divided into nine minor circles, and contains 23 towns, 1 market-town, and 1142 villages. The surface is a level, occasionally broken by elevations, and rising into sand-hills near the Baltic. There are considerable woods and forests. Cöslin is watered by the Rega, Persante, Wipper, Stolpe, and numerous other streams; it has several lakes, but none of any considerable dimensions. Agriculture and grazing are the chief pursuits; to these must be added the manufacture of woollens, cottons, ribbons, leather, iron-ware, glass, paper, tobacco, &c. Amber is obtained along the whole coast. The population in 1817 was 244,515, of whom 239,000 were Protestants, 3336 Roman Catholics, and 1585 Jews. In 1831 the number of dwelling-houses was 36,322, and the population had increased to 323,450, and in 1834 to 329,298.

The stock in 1831 consisted of 43,687 horses, 129,681 heads of cattle, and 506,476 sheep and goats. The chief towns, besides Cöslin, the capital, are Stolpe, (6600 inhabitants), Colberg (6300), Rügenwalde (3400), Neustetten (3250), and Belgard (2800).

CÖSLIN (formerly Cholin), the capital of the government circle, and of the principality of Camin, is about five miles from the Baltic, and situated on the banks of the Niesenbecke, or Nesebach, which falls into the Lake of Jasmund. Cöslin lies at the foot of the Gollenberg, from which it is supplied with fresh water by means established in 1734, and is above a mile in length. Cöslin, which is situated in 54° 13′ N. lat., 16° 12′ E. long., is well built, surrounded with a wall, and has 4 gates, 3 suburbs, 1 market-place, 1 Lutheran church, 2 chapels, 690 houses, and about 6600 inhabitants: an increase of about 1700 since the year 1817. It was formerly the residence of the bishops of Camin, and is now the seat of provincial administration, and of the superior courts of judicature. It has a gymnasium, and a seminary for educating teachers. The population is chiefly engaged in navigation and commerce, and the manufacture of Russia leather, linens, woollens, and tobacco, as well as in dyeing, brewing, and fishing.

The spacious market-place contains a statue in freestone of Frederick William I., who had the town rebuilt in a regular style after its destruction by a dreadful conflagration on the 11th of October, 1718. On the Gollenberg is a monument commemorative of the Pomeranians who fell in the campaigns of 1813, 1814, and 1815. In the vicinity of Cöslin is the lake of Jasmund, on the banks of which the antient Jomsburg is said to have stood.

COSMO THE ELDER. [MEDICI.]

COSMO I., duke of Florence, and afterwards grand duke of Tuscany, was the son of Giovanni de' Medici, a celebrated condottiere of the fifteenth century, who was descended in a direct line from Lorenzo, the younger brother of the elder Cosmo. This line formed a collateral branch of the first house of Medici, and its members remained in a private station as wealthy citizens of Florence during the lives of Cosmo, Pietro, Lorenzo the Magnificent, and Leo X., taking little part in the civil broils which agitated the republic under the administration or influence of the elder branch. That branch became extinct by the death, in 1519, of Lorenzo de' Medici, duke of Urbino, the only legitimate grandson of Lorenzo the Magnificent, which was followed soon after by the death of his uncle, Pope Leo X. The duke of Urbino left an illegitimate son, Alessandro, who was made duke of Florence after the surrender of that city to the allied arms of Charles V. and of Pope Clement VII., in 1530. Alessandro was a profligate prince, and after several years of tyranny was murdered by his relative Lorenzino, who belonged to the junior branch of the Medici, in 1537. Upon perpetrating this murder, Lorenzino fled to Venice. The friends and councillors of the late duke, with Guicciardini the historian at their head, proposed to appoint young Cosmo, of the younger branch of the Medici, as successor to Alessandro. Cosmo had against him a number of emigrants, some of the first families of Florence, who were hostile to the Medici, some through jealousy and rival ambition, and others because they wished to re-establish the republic. These emigrants were scattered about the different Italian cities, and were encouraged and supported by Pope Paul III., by Count Pepoli of Bologna, and others. They also relied on the protection of Francis I. of France, while Cosmo on his side was protected by the emperor Charles V., who acknowledged him as duke of Florence. The emigrants, having collected a few thousand men, invaded the Florentine territory, but were defeated by the troops of Cosmo at Montemurlo; and their leaders, Albizzi, Valori, and Filippo Strozzi, were taken prisoners and put to death. From that time Cosmo reigned absolute lord of Florence. He extinguished all remains of popular liberty, and he established a system of inquisitorial police by means of numerous informers. Persons accused of any designs against the government were tortured, and often put to death. He had agents also in various parts of Italy to watch the conduct of the Florentine emigrants, and in some instances to get rid of the most dangerous by assassination or poison, as in the case of Lorenzino, who was murdered at Venice by his order, in 1548. He effected a striking change in the manners of the Florentine people, who were before noted for their garrulity and lightness of conversation; they became henceforth taciturn and cautious, and spoke in half sentences. In other respects the administration of Cosmo was orderly and wise; he was attentive to business, and looked himself into all public affairs. He had considerable abilities; and if he rendered Florence and Tuscany entirely dependent on his will, he at the same time succeeded by consummate political skill in keeping his state independent of all foreign powers. He would be master at home: he freed his towns from the imperial garrisons, and resisted several attempts at encroachment from the court of Rome. He was the first to establish the unity and independence of Tuscany as a political state. He formed a native militia of the peasantry, well exercised and disciplined by experienced officers, so that at three days' notice he could collect 12,000 men in any particular point, besides the regular regiments which he kept in the towns. His finances were in good condition, and his treasury always well supplied with money.

Cosmo possessed at first the territories of the two republics of Florence and Pisa, the latter of which had been conquered by the Florentines before his time. In 1552 he added to his dominions, by an agreement with Jacopo d' Appiano, lord of Piombino, that principality, and also the island of Elba, when he fortified Porto Ferrajo, and improved its harbour. But a more important acquisition was that of Siena. That republic had survived the freedom of Florence, and had retained its independence under the protection of Charles V. But in 1552 civil factions having broken out among the citizens, who were excited also by the Florentine refugees, they drove away the Spanish garrison and admitted a French auxiliary force. In the following year Charles V. sent troops to reduce Siena, and Cosmo joined his forces to those of the emperor. Not succeeding that year, the emperor withdrew most of his troops; but at the beginning of 1554 Cosmo put together a larger force, attacked Siena, and occupied its territory. At the battle of Marciano, in August of that year, the Siennese and their French allies were defeated. After a long and obstinate resistance, in which the women took part, Siena was compelled by famine to surrender to Cosmo in April, 1555. The conditions were not harsh. Siena retained her municipal institutions under the protection of the emperor, who was to keep a garrison in it; but in the mean time Cosmo placed a garrison in it himself. All those citizens who chose to emigrate were at liberty to do so. A great many availed themselves of this stipulation, and retired to the town of Montalcino, where they kept up the semblance of a republic a little longer. Of 40,000 inhabitants which Siena had previous to the siege, only 6000 remained: the rest had either died or emigrated. In July, 1557 Cosmo received of Philip II., who had succeeded Charles V., the formal possession of Siena and its territory, exclusive of the coast near Monte Argentaro, with the ports of Orbitello, Telamone, Santo Stefano and Port' Ercole, which remained as a dependency of Spain, and were afterwards annexed to the crown of Naples under the name of 'Stato de' Presidj.' The Siennese swore allegiance to Cosmo, who left to them their municipal laws and magistrates. In August, 1559, the small residue of the Siennese republic at Montalcino surrendered to Cosmo. All Tuscany was now, for the first time since the fall of the Roman empire, united under one government.

Cosmo married Leonora, the daughter of Don Pedro de Toledo, Spanish viceroy at Naples, and had five sons by her. Two of these, Giovanni, who had been made a cardinal, and Garzia, died suddenly towards the end of 1562, and their mother soon after followed them to the grave A report was spread and readily believed by the numerous enemies of Cosmo, that Giovanni had been killed by his brother, after which Cosmo, in his wrath, had killed Garzia with his own hand. Alfieri has made this the subject of a tragedy. Probabilities, however, are against the truth of this assertion. (Botta, *Storia d' Italia*, lib. xii.) Cosmo's eldest son, Don Francesco, married the archduchess Joanna, daughter of the emperor Maximilian. In 1569 Pope Pius V., by a solemn bull dated 28th August, conferred upon Cosmo and his successors the title of grand duke of Tuscany, as superior to all dukes and princes, and inferior in rank only to kings. In the following year Cosmo went to Rome to receive his grand ducal crown from the hands of the pope. In his bull the pope set forth the merits of Cosmo towards the Holy See for having entered zealously into the war against the Turks, and founded the military order of St. Stephen, in imitation of that of St. John of Jerusalem, for having given assistance to the king of France against the Huguenots, and having prosecuted the heretics in his own dominions. The Inquisition was established in Tuscany; but Cosmo insisted upon having reports of its proceedings, and that its sentences should not have effect without his approbation. Several, however, suffered death for heresy or blasphemy; one of whom, Pietro Carnesecchi, a Florentine, who was very intimate with Cosmo, and had been repeatedly charged with heresy, being demanded by Pope Pius, was given up by the duke, taken to Rome, and there sentenced to death, and publicly executed in September, 1567.

Cosmo spent the latter years of his life chiefly at one or other of his villas, having entrusted the cares of administration to his son Francesco in 1564. Many things are said of the irregularity of his life in his old age, and his sons Francesco and Pietro were worse than their father in this particular. In 1570 he married Camilla Martelli, a private lady of Florence. Cosmo died 21st April, 1574, in the palace Pitti, which had become the residence of the grand dukes, and was succeeded by his son Francesco.

Cosmo, though an unprincipled man, was a very able statesman. In the general breaking up of most of the Italian independent states in the sixteenth century, he found means to create and consolidate a new and considerable principality, which has remained ever since independent, and he thus saved that fine country Tuscany from becoming a province of Spain, like Naples, Sicily, and Lombardy. He had the firmness to refuse Philip II.'s first offer of Siena as a fief of the Spanish crown, answering, that he was an independent sovereign, and would not make himself the vassal of another. He refused the crown of Corsica, which was offered to him by the insurgents in 1564, because it would have embroiled him with other powers and endangered his own states. Cosmo encouraged the arts and literature. He founded the Florentine Academy, the Academy del Disegno, or of the fine arts; and he restored the University of Pisa. He was the friend of several learned men, among others of Benedetto Varchi, a republican of the old school, who wrote his history under his patronage, and Cosmo was not offended at the freedom of his sentiments. The Medici dynasty founded by Cosmo became extinct in 1737 by the death of the grand duke Gian Gastone. He was succeeded in his sovereignty by Francis duke of Lorraine, the husband of Maria Theresa of Austria. (Botta, *Storia d' Italia;* Galluzzi, *Storia del Gran Ducato di Toscana;* Ammirato, *Istorie Fiorentine*, &c.)

COSMO'GONY, in the proper sense of the term, is the science of the creation of the world. As the creation of the world was not observed by man, and as it is not possible for man to observe the creation of a world, so cosmogony cannot be a science founded on direct experience, but must necessarily be a philosophical science. But though cosmogony belongs to the department of philosophy, yet, as it requires an accumulation of facts and observations to rest on, it must still be classed under the division of practical philosophy. The antients not possessing these facts and observations, cosmogony has only become a science in modern times. The German philosopher Kant has denied the capacity of the human mind to entertain this science.

The doctrine of the creation of the world may be considered in three ways: the inqurer either confines himself to the creation of our earth, and reduces cosmogony to geognosy, geogony, speculative geology, and oryctognosy, (which latter is a science of itself,) or he may merely investigate the creation of celestial bodies, or he may extend his researches to the origin of creative power, and the creation of the elements of matter.

The first of these modes of investigation is pure cosmogony; the second is a union of cosmogony with dynamogony, physiogoy, and speculative chemistry and physics. The antients speculated or dogmatized in both these divisions of the science. Anaximander considered the sun to be only a little larger than the Peloponnesus; Leucippus and Democritus asserted the existence of different kinds of atoms, and that the soul also was composed of atoms. Heraclitus supposed heat to be the primitive element and the omnipotent power. Plato, besides an eternal supreme intelligence, believed in the existence of a primitive and eternal matter, which was divided by the intelligence into the four recognised elements, and vivified by a soul, making the world an animal, with the stars as limbs. Aristotle admitted the elements of Plato, but denied the soul; substituting in its stead individual souls. Epicurus supposed an infinite variety of atoms, which being in constant motion, form bodies by accidentally coming into contact with each other. Empedocles, the most enlightened of these antients speculators, believed that the four elements were not originally individually developed, but were in a state of amalgamation; that, after the developement of the elements, enmity (repulsion) and friendship (attraction) became inherent properties of them, and that the soul was formed of these elements, fire predominating in it. Pythagoras, in consequence of his numeric system, taught a central heat, the existence of ten spheres, the sun, moon, five visible planets, the earth, an opposite earth, and the stars; also a music of the spheres, produced by the harmonic movements of the heavenly bodies. The new Platonic school of Alexandria, under Ammonius, Plotinus and Iamblichus, believed every thing to be an emanation or effusion from a supreme power.

Modern cosmogonists may be divided into two classes; first the dogmatists, as Buffon in his Histoire Naturelle, Wolff in his Cosmologia, Maupertuis in the Essai de Cosmologie, Lambert in the Kosmologische Briefe, Dalberg in the Betrachtungen über Universum, Berger in his Philosophische Darstellung des Weltalls, Des Cartes, Opera Omnia, lately edited by Victor Cousin; and Hollbach in the Systême* de la Nature. Secondly, the critical cosmogonists, who conduct their inquiries according to the principles of Kant, as developed in his Allgemeine Naturgeschichte, und Theorie des Himmels; and in detached parts of the philosophical systems of Schelling, Hegel, Herbart, and in the Naturphilosophie of Oken, which contains a complete system of cosmogony, dynamology and physiogoy and in a little work of John Müller. entitled Ueber die Entstehung der Welt aus Nichts, of which, as it is the latest German publication on the subject, we give an abstract.

Müller, after premising that *nothing* cannot be productive of anything, admits the existence of an original governing power, possessed of omnipresence and consciousness, consequently of omnipotence and universal benevolence, but unembodied. From eternity this power designed the formation of the world, which could only be effected in one of two modes, either in a pantheistical or spiritual mode. As in the abstract, or in the world as it is objectively, there exist no limited magnitudes or quantities, but only the infinitely great or infinitely small, out of the amalgamation of which, things limited or measurable proceed, such a power, as before described, could create the world either with his own entire and undivided power, bestowing on it an all-pervading soul, contradistinguished from individual souls, which is the doctrine of Pantheism; or the intelligence has parted with an infinitely small portion of its power, which of itself created the world: this is the doctrine of Spiritualism. This last process this writer considers to have been the case, and asserts that the infinitely small portions of power which the intelligence parted with are what we call time. The continued existence of time not only shows the continual existence of the power predicated, but also disproves Pantheism. The act of parting with power or forces, frequently observable in organic chemistry, is apparent to sensible creatures in space, and the act of parting with time in indefinite space. If an eternity be allowed to an infinitely small portion of power for growth or formation, it must become definite: an eternity of passed time is equal to existent power. A point being given, as a centre in indefinite space, a nebula is immediately formed by this power, and, according to Müller, the action of this original power is three-fold, viz. by attraction, repulsion, and a power indifferent to both, which is quiescent, and what we call original matter, or physis, or hyle, or æther; and there being a constant preponderance of attraction to the centre, the æther is attracted or compressed towards it. Besides this, the nebula possesses a rotatory motion, of which even the smallest parts partake, and assume the form of a vortex or atom. Every vortex possesses attraction, repulsion, æther, and, as it turns upon its axis, a rotatory motion. Either the vortex has just the degree of velocity in its rotation, which, added to the constantly decreasing repulsion, is equal to the attraction, and then the vortex is fluid, and assumes the form of drops; or there is a preponderance of rotation, when the vortex becomes gaseous; or there is too little rotatory motion, in which case the vortex concentrates itself into a substance, and throws off particles, which move round it as a centre and together form a system: the vortex then is solid or fixed. The vortices are atoms; the rotatory motion when increased is heat; when diminished is cold.

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* This celebrated work has been ascribed to Mirabaud and La Grange, but was in fact written by Baron Hollbach, when residing in the house of La Grange.

Every vortex or atom, as soon as it has positively adopted one of the three forms, fluid, gaseous, or solid, is an element, and is unchangeable. There is in the universe an infinite number of elements, which differ in their inherent powers according to the different quantities of æther which they contain. These elements may be denominated metals, and of them oxygen, as containing the least attraction, may be overcome by any of the others; when thus overcome the process is called oxidation. The more solid and dense elements accumulate round a heavenly body in the progress of its formation, while the lighter and finer elements settle on its surface; thus oxygen is everywhere in our atmosphere. Out of these materials an original central heavenly body formed itself. According to mathematical laws, rotation must have increased in proportion as the condensation augmented, and consequently the more dense the vortices or atoms became, the greater was their rotatory motion, which produced increase of heat, and consequently oxidation of oxygen, and fire, and the throwing off, from the equator of the original central heavenly body, masses of burning and melting metals; in proof of which it has been calculated that our earth would throw off masses from the equator if it revolved upon its axis 121 times quicker than a cannon ball flies, and that these fragments would move round the earth as its satellites.

Applying this process to the original central heavenly body, we arrive at the result that the twenty millions of stars of the Milky Way are the first regular metallic fragments thrown off by that body, while the few thousands of stars, visible to the eye, and the sun, are the later and irregularly-ejected portions, all of which still burn, and consequently give light and heat to their respective planetary systems. The planets are probably thrown-off portions of the sun, and, in consequence of their now limited size, have long since cooled, grown habitable, and become satellites of the sun. He considers comets to be masses of water, or of vapour arising from water.

In thus giving an account of this system of cosmogony, it is almost unnecessary to observe that it is merely presented here to show what kind of speculations the term cosmogony, as at present understood, includes.

COSMO′GRAPHY (κοσμογραφία), the description of the system of the world, from the two Greek words γράφω, to write, and κόσμος, which signifies the world, or the universe, considered as a system of order. Cosmography, strictly limited, has nothing to do either with the origin and creation of things, which is the subject of cosmogony, nor with the metaphysical philosophy of the constitution of things, which is cosmology. It is merely the description of the system of the material world, as it is, or as it appears to our senses. Nor does it comprehend any examination of the separate parts of the system, except in so far as each is connected with the whole, any more than the description of a machine comprehends any account of the wood or iron or other material of which it may be fabricated. Yet this distinction has been sometimes neglected. There is a work, for instance, by Paul Merula, under the title of 'Cosmographia Generalis,' fol. Amst. 1621, which is in the greater part merely a description of the different countries of the earth, or in other words a treatise of geography. In like manner, the English work of Dr. Heylin, first published in 1622 under the title of 'Microcosmos,' and afterwards under that of his 'Cosmography,' is merely a compilation of geography and history. The word cosmography may perhaps legitimately admit of some variety of acceptation, in regard to the extent of what is to be considered the system of the world, or of the universe. Of the universe absolutely we can of course predicate nothing; but as anything may be called the whole which can be regarded as complete in itself, so the word universe is applied sometimes to this globe alone, which in one sense is the universe to us, and sometimes to that solar system of which our globe is one of the parts. But the term cosmography might also, without impropriety, be used as meaning a view or description of any separate portion of the entire universe still more extensive than the solar system.

COSNE, a town in France, in the department of Nièvre, on the right or east bank of the Loire, just at the junction of the little river Novain, 102 miles in a straight line S. by E. of Paris, or 110 miles by the road through Fontainebleau and Montargis, 47° 24′ N. lat. and 2° 56′ E. long. Cosne is a town of considerable antiquity, and appears in the 'Itinerary of Antoninus,' under the name of Condate, a Celtic word, denoting 'a corner,' and applied commonly to places situated in the angle formed by the junction of two streams. (D'Anville.) In the records of the middle ages the town is mentioned by the name of Condida.

Cosne is situated in a country rich in iron ore, and is one of the principal towns for the manufacture and sale of iron goods. Knives and scissars are mentioned by Expilly (1762) as the principal articles of manufacture: since his time the manufacture of anchors of the largest size, cannon-balls, and iron work for ships or for warlike purposes, has grown to great importance; that of cutlery is still carried on. There are several cooperages; gloves are also made. The town is situated at the foot of a plateau or table land; it is neat and well laid out, though in the older part the streets are narrow. There is a handsome theatre, and there are several good inns, and a public walk on the bank of the Novain. The population in 1832 was 5123 for the town, or 5987 for the whole commune.

Before the revolution this town contained several monastic establishments. It has now a court of justice (*Tribunal Civil*, or *Tribunal de Première Instance*) the court-room of which is handsome. It is the capital of an arrondissement, occupying the north-west extremity of the department, and containing (in 1832) a population of 66,850; there are in it many iron works.

COSSACKS, a people inhabiting those parts of the Russian empire which border on the northern dominions of Turkey, Poland, and Tartary, as well as the southern parts of Siberia. Both the name and origin of this singular people are involved in uncertainty: the former they appear to derive from the Tartar word Kasak or Kaisaks, signifying light-armed mercenary horsemen. They were for a long time known by the Caucasian appellation of Tsherkassi (or Circassians), and to this day call their capital Tsherkask. As to descent they appear to be of the native Russian race, intermixed with Tartars, Calmucks, and Gipsies, an origin of which their language and religious practices leave scarcely a doubt. Russian forms the groundwork of their dialect; in military matters it is corrupted with Turkish, and in legal affairs with Polish words. The first mention made of them is about the time of the downfall of the Tartar dominion in Russia. As a united people they seem to have sprung up in Southern Russia out of the remains of that dominion. There, amalgamating with the natives and fugitives from all parts, they gradually extended their power to the Bug and Dniester, building towns and villages, and waging war against the Turks and Tartars. For the purpose of defence they were classed into the married and unmarried, of whom the latter devoted themselves exclusively to the profession of arms, warfare, and plunder. They fortified themselves in their head-quarters on an island of the Dnieper called Korlitzkoi-Ostrof, from three streams on the right bank of the river. They gave this settlement the name of Setch or Setcha, while they themselves, from their local position, bore that of Zaporoghes. The married men lived at some distance from the spot, in villages, between the Dnieper and Bug. At this period, the middle of the fifteenth century, the Cossacks do not appear to have had any regular government; but when the emergency arose they elected a chief, whose authority terminated with the cessation of the emergency. They furnished troops at their own cost to the Voivodes, established in the Ukraine by the Lithuanian princes.

Towards the commencement of the sixteenth century, a kind of military republic, governed by elective chiefs, was established among these rude tribes by a Russian of low origin but great courage. They had not at this time assumed the name of Cossacks, nor were they known by it in history until the year 1516, when they began to act a conspicuous part in Polish affairs.

In 1575 Yermak or Yermolai-Timofief, a Cossack of note, exasperated by Muscovite oppressors, who had subjugated the Cossacks of the Don in 1549, deserted his quarters on that river, directed his flight along on the Volga, destroyed the Khannate of Kutchum, and then established his followers in the south of Siberia; hence arose the nation of the Siberian Cossacks. In 1580 the Cossacks are first mentioned as distributed into 'Pulks,' or regiments, on the occasion of their defending Tshegrin, in Poland, against the Tartars, under the command of Ostafy Dakiewitsh. Ten years before, upon their return from a victorious campaign against the Turks, as auxiliaries of Ivan IV. of Muscovy, they founded New Tsherkaskoi on the right bank of the Don. They next accepted the protection of Poland, and, in 1592, Stephen Bathory, the king of that country, divided their forces into 10 regiments of infantry and 2000 horsemen, the latter receiving pay out of a tax levied upon the rebel peasantry. He also appointed an Attaman or Hetman as chief over them, and his successors endeavoured on all occasions to interpose them as a barrier against the incursions of the Tartars of the Crimea and Budjak, and hence arose their implacable enmity to the Turks and Tartars. The encroachments made on their rights by Sigismund III. gave rise to a long series of contentions, which ended by Chmielnitzki, their Attaman, seeking the protection of Russia in 1654. At this time their force consisted of 15 regiments, 37,549 men strong, besides some hundreds of horsemen. They remained faithful to Russia until the year 1708, when their Attaman Bulavine went over to Charles XII. of Sweden; but he was not followed by the Zaporoghes of the Dnieper. They again became subject to Russia, and in Peter the Great's time we find him disbanding the Cossack regiments in his service, and re-modelling them. This harsh measure induced them to throw themselves into the arms of the Khan of the Crimea; but they speedily became disgusted with their new masters, and successfully sued for pardon of the Empress Anne, who allowed them to settle again on the Russian territory. Here they remained until they provoked the Empress Catherine by their turbulences, who ordered their Setcha to be destroyed, the inhabitants to be scattered, and the Cossacks of the Ukraine to be formed into regiments of hussars. The Zaporoghes were banished to the peninsula of Taman, and from these exiles sprang the present Cossacks of the Euxine. In later times the Cossacks have been allowed the tranquil enjoyment of their settlements, and have been exempted from taxation on condition of furnishing certain contingents to their Russian masters. In 1831 the emperor Nicholas re-established the regiments of the Ukraine under the denomination of the Cossacks of Little Russia. At present their troops are wholly composed of cavalry, and are thus distributed:—

Imperial Guards.			Men.
Cossacks of the Don	1 regt.,	10 squads.,	1200
” Euxine	1	2	240
” Ural	1	—	120
” Attaman	1	10	1200
			2760

Of the Line.			Men
Brought forward			2,760
Cossacks of the Don	70	350	42,400
” Euxine	21	195	12,600
” Little Russia	18	90	12,800
” Siberia	30	150	18,000
” Ural	10	50	6000
” Upper Terek	3	15	1500
” Lower do.	3	15	1800
” Volga	3	15	1800
” Bob	3	15	1800
	164	917	101,760

Besides two batteries of horse artillery of the Don. One-half of this force is always kept in readiness for service; the other forms the reserve: the whole however may be called out at once, and the strength of the regiments may be augmented at the emperor's mandate. Every Cossack, between the ages of 18 and 40, is liable to perform military duty. Each regiment is drawn from one or more stanitzas or districts, and every Cossack is required to supply himself with a horse, arms, and equipments. The young are called out first, and men of advanced age are retained as the reserve, unless they volunteer for field duty. The recruits are more favoured than any others in the Russian service; they are neither chained on the march to head-quarters nor subject to bodily examination. In time of war the period of service is unlimited; in time of peace it is confined to three years. The Cossacks of the Euxine, who are attached to the corps stationed in the regions of the Caucasus and Georgia, are almost invariably in active service. There is no longer a local Attaman; Count Razumoufsky, the last chief of the Ukraine, was dismissed by Catherine II., and the post of Attaman of the Don has been suppressed by the present emperor. The nominal dignity of Attaman is vested in the heir-apparent to the Russian crown. The Cossack receives no pay but when in the field or on the Russian frontier. The dress of the soldiery is a short vest in the Polish style, large trowsers of deep blue, and a black sheepskin cap. Their arms consist of a long spear, sabre, musket, pair of pistols, and a whip with a leather thong, called a natraika, which they apply to their enemy's as well as their charger's back. They are mostly members of the Russo-Greek church, enjoy their own independent constitution, and are a purely military people. The only authority that we possess as to their actual numbers is a return of the year 1749, when the number of hearths was 118,459, and of male persons 955,228. In the beginning of the present century Archenholtz affirmed the number of males fit for duty to be 700,000.

COSSEIR, a town of Egypt on the Red Sea, in 26° 7′ N. lat., and 34° 21′ E. long. It is about 100 miles east of Kenneh on the Nile in Upper Egypt. The caravans which trade with Arabia, proceed from Kenneh to Cosseir, through the sandy desert east of the Nile; the track, about two thirds of the way from Kenneh, crosses a rocky ridge, on the east side of which a valley opens, leading to the coast of the Red Sea where Cosseir is situated. Several springs or wells are found on this track. The Ataoni Arabs live in this part of the country, and escort the caravans between Kenneh and Cosseir. Cosseir is only an open road, but it is the chief medium of communication between Egypt and Arabia, especially since Mehemet Ali Pacha has become master of the Hedjaz in the latter country. From Cosseir vessels cross over to Jidda, the port of Mecca, or to Yambo, the port of Medina. Cosseir is a small assemblage of poor dwellings, the resident population of which amounts to only about 1000; but there are large storehouses where the caravans deposit their goods. (See the Chart of the Red Sea, north of Jidda, 1836, published from the survey of Maresby and Carless.)

COSSIMBAZAR. [MOORSHELABAD.]

CO'SSONUS (Clairville), a genus of Coleopterous insects, of the family Curculionidæ. Technical characters:—Antennæ short, rather thick; funiculus seven-jointed, the basal joints longer than the following; club large, and of an oval form; rostrum rather long, thickened at the apex; thorax truncated before and behind, and somewhat depressed above; elytra elongate, moderately convex above, and covering the abdomen; tibiæ dilated towards the apex, where there is a large hook; tarsi rather slender, the penultimate joint bilobed.

About seventeen species of this genus are known, of which Schoenheer selects *Cossonus linearis* as the type. This species is not uncommon in England, and has been found in boleti and in old trees· it is about a quarter of an inch in length, and of a narrow elongated form, and black or brown colour; the elytra are punctate-striated. *Cossonus tardii* is another British species, which closely resembles the last, but is of a larger size, being nearly half an inch in length.

COSSUS (Fabricius), a genus of moths—section, Lepidoptera Nocturna—family, Hepialidæ (Stephens). Technical characters: antennæ long, rather slender, furnished on the inner edge with a series of transverse elevated ridges (which, when viewed from the side, resemble the teeth of a saw); two distinct palpi, thickly clothed with scales, and each three-jointed; head very small; upper wings longer and larger than the lower; body large.

Larva lignivorous. Pupa enclosed in a cocoon.

Cossus ligniperda (Fab.) is one of the largest of the British moths, measuring, from tip to tip of the wings when expanded, from three to three and three quarter inches. It is of a grey colour: the upper wings are mottled with white, and adorned with numerous irregular black lines; the under wings are almost of a uniform brownish-ash colour; the anterior part of the thorax is of a buff colour, and there is a transverse dark mark towards the posterior part; the body is of a dark brownish-grey colour, with rings of a silver-like hue.

The larva or caterpillar is about three inches in length when full-grown, and of a yellowish colour; the upper part of the body is pink, the head is black, and the first segment of the body (or that joining the head) has two irregular black patches above.

This caterpillar emits a very strong and disagreeable odour, and if touched with the hands, the scent cannot be discharged from them for some considerable time, although they may be frequently washed. It resides in and feeds upon the wood of the poplar, oak, and aspen; but old pollard willows appear to be its most favourite haunts. These we frequently see perforated with numerous oval holes, large enough to admit the finger, and when the caterpillars are abundant, the trees attacked eventually fall a sacrifice to their ravages. It is three years before attaining maturity, at which time it encloses itself in a tough cocoon, formed of pieces of wood joined together by a glutinous web.

The moth is common in various parts of the south of England, and is often called the *goat-moth*, a name which has probably been applied from the property of emitting a disagreeable odour having been transferred from the caterpillar to the moth.

A detailed history of the Cossus ligniperda will be found in the 'Mémoires pour servir à l'Histoire des Insectes,' by De Geer; and for its anatomy we refer our readers to the 'Recherches sur l'Anatomie et les Métamorphoses de différentes Espèces d'Insectes,' by L. L. Lyonet. This latter author has also published a substantial quarto work, with numerous beautiful plates, engraved and drawn by himself, which is entirely devoted to the anatomy of the caterpillar above mentioned. This work, which was the labour of years, must ever stand as a monument of the great skill and perseverance of its author, who boasts of having destroyed but one caterpillar for its completion. It is entitled, 'Traité Anatomique de la Chenille qui ronge le Bois de Saule,' &

CO'SSYPHUS (Olivier), a genus of Coleopterous insects, of the section Heteromera, and subsection Taxicornes. The principal character of this genus consists in the dilated and flattened sides to the thorax and elytra—a structure also found in many of the Nitidulæ and in the Cassidæ. These insects, if it were not for the dilated portions of the thorax and elytra, would be of a long and narrow form, but with these parts they present an oval outline. The thorax is nearly semicircular, and its dilated margins, as well as those of the elytra, are semitransparent. The antennæ are eleven-jointed; the four last joints are considerably thicker than the preceding, and rather flattened; the terminal joint of the maxillary palpus is dilated, and of a somewhat triangular form; the head is completely hidden by the anterior part of the thorax.

These insects inhabit the south of Europe, and the northern parts of Africa and India. About ten species are known.

Cossyphus Hoffmansegii is nearly half an inch in length, and of a dark-brown colour; the parts of the thorax and elytra which extend beyond the insect itself are of a paler hue. It is difficult to give an accurate idea of this curious insect, which appears as if it were an ordinary shaped beetle pressed against the under side of a little oval scale of wax, so that its impression is distinctly visible above, being convex, whereas the scale itself is concave.

The present genus, with two others (*Helæus* and *Nilio*), form, according to Latreille, the second tribe of the family Taxicornes, and are included under the head *Cosyphenes.*

COSTA-RICA. [CENTRAL AMERICA.]

COSTANTI'NA or COSTANTINAH, as the Arabs pronounce it, the ancient Cirta, once the capital of Numidia, is the capital of the east division of Algiers, and the largest town of the whole state next to Algiers itself. It stands on a steep rocky hill, round three sides of the base of which flows the river Rummel, which is the principal affluent of the Wad-el-Kebeer, the ancient Ampsaga. The rocky peninsula on which the town is built is joined on the south-west side by a neck of land to the adjacent country. The country around Costantina is a high terrace between the lesser or maritime Atlas to the north, and the higher or central chain to the south. The Wad-el-Kebeer, and the Seiboos, or river of Bona, both flowing northwards into the Mediterranean, and the Sirkah or Abeadh river, which flows southward into the Melgigmarsh, have their sources in this high land. The central Atlas range which runs from west to east through the province of Titterie, on entering the borders of the province of Costantina, south of the Jurjura mountains, which belong properly to the Maritime Atlas, inclines to the south-east, forming the groups called Vanougah, I-aite, Sellim, and Mustewah; it then joins the extensive group called Jebel Auress, which is directly south of Costantina, beyond which it continues in an east direction, forming the mountains of Tipasa, in which the Mejerdah has its sources, and which extend into the kingdom of Tunis; from the Jebel Auress, however, an offset is detached to the north-east, separating the waters of the terrace of Costantina which flow northwards into the Wad-el-Kebeer and the Seiboos from those which flow eastward into the Mejerdah or Bagradas. East of this ridge, and towards the sources of the Mejerdah, are the plains of Myskianah, renowned for their fertility; they belong to the province of Costantina, and border on Tunis.

Among the towns are Tipsa or Tipasa, Gella, a frontier town and garrison near the Mejerdah, which is here called Serrat, and further north, in the valley of the Sujeras, an affluent of the Mejerdah, is Tiffesh, the ancient Thebestis. This part of the country has been lately visited from the side of Tunis by Sir Greville Temple, *Excursions in the Mediterranean*, 1835.

The road from Algiers to Costantina, after crossing the river Isser, passes over the southern skirts of Mount Jurjura, and then enters a narrow defile called by the Arabs Beeban, or 'the gates,' and by the Turks, Dammer Cappi or the 'iron-gates,' which is cut through perpendicular rocks. Six miles east of it is another difficult pass called Accaba, or 'the ascent,' being over a ridge which seems to connect the Maritime Atlas with the more south or central range. The road lies over a high narrow ledge with precipices on each side. Descending to the east, the road enters the fertile plain or terrace of Mayanah. In this region the Boosellam, an affluent of the Boojeyah river, has its source. Proceeding to the east is Zammorah, known for its olive plantations, and farther on the road to Costantina is Seteef, the Colonia Sitifensis, of which Shaw describes some remains. The town stood on a hill facing the south, near the Boosellam. In the plains south of Seteef, which consist chiefly of pasture land, dwell several Arab tribes, one of which, the Beni Ammer, have a very bad character. About twenty miles south-east of Seteef, are Taggah and Zainah, in a fine open country at the north base of the Jebel Mustewah. At Zainah, Shaw saw the remains of a triumphal arch in honour of Severus, and other antiquities. He thinks that Zainah is probably the ancient Zama. About fifteen miles east of Zainah is Medrashem, in a plain on the skirts of the Jebel Auress, with a handsome sepulchral monument supported by pillars. On the opposite or south side of the Atlas ridge lies the valley of the Shatt or Shott, a marsh into which several streams empty themselves, and which is again separated by another more southern ridge from the Zaab, or valley of the Adje-dee river, where the Biscareens dwell. In the valley of the Shatt are the ruins of Thubuna, now called Thubna. This part of the country is inhabited by several powerful Berber tribes.

Returning to the latitude of Costantina, there seems to be to the east of Seteef a transverse ridge of high land which divides the plains of Seteef from the terrace of Costantina, which appears to be higher, and which extends nearly 80 miles towards the east, where it is bounded by the ridge already mentioned, which divides the sources of the Seiboos from those of the Mejerdah. This region, which is very elevated, consists of fertile plains with hills upon them, and to the south it blends itself with the valleys which lie within the extensive group of the Jebel Auress. The country is partly tilled and sown with corn, or planted with olive and other fruit-trees, and partly left for pasture. It also produces rice, hemp, flax, and tobacco. Between the Jebel Auress and the town of Costantina, is a mountain called Ziganeah, apparently a projection of the Auress, and at the foot of which lies Physgêah, formerly a Roman colony, with an abundant fountain and reservoir, the water of which was formerly carried to Costantina by an aqueduct. Physgêah is about fifteen miles south of Costantina. To the north, the terrace of Costantina opens towards the coast of the Mediterranean, by two valleys or gorges formed through the ridge of the lesser or maritime Atlas, one by the course of the Wad-el-Kebeer, almost direct north from Costantina, and the other by the Seiboos in a north-east direction to the gulf of Bona. The mouth of the Wad-el-Kebeer, which is the nearest point of the sea to Costantina, is about forty-eight miles distant. The distance from Costantina to Bona is about 100 miles, and from Costantina to Algiers twice as much. About half way between Costantina and Bona is Gelma, or Guelma, where are some Roman remains, and which seems to be a strong position, commanding the entrance into the plain of Costantina. The French expedition under Marshal Clausel, in November 1836, assembled at Bona to the number of about 8,000 men, whence they marched upon Costantina by the left or west bank of the Seiboos; they found great difficulty in passing their cannon and waggons over that part of the lesser Atlas which lay in their way, and in crossing the swollen torrents. When they arrived on the high terrace of Costantina, they experienced a heavy fall of snow, which lasted several days, and by the severe cold disabled or killed a large part of the army. Having come in sight of Costantina, they found the place defended by Arabs and Kabyles, with some cannon on the walls, and too strong to be carried without a regular siege, for which they were not prepared. Accordingly they were obliged to march back to Bona, much annoyed by the Arabs during the first day's retreat. They left a body of troops in the position of Guelma, and a new expedition against Costantina is talked of. (Marshal Clausel's *dispatch* after his return to Bona, as given in the *Times* and other newspapers of the 19th December, 1836.) Costantina is described as a large city, larger than Algiers in appearance, though Shaw gives it only a good mile in circumference; the houses have sloping roofs covered with tiles, a circumstance which of itself denotes the difference of its climate from that of the sea coast. The population is supposed to be between 30,000 and 40,000. It was the ancient Cirta (probably Carth, 'the city'), the residence of Massinissa and Jugurtha; it afterwards became a Roman colony in the time of Cæsar, Cirta Sittianorum, and the head town of Numidia Propria, until Constantine gave it his own name. A Roman bridge, a triumphal arch, several cisterns, a handsome gate, and other remains of antiquity, have been described by Shaw, who is still the best, we had almost said the only good, authority for this fine and extensive region. (See also *Nachrichten und Bemerkungen, über den Algierschen Staat*, Altona, 1798, and Poiret, *Voyage en Barbarie*, in 1785-6.) The Beylik of Costantina occupies nearly the one half of the whole Regency of Algiers, and most of it, especially its south part, is still unknown to Europeans. It is impossible to guess at its population; but by reckoning the numerous tribes scattered over its surface, it must be considerable. Under the Romans it formed part of Mauritania. After the invasion of the Arabs, and the subsequent breaking up of the power of the eastern Caliphs, it formed a separate kingdom, nominally subject to the Fatimites. It had wars with the kings or sultans of Tunis, and about 1520 was subjected by Khair Eddin Barbarossa, from which time it has remained annexed to the Regency of Algiers. The Bey of Costantina was the most powerful of the three Beys among whom the territory of the Regency was divided. His sway however extended only over the open country around his capital, and some other places where he kept garrisons, such as Bona, Boojeyah, and a few more points along the coast or towards the frontiers of Tunis. All the mountainous parts are inhabited by tribes of Arabs and Berbers, who never acknowledged the sovereignty of the Turks, and only pay tribute when obliged to do so by force. Ahmed, the present Bey of Costantina, has remained in his capital as an independent Bey of the country ever since the French took possession of Algiers. For the maritime towns of the province of Costantina, see ALGIERS and BONA.

COSTARD, GEORGE, born about 1710, M.A. of Wadham College, Oxford (of which he afterwards became fellow and tutor), in 1733, rector of Twickenham, in 1764, at which place he died, January 10, 1782. He was respectable, both as a classical and oriental scholar, and as a mathematician; an account of his miscellaneous writings may be found in Kippis's 'Biographia Britannica.' He was the editor of the second edition of Hyde's work on the 'History of the Persians;' but his claim to notice is principally derived from his 'History of Astronomy,' &c. London, 1757. This work appears to have obtained more reputation abroad than at home, where it certainly is not appreciated. It is a history of the rise and progress of the fundamental doctrines of astronomy, mixed up with an elementary account of them, in order of discovery, and accessible to a student who can use a common globe, and has the first rudiments of geometry. In all matters of ancient and oriental learning, Costard frequently cites the passage and always the reference, which gives his work a lasting value.

COSTER, LAWRENCE, or LAURENT JANSZOON, a native of Haarlem in Holland, whom the Dutch consider as the true inventor of the art of printing. He is believed to have been born at Haarlem about the year 1370; and in after-life filled successively several minor offices in his native town, as sacristan, churchwarden, and treasurer of the church of St. Bavon. His name appears in the registers of that church in the years 1423, 1426, 1432, and 1433. The time of his death is not mentioned. The following is the account given by Hadrian Junius, a Dutch writer of the sixteenth century, of Coster's claim to the discovery of printing. Junius's 'Batavia' was published in 1588, but the passage, the substance of which we here give, is believed from the context to have been written twenty years before. He relates, that about 128 years before he wrote, this Lawrence Coster resided in a large house, situated opposite the royal palace at Haarlem, which was still standing. That Coster, during his afternoon walks in the vicinity of the city, began by amusing himself with cutting letters out of the bark of the beech-tree; and with these, one after another, the letters being inverted, he printed small sentences for the instruction of his grandchildren. That being a man of genius and research, and finding the ink then commonly used apt to spread, he afterwards discovered, with the assistance of his son-in-law, Thomas the son of Peter (who, he tells us, left four children, most of whom afterwards enjoyed high offices in the state), a more glutinous kind of ink, with which he succeeded in printing entire pages, with cuts and characters. That he, Junius, had seen specimens of this kind, printed on one side of the paper only, in a book entitled 'Speculum Nostræ Salutis,' written by an anonymous writer in the Dutch language; the blank pages being pasted together, that the leaves might turn over, like those of an ordinary book, without showing the vacancies. That, afterwards, Coster made his letters of lead instead of wood; and lastly of pewter, finding that metal harder, and consequently more proper for the purpose; and that various drinking cups, made of the remains of this old type, were still preserved in the aforesaid house, where, but a few years before, Coster's great-nephew, or great-grandson, Gerard Thomas, had died at an advanced age. That the invention in question soon meeting with encouragement, it became necessary to augment the number of hands employed; which circumstance proved the first cause of disaster to the new establishment; for that one of the workmen, named John (whom Junius suspects might be Fust, for he does not absolutely accuse him), as soon as he had made himself sufficient master of the art of casting the type, and joining the characters (notwithstanding he had given an oath of secrecy), took the earliest opportunity of robbing his master of the implements of his art; choosing, for the completion of his purpose, the night preceding the Feast of the Nativity, when the whole family, with the rest of the inhabitants of the city, were at church, hearing the midnight mass. That he escaped with his booty to Amsterdam, thence to Cologne, and, lastly, that he took up his residence at Mentz, where he established his printing-press; from which, within the following year, 1442, were issued two books, printed with the characters which had been before used by Lawrence Coster at Haarlem: the one entitled 'Alexandri Galli Doctrinale,' the other 'Petri Hispani Tractatus.'

This account, Junius assures us, he had from several old gentlemen who had filled the most honourable offices of the city, and who themselves had received it from others of equal respectability and credit, as a well-founded tradition; as a lighted torch, he says, passes from one hand to another without being extinguished. He adds, that he well remembers that Nicholas Galius, the tutor of his youth, who was an old gentleman of very tenacious memory, used to relate that, when he was a boy, he had often heard one Cornelius, then an old man upwards of eighty years of age, who had been a bookbinder, and, in his youth, had assisted in the printing-office of Coster, describe, with great earnestness, the various trials and experiments made by his master in the infancy of the invention: upon which occasions he would even shed tears, especially when he came to the robbery committed by one of the workmen, which he related with great vehemence; cursing those nights in which, as he said, for some months, he had slept in the same bed with so vile a miscreant; and protesting that he could, with the utmost pleasure, execute the thief with his own hands, if he had been still alive: which relation, as Junius tells us, corresponded with the account which Quirinus Talesius, the burgomaster, confessed to him he had heard from the mouth of the same old bookbinder.

It is mainly upon this testimony that the writers of Holland found what they consider the undoubted pretensions of Haarlem to the invention of printing. Junius is the earliest writer at present known who makes express mention of Lawrence Coster as the inventor of typography; but he certainly was not the first who asserted that the art was invented at Haarlem. Scriverius mentions that a treatise expressly upon the subject in question was written at Haarlem, between 1549 and 1561, by John Van Zuyren, who was for some time scabinus or sheriff, and afterwards burgomaster of that city. Theodore Volchart Coornhert, in the dedication of a translation of Cicero's 'Offices' to the burgomaster, judges, and senators of Haarlem, where the book was printed in 1561, also ascribes to this city the invention of the art; as does Guicciardini, in his 'Descrizione di tutti i Paesi Bassi,' printed at Antwerp in 1567, p. 180. All these writers however appear to have founded their statements upon the very same tradition as that related by Junius, with the omission only of Coster's name. The question, it will be readily seen, is too complicated for further discussion here. The reader who would enter more fully into it must consult Meerman's 'Origines Typographicæ,' printed at the Hague in 1765, 2 vols. 4to., and Ottley's 'Inquiry into the Origin and Early History of Engraving upon Copper and in Wood,' 4to., London, 1816, vol. i. pp. 172, and seq. These authors support the cause of Haarlem. Baron Heineken, in his 'Idée Générale d'une Collection complette d'Estampes,' 8vo., Leips., 1771, and Lambinet, in his 'Origine de l'Imprimerie,' 2 vols. 8vo., Paris, 1810, consider the whole story as not entitled to the least credit, and are the chief writers on the other side.

COSTROMA, a province in the eastern part of Russia in Europe, forming a portion of Great Russia, and situated between 57° and 58° N. lat. and 40° and 42° E. long. According to Arsenief its area is about 29,990 square miles: the surface is in general level, and the soil, though not naturally fertile, has been rendered productive: the northern parts of the province are full of swamps, and the southern sandy. The Volga enters Costroma a little above Yaroslaf, in the south, and traverses it in a north-westerly direction: the Costroma and Unsha, or Ounya, as well as the Vetluga, which fall into the Volga on its left bank, drain the northern, eastern, and southern districts. There are several lakes; the largest, that of Galitsh, near the town of that name, is about 10 miles long and 5 broad; and the Tshuklonea, further north, is upwards of 5 miles in diameter. The inhabitants are active agriculturists: though they import wheat, they grow more rye than they consume, together with much hemp and flax. The land is full of large forests, which are principally crown property. The bear, lynx, wolf, and fox are common. Little attention is paid to the breeding of cattle, but the fisheries are carried on vigorously, and produce nearly 800 tons per annum of salmon, sturgeons, &c. There are considerable manufactures in the province, particularly of linens, woollen cloths, Russia leather of superior quality, brandy, and mats; the majority are established in and about the capital, and the number of hands employed on them is upwards of 6000. There were 19 schools in the province in the year 1832, independently of 11 ecclesiastical seminaries. In 1796 the population amounted to 1,046,092 souls; and as the average increase for the years 1825-6-7 was upwards of 11,200, it cannot at present be estimated at less than 1,500,000. Two-thirds of the rural population are vassals of the nobility, who are the great land proprietors. In summer great numbers of mechanics leave their homes in quest of subsistence in other quarters. The province contains 12 circles, 17 towns, and 851 parishes It is an eparchate or bishopric, styled the Eparchate of Costroma and Galitsh, and in 1830 contained 11 monasteries, 3 nunneries, 13 what are termed cathedrals, and 858 churches. The revenue which Costroma yields is about 3,300,000 roubles a year (about 150,000*l.* sterling). The principal towns, besides Costroma, the capital, are Galitsh (about 7000 inhabitants); Makurief, the town next in importance to Costroma for its trade (3000); Yurgowetz-Powolskoi (2600); Sol-Galizkaya (3400); and Kinishna (2400).

COSTROMA, the seat both of the civil government of the province and of the military government of Costroma and Vladimir, is agreeably situated at the confluence of the Volga and Costroma, or Kotorosla, in 57° 45′ N. lat. and 41° 12′ E. long., about 325 versts (about 217 miles) to the north-east of Moscow. It is said to have been built in the year 1152, and was united to the grand duchy of Moscow by Ivan Vassiljewitsh I. A wall of earth, which has been converted into walks, surrounds it. The upper part of the town covers a height, on the summit of which stands the cathedral, a handsome edifice, surrounded by trees and showy buildings. In this quarter are the government buildings, with the 'Gostinoi-Dwor,' or bazaar, a spacious quadrangle with piazzas, facing them; and betwixt them is the flower and fruit-market, which is held under a roof covered with canvass. Below this upper town, and above the lower town, is another quarter, built entirely of stone; and along the high banks of the Volga runs the third quarter, consisting of a long line of neat houses, of wood and stone, relieved by the trees and gardens interspersed between the buildings. Costroma contains 42 churches, besides 11 chapels, a mosque, and 2 wealthy and spacious monasteries. One of these establishments, that of Ipatskoi, founded in 1330, is celebrated as having been the spot from which the czar, Michael Fedorovitsh Romanoff, the father of the present dynasty, emerged, in 1613, to assume the sceptre of Muscovy. The gate through which he then turned his back on the hood and cowl has been kept closed ever since. The bishop of Costroma has his residence in this monastery, which is enclosed with a stone wall. There is a Tartar suburb and mosque outside of the walls. Costroma is an affluent and thriving town; it has 8 asylums for the indigent, an ecclesiastical seminary, a high school and a district school, about 1100 houses, and about 10,000 inhabitants, who are employed partly in trade and partly in the manufacture of linens, Berlin-blue, sealing-wax, soap, leather, bells, &c. It has periodical fairs.

COSTS, in the technical sense of the word, are the expenses incurred by parties in proceedings at law or in equity. In civil actions particular importance and interest attach to the principles and practice concerning them, since though in themselves merely incidental and subordinate to the main cause of action, it not unfrequently happens that they become a prominent object of anxiety and contention. Under the head of COSTS IN CIVIL ACTIONS may be considered the steps by which the mutual rights and liabilities to them were originally created, and have been subsequently qualified; the modifications to which those rights and liabilities are subjected by reason of the particular character in which the parties may sue or be sued; and the practice by which the amount of costs is ascertained and controlled.

At common law neither the plaintiff nor the defendant was entitled to recover costs the one from the other as a matter of right; the only liability which attached to the unsuccessful party, beyond the direct result of the suit, being an amercement imposed upon him for his false complaint or defence. If, however, the plaintiff succeeded, the jury were at liberty, and were usually directed, to take his costs into consideration in estimating the amount of damages. And before there was any legislative enactment upon the subject, it is said that the justices in eyre, and afterwards those of assize and nisi prius, were in the habit of assessing the plaintiff his costs, exclusively and apart from the damages.

The first statutory provision with respect to costs was that of the statute of Marlbridge (52 Hen. III., c. 6), which gave them to the defendant in one particular case (wardship in chivalry), which became extinct in the reign of Charles II. Then came the statute of Gloucester (6 Edw. I., c. 1), by which a successful plaintiff recovered the costs of his suit in all cases where he was previously entitled to recover damages. The right to costs under this statute, which were styled costs of *increase*, was entirely independent of the amount of damages recovered. The consequence of this being found mischievous, power was given to the judges by the stat. of 43 Eliz. c. 6, s. 2, in all personal actions, except such as concerned the title or freehold of land, and those of battery, where the debt or damages did not amount to 40*s*., to grant a certificate of that fact, and to award to the plaintiff no greater or more costs than the sum of the debt or damages recovered should amount to, but less at their pleasure. Owing to the indisposition of the judges to grant certificates under this statute, it was for some time wholly inoperative, and it was therefore enacted, by the statute of 22 and 23 Car. II., c. 9, s. 136, that in all actions of trespass, assault, and battery, and other personal actions, where the jury should find damages under 40*s*., the plaintiff should recover no greater costs than damages, unless the judge should certify that an assault and battery were sufficiently proved, or that the freehold or title of land was chiefly in question. It has been observed of this statute, with great show of reason, that the legislature intended by it to preclude the plaintiff absolutely from recovering full costs, where the damages were below 40*s*., in all personal actions but those specially named, and even in them, unless the judge *gave* them by a certificate under the act. It received, however, a different construction from the courts, by which it was held to apply to those actions only in which it was possible to grant the prescribed certificate, all others being left to the provisions of the previous statute. Wherever therefore it appeared, either from the form of the action, or from the pleadings, or the nature of the case, that no question of a battery, or of freehold or title of land, could possibly be involved in the dispute, so as to give the judge the option of certifying, it was held that the plaintiff would be entitled to full costs, notwithstanding the statute.

It may here be observed, that the changes which have recently taken place in the rules of pleading seem to have worked a virtual repeal of so much of the statute of Charles as relates to trespasses on real property.

By a statute passed in the reign of William and Mary, and repealed by the new Game Act of the present reign, full costs of suit were given to plaintiffs, in actions where 'inferior tradesmen, apprentices, and other dissolute persons' were found guilty of trespassing upon other persons' lands in pursuit of game or fish. And by the statute of 8 and 9 Will. III., c. 11, full costs were given to the plaintiff in actions of trespass, where the judge should certify that the trespasses were wilful and malicious.

In the particular case of actions for oral slander, where the words are actionable in themselves, either from their own intrinsic meaning, or from having been spoken of a party in reference to his profession or trade, the plaintiff's right to more costs than damages, where the latter fall short of 40*s*., is absolutely barred by the statute of 21 Jac. I., c. 16.

Hitherto, those statutes only have been considered which relate to a *plaintiff's* right to costs. The first act which recognised the interest of *defendants* in personal actions was one passed in the twenty-third year of Henry VIII., which, jointly with another act of the reign of James I., gives costs to the defendant where the plaintiff is nonsuited or has a verdict passed against him, in all cases in which the plaintiff would have been entitled to them if he had succeeded. By a subsequent enactment of the reign of Elizabeth, costs are given to the defendant where the plaintiff is guilty of delay or discontinuance in his suit. The defendant's right to costs is farther extended by an act of the present reign, which gives him proportional costs in cases where the plaintiff enters a *nolle prosequi*, i. e., remits his suit as to part of his alleged cause of action. The same act gives reasonable costs to one or more of several defendants sued together, who shall have a *nolle prosequi* entered as to him or them, or upon trial of the action shall have a verdict pass for him or them, unless the judge shall certify that there was reasonable cause for joining him or them in the action.

In cases cognisable by the court of requests or of conscience of any city, borough, or town, it is usually provided by the statute creating the jurisdiction of the inferior court, that if the plaintiff recover any sum within the limits of the inferior court, he shall not be entitled to costs; and that the defendant, if he succeed, shall recover double costs.

It having been found that plaintiffs frequently oppressed their debtors by arresting them for a larger sum than that which they really owed, thus subjecting them to greater expense and difficulty in procuring bail and effecting their liberation from custody, it was enacted, by the stat. of 43 Geo. III., c. 46, that if a plaintiff did not recover the sum for which he arrested and held the defendant to bail, the court, upon motion, might direct that the defendant should be allowed his costs, if it should be made appear by affidavit, to the satisfaction of the court, that the plaintiff had not any reasonable or probable cause for holding to bail to that amount. To bring a case within this statute it would seem to be necessary to make it appear to the court *affirmatively* that the plaintiff had no reasonable or probable cause, and that a case of suspicion only will not be sufficient to entitle the defendant to his costs. In estimating the amount of probable cause, the court will take into consideration the particular circumstances of the case in question, and not merely the amount of the verdict.

In the late very important changes which have been made with regard to the mode of pleading in civil actions, the courts have taken great pains to provide a more equitable apportionment of costs between the parties than was formerly observed. Thus, for many of the cumbersome and prolix forms in which it was usual to state the more ordinary causes of action, they have prescribed certain concise precedents, an adherence to which is enforced by allowing to the defendant the costs occasioned by any excess, and throwing them upon the party really in fault, the plaintiff's attorney. By another rule, made expressly for the benefit of defendants, it has been ordered, that no costs shall be allowed to a plaintiff upon any count or issue upon which he has not succeeded at the trial, and that the costs of all issues found for the defendant shall be deducted from the costs payable to the plaintiff. The effect of this rule is most important, inasmuch as it puts an end to the former unjust practice, which in some cases allowed the plaintiff costs, and in others disallowed them to the defendant upon those issues upon which the latter was successful. By a still later rule, directed both against plaintiffs and defendants, it has been ordered, that where several counts or pleas shall have been put upon the record, the successful party shall not be allowed any costs upon the issue or issues upon which he succeeds, unless the judge trying the cause shall be of opinion, and shall so certify, that a distinct subject matter of complaint or defence was *bonâ fide* intended to be established in respect of each count or plea.

As to the manner in which the right or liability of a party to costs may be modified by the particular character which he sustains, a striking instance used frequently to occur in former days, in the case of plaintiffs suing in the representative character of executors or administrators. In favour of such parties it was held, that wherever they sued for a cause of action which they could not have recovered in their individual capacities, they would not be liable to the defendant for costs, upon being nonsuited, or having a verdict pass against them. For some time a notion prevailed that this exemption proceeded from a consideration of the degree of ignorance under which they were supposed to lie with respect to the contracts or other causes of action of the deceased parties whom they represented. But the sounder opinion at length obtained, that the true cause of this freedom from liability was to be found in the particular language of the different enactments bearing upon the subject.

After having been long considered too extensive, this privilege has been effectually curtailed by an enactment of the present reign, 3 and 4 Will. IV., c. 42, s. 31, which puts executors and administrators upon the same footing with other plaintiffs, unless the judge before whom the action shall be brought, or a judge of any of the superior courts, shall otherwise order. The disposition of the courts, with regard to this act, appears to be not to interpose in behalf of the plaintiff, unless the defendant has brought the action upon himself by practising something like a fraud upon the plaintiff, thus discouraging the practice formerly prevalent of bringing merely speculative actions in a representative character, under the shelter of immunity from costs.

In penal or *qui tam* actions, the plaintiff's right to costs depends altogether upon the provisions of the statute which creates the cause of action. There are also express statutes which impose additional liabilities upon a plaintiff of this class under certain circumstances.

When a party has obtained the permission of the court to sue *in formâ pauperis*, i. e. to be provided, on account of his poverty, with all necessary writs, as well as with counsel and attorney, gratis, he will not be liable to pay any costs, but he will still be entitled to receive them.

The mode in which the amount of costs payable between the parties is ascertained, is by taking the Nisi Prius records, with all the papers, briefs, and other documents, to the proper officer of the court, who then taxes the costs according to a certain prescribed scale, allowing or disallowing particular charges at his discretion. Before the late act for the amendment of the law (3 and 4 Will. IV., c. 42), a different system of taxation prevailed in the different courts at Westminster, to remedy which defect power is given to the judges, by the act referred to, to make regulations for establishing an uniform practice in all.

Hitherto we have only considered *single* costs, or those derived from the statute of Gloucester. In some cases *double* and *treble* costs are expressly given by statute: and wherever a statute gives double or treble damages, the plaintiff shall also have double or treble costs. The following is the manner in which double costs are calculated:—First, the prevailing party is allowed his single costs, which include the expenses of witnesses, counsel's fees, &c., and afterwards he is allowed half the amount of the single costs, without making any deduction on account of counsel's fees, &c. Treble costs consist of the single costs, half the single costs, and half that half again.

Such are some of the principal matters relating to costs in actions at law, a subject so purely technical in its nature, that any minute inquiry into its rules and mode of administration would be foreign to the purposes of this work. Between the courts of equity and those of common law there is this important difference with respect to costs, that the former are not bound by any of the enactments above enumerated, but are invested with a discretionary power upon the subject. In the exercise of this power they are guided, not merely by the event of the suit, but by a consideration of its real merits, and of the interests of the parties concerned. Thus, although the party failing is *primâ facie* liable for the costs, he will be relieved from the burden if he has prosecuted the suit in the conscientious discharge of a duty imposed upon him as a trustee for the benefit of others. On the other hand, a party proceeding erroneously will not be allowed the costs of his erroneous proceedings, ever though the decree of the court may ultimately be in his favour.

In *criminal proceedings* the rights and liabilities of parties to costs depend altogether upon express statutory enactments. With a view to forward the ends of justice, provisions have been made by various statutes to defray, out of the funds of the county, at the discretion of the court, the expenses incurred by prosecutors and their witnesses in cases of felony. (Hullock *on Costs;* Tidd's *Practice;* Archbold's *Practice of the Court of King's Bench;* Grant's *Practice of the High Court of Chancery.*)

CÔTE D'OR, a department in France, forming part of the antient province of Bourgogne. It is bounded on the north by the department of Aube, on the north-east by that of Haute Marne on the east by that of Haute Saône, on the south-east by that of Jura, on the south and south-west by that of Saône-et-Loire, on the west by that of Nièvre, and on the north-west by that of Yonne. Its form is irregularly oblong: the greatest length is, from N. N. W. to S. S. E., about eighty miles; and the greatest breadth at right angles to the length is about seventy miles. The area of the department is about 3365 square miles; and the population, in 1832, 375,877, or 111 or 112 to a square mile, being much below the average of France. Dijon, the capital, is 161 miles in a straight line south-east of Paris, or 185 miles by the road through Melun, Sens, Joigny, and Tonnerre.

This department is traversed in the direction of its breadth by hills, forming part of the chain which connects the Cévennes with the Vosges. A range of these hills to the south-west of Dijon is called Côte d'Or, the golden slope or upland, and gives name to the department.

These hills separate the basin of the Seine from that of the Saône and Rhône. The Seine itself, and its tributaries, the Brevon and the Ource, with its feeders the Digenne and the Grame, rise on the north-western slope of these hills; as do the Voisin, the Cousin, the Serein, with its feeder the Argentalet, and the Armançon, with its feeders the Brenne, the Lozerain, and the Loze, whose waters all find their way into the Yonne, an important tributary of the Seine. The Ource does not rise in this department, but just within the adjacent one of Haute Marne; it has however the greater part of its course in the Côte d'Or. On the south-eastern slope of the hills rise the Tille, with its feeders the Ignon and the Norges. the Suzon, a tributary of the Ouche, and the Meuzin, Mauzin or Meuzain. with its tributary the Bouzoire. The Ouche rises on the northern side of the hills, but passes through a depression, by which the chain is separated into two parts, and, with all the waters from the south side, flows into the Saône. The Dheune or Dheure, a tributary of the Saône, flows along the southern boundary of the department: the Arroux and the Gors, which fall into the Loire, water the south-western part. The Saône waters the south-eastern part of the department.

In agricultural produce the department of Côte d'Or is, on the whole, rich: the quantity of wheat raised is half as much again as the average produce of the departments of France, and in rye and mixed corn double. In maize the produce is rather below the average; in barley, oats, buckwheat, and potatoes, very much below. In wine, which is chiefly produced in the southern part of the department, where the range of the Côte d'Or extends, the produce is very great. Not only is the quantity of land occupied by the vine more extensive than in the average of the departments, but the vines are much more productive. The wine, which is chiefly red wine, is known by the general name of Bourgogne (Burgundy): the first growths are La Romanée-Conti, Chambertin, Richebourg, Clos-Vougeot, La Romanée-St. Vivant, La Tache, St. George, and Corton: of white wine, the only first growth is Puligny. Much wine is exported. The quantity of woodland is much above the average. Horses and horned cattle are numerous, especially the former; but of sheep the number is comparatively small. The wool grown is altogether insufficient for the wants of the department; and as there are few woollen manufactures, the inhabitants have to import woollen cloths and other goods. The fields in this department (on the western side at least) are divided by quickset hedges as in England.

The north-east part of the range of hills which we have mentioned as crossing the department, contains iron; and there are many iron-works, for carrying on which the quantity of wood affords great facility. The department is well provided with the means of communication: the high road from Paris by Dijon to Geneva passes through the middle of it, and that from Paris by Auxerre and Châlons-sur Saône to Lyon crosses it in the south-west part; these are both roads of the first class. Roads of the third class connect these two: one from Montbard to Saulieu; another from Rouvray by Vittaux to Dijon; and a third from Dijon by Beaune to the village of La Rochepot: five other roads of the same class unite at Châtillon-sur-Seine, in the north part of the department; and two others lead, one from Dijon to Langres (department of Haute Marne), where it meets the high road from Paris to Bâle or Basel, and the other from Beaune to Dôle and Besançon. The Canal de Bourgogne traverses the department, following the valleys of the Armançon in the north-west and the Ouche in the south-east. The Saône is the only navigable river. There is no predominant manufacture in the department, unless we except that of iron wares: some cottons and woollens are made; also paper, leather, hats, earthenware, copper utensils, and some chemical articles, as soda, chlorine, and acetic acid.

The department of Côte d'Or is divided into four arrondissements or sub-prefectures: that of Châtillon in the north, population 52,226; that of Dijon in the east, population 135,435; that of Beaune in the south, population 117,996; and that of Sémur in the west, population 70,220. The department constitutes the diocese of Dijon, the bishop of which is a suffragan of the archbishop of Lyon. It is under the jurisdiction of the Cour Royale of Dijon; and sends five members to the Chamber of Deputies. It is in the eighteenth military division, the head-quarters of which are at Dijon.

The principal towns are Dijon (population 25,352 for the town, 25,552 for the whole commune), on the river Ouche, at the junction of the Suzon; Beaune (population 9272 for the town, 9908 for the whole commune); Sémur (population 3985 for the town, 4088 for the whole commune), on the Armançon; Châtillon-sur-Seine (population 3689 for the town, 4175 for the whole commune); Seurre (population 3571 for the town, 3591 for the whole commune), on the Saône, Auxonne (population 3477 for the town, 5287 for the whole commune) on the Saône; and Saulieu (population 3050), near the springs of the Voisin, the Cousin, and the Argentalet. For Dijon, Beaune, and Auxonne, we refer to their respective articles: of Sémur, Châtillon, Seurre, and Saulieu, as well as of some smaller towns, we subjoin an account.

Sémur, the capital of an arrondissement, 148 miles from Paris by Avallon, and 40 from Dijon, is sometimes called Sémur-en-Auxois (Auxois was a division of the former province of Bourgogne), to distinguish it from another town of the same name (Sémur en Brionnois) in the adjoining department of Saône et Loire. It is built on a granite rock, on the picturesque banks of the Armançon, which nearly encircles the town, and over which are two good bridges. The streets are neat, and tolerably paved; the houses handsome, and the public walks agreeable. There is an antient church, and a 'donjon' composed of four antient Gothic towers. The population, in 1832, was 3985 for the town, or 4088 for the whole commune. The manufactures of Sémur are cotton and woollen yarn, calico, woollen cloth, umbrellas, and bee-hives. There are many nursery-grounds near the town, and trade is carried on in corn, wool, and hemp grown in the neighbourhood. The frogs of Sémur are in high repute; and it is said that by the sale of these creatures, 600*l.* or 800*l.* is obtained yearly. Sémur is the residence of a number of the antient gentry of the district, whose resources have however been much impaired by political changes. There were, before the Revolution, many religious houses. There are a *tribunal de première instance*, a high school, a small public library, a small theatre, and the *depôt de mendicité* (poor-house) of the department. The town of Sémur was the only one in Bourgogne that in the time of the League adhered to Henry IV., who recompensed the fidelity of the inhabitants with some marks of favour. It was reduced to ashes by fire, A.D. 1588. The celebrated Saumase (Salmasius), the antagonist of Milton, was born in this town in the same year.

Châtillon, distinguished as Châtillon-sur-Seine, from its situation on the banks of that river, is on the road from Paris to Dijon by Troyes, 134 miles from Paris, and 48 from Dijon. The town, though with a population of no more than 3689 (4175 for the whole commune), extends for about a mile along the road. The main street is neat and of considerable breadth. There is a handsome château on an eminence, with a garden, park, and piece of water, which belonged to Marshal Marmont, a native of this town. At a short distance from the town, on a hill planted with trees, is the striking ruin of an antient castle of the dukes of Bourgogne. From the foot of this hill rises the Douix, a stream which, though it joins the Seine at the distance of a few musket-shots from its spring, equals in winter the Seine itself in the volume of water, and in summer surpasses it. The town possesses an hospital and a high school, a library, a *tribunal de commerce* or mercantile court, and a subordinate court of justice, *tribunal de première instance*. The trade of the town and its immediate neighbourhood is considerable: the chief manufactures are iron wares, cotton goods, coarse woollens, leather, cask staves and hoops, paper, and hats: there are breweries and bleaching houses for wax. Much agricultural produce, wine, wool, and wood, horned cattle and sheep, is sold at the weekly market. While Marshal Marmont occupied the château, he had a large farm, in which the most improved methods of cultivation were practised, and where he kept a numerous flock of merino sheep, and breeding-stables for horses: he had also in his park iron-works, and manufactories of beet-root sugar, of sal-ammoniac, and of vermicelli. The immediate environs of the town are devoted to the cultivation of oats and rye. Of the whole arrondissement one-third is woodland, from which the iron-masters derive their fuel.

Châtillon was in the middle ages a place of some strength and the capital of a county, which was long united to the duchy of Bourgogne. There were, before the revolution, many religious houses. In 1814 it was the seat of fruitless negotiations for peace between Napoleon and the allies. It is much resorted to in winter by the neighbouring gentry.

Seurre is on the left or south-east bank of the Saône, and on the road from Beaune to Dôle and Besançon, 220 miles from Paris by a circuitous road through Dijon and Beaune, and 38 from Dijon. The situation of the town is very pleasant; the houses are well built of brick; and there is a fine park, which serves as a promenade for the townsmen, with a château of modern construction, built in imitation of the English style. There were formerly several religious houses here for persons of both sexes. There is a bridge over the Saône, which has been repeatedly carried away and re-established. The inhabitants (population 3571 for the town, 3591 for the whole commune) carry on trade in corn and hay, the produce of the neighbourhood, to which we may probably add fish and fruit.

Saulieu is on the great road from Paris by Auxerre and Châlons to Lyon, 152 miles from Paris. It is a place of considerable antiquity, and existed in the time of the Romans. Ammianus Marcellinus, the Itinerary of Antoninus, and the Theodosian Table mention it under the name of Sidolocum. There existed for some time the remains of a building, which was always considered to have been a temple of the sun; and some antiquities dug up in the neighbourhood have served to confirm the tradition. It is said that St. Andoche, one of the early missionaries of the gospel in Gaul, suffered martyrdom here in the persecution under Marcus Aurelius. At an early period there was established a Benedictine monastery, which was, A.D. 731, pillaged and burnt by the Saracens, and afterwards re-established and endowed by Charlemagne; but about the middle of the twelfth century it was secularized, the church (dedicated to St. Andoche) was made collegiate, and the ample revenues of the monks were for the most part appropriated by the bishops of Autun. In 1359 Saulieu was sacked, and the church pillaged and burnt, by the English. In the wars of the subsequent period, domestic and religious, it suffered much. In 1579 it was besieged by the army of the League under Tavannes, to whom it surrendered; but the inhabitants, a few years after, admitted the royalist troops. The immediate site of the town is flat, but it is half way up a hill of considerable elevation, which rises on the south-west: the town itself is walled the faubourgs or suburbs are more extensive than the town and better built. The population in 1832 was 3050. Saulieu has long been a place of great trade: there are twelve considerable fairs in the year; and there is a *tribunal de commerce* for the regulation of mercantile affairs. Cotton yarn is spun; this branch of industry was introduced by the curé or parish priest, M. Meigret, A.D. 1760, for the charitable purpose of giving employment to the poor: woollen cloths and hosiery are made; and tannery is carried on, though not to the same extent as formerly; in the early part of the last century there were 22 tan-yards. The other articles of trade are produced in the neighbourhood: wine, wool, flax, hemp, timber (especially staves for casks), fire-wood, turnips, which are in great repute, and cattle the cattle are reared in the pastures of Morvan, a neighbouring district, and sold to the people of Lorraine and Alsace. Saulieu was the native place of the engineer Vauban. Before the Revolution there were a small hospital and one or two religious establishments.

Arnay-le-Duc is on a branch, now disused, of the road from Paris to Lyon, about 167 or 168 miles from Paris. It is near the river Arroux, whence it is sometimes called Arnay-sur-Arroux. The population, in 1832, was 2412 for the town, or 2563 for the whole commune. The chief trade of the place is in grain, wool, and cattle. Some coarse woollens, serges, and druggets are manufactured. There was formerly a castle here, of which one tower yet remains; it was used about the middle of the last century as a town-hall.

Nuits or Nuyts or Nuys is a small town at the foot of a hill, on the river Mauzin or Meuzain, 14 or 15 miles from Dijon, on the road to Beaune. The town was formerly fortified. It was taken by the Germans who, in the religious wars of the sixteenth century, came to the aid of the French

Protestants: after the town had capitulated, it was set on fire, and many of the inhabitants massacred. The walls were afterwards allowed to go to decay, and ultimately the site of them and of the ditches was disposed of for building houses. Coarse woollens and paper are made, and there are many dye-houses. The neighbourhood affords good building and paving stone; but it is especially famous for its wine, which bears the highest character. The population, as given in the *Forces productives de la France* of M. le Baron Ch. Dupin (1827), was 2633. Thurot, a French naval commander, killed A.D. 1760, in a naval combat with the English, on the coast of Ireland, was a native of this town.

Meursault, rather a village than a town, is in the neighbourhood of Beaune. It is famous for its wines. The population, in 1832, was 2016 for the place itself, or 2066 for the whole commune.

Montbard or Montbart is on the road from Paris to Dijon by Joigny and Tonnerre, 142 miles from Paris and 42 from Dijon: it is on the river Brenne, a little above the junction of that river with the Armançon. The town is built on the slope of a hill, and behind it rise the gardens of the château which has been rendered illustrious as the residence of the naturalist Buffon. In the highest part of the gardens (which include the summit of the hill) is an antient tower, the relic and memorial of a castle which in feudal times commanded the place. The walls of the castle and several of the towers were standing till a comparatively late period. The town is divided into two parts by the Brenne: the streets are steep and irregular, but neat. The inhabitants, in 1832, amounted to 1916 for the town, or 2074 for the whole commune: they manufacture dog-skin gloves, laces, woollen cloth, and hosiery; and trade in wool, hemp, wood, and leather. There are some iron-works at the village of Buffon in the neighbourhood, established by the great naturalist: marble is also quarried not far off. The house of M. Buffon is in the main street of Montbard, and is a plain building: the court and the garden (the entrance to which is by steps) are behind. The garden is laid out in terraces rising one above another, and planted with trees, chiefly foreign, which form agreeable thickets. The pavilion in which Buffon wrote the principal part of his great work is still standing, but it has suffered during the revolutionary troubles, in the course of which it was pillaged, and much of the furniture which was in it in the time of Buffon has disappeared: there are in the house some remains of his cabinet of natural history. Buffon was a native of Montbard, which was also the native place of his coadjutor d'Aubenton, whose experiments for the improvement of wool were carried on here. The Canal de Bourgogne passes close to Montbard.

Nolay is in a narrow valley on the road from Beaune to Autun. It had, according to '*Le Dictionnaire Universel de la France*' (1804), 1988 inhabitants: they manufacture woollen cloth, common hats, and leather. Carnot was born here. The vineyards of Montrachet, which produce the finest white wine in the department, are near this town.

Vittaux or Vitteaux is on the river Brenne, and on the road from Paris to Dijon by Auxerre and Rouvray, 160 miles from Paris and 28 from Dijon. It is a small town, of tolerably good appearance, with the ruins of an antient castle, destroyed in 1631 by the order of Louis XIII., and a public walk of plane-trees. The inhabitants amounted, in 1832, to 1904 for the town, or 1919 for the whole commune: they manufacture woollen cloth, and trade in grain, wool, hemp, hay, and some wine. Near the town is a water-mill for expressing oil. Many Merino sheep are bred in the neighbourhood.

St. Jean de Losne is on the right or north-west bank of the Saône, at the point where the Canal de Bourgogne joins that river. It is known in history for the gallant defence made by the townsmen, 400 in number, and a garrison of 150 soldiers, against the forces of the duke of Lorraine and the imperial general, Matthias Gallas,[*] amounting to 60,000 or even 80,000. Under the command of the chief municipal officers, and supported by the courage of the women, who shared the dangers of the fight, the defenders withstood and repelled two successive assaults. The approach of a body of French troops caused the siege to be raised. Louis XIII., then king of France, recompensed the loyalty of the townsmen by an exemption from taxes of all sorts. The inhabitants, in 1832, amounted to 1744: they trade in grain and hay, and manufacture woollen cloths and serges: there are some breweries.

Selongey is a small town on the Venelle, a streamlet flowing into the Tille, but which is in summer often dried up. It had, in 1832, a population of 1687. Good horses are bred in the neighbourhood. The other towns are Bezé, Grancey-en-Montagne, Is-sur-Tille, Mirebeau, Pontaillier sur-Saône, St. Seine, Sombernon, and Thil-le-Châtel, in the arrondissement of Dijon; Bligny, Châteauneuf, Cîteaux, where was a celebrated abbey [CITEAUX], Mont St. Jean, and Pouilly, in that of Beaune; Bussy-le-Grand, Chanceaux, Epoisses, Flavigny, Moutier St. Jean, Sainte Reyne, and Rouvray, in that of Sémur; and Aignay-Côte-d'Or, Baigneux, Laignes, Recey, and Vanvey, in that of Châtillon. But the population of each of these towns is probably below 1500.

COTE' DROIT, COTE' GAUCHE, the names given to the two great divisions of the Chamber of Deputies, or French representative assembly. That assembly, like most other representative bodies in Europe, consists of individuals some of whom are inclined to favour the royal prerogative, while others are in favour of democracy, or popular supremacy. The former take their seats on the benches which are to the right of the President's chair; the other on those to the left. The shape of the House is a semicircle, with nine or ten rows of seats raised one above the other. The President's chair is in the middle of the chord, facing the assembly. As in every great political party there are shades of opinion, some being more warm and violent, and others more moderate, discriminating, or cautious, so both the coté droit and the coté gauche are generally subdivided into three sections each. The more zealous royalists take their seats at the outer extremity of their side of the House towards the President, and are styled the 'extrême droite;' the ultra-liberals sit on the corresponding seats on the opposite or left side, and are styled the 'extrême gauche.' Next to each of these extremes, moving inwards towards the middle part of the curved line of the semicircle, sits the main body of each of the two divisions, which are simply styled coté droit and coté gauche, or la droite et la gauche, composed of men who are the professed supporters of certain fixed principles, monarchical or popular, free however from violence or faction. From the middle of each side of the House to the point directly opposite to the president, the remaining sections, forming two-fourths of the semicircle, are called the centre droit and centre gauche, and are occupied by members who, although with some shades of difference in their opinions, generally vote for ministers. These two centres united form about one-half of the House, and are in fact what in England would be called the ministerial side of the House. But instead of one opposition, as has been until now the case in the British parliament, there are in France two oppositions, right and left, of opposite sentiments, one royalist and the other liberal. According as the measures of the ministry for the time being are acceptable to either of these two parties, they obtain the votes of part of either coté, which, joining the two centres, gives the majority to ministers.

In the legislative assembly which succeeded the first national or constituent assembly in 1791, and which destroyed the monarchy, the left was occupied by the republican members, who were themselves divided into Girondins and Montagnards. The name of Montagne was given to the extreme or terrorist party, because its members crowded together on the upper seats of the left, where, seen from below, they formed a mountain of heads, dark and threatening in appearance.

COTENTIN, or COUTANTIN, a district in France, now comprehended in the department of Manche, except a small portion which is included in the department of Calvados. It took its name from its capital Coutances. Cotentin is a peninsula, jutting out into the English channel, by which it is bounded on the north, the west, and part of the east side; on the remaining part of the east side (viz., the south-east) it is bounded by the districts of Bessin [BAYEUX], and Le Bocage [BOCAGE], and on the south by the district of Avranchin. [AVRANCHES.] The length from N.N.W. to S.S.E. is about eighty miles, the breadth above thirty. It is watered by the river Vire, which divides it on the east from Bessin and Le Bocage, the Douve, and several smaller streams. The strata are chiefly of granite and schistus, and the soil is fertile in grain, but especially in pasturage; much butter is made, and many horses are reared, which are much esteemed: poultry is reared and sent to Paris. The quantity of wood is not great, and there are no vineyards, but cider is made in considerable quantity. Hemp and flax are grown. [MANCHE, DEPARTMENT OF.] The chief towns included in the district, with their population in 1832, are as follows: — Coutances, the capital, 8957; Cherbourg, 18,377 for the town, 18,443 for the whole commune; Granville, 7350; Valognes, 6338 for the town, 6940 for the whole commune; St. Vaast, 3502; Villedieu, 3074 for the town, 3095 for the commune; Montebourg, 2423 for the town, 2523 for the commune; Carentan, 2292 for the town, 2773 for the whole commune; and Périers, 1934 for the town, 2605 for the whole commune. The map of the 'Encyclopédie Méthodique' includes St. Lo (8154 for the town, 8421 for the whole commune) in Cotentin: we believe this to be correct.

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[*] Malte Brun, confounding these two leaders, speaks of the assailants as being under the command of 'Le Grand Duc Galéas.'

Cotentin has many islands along its coast line.

COTES, ROGER, born July 10, 1682, at Burbage, near Leicester, of which place his father was rector. His first education was received partly at Leicester school, partly from an uncle, who was the father of Dr. Robert Smith, the author of the Optics. He was afterwards placed at St. Paul's School, and in April, 1699, was admitted at Trinity College, Cambridge, of which foundation he was elected Fellow in 1705. In January, 1706, he was elected Plumian Professor, at the time of the establishment of that Chair. In 1713 he took orders. He died June 5, 1716, aged thirty-four, and is buried in the chapel of his college, where there is an epitaph upon him by Dr. Bentley. He was succeeded in the Plumian professorship by his cousin, Dr. R. Smith, the editor of his works. (*Biographia Britannica.*)

The early death of Cotes being taken into account, few persons have left more reputation behind them than he did, in matters of exact science. Newton is reported to have said, 'If Cotes had lived, we should have known something.' As it is, we have not much to say in a biographical article. The discoveries of Cotes have exercised an influence upon various parts of mathematics, which will be alluded to in the proper place. For his reputation on the continent, it is unfortunate that he died so near the termination of the discussion relative to fluxions. The problems which he left were made the subject of a challenge to foreign mathematicians by Dr. Brook Taylor, in the interval which elapsed between his death and the publication of his works; and some bitterness of feeling was excited which was unfavourable to the proper estimation of their merits. (Montucla, *Hist des Math.*, vol. iii., p. 154.) We shall now briefly describe them.

The first work which Cotes published was the second edition of Newton's 'Principia' (A.D. 1713), to which he prefixed the well-known preface. This treats of gravitation in general, and of the objections which were made to it. He also published an account of a remarkable meteor in the 'Phil. Trans.' for 1715. His hydrostatical and pneumatical lectures were printed after his death in 1738, by Dr. R. Smith.

The mathematical papers of Cotes were published after his death by Dr. Smith, under the title of 'Harmonia Mensurarum, sive analysis et synthesis per rationum et angulorum mensuras promotæ: accedunt alia opuscula mathematica,' Cambridge, 1722. The most definite description which can be given of it is, that it was the earliest work in which decided progress was made in the application of logarithms and of the properties of the circle, to the calculus of fluents. The first book contains an extended comparison of systems of logarithms, with applications of them to the finding of areas. The second is what we should now call a table of integrals, depending on logarithms and arcs of a circle. The third consists in applications of the second. Then follows a mass of extensions, digested, mostly from Cotes's papers, by Dr. Smith. The *opuscula* consist in, 1. A tract on the estimation of errors in mixed mathematics, consisting mostly of an investigation of the method of choosing spherical triangles, so that the errors of the *data* shall produce least effect upon the *quæsita*, but ending with what we must call the first glimpse of a method of choosing the proper mean for discordant observations. [LEAST SQUARES, METHOD OF.] 2. A tract on the differential method of Newton. 3. On the construction of tables by differences. 4. On the descent of heavy bodies; on cycloidal motion, &c.

CÔTES DU NORD, a department in France, one of the five into which the former province of Bretagne has been divided. [BRETAGNE.] It lies on the coast of the great bay of St. Malo, an inlet of the English channel, which bounds it on the north. It is bounded on the east by the department of Ille-et-Vilaine, on the south by that of Morbihan, on the west by that of Finistère; all of which are portions of the antient Bretagne. The greatest length of the department is from W. b. N. to E. b. S., about eighty-one or eighty-two miles; the greatest breadth about fifty-three. The area is about 2868 square miles, and the population, in 1832, 598,872, giving 209 or 210 inhabitants to a square mile, which is above the average population of France. The capital is St. Brieuc, on the small river Gouet near its mouth, 230 or 232 miles in a straight line west of Paris, or 278 miles by the road through Dreux, Alençon, Mayenne, Laval, and Rennes. [BRIEUC, ST.]

The coast line of this department is very irregular, being broken by deep bays, the principal of which is that of St. Brieuc, and jutting out in a number of small headlands, of which the following succeed each other from east to west:— Pointe St. Cast, Cap Frehel, Pointe d'Herquin, Pointe de Port de Pomme (these two are at the extremities of the bay of St. Brieuc), Pointe de Plouaze, Pointe de Minar, Pointe de Milfaut, Pointe du Sillon, and Pointe de Chien. The coast is studded with small islands and rocks; Ile d'Embier is near the Pointe de St. Cast, Les Verdelets in the bay of St. Brieuc, the Ile St. Roui and the Iles de Brehat between the Pointe de Milfaut and the Pointe du Sillon, the Ile d'Er between the last point and the Pointe de Chien; the Ile de Gueltat, Ile Tomé, the Iles Melban, Platte, Riouzoi, and the others of the group called les Sept-Iles (the Seven Islands), Les Triagons, the Ile Molenes or Molenoe, and Le Taureau, are to the west of Pointe de Chien.

The Ménez mountains run through this department in the direction of its length, and parallel to the coast: the predominant rock in this chain is granite. From these mountains on the north side flow a number of streams, the general direction of which is north and south, and which after a short course fall into the English channel. The Rance flows first towards the east, it then turns northward, passes Dinan, where the navigation commences, and entering the department of Ille et Vilaine, falls into the sea at St. Malo: this is perhaps the longest river in the department; its whole course is about sixty miles, for fifteen of which it is navigable. The other streams we shall enumerate in the order in which they occur from east to west:— The Fremur; the Arguenon, with its tributaries, the Rosette and the Rieulle; another Fremur; the Evran; the Urne; the Gouet or Goy, which passes St. Brieuc and falls into the sea just below it; the Ic; the Trieux, with its tributary the Leff; the Jaudy and the Guindy, which unite at Tréguier; and the Guer, which passes Lannion, with its tributary the Guier. The streams which rise on the southern slopes of the Ménez mountains flow into the Blavet or the Vilaine, which fall into the Atlantic; except the Hiere, which flows into the Aulne, a river that empties itself into the Brest Road. The Blavet itself rises in the department, as do its tributaries, the Lorette, the Salon, and the Doulas; while the Oust, the Forest, the Lie, the Trinité, the Livet, the Grenedan, and the Mue, immediately or ultimately flow into the Vilaine.

The high road from Paris to Brest traverses this department from E. b. S. to W. b. N., entering it near the little town of St. Jouan de l'Ile, and passing by Lamballe, St Brieuc, Guingamp, and Belle-Ile-en-Terre.

The climate of this department is temperate, but the atmosphere is foggy near the coast. The soil varies considerably. The Ménez mountains have a dry stony soil, and barren heaths of sand extend both on the north and south side of them; but to these heaths succeed, especially near the coast, plains of very great fertility. Maize and wheat are raised in abundance; a considerable quantity of wheat is exported to Spain and Portugal. Flax and hemp are grown, and apples for the purpose of making cider. The *Encyclopédie Méthodique* states that some wine is made, but that it is consumed in the district: when the vintage is abundant, much of it is converted into brandy. The pasturage is excellent, great numbers of horned cattle are reared, and some horses: butter is made, and sent to Paris and elsewhere. The mineral wealth of the department consists of iron and lead, marble, granite, slate, and coal. The inhabitants are generally engaged in agriculture, in fishing, and in various manufactures, especially of linens, which bear the name of Breton linens; in making which, in several places, many hands are employed. Like the other departments of Bretagne, this is remarkable for the preponderance of the rural population over that of the towns.

The department is divided into five arrondissements; viz., Loudéac in the S.E. (pop. in 1832, 98,604), and Guingamp in the W. and S.W. (pop. 115,679), both in the inland parts of the department; Dinan on the E. (pop. 111,739), St. Brieuc in the centre (pop. 171,730), and Lannion in the W. (pop. 103,120), along the coast. The chief towns are St. Brieuc, the capital, on the Gouet (pop. 10,420), Dinan on the Rance (pop. 8044), Guingamp on the Trieux (pop. 6100), Lannion on the Guer (pop. 5196 for the town, or 5371 for the whole commune), and Loudéac (pop. 1865 for the town, or 6736 for the whole commune): for an account of which the reader is referred to their respective articles. Of the other towns we shall subjoin a brief notice.

Lamballe is in the arrondissement of St. Brieuc, and on a river which unites with the Evran: it is on the high road from Paris to St. Brieuc, 266 miles from Paris and 12 from St. Brieuc. It is supposed to be an antient place; and according to some, derives its name from the Ambiliati or Ambialiates, or Ambialites, who (according to some MSS.) are mentioned in the Commentaries of Cæsar (de B. G. III. 9) among the allies of the Veneti in their naval war against the Romans. The town is surrounded with old walls; the houses are whitened; and the situation of the place in the midst of orchards, gardens, and meadows, renders it very agreeable. It is divided into the upper and lower towns, and has, beside, two suburbs. There is an antient castle, formerly belonging to the Dukes of Penthièvre, and a promenade attached to it, planted with large trees. The inhabitants amounted, in 1832, to 4390: they manufacture the best parchment in France, thread, linen, and leather; and trade in cattle. There is a library attached to a reading society in the town. La Noue, a celebrated Huguenot captain, was killed, A. D. 1591, at the siege of Lamballe, which was held by the Duke of Mercœur against Henri IV.

Quintin is on the upper part of the river Gouet, about 10 or 12 miles south-west of St. Brieuc, in the arrondissement of St. Brieuc. It has an antient castle of singular architecture; and in the neighbourhood are two Druidical obelisks or stones, of 26 or 27 feet high, one of which is yet standing; the other has been thrown down. The inhabitants, who amounted in 1832 to 4293, manufacture and export fine linens and iron wares; they trade also in honey, hides, wax, and hats.

Tréguier is in the arrondissement of Lannion, near the sea, at the junction of the rivers Jaudy and Guindy: it is not on any main road. Tréguier was, in the middle ages, a place of greater consequence than now. It was the seat of a bishopric, erected in the ninth century, and appears to have been a prosperous place of trade until it was burnt, A. D. 1592, by the Spaniards who supported the party of the Duke of Mercœur, a blow from which it never fully recovered.

It has now a population of 3178 persons, who carry on considerable commerce; they manufacture linen yarn, and rear a number of the best horses in Bretagne. A good deal of hemp is grown in the neighbourhood, from which sail-cloth is made. The port of Tréguier, which is formed by the æstuary of the rivers, is safe, and accessible to vessels of 200 tons.

Paimpol is in the arrondissement of St. Brieuc, on the coast, not far from the mouth of the river Trieux: it is not on any main road. Paimpol has a safe and convenient harbour, from which vessels are fitted out for the Newfoundland cod fishery; and some trade is carried on in corn, butter, hemp, flax, and linen yarn. The population in 1832 was 1917 for the town, or 2108 for the whole commune.

Moncontour is in the arrondissement of St. Brieuc, several miles south-east of that city. It has a population of 1670. Fine linen is manufactured here.

Pontrieux is in the arrondissement of Gulingamp, on the river Trieux (from which it takes its name), several miles above its mouth, and not on any main road. The population in 1832 was 1562 for the town, or 1647 for the whole commune.

The other towns are—in the arrondissement of St. Brieuc, Châtelaudren, between St. Brieuc and Guingamp, with the bourgs or subordinate towns of Ploeuc (population of the commune 5453), St. Jacques, Lanvollen, and Pommerit:—in the arrondissement of Dinan, Jugon, on the Arguénon, on the road between Dinan and Lamballe, and Matignon on the coast; with the bourgs of Broons, St. Jouan de l'Ile, and Plancoet:—in the arrondissement of Gulingamp, Callac near the Hière, and Rostrenen near the Lorette, both in the mountainous part of the department; with the bourgs of Belle-ile-en-terre and Bourbriac (population of the commune 3613):—in the arrondissement of Lannion are the bourgs of Plestin (population of the commune 5040), La Roche, Lezardieux, and Vieux Marché:—in the arrondissement of Loudéac, Corlay, between Guingamp and Pontivy, on the river Salon; Uzel, near the Oust; and La Cheze on the Lie; with the bourgs of Plemet (population of the commune 3013), Colinée, St. Caradec, Gouarec, Langast, and Merdrignac. Where the population is not given it does not amount to 1500 for the towns or 3000 for the communes. There are several villages in the department which have a large rural population; as Plouha, Plelo, and Louargat, which have above 5000 each; eleven others have above 4000 each. Of the towns mentioned above Uzel is one of the chief marts in the department for the sale of linens; Jugon trades in linen, butter, and corn; and Châtelaudren in linen yarn, corn, trefoil seed, cattle, butter, and honey: this last-mentioned town was some years since nearly destroyed, and most of the inhabitants drowned, in a great flood, caused by a neighbouring lake breaking its banks. The village of Corseul, not far from Dinan, preserves the name of the Curiosolitæ or Curiosolites, the tribe who, in Cæsar's time (Cæs. de B. G. II. 34, III. 7, VII. 75), inhabited the district. The traces of a considerable town, destroyed many ages since, may be perceived near this village.

The department of Côtes du Nord constitutes the diocese of St. Brieuc, the bishop of which is a suffragan of the archbishop of Tours. It is under the jurisdiction of the *Cour Royale* or high court of justice of Rennes, and is comprehended in the XIIIth military division, of which Rennes is the head quarters. It sends six members to the Chamber of Deputies. Education here, as indeed throughout Bretagne, is in a very backward state.

COTINGA. [CORACINA (*Coracina Scutata*). PIAUHAU. PROCNIAS.]

COTTAGE. [HOUSE.]

COTTAGE ALLOTMENTS may be considered as such portions of land hired by labourers, either attached to, or apart from, their dwellings, as they, assisted by their families, may be able to cultivate without ceasing to let out their services daily to others. They are thus distinguished from larger portions of land which require some capital and the occupier's whole attention, and consequently partake more of the character of small farms. The object of cottage allotments is to increase the resources of the labourer; firstly, by supplying him with many necessaries and comforts which he would have a difficulty in purchasing from a portion of his wages, and which, if even he could do so, he would purchase at a great disadvantage; secondly, by enabling him to turn everything to profit, so that nothing need be lost. With regard to the quantity of land which ought to be let to the labourer for this purpose, there has been much discussion. Various experiments have been tried, and the opinion of the persons best informed upon the subject appears now to be, that a quarter of an acre is about the quantity which, without prejudice to his other employments, a labourer can in general thoroughly cultivate, and consequently derive the greatest profit from; but this, of course, will vary with circumstances. A large family, some of whom can assist, and uncertain employment, may render a larger portion desirable. In limiting the quantity to a quarter of an acre of land, it must be understood that we are speaking of land under cultivation; where means have been found in a neighbourhood for letting a sufficient quantity of pasture to cottagers for one or two cows, no inconvenience has been found to result, while a most important addition has thus been made to their means of subsistence. But the possession of a cow or cows by labourers is attended with other advantages: An appropriate employment is thus supplied to the female portion of their families, whom mechanical inventions have deprived of the facility which they formerly had of gaining their livelihood by knitting and spinning. Cheap and nutritious meals are afforded to persons of all ages, but more particularly children; and additional facilities are given for keeping pigs, which contribute not only to the immediate support of the family but, together with the cows, supply the means of maintaining the land in good heart by the manure which is produced.

The peasantry however throughout the country appear to possess very imperfect knowledge respecting the best mode of accumulating, preserving, and economizing manure, and some means for improving the practice upon this head appears necessary. During the last 50 years cottages in large numbers have been built in various parts of the country with little or no land attached to them, and even the land which formerly surrounded the antient dwellings of the poor has, in many instances, been taken away. Attention has however of late years been called to the destitute and helpless state of the peasantry, and it has been found, that from the circumstance of their having nothing which could call forth prudence and ingenuity, they were become reckless, devoid of skill, and incapable of taking care of themselves. For the purpose of improving them it has been reasonably considered that to make them careful they must have something to care for; to render them skilful they must be placed in circumstances which render the exercise of ingenuity necessary. All these objects are supplied by allotments of land, which are now daily becoming more common, although several serious difficulties to the immediate adoption of the system have to be encountered: a few of these difficulties we shall here enumerate:—

1stly. The builders and other speculators, to whom too many of the cottages in some of our rural districts belong, have built them close together in rows or streets, which renders it impossible for the allotments in such instances to surround the dwellings, a circumstance necessary in order that the cottager should derive full benefit from them. When the land surrounds the cottage the children may be occupied upon it without being removed from the mother's superintendence. The father, who, after a day's work, would hesitate about walking a quarter of a mile and back, may easily apply a little labour to his garden without separating himself from his family.

2ndly. The peasantry are ignorant of the value of allotments and the mode of cultivating them. These circumstances present difficulties which nothing but an early training in industrial schools arranged for the purpose can completely overcome.

3rdly. The farmers generally have strong prejudices against the system.

With regard to rent, it should be the fair value of the land, the same as would be paid by any other description of tenants. When allotments are given gratuitously they are lightly valued, and when let at too high a rent they cannot make a return to the labourer which will induce him to continue his exertions. It would seem that they should be let directly by the proprietor of the soil to the labourer, or the evils of the Irish system may be feared. The state of things in Ireland has been continually urged against the allotment system, but, as we think, without reason; for, 1stly., The Irish peasant depends almost wholly upon his allotment, looking to it, not as an auxiliary to his daily earnings, but as the total of his means of support; 2ndly., He is obliged by the competition for land to pay a rent which far exceeds the proportion paid by the tenants, and leaves him only a miserable pittance to subsist upon.

It has also been urged against the system of cottage allotments that it tends to encourage early marriages, and to the production of a race of beggars. That cottage allotments may have this effect is true, but the objection is mainly applicable, and perhaps has been mainly applied, to cottage allotments which are of such a magnitude as to render it impossible for the cottager to cultivate them without exchanging his character of a labourer for that of a farmer without adequate capital, or, as already observed, the objections apply to a state of society like that in Ireland. The multiplication of small farms is quite a different question from that of cottage allotments as here understood, and opinions can hardly be much divided as to the inexpediency of such increase.

Part of the objections also raised against cottage allotments will be removed by the improved administration of the Poor Laws.

It remains then to consider whether, under the actual circumstances of this country, the advantages above suggested, as likely to arise to the labouring man from the possession and cultivation of a small piece of ground attached to his dwelling, will not counterbalance all possible disadvantages which have been suggested as likely to result from the system; whether in fact the possession of a small piece of ground, as here understood, will or will not tend to raise the standard of comfort which a labouring man and his children will enjoy; and whether, if such be the case, such possession will not have a tendency directly the opposite to that which has been imputed to the system of small allotments of land.

For further information upon this subject see the publications of the Labourers' Friend Society, and the evidence taken before a Committee of the House of Lords upon the subject of the Poor Laws in 1831. [GARDEN HUSBANDRY.]

COTTBUS, a circle lying on both banks of the Spree, in the southern part of the Prussian province of Frankfort-on-the-Oder. It has an area of about 334 square miles, and, by the census at the close of the year 1831 contained 42,000 inhabitants, an increase of 2110 since the year 1826. The northern parts consist in general of elevated moors; the southern, of sandy flats: there is an abundance of timber. Besides the Spree, this circle is watered by the Mala or Malcke, and a number of rivulets. There are several large ponds or natural expanses of water, such as the 'Devil's Pond,' south of Pictz, the royal 'Carp Pond,' near Bahrenbrück, &c. The chief pursuits of the inhabitants are agriculture and grazing; the principal products are rye, potatoes, flax and hemp, tobacco, chicory roots, wine, and fish. The stock, at the close of 1831, consisted of 3568 horses, 15,566 horned cattle, and 18,373 sheep and goats. Operative industry is almost wholly confined to the towns; and the principal manufactures are woollens, linens, stockings, tobacco and snuff, leather, spirits, and beer. There is an iron-work near Pritz, with a high-blast furnace and 5 hammers, and 3 boiling-houses for tar. Good iron-stone and peat are found at Werben. Besides the chief town, the circle contains Pritz on the Mala and on the canal of the Spree, with about 2100 inhabitants and 124 villages. Cottbus, the chief town, lies on the left bank of the Spree, in 51° 45′ N. lat. and 14° 22′ E. long., and is surrounded by high and strong walls. Its population amounts to about 8200 (in 1817, 6437, and 1831, 8046): it contains 4 churches, a gymnasium, an orphan asylum, and 2 hospitals. The inhabitants are employed in the manufacture of woollens, linens, beer, and brandy. It is the seat of a considerable transit-trade between the Elbe and Oder, as well as between Stettin and the eastern parts of Germany.

COTTESWOLD HILLS, THE, traverse the eastern part of Gloucestershire, beginning on the north near Chipping Cambden, and terminating a short distance north of Bath. Their whole length may be somewhat more than forty-five miles. They are divided into the upper and lower Cotteswolds. The upper extend from Chipping Cambden to Stroud, running nearly from N.N.E. to S.S.W. about twenty-five miles, and contain the highest portion of the ridge. Broadway Beacon, near the northern extremity, rises to 1086 feet; Cleeve Hill, east of Cheltenham, to 1134 feet; and Symmonds Hall, not far from Stroud, is 795 feet above high-water mark. The hills in this part are three or four miles across, and include many small valleys, to which agriculture was formerly limited, but in modern times it has been carried to the very summits of the hills; though the higher situations are much exposed to cold winds. The lower Cotteswolds, between Stroud and Bath, extend about twenty miles nearly due north and south. They hardly rise any where to 500 feet, and constitute a high ground from one to two miles wide. By the flat hills east of Malmsbury the Cotteswolds are connected with the hilly country along the Channel. The waters which descend from the western declivity of the Cotteswolds, which is the steep side, fall after a short course into the Severn. Those which descend from the eastern declivity form the upper branches of the Thames. These hills contain no minerals except freestone and limestone.

COTTIN, SOPHIE RESTAUD, born in 1773, was brought up at Bordeaux by her mother, who was an accomplished and well-informed woman. At the age of seventeen she married Mr. Cottin, a wealthy Parisian banker, with whom she resided in the capital. Three years after, she lost her husband, which circumstance, added to the horrors of the revolution, induced her to retire to a cottage in the valley d'Orsay. To beguile her solitude she began to write a novel, 'Claire d'Albe,' which, notwithstanding the good intentions of the authoress, whose object was to point out the dangers of seduction, cannot be called moral, it being calculated to engage the sympathies in favour of the heroine, who is guilty of adultery. This bad taste in morality, of making vice interesting, is common to many, and some of the best, French novels, such as Rousseau's 'Julie,' Madame de Stael's 'Delphine,' and many others: it has also spread to English literature, and infected not only novels but poetry A person is represented with a thousand amiable qualities, and one single vice; or with one single virtue, and a thousand crimes; the result is the same in both cases: our sympathies are excited in favour of the guilty, which is not the best way of forwarding the cause of virtue. In Madam Cottin this was only an error of judgment and inexperience, for her heart was pure, and her sentiments and conduct strictly virtuous. It is said that the publication of Claire d'Albe' was owing to a feeling of benevolence. A person of her acquaintance being proscribed during the revolution, stood in need of money to effect his escape; Madam Cottin hastily offered the sheets, which she had been writing for her amusement, to a bookseller, and gave the produce to the fugitive. Some say that 'Malvina' was the work which served this benevolent purpose. The subject of 'Malvina' is a woman married to a confirmed libertine, whose conduct drives her to insanity, from which she recovers only to die in the arms of her repentant husband. Her third work, 'Amelie Mansfield,' although cleverly written, is exceptionable on the same grounds as 'Claire d'Albe.' Madam Cottin afterwards wrote 'Mathilde,' a tale of the Crusades, which had great popularity. The charm of Madam Cottin's writings consists in her description of the feelings of the heart in trying circumstances: she always excels when she describes those of virtuous unsophisticated persons, for she then drew from the source of her own pure feelings, but she does not succeed so well in painting bad and stormy passions and worldly intrigues, to which she was entirely a stranger. Her last and best work was 'Elizabeth, or the Exiles in Siberia,' the characters and sentiments of which are most unexceptionable, the action well conducted, and the termination satisfactory. A delightful atmosphere of pure and almost infantine innocence seems to attend the heroine throughout her task of filial devotion. 'Elizabeth' is accordingly a work which is generally put into the hands of young persons, and has been translated into most European languages. The subject is a young girl, who is living with her exiled parents in Siberia, and who forms and executes the resolution of proceeding to Moscow on foot to ask their pardon of the emperor. It seems that in the beginning of the reign of the late Emperor Alexander, there was a young person, called Praskowja Lupolowa, who actually performed this journey of more than 2000 miles, and obtained the object of her petition. Madam Cottin has worked upon this fact, and embellished it with all the charms of description. The account of Siberia, and of the mode of existence of the unfortunate exiles, is pretty exact, except in one or two cases, as where, for instance, she speaks of avalanches falling from the mountains in Siberia, which is one of the flattest regions on the face of the globe. But her novels must be judged of as works of imagination, and as such they rank high in French popular literature. The style of 'Elizabeth' is considered more carefully correct and finished than that of her other novels. Madam Cottin, who was a Protestant, and had attentively studied the Scriptures, had begun a work intended to demonstrate the truth of the Christian religion by its sympathy with the best sentiments and affections of the heart. She had also begun a work on education. She did not live to finish either: she died in August, 1807, at the age of thirty-four, sincerely regretted by all who knew her. Her extreme modesty and total absence of ambition made her shrink from rather than court popularity and fame: most of her works were published anonymously. They have been since collected and published at Paris, in 5 vols. 8vo., 1817.

COTTON, a word derived from *Kutn*, or *Kutun*, one of the names given by the Arabs to this substance, is a filamentous matter produced by the surface of the seeds of various species of Gossypium. [GOSSYPIUM.] It consists of vegetable hairs, of considerable length, springing from the surface of the seed-coat, and filling up the cavity of the seed-vessel in which the seeds lie. Hairs [HAIRS] are extremely common on the surface of plants; frequently however they are unobserved, in consequence of their small number and minuteness; while on the other hand in some cases they give plants, such as the Mullein for instance, a remarkably hoary appearance. On the surface of seeds they are uncommon; and yet in the Malval alliance, to which the cotton plants belong, they not only exist abundantly on the seeds of that genus, but in several other species. Vegetable hairs are one of the many forms in which the cellular substance of vegetation is developed, and they consequently partake of two of the great characteristics of that form of tissue, namely, thinness and transparency. In the cotton they are long weak tubes, which, when immersed in water and examined under the microscope by transmitted light, look like flat narrow transparent ribands, all entirely distinct from each other, and with a perfectly even surface and uniform breadth; it is only occasionally that any appearance of joints is observable in these hairs, and when this happens the articulation is formed by a line, perpendicular, or nearly so, to the side of the tube. Sometimes a slight trace of fine grains is discernible in the interior, but more frequently the hairs seem empty; if strained singly they have little strength and readily break, and it is only when many are entangled together that they acquire any appreciable degree of strength. In all these points cotton differs from the vegetable matter that constitutes linen; the latter consists of woody tissue, in the state of long tubes, but is at once distinguished by the tubes adhering in bundles, which it is difficult under a microscope to break up into their component parts; the tubes are thick-sided, and will not acquire a riband-like appearance when viewed in water, but rather resemble extremely minute thermometer tubes. When they are jointed together the articulation is oblique, the ends of the tubes being pointed and overlying each other; and finally, in each particular tube of the woody tissue, delicate as it may be, there is a sufficiently appreciable degree of toughness when an attempt is made to break it. In short, cotton is a development of the parenchymatous part of the gossypium; linen is a form of woody matter; hence it is easy to distinguish with certainty linen from cotton manufactured articles, in cases of doubt; and hence also the well-known superiority of linen to cotton in strength: the latter is manufactured from the most delicate part of plants, the former from the toughest.

Cotton is produced by many different species and varieties of the genus Gossypium, under which article their differences, or at least what is known of them, will be explained. In this place a general description of the genus will be sufficient.

It consists of herbaceous, or nearly herbaceous plants, varying in height from three or four to fifteen or twenty feet, according to the sort; sometimes the branches become woody, but they always partake very much of the herbaceous character. The leaves are downy and more or less lobed, being sometimes however near the top of the stem undivided; at their base is seated a pair of awl-shaped stipules. The flowers are either yellow or dull purple, and have the ordinary structure of the Malvaceous family; each is surrounded by three heart-shaped bracts, which are more or less lacerated. The calyx is a bluntly five-toothed cup. The seed-vessel is a capsule opening into from three to five lobes, and then exposing many seeds enveloped in cotton, which sometimes adheres to them so firmly that it is separated with difficulty; sometimes it parts freely from them; in some sorts it is long and in others comparatively short, giving rise to the commercial names of long staple and short staple.

The sorts of cotton-plants are extremely numerous, but never having been critically and comparatively examined, they are in great confusion. And yet it is a point of the first consequence to ascertain the exact nature of their differences, and to name them with rigorous precision; for it is thus only that knowledge can be acquired of the kinds that yield the numerous qualities of cotton now in the market, and that the cultivator can be enabled to improve his plantations. But, as Professor Royle has very correctly observed, 'there are great, and in some respects insurmountable difficulties, as botanists have generally neglected the subject, and omitted mentioning the cultivated species; while cultivators have used provincial names, or applied new ones of their own, to the exclusion of any notice of the names in use among botanists. This has rendered it impossible for others to ascertain to what species their otherwise valuable observations refer. The celebrated De Candolle has admitted thirteen species, observing that they are all uncertain, and that no genus more requires the labour of a monographist; two additional species have been described by Dr. Roxburgh, one by Raeusch, and another in the *Flore de Sénégambie*. Dr. Von Rohr describes twenty-nine species or varieties, Mr. Badier eighteen, and Mr. Bennet mentions that he knew more than 100 kinds, and that they appeared to him never-ending.' Mr. Royle himself fixes the supposed species, as far as he could determine them, at eight.

This is certainly not creditable to the managers of colonial gardens; it says little for the good sense of the superintendents of those establishments, where alone the subject can be investigated, that there should not to this hour be even one good series of experiments, except Dr. Roxburgh's, upon record, regarding a plant of such immense importance as cotton. In the West Indies there have been public botanic gardens at Jamaica, St. Vincent's, and Trinidad; the last at least remains. In that situation all the varieties of cotton from the islands and the main land of America might be cultivated side by side, and in the East no place could be more favourable for the comparison of all the sorts found in India and Africa than the botanic garden of the Mauritius. The results could without difficulty be accurately compared, and in six or seven years this great desideratum in commercial knowledge might be supplied.

Cotton-plants are found wild in both the old and new world. Herodotus and Arrian speak of the cotton-plant as indigenous in India, and the linen found in Peruvian tombs sufficiently attests its having existed in that country long before it could possibly have been carried to America by eastern intercourse. In fact the wild American cotton-plants are specifically different from those of the old world; but at the present day the cotton of the West is cultivated in Asia and Africa, while that of the East has long since been introduced to the American plantations.

The situations in which cotton-plants have been advantageously cultivated are included between Egypt and the Cape of Good Hope in the Eastern, and between the southern banks of the Chesapeak Bay and the south of Brazil, in the Western hemisphere. It has not been found to succeed beyond the parallels that limit those countries. In the equinoctial parts of America Humboldt found it at 9000 feet elevation above the sea; in Mexico as high as 5500 feet; and Professor Royle saw it at the elevation of 4000 feet in the Himalaya. It seems generally to prefer the vicinity of the sea in dry countries, and the interior districts of naturally damp climates: thus, while the best cotton is procured in India from the coast of Coromandel, or other maritime districts, and in the southern states of the American Union from certain coast-islands, the coast cotton of Pernambuco is inferior to what is produced in the interior of that country. These facts lead to the inference that it is not merely temperature by which the quality of cotton is affected, but a peculiar combination of heat, light, and moisture; the most favourable instance of which may be assumed to be the coast of Georgia and the Carolinas, and the worst to be Java and the coast of Brazil.

That this should be so, would, in the absence of positive evidence, be probable, considering the nature of cotton. We have seen that it is a hairy development of the surface of the seed; and nothing in the organization of plants is more affected by the situation they live in than their hairs: thus scarcely any water-plants have hairs, except in a slight degree, while the same species transferred to a dry exposed station is closely covered with such organs, and *vice versâ*. The quantity of hair is also affected in an extraordinary degree by local circumstances. The Venetian sumach plant, when in flower, has its flower-stalks nearly naked; a large proportion of the flower-stalks has no fruit, and becomes covered with very copious long hairs, whence the French call this plant *Arbre à perruque;* but those flower-stalks which do bear fruit remain hairless. In this case the local cause is the abundant food thrown by the system of the sumach-plant into the flower-stalks for the nourishment of the fruit; and the fruit not forming, the food intended for it is expended in the formation of hairs upon the surface of the flower-stalk: this is a local circumstance that may be referred to the class of accidents. But local circumstances conducive to the formation of cotton in excess may be permanent, and derived from the situations in which the plants grow. In a damp cloudy climate the food procured from the soil may not be concentrated upon the surface of the seed, but may be expended in the production of excessive quantities of leaves, and of proportionally few flowers; or it may pass off into the atmosphere in the form of mere exhalation, a small proportion only being consolidated; or in a dry climate the soil may not be able to furnish food enough to the plant out of which to form more cotton than it is absolutely its specific property to produce under any circumstances. Or, lastly, there may be a mean where the powers of vegetation are called into their utmost activity by warmth and abundant food, and where, nevertheless, the dryness of the atmosphere and the brightness of the sun, constantly acting upon the surface of the cotton pods (seed-vessels), may drive back the juices from the surface of the latter to that of the seeds, and thus augment the quantity and improve the quality of the cotton itself: this may explain the action of climate upon this substance.

The question is however rather more complicated; the different specific qualities of different varieties of the cotton-plant must be also taken into account. It has already been seen that a considerable number of varieties of cotton is certainly cultivated, although so little is correctly known about them. In some of them the cotton is long, in others it is short; this has it white, that nankeen-coloured; one may be cultivated advantageously where the mean winter temperature does not exceed 46° or 48°, and another may require the climate of the tropics. This is just what happens with all cultivated plants. Some vines will produce only sweet wine, others only hard dry wine, and some are suited only to the table; some potatoes are destroyed by a temperature of 32°, while others will bear an average English winter; only one kind of wheat produces the straw from which the fine Leghorn plait for bonnets is prepared. But to multiply such instances is unnecessary. There can then be no doubt that the quantity of cotton will depend upon climate in part, and upon the specific properties of different varieties also in part.

For further information and numerous details upon this subject, we refer the reader to a very important dissertation upon the cotton cultivation of India, by Professor Royle, in his *Illustrations of the Botany and other branches of the Natural History of the Himalayan Mountains, and of the Flora of Cachmere*, article 'Malvaceæ.'

The *Cotton-plant*, or Gossypium, must not be confounded with the *Cotton-tree*, Bombax, or Eriodendron; the latter has also cottony seeds, but they cannot be manufactured.

COTTON CULTIVATION AND TRADE. Cotton is called, in French, *Coton;* German, *Baumwolle;* Dutch, *Katoen, Boomwol;* Danish, *Bomuld;* Swedish, *Bomull;* Italian, *Cotone, Bambagia;* Spanish. *Algodon;* Portuguese, *Algodao;* Russian, *Chlobtschataja Bumaga;* Polish, *Bawelna;* Hindustani, *Rûhi;* Malay, *Kapas;* Latin, *Gossypium.*

The distinctive names by which cotton is known in commerce are, with the following two exceptions, derived from the countries of their production. The finest kind, which commands the highest price, is called sea-island cotton, from the circumstance of its having been first cultivated in the United States of North America, in the low sandy islands on the coast, from Charleston to Savannah. It will not flourish at a distance from the sea, and it is said that its quality is gradually deteriorated in proportion as the plants are removed from 'the salutary action of the ocean's spray'; it succeeds only in South Carolina, Georgia, and Florida. This cotton is composed of filaments longer than those of any other description, which circumstance, joined to its even and silky texture, fits it for the production of the finest yarns. The seed is black, and in the southern states of North America it is thence frequently called 'black-seed cotton,' to distinguish it from the short-staple cotton produced in the interior of those states, and which, from a like natural cause, is distinguished as green-seed cotton. The seed of the sea-island cotton is sown every year; but the plant when cultivated within the tropics will live and yield harvests for several years in succession. It is supposed to have come originally from Persia. It was taken from the Island of Anguilla to the Bahamas for cultivation, and was first sent thence to Georgia in 1786: it is not said how the seed found its way to the little island of Anguilla: the annual average crop does not exceed 11,000,000 pounds.

Upland or Bowed Georgia cotton, the green-seed kind, has received its name of *upland* to distinguish it from the produce of the islands and low districts near the shores. The expression bowed was given as being descriptive of the means employed for loosening the seed from the filaments, which was accomplished by bringing a set of strings, attached to a bow, in contact with a heap of uncleaned cotton, and then striking the strings so as to cause violent vibrations, and thus open the locks of cotton and cause the seeds to be easily separable from the filaments. The remaining kinds of cotton now brought to English markets are distinguished by names so plainly descriptive of the countries of production, that it is not necessary to offer any description of them with that view.

The materials for the early history of the cultivation and use of cotton are very scanty. In India and many of the islands in the Indian Ocean, the plant has been cultivated, and its filaments have been spun and woven, from time immemorial. In Mexico the Spaniards found cotton cloths in common use at the time of their conquest of the country. The Egyptians were acquainted in the time of Pliny with the use of cotton; but the manufacture of textures of this material must have been introduced among them at a period not so remote as the æra which produced many of the remains of that people which have been handed down to us. Such mummy-cloths as have been submitted to microscopic examination are all linen; and while delineations of the flax plant are commonly found in Egyptian paintings, none of the cotton shrub has been discovered. It is said that the cotton plant was very early known in China, and cultivated as an ornamental garden shrub, but that its filaments were not brought to use until the thirteenth century of the Christian æra, when its cheapness, as compared with wool and silk, caused it to rival those products, notwithstanding the opposition offered to its introduction through the generally unchanging habits of the people. More than 300 years before the date just mentioned, the plant was cultivated and its produce made into clothing in Spain under the dominion of the Moors. At that time the manufacture of cotton cloths was carried on extensively at Seville, Cordova, and Granada. In the Island of Sicily, then in possession of the Saracens, the cotton plant was cultivated. The mutual repugnance to each other of the Mohammedans and Christians was doubtless the cause of this valuable plant not having been usefully known at that period in other parts of Europe. The manufacture of cotton goods is said to have existed in Italy at the beginning of the fourteenth century; but there appears so much confusion in the names and description of the various tissues then known in commerce, that it is not possible to speak with much confidence on the subject.

It is not until towards the middle of the seventeenth century that we find any distinct mention made of the cotton manufacture as being carried on in England, although it has been shown by Mr. Baines that *cotton wool* was brought hither from the Levant and manufactured in Manchester at a somewhat earlier period.

The limited degree and the mode in which cotton was used for the production of tissues in this country, up to the time of Arkwright, has already been shown in this work. [ARKWRIGHT.] The cotton goods of which mention is made in the early history of the manufacture were mixed goods, of which the warp was composed of linen and only the weft of cotton, the mode of spinning then in use not giving sufficient strength to fit the latter for being used as warp. This difficulty was surmounted by the invention of Arkwright, whose first patent was obtained in 1769, from which time cotton fabrics have been made exclusively with that material. The progress of the manufacture did not at first give promise of the rapid extension which it afterwards exhibited. In 1764 the quantity of cotton imported was 3,870,392lbs., and the annual average from 1771 to 1775 did not amount to one million of pounds beyond that quantity. In the five following years the annual average quantity was no more than 6,766,613; but in 1790 the quantity used was 30,603, 451lbs., and at this rate the manufacture continued stationary during the remainder of the century if the yearly average is taken. In 1800, the last year of the last mentioned series, the quantity was above 50 millions of pounds. From that time until the close of the war, in 1814, the advance of the manufacture was unimportant, the annual average consumption being 66 millions of pounds; but with the return of peace an extraordinary impulse was given to the trade, and the annual average consumption of cotton, taken in periods of five years, has been as follows:—

1815 to 1819	118,267,611 lbs.
1820 to 1824	152,201,824 „
1825 to 1829	205,665,011 „
1830 to 1834	280,918,826 „

And in 1835 the consumption was, 326,407,692 „

The following statement of the production of cotton in various parts of the world, at different periods during the past half century, is taken from a collection of 'tables and notes on the cultivation, manufacture, and foreign trade of cotton,' compiled by order of the American congress, and presented to the House of Representatives by Mr. Levi Woodbury, the secretary of the United States' treasury. These tables appear to have been compiled with great care and industry, and they present the most complete view of the subject which has hitherto been offered. The following table, in which round numbers are used, must evidently be taken as only an approximation to the truth.

Years.	United States of America.	Brazil.	West India Islands and Colonies.	Egypt.	Other parts of Africa.	India.	Other parts of Asia.	Mexico and South America (exclusive of Brazil).	Other parts of the World.	Total production of Raw Cotton.
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
1791	2,000,000	22,000,000	12,000,000	..	46,000,000	150,000,000	190,000,000	68,000,000	..	490,000,000
1801	48,000,000	36,000,000	10,000,000	..	45,000,000	160,000,000	150,000,000	56,000,000	15,000,000	520,000,000
1811	80,000,000	35,000,000	12,000,000	..	44,000,000	170,000,000	146,000,000	57,000,000	11,000,000	555,000,000
1821	180,000,000	32,000,000	10,000,000	6,000,000	40,000,000	175,000,000	135,000,000	44,000,000	8,000,000	630,000,000
1831	385,000,000	38,000,000	9,000,000	18,000,000	36,000,000	180,000,000	115,000,000	35,000,000	4,000,000	820,000,000
1834	460,000,000	30,000,000	8,000,000	25,000,000	34,000,000	185,000,000	110,000,000	35,000,000	13,000,000	900,000,000

The cultivation of cotton has lately become an object of attention in Peru, and it appears probable that considerable supplies may be sent thence to Europe. The plant may be successfully cultivated along the whole coast of Peru. The quality of the produce is said to be equal to that of Upland Georgia cotton, some shipments made in 1835 having sold at the same price as Georgia cotton. The quantity exported from Peru in that year was 800,000 lbs.

A further table is given by Mr. Woodbury, showing the distribution of cotton at various periods from 1770 to the present time. It may suffice to give these particulars for one year (1834); the difference between the quantities produced in and exported from the different countries represent the probable consumption in the places of cultivation.

Exports from the United States to England . .	266,750,000 lbs.	lbs.
„ „ „ to France . .	79,900,000	
„ „ „ to other places .	20,000,000	
Total from the United States		366,650,000
Exports from India to England	32,000,000	
„ „ to China	40,000,000	
Total exports from India		72,000,000
Brazil to England		18,000,000
West Indies to England		4,000,000
Brazil and West Indies to France		4,000,000
Egypt and Turkey to England		1,500,000
„ „ to France		7,000,000
		lbs. 473,150,000

It appears from the foregoing figures that rather more than two-thirds (68 per cent.) of all the cotton sent away from the places of production are shipped to England. It is further remarkable, that while the production of this article has increased in the United States until it now equals the production of the whole world as it existed in 1770, the quantity grown in all other countries, with the exception of India and Egypt, has materially decreased. This result has been attributed to various causes, among which may be mentioned the good quality of American cotton, the low price of land there, and the great improvements that have been made in cleaning the cotton from its seed by means of Whitney's saw-gin, introduced in 1793. It is evident however that the greater part of these advantages might have been shared by many other countries in which the soil and climate are equally favourable for this branch of husbandry: and it will probably be more in agreement with the fact if we attribute the success of the American planters to their greater intelligence and industry, seconded by the commercial enterprise by which their country is characterized.

During the period in which the increased production has been going forward with the greatest rapidity in America, the prices have been continually declining. In the table of prices given by Mr. Woodbury as those of the United States, at the places of exportation, and including all kinds of cotton, it is shown that the average price of each period of five years, from 1791 to 1835, has been as follows, viz.·—

	per lb.		per lb.		per lb.
1791 to 1795...	15¾d.	1806 to 1810...	9½d.	1821 to 1825...	8d.
1796 to 1800...	18½d.	1811 to 1815...	7¼d.	1826 to 1830...	5d.
1801 to 1805...	12¼d.	1816 to 1820...	13d.	1831 to 1835...	6d.

The higher prices obtained in the earlier years of this series must not be taken altogether as the measure of the planters' gains; but there can be no doubt that those gains were sufficiently great to stimulate production; and if the estimates obtained from Mr. Woodbury's tables and other sources are to be relied on, there is no reason to fear that the market value of their produce is yet so far reduced as to check the extension of cotton cultivation in the south-western states, and prevent it from keeping pace with the increasing demands of European manufacturers. 'Where rich lands and labour were low, as in Mississippi and Alabama a few years ago, two cents (one penny) per pound for cotton in the seed, or eight cents when cleaned, would pay expenses. It is supposed to be a profitable crop in the south-western states, at ten cents per pound.' (Woodbury's *Tables, &c.*, page 17.) An American gentleman, Mr. Joshua Bates, who is a partner in the house of Baring and Co., stated in his evidence before the Select Committee on Manufactures, Commerce, &c., in 1833, that "it is understood that even six cents or three-pence per pound is a price at which the planters can gain money in the valley of the Mississippi.'

Bengal cotton of inferior quality can, it is said, be raised for three half-pence per pound, and delivered in England at an advance of one penny upon that price. Good Surat cotton is said to cost two-pence half-penny per pound, delivered at Bombay. The cost of production in our West India colonies is considerably greater, and the cultivation of cotton has consequently been for the most part abandoned by the British planters.

Land fresh brought under cultivation in the United States will yield on an average from 1000 to 1200 pounds per acre of cotton with the seed, which will yield of clean cotton from 250 to 300 pounds. In the old states, the produce is not more than one-half this quantity. One able-bodied labourer is sufficient for each eight acres of land, if assisted in the lighter part of the work by the aged and infirm, and the young people who belong to their families; the whole will, at the same time, be able to cultivate from five to eight acres of provision ground. The proportion of able-bodied labourers in each 100 of the entire working population of the cotton-growing districts in America is 32; the proportion of young persons not yet arrived at their full strength, and of elderly people still capable of some degree of labour, is 25; the remaining 43 are composed of children under fourteen years of age, and superannuated persons, none of whom are capable of any but very light work, such as weeding and picking the cotton. Captain Basil Hall has given the details of a plantation where 200 acres were under cotton cultivation, on which the entire number of negroes was 122; of these 48 were children under fourteen, and four were wholly superannuated. Of the remaining 70 only 39 were considered 'full hands,' 16 were 'three-quarter hands,' 11 'half-hands,' and 4 'quarter-hands,' the whole being equal to 57¼ able-bodied labourers. This proportion of labourers is greater than that first stated of one able-bodied labourer to eight acres, which rests upon the authority of Mr. Woodbury's tables. On the same authority we are told that the whole quantity of land cultivated for cotton in the United States at this time (1836) should be estimated at two millions of acres; that the capital employed for the purpose is from 800 to 900 millions of dollars; and that the whole number of persons who are engaged in field labour, picking, and otherwise assisting in the cultivation of cotton, and raising their own provisions, is about 680,000. If to these are added the aged, the infirm, and the very young children composing the families of the labourers, 'besides overseers, owners, and their respective families dependent on the cotton crop, it is presumed that a million of persons are now engaged in the growing of cotton in the United States.'

The relative value of the kinds of cotton more commonly introduced for sale and use in this country, will be seen in the following list of prices quoted by the brokers of Liverpool, the greatest cotton market in this kingdom, or indeed in the world, on the 13th January, 1837.

	s.	d.		s.	d.	
Sea Island . . .	2	1	to	3	0	per lb.
Demerara and Berbice .				1	1	
Egyptian . .	0	11½		1	4½	
Pernambuco and Ceara .	0	10¾		1	1	
Bahia and Macaio . .	0	9		0	11½	
Maranham . .	0	10		1	0½	
Mobile and Alabama .	0	7½		0	11½	
New Orleans . . .	0	7¾		0	11½	
Upland Georgia . .	0	7½		··	11	
Common West India .	0	10		0	11½	
Surat . . . . Madras	0	4¼		0	7¾	

More than four-fifths of all the cotton brought into the United Kingdom is of the growth of the United States of America. The importations during 1835 were:—

From Egypt and ports in the Mediterranean	5,181,017 lbs.
„ East India Company's territories .	41,429,011
„ British West Indies . .	1,815,270
„ Brazil	24,986,409
„ United States of America . .	284,455,812
„ Other places . . .	5,835,444
Total	363,702,963

The growth of this trade has been rapid beyond all commercial precedent. In 1786 the total imports were somewhat less than 20,000,000 pounds, no part of which was furnished by North America. Our West India colonies supplied nearly one-third, about an equal quantity was brought from foreign colonies in the same quarter, 2,000,000 pounds came from Brazil, and 5,000,000 pounds from the Levant. In 1790 the importations amounted to 31,447,605 pounds, none of which was supplied by the United States. In 1795 the quantity was only 26,401,340 pounds. In this year a commercial treaty was made between the United States of North America and Great Britain, by one article of which, as it originally stood, the export was prohibited from the United States in American vessels of such articles as they had previously imported from the West Indies. Among these articles cotton was included, Mr. Jay, the American negotiator, not being aware that cotton was then becoming an article of export from the United States. In 1800 the imports had more than doubled, having reached 56,010,732 pounds. This was the first year in which any considerable quantity was obtained from America; the imports from that quarter were about 16,000,000 pounds. The progress of this trade during the present century is shown by the following table, exhibiting the imports at intervals of five years:—

	From all places.	From the United States.
1805 ..	59,682,406 lbs.	32,500,000 lbs.
1810 ..	132,488,935 ..	36,000,000
1815 ..	99,306,343 ..	45,666,000
1820 ..	151,672,655 ..	89,999,174
1825 ..	228,605,291 ..	139,908,699
1830 ..	263,961,452 ..	210,885,358
1835 ..	363,702,963 ..	284,455,812

The quantities actually employed in our manufactories in different years during the same period and at equal intervals have been as under·—

1800,	51,594,122 lbs.	1820,	152,829,633 lbs.
1805,	58,878,163	1825,	202,546,869
1810,	123,701,826	1830,	269,616,640
1815,	92,525,951	1835,	326,407,692

The rapid extension thus shown has altogether resulted from the inventions of Hargreaves, Arkwright, Crompton, and others, in spinning machinery, and more recently from the invention by Dr. Cartwright, since perfected by other mechanicians, of the power-loom. But for these inventions it would have been impossible for our artizans to have competed successfully with the spinners and weavers of India, from which country we previously received our supply of muslins and calicoes. The wonderful proficiency of the Hindus in this branch of manufacture and the low rate of wages among them have, by means of our inventions, been so completely overcome, that not only have we ceased to import for use the muslins of India, but have for many years sent great and continually increasing shipments of those goods to clothe the natives of India. These shipments were quite inconsiderable until the partial opening of the trade with India in 1814, in which year our looms supplied 818,202 yards of cotton goods to India. Two years afterwards the shipments were doubled. In 1818 they amounted to about 9,000,000 yards, and from that time the shipments have increased so greatly, that in 1835 the markets of India and China took from us 62,994,489 yards, the declared value of which amounted to 1,660,806*l.*, exclusive of 8,233,142 lbs. of cotton yarn, valued at 603,211*l.* Considerable shipments of cotton piece goods are still made from India to this country, but nearly the whole are re-exported.

It is owing to the low price of our manufactures, more perhaps than to their comparative excellence in other respects, that this commercial revolution has been brought about. The hand-spun yarns of India, produced as they are from cotton of a quality inferior to that employed in our factories for the finer kinds of fabrics, are more durable and are capable of being converted into cloths more curiously fine than have hitherto been woven in England; but so great is the economy attained in the various processes of our manufacture, that this advantage of durability has been more than counterbalanced.

The quantity of cotton manufactured in various countries, as given in Woodbury's Tables for the year 1833, was as follows:—

England	284,500,000 lbs.
France	87,000,000
United States . . .	80 to 85,000,000
India and China . . .	242,000,000
Mexico and South America, including Brazil .	35,000,000
Germany	36,000,000
Turkey and Africa . .	42,000,000
Spain	10,000,000
Prussia	20,000,000
Elsewhere	40,000,000

The number of persons employed in and connected with the cotton manufacture, and the number of spindles in use in some of these countries, is stated in the same tables as follows:—

		Persons.	Spindles.
England . .	1833	1,590,000	9,500,000
United States	1831	200,000	1,750,000
France . .	1834	600,000	3,250,000
Switzerland .	1824		259,200

It has been computed that the produce of thirty-seven spindles is required for the supply of one loom; but this proportion partly depends upon the fineness of the yarn, and is not applicable where power-looms are used, the quantity of cloth woven in these being greater than that made in hand-looms in the proportion of five to two. The number of power-looms used for weaving cotton at the end of the year 1835, in the United Kingdom, was 109,626, of which 90,679 were in England, 17,531 in Scotland, and 1,416 in Ireland. The number of persons employed in cotton factories in the same year was 220,134. The proportions in the three divisions of the kingdom were:—

	Males.	Females.	Total.
England	88,327	94,916	183,243
Scotland	10,529	22,051	32,580
Ireland .	1,639	2,672	4,311
	100,495	119,639	220,134

These numbers do not include persons employed in the processes of dyeing and printing, hand-loom weavers, stocking-knitters, nor makers of bobbin-net.

The first cotton-mill built in the United States was set to work in Rhode Island in 1790. Attempts had been made in the previous year 'to get the machinery into operation by water, by means of models for carding and spinning, which the state of Massachussetts had procured from abroad; but no mill was begun until the autumn of 1789, when one was commenced by the assistance of Mr. Slater, who had then recently come from England. About this time a cotton-mill was erected at Beverley, Massachussetts, by an incorporated company.'

The manufacture made at first so little progress in the United States, that up to 1808 not more than 15 spinning mills had been erected. There was a great increase in 1812, occasioned by the war between England and America; again from 1820 to 1825 much capital was applied to this object, and a further extension of the manufacture was made in 1831 and 1832; in the first of which years we have seen that, according to Mr. Woodbury, the number of spindles in use in the United States was between one-fifth and one-sixth of the number used in this country. The great demand for cotton goods within the States has hitherto prevented any very considerable exportation; the total annual value of the shipments made between 1826—previously to which year the official tables are silent as to any exports—and 1832, was under 250,000*l.* In 1833 the value is given at 2½ millions of dollars (520,000*l.*), and in 1834 at 2,200,000 dollars (458,000*l.*). The greater part of these shipments were made to Mexico and the South American states.

The quantity of cotton imported into France in 1787, the earliest year as to which any returns are given, was 4,466,000 kilogrammes, or not quite ten millions of pounds; and it was not until after the return of peace that any decided augmentation occurred in this branch of industry. In 1815 the importation of cotton was 16,414,606 kilogrammes—36 millions of pounds; in 1820 it had reached 20,000,000 kilogrammes; in 1825 it was still below 25 millions; in 1830 it amounted to 29½ millions, and in 1833 reached 35,609,818 kilogrammes (78½ millions pounds). In the same years the weight and value of cotton goods exported from France were as follows:—

	Kilogrammes.	Francs.
1787 .	.. .	21,227,200
1815 .	,445,884 .	8,698,840
1820 .	1,439,358 .	29,120,058
1825 .	1,914,718 .	43,190,495
1830 .	2,454,569 .	55,636,150
1833 .	2,556,527 .	57,007,133

If we compare the quantities here stated for 1833 with the consumption of our own factories and the shipments made from the United Kingdom in the same year, it will be seen that the quantity of cotton spun in France was equal to, or rather more, than one-fourth of that used in our mills, and that the value of the exports from France was not quite equal to one-eighth part of the value of the shipments from England.

The only other country in which the cotton manufacture is prosecuted with a view to the supply of foreign markets, is Switzerland. The entire and absolute freedom of trade allowed throughout the Swiss cantons prevents our giving any statement of the quantity of the raw material at any time imported, or of manufactured goods exported. The cotton manufacture is of modern introduction: the first spinning machine was established at St. Gall, in the year 1800; but Switzerland still imports considerable quantities of foreign-spun yarns for the use of her hand-loom weavers, as well as of power-loom cloths from England, which are dyed and printed, and afterwards exported. Finding themselves shut out from the greater part of the markets of Europe by heavy duties and prohibitions, the merchants of Switzerland have directed their attention to the supply of North and South America, and partially of India also. The perfection to which dyeing and cotton-printing have been brought in the cantons gives them great advantages. So great is the degree of perfection attained in the application of the colour denominated Turkey red, that calicoes and prints of that colour are imported from Switzerland into England: the same may be said of embroidered muslins.

The cotton manufacture is the most generally diffused of all the branches of industry upon which the production of clothing depends. The greater part of the countries in which it is carried on limit their production of cotton goods to the wants of their own people. The perfection to which the spinning processes have been carried in this country has made the greater part of the world in some measure dependent upon our cotton mills for the finer descriptions of yarns; and a sufficient indication of the universality of cotton-weaving may perhaps be afforded by inspection of the table given under the head of COTTON MANUFACTURES, and which contains a statement of the quantities of different descriptions of cotton fabrics, and of twist and yarn, exported from the United Kingdom during the year 1835.

COTTON SPINNING. Among all the antient mechanical arts there were few so simple as that of converting the downy filaments of the cotton plant into a continuous thread according to the methods generally used before the time of Hargreaves and Arkwright, and which methods are still employed in eastern countries. There are, on the other hand, few processes for the performance of which the inventive powers of man have, since that period been more taxed, in this country and during this age of invention, than for the cheap and perfect production of cotton twist and yarn.

The use of the spindle and distaff was superseded in England by the spinning-wheel, in or soon after the reign of Henry VIII. The next improvements in this useful art were those of Hargreaves and Arkwright, the introduction of which is noticed under the head COTTON MANUFACTURES. Since that time the inventions by which the art of cotton-spinning has been advanced in this country have been so numerous, that a large volume would hardly suffice for their full explanation; all that can here be attempted is a description of the various processes now in use in the best regulated cotton-mills of Lancashire, and a summary notice of the more striking effects which have resulted from their introduction.

Owing to the great variety generally found in the quality of different bags of cotton, which would otherwise occasion a corresponding difference in the quality of the yarn produced, the contents of several bags are mixed together in a heap. This is done by spreading out the contents of each bag in a horizontal layer of uniform thickness, the contents of the several bags forming separate layers and resting one upon the other, so that the number of layers corresponds to the number of bags. In making this heap, which is called a *bing* or *bunker*, the several layers are to be trampled or pressed together somewhat in the manner of building a hay-stack. The cotton of which the bing is composed is then torn down by a rake from top to bottom. It is evident that in its progress a portion of each horizontal layer will be brought away, and that thus, if the work be skilfully done, the contents of the different bags must be collected together in a mass of uniform quality.

It is customary to mix in this manner different descriptions of raw cotton for the production of various qualities of yarn, and some skill on the part of the manufacturer is called for in order to produce a mass that will answer the intended purpose at the least possible cost. The practice of different spinners varies much in this respect, but it is considered proper as a general rule to mix together only such qualities as are similar in the length of their staple. The waste cotton produced in the previous operations of the mill are mixed in the bing in certain proportions for making the lower qualities of yarn. For the higher numbers, and for twist which is used for warp, finer qualities of cotton are required than for low numbers or for weft.

The scutching machine is used to open the locks of cotton and separate its fibres, while at the same time it separates from it any sand or seeds which it may contain. This machine consists of feeding-rollers made of wood and placed at a short distance from each other, through which the cotton is made to pass slowly, after passing through which it is struck by a set of beaters made to revolve 1600 or more times in a minute. The cotton is thus passed through two sets of rollers, and subjected to two sets of beaters It is then taken to the spreading-machine, the use of which is to spread a given weight of cleaned cotton into a given length and breadth, in order to its being presented of uniform thickness to the next machine—the carding-engine. The spreading-machine is not universally used. Where the heavier quality of yarn is spun it answers sufficiently well, and effects an adequate saving of labour, but for fine yarns, where the greatest precision is required in order to produce regularity in the size of the yarn, machine-spreading does not answer so well as hand-spreading. The cotton must be weighed very accurately before it is put into the spreading-machine, and when perfectly spread is called a *feed*, the thickness of which will of course be regulated by the weight of cotton supplied to the machine. This operation is repeated continuously, so that an unbroken sheet of cotton passes through the machine and is wound on a wooden roller. In this form the cotton is called a breaker lap, and is then ready for the carding-engine.

Up to this stage the fibres of the cotton cross each other in every direction. The use of the carding-engine is to disentangle them, to draw them out and to lay them parallel to each other: properly speaking, this is the first operation of spinning, the previous processes being used only to open and clean the cotton. The card is a species of brush made of short wires passed through a sheet of leather and pointing all in one direction. In the early period of cotton-spinning in this country, these cards were nailed on small pieces of board with handles, and two of them were used together, one held in each hand. The first improvement made in this implement was effected about 1760, by James Hargreaves, who, a few years later, invented the spinning-jenny. This improvement in the cards consisted in having one of them greatly increased in size, and fixed; this was called the stock, and the other was suspended by a cord working in a pulley, fixed to the roof of the chamber; the effect of this arrangement was that two or more cards could be applied to the same stock. This modification was immediately followed by the greater improvement of cylinder cards; the father of the late Sir Robert Peel set up a machine of the kind at Blackburn in 1762, with the assistance of Hargreaves. The inventor of cylinder cards is not known with certainty. Mr. Baines ascribes the invention to Lewis Paul, who took out a patent in 1748 for improvements in carding. The carding-engine consists of a horizontal cylinder covered in its entire circumference with narrow fillet cards wound spirally round the cylinder, leaving an intervening space between the several spiral lines thus described on the surface of the cylinder. Over the cylinder is a concave frame, the interior surface of which is lined with cards, and the form of which corresponds to that of the cylinder. When the cylinder is made to revolve, the cards on it and on the frame work against each other, by which means the fibres of cotton are disentangled and properly arranged, as already mentioned. The cylinders, which are usually about 3 feet in diameter, and 3 feet long, are made to revolve at the rate of about 170 revolutions in a minute.

The cotton, in the form already described as a breaker lap, is led into the carding-machine by a slow motion through feeding-rollers, one inch in diameter, which revolve only twice in a minute. The fibres of the cotton are then immediately engaged by the wires of the main cylinder, and after being by their means properly arranged, are thrown off by its velocity to a second cylinder called a doffer.

When cylinder-cards were first used, hand-cards were employed to take off the cotton. Various contrivances were at different times adopted for improving this part of the process, until at length Arkwright contrived for the purpose a plate of metal toothed at the edge like a comb, which, instead of revolving as the former contrivances had done, was, by means of a crank, made to move rapidly in a perpendicular direction, and with slight but reiterated strokes on the teeth of the cards detached the cotton from them in a uniform fleece. This fleece is made to undergo compression on its passage to a roller, from which it is delivered in the form of a thick but soft thread, called a card-end, or sliver, into a tin can. The duration of the carding process is made to depend upon the quality of the cotton under preparation. If the fibres are short and coarse, the carding should be quickly performed, not indeed by accelerating the speed of the cylinders, but by taking the cotton faster off the cards.

The next operation is called drawing, and the machine by means of which it is performed is called the drawing-frame. The object of this drawing is to complete what has been begun by the carding-engine, viz., the arranging of the fibres of cotton longitudinally, in a uniform and parallel direction, and to remedy all existing inequalities in the thickness of the sliver. The drawing-frame acts upon the same principle as Arkwright's spinning-frame, two sets of rollers being employed moving with unequal velocities. In its passage through the first pair the sliver is simply compressed, but being drawn through the second pair with twice or thrice the original velocity, it is necessarily drawn out in the same proportion. In repeating this operation, which is called doubling, two, three, or a greater number of the drawings are passed through both sets of rollers; in the first they are made to coalesce, and in the second are again drawn out. This doubling and drawing process is repeated very frequently, in some cases as many as 1000 times, in order to correct every inequality in the thickness of the cord or sliver: up to this point the cotton has not been made to undergo any twist. This doubling and drawing process is of the utmost importance, and if ill or insufficiently performed, the yarn cannot prove of good quality.

Roving, the next step in the process, is a continuation of the drawing, with this only difference, that the cord, now called a rove or slub, being so much reduced in thickness that it will not otherwise hold together, a slight twist is given to it by passing it into a conical can, which, while receiving it, is made to revolve with great velocity. The rove thus slightly twisted, is wound upon bobbins by children, and is then ready for the spinning frame. About the year 1817, a machine called a *fly frame* was contrived for preparing rovings for inferior numbers of yarn. Instead of revolving cans, this frame is provided with a series of spindles, each of which is provided with a flyer, the revolutions of which give the requisite twist to the cord, which is delivered at once to the bobbin fitted loosely on the spindle. The *tube frame*, more recently introduced, is used for preparing yarns of all qualities. Instead of cans, this frame is provided with revolving horizontal cylinders, and by its means a much greater quantity of work can be done in a given time than with the fly frame. The rove which it produces has no twist, and is therefore very tender, and the quantity of waste which it occasions is greater than is otherwise experienced. The tube frame is an American invention, but has been improved in this country; a patent for these improvements was granted in 1829.

The principle of Arkwright's spinning frame has been already explained. [ARKWRIGHT.] The yarn produced by its means received the name of water-twist, from the circumstance of the machinery being at first set in motion by water power. The throstle-frame is the same in principle as Arkwright's invention, but the movement of the parts is simplified, so that the speed of the machine is increased, and a greater number of spindles may be driven with an equal amount of power; it was introduced about the year 1810. The mule-jenny, invented by Samuel Crompton, combines the essential principle of Arkwright's frame with the property of stretching possessed by Hargreave's jenny. By means of the mule-jenny, the roving is first drawn and then stretched. The effect of this improvement is to make the yarn finer, and of a more uniform tenuity. When delivered by the rollers, the thread is thicker in some parts than in others, and these thicker parts not being so effectually twisted as the smaller parts, are softer and yield more readily to the stretching power of the mule, and by this means, the twist becomes more equal throughout the yarn. Throstle-spinning is seldom employed for higher numbers than forty to fifty hanks to the pound, because smaller yarn would not have strength to bear the drag of the bobbin, but in mule-spinning no bobbin is used, and the yarn is wound or built upon the spindles without subjecting it to any strain. The spindles in this machine are regularly arranged on a carriage, which when put in motion recedes from the rollers with a velocity somewhat greater than that at which the reduced rovings are delivered from them; during this time the yarn is receiving its twist by the rapid revolving of the spindles, and when the rollers are made to cease giving out the rovings, the mule-jenny still continues to recede, but with a slower motion, and its spindles to revolve, and thus the stretching is effected. The distance which the spindles recede from the rollers while both are in action is called a stretch; this is usually about fifty-four or fifty-six inches; the space through which the mule moves greater than and during the giving out of the rollers, is called the gaining of the carriage; and the further space accomplished by the carriage after the rollers are stopped, is called the second stretch; during this latter part of their progress, the spindles are made to revolve much more rapidly than before, which is to save time. When the drawing, stretching, and twisting of the thread are thus accomplished, the mule disengages itself from the parts of the machine by which it has been driven, and then the attendant spinner returns the carriage to the rollers, again to perform its task. While returning to the roller, the thread which has been spun is wound or built on the spindle in a conical form, and is called a cop. The mule-jenny is a complex piece of mechanism, and requires to have all its parts very nicely fitted and adjusted. At first it was constructed with only twenty spindles, but by successive improvements has been made sometimes to contain upwards of 1000.

The last great triumph of invention connected with cotton spinning which it is requisite to notice, is the self-acting mule contrived by Mr. Roberts, of the firm of Sharp, Roberts, and Co., machine-makers in Manchester. The carriage of this mule, after having drawn out and stretched and twisted, the thread is returned again to the rollers by mechanical means without the guidance or intervention of any intelligent agent, the only attendance required being that of children to join such threads as may have been accidentally broken in the stretching. This self-acting mule is even more complex in its arrangements than the original machine, and hence great doubts were entertained as to its successful working. It is probably owing to the great care and ability shown by the inventor in their construction that these doubts have proved ill-founded. This invention in its improved form was secured by patent in 1830, and has already come extensively into use; its advantages as regards economy, and rendering the manufacturer independent of a class of workmen who have frequently proved refractory, are so great, that this machine will, as a matter of course be adopted in every case where new machinery is required; it is already (1836) used in more than 100 factories.

If the yarn spun with the mule-jenny be intended for use as weft in the factory where it is produced, the cops are at once applied to the shuttle, and of late it is sometimes the custom to export them in that form; but when intended for warp, and generally when exported, the yarn is reeled into hanks each 840 yards in length, for performing which operation a self-acting reel has been contrived. This process is attended by young women. The diameter of the reel is 4½ feet; when it has performed 80 revolutions, a lay is formed measuring 120 yards, and seven of these lays make up a hank. Each hank is separately tied round with a thread, and weighed to ascertain its fineness; the different sizes are then put by themselves and separately packed in paper bundles of either five or ten pounds weight.

Fine yarns are usually singed, in order to remove their loose downy fibres and to give them smoothness. This is accomplished by subjecting the thread to the action of a series of coal-gas flames, through which it is several times passed with great velocity.

Cotton thread is made by laying together two or more yarns of equal quality, and twisting them, for which purpose also machinery is employed. Previous to the doubling and twisting, the yarn is passed through a trough, containing a thin solution of starch; the twist is given in an opposite direction to that applied by the spinning machine, causing the thread to resemble in this respect organzine silk.

Scarcely any operation in a cotton mill is carried forward without the intervention of a machine, by which the work is done with greater precision, and also with greater celerity, and consequently greater economy. The packing of the hanks of yarn into bundles is the work of a *bundle press*, by means of which the hanks are pressed into a very small compass, the power of the machine enabling young females to exert quite sufficient strength for the purpose.

The degree in which the inventions that have here been noticed have reduced the expenses attending this branch of manufacture, is shown by the following statement, drawn up by Mr. Dugald Bannatyne, lately and for many years secretary to the Chamber of Commerce at Glasgow. Prices of cotton-yarn, 100 hanks to the lb., in the following years:—

	s.	*d.*			*s.*	*d.*	
1786	38	0	per lb.	1799	10	11	per lb
1787	38	0	,,	1800	9	5	,,
1788	35	0	,,	1801	8	9	,,
1789	34	0	,,	1802	8	4	,,
1790	30	0	,,	1803	8	4	,,
1791	29	9	,,	1804	7	10	,,
1792	16	1	,,	1805	7	10	,,
1793	15	1	,,	1806	7	2	,,
1794	15	1	,,	1807	6	9	,,
1795[*]	19	0	,,	After many fluctuations, in			
1796	19	0	,,	1829	3	2	,,
1797	19	0	,,	1832	2	11	,,
1798[†]	9	10	,,				

The waste of material in spinning cotton is variously estimated. Mr. Kennedy calculated, in a paper contributed by him to the Manchester Literary and Philosophical Society, that the waste amounts to 1¼ oz. per lb., or nearly one-tenth of the original weight; and this estimate is thought to be very near the truth.

The following statement, taken from the report of the commissioners appointed to inquire concerning the labour of children in factories, was designed to show, from actual returns made by a great number of manufacturers, the manner and proportions in which the different classes of work-people are employed in cotton mills, and the aggregate amount of their monthly net earnings throughout the kingdom.

[*] Spun from Bourbon cotton.

[†] Spun from Sea Island cotton.

Employed in	Adults.		Children under 18 years of age.						Proportion whose age and sex are uncertain, from a deficiency in the returns.	Total number employed.	Aggregate amount of monthly net earnings.		
			Males.			Females.							
	Males.	Females.	In the direct employ of masters.	In the direct employ of operatives.	Employer uncertain.	In the direct employ of masters.	In the direct employ of operatives.	Employer uncertain.					
Cleaning and spreading cotton	1,330	2,319	951	3	31	345	6	13	..	4,998	£ 8,631	19	6
Carding	10,361	15,062	4,983	461	78	8,099	458	163	819	40,484	75,276	10	0
Mule-spinning	22,727	5,196	3,038	23,634	257	1,255	8,663	82	364	65,216	139,660	17	9
Throstle-spinning	793	3,000	1,409	25	100	2,203	19	160	..	7,709	11,615	10	1
Reeling	722	11,208	182	25	..	2,306	76	119	..	14,638	22,817	8	4
Weaving	20,440	28,566	4,561	2,582	204	12,109	4,261	119	2193	75,055	168,663	16	3
Roller covering	261	389	19	3	..	31	22	..	..	725	1,764	18	5
Engineers, &c.	3,759	34	151	9	19	3	..	..	..	3,975	15,987	0	9
	60,393	65,774	15,314	26,742	689	26,351	13,505	656	3376	212,800	£444,481	1	1

The following statement exhibits the actual working of a cotton-mill in Manchester, in the year 1834. The yarn made was all of fine quality; viz.

No. 130 to 150	5,038 lbs.
„ 155 to 160	16,478 „
„ 165 to 170	19,488 „
„ 175	21,679 „
Total quantity of yarn spun	62,683 „
Total weight of rovings	68,127 „
Waste (1.278 oz. per lb.)	5,444 „
Number of mule jennies	109
„ of spindles	32,448
Weight of yarn per spindle	1 lb. 14$\frac{15}{16}$ oz.
Number of spinners employed	56
„ of piecers employed	156
Total amount of wages paid	£5,894
Spinner's average net weekly earnings	24*s.* 8¼*d.*
Cost of wages on each pound of yarn	1*s.* 10½*d.*

The relative cost of yarns of different degrees of fineness, the description of cotton used for their production, and the countries which are our chief customers for each quality, are as follows:—

Quantity of yarn.	Price per lb.	Growth of cotton employed.	Countries to which exported.
	d. *d.*		
Water twist, No. 12	12¼ to 13	North America, or India	Italy.
„ 20	13¼ „ 14	ditto	Germany and India.
„ 30	16 „ 16¼	ditto	Russia, Germany, India, and China.
Mule twist, No. 40	16 „ 16¼	ditto	
„ 50	18¼ „ 19	ditto	
„ 60	21 „ 22	ditto	
	s. *d.*		
„ 70	2 2¼	North America, or Egypt	
„ 80	2 5	ditto	Germany, Switzerland, Russia, and India.
„ 90	2 10	ditto	
„ 100	3 3	ditto	
„ 120	4 1	ditto	
„ 130	4 6	ditto	
„ 140	5 1	North America.	Switzerland and France.
„ 150	6 6	ditto	
„ 160	7 4	ditto	
„ 170	8 5	ditto	
„ 180	9 8	ditto	
„ 200	13 0	ditto	
„ 250	27 0	ditto	

The prices here stated were those obtained in January, 1836. It will be seen that the price of the same *count* is greater for water twist than for mule twist. The hardness and closeness of texture of the former better fits it for warps for heavy goods, such as fustians and for sewing cotton, while the lower numbers of mule twist are best adapted for weft in coarse goods, and the higher numbers for both warp and weft of fine cloths, such as muslins.

The rate of wages paid to persons of various ages in the cotton mills at Manchester, has been stated on the authority of the Factory Commissioners as under:—

	Average weekly wages. Males.		Females.	
	s.	*d.*	*s.*	*d.*
From 9 to 10	2	9¾	2	11½
„ 10 to 12	3	8	3	9½
„ 12 to 14	5	0¼	4	10¼
„ 14 to 16	6	5¾	6	4¾
„ 16 to 18	8	2¾	8	0½
„ 18 to 21	10	4	8	11
„ 21 and upwards	22	5¾	9	6½

The Act of 1833, for regulating the labour of children in factories, forbids the employment in a cotton factory of any child under thirteen years of age for more than nine hours during the day.

It is a curious fact, that a great part of the yarn used for making very fine muslins at Paisley and Glasgow is spun in Lancashire. The machinery in the Scottish mills is equally well constructed, and the material used is of the same quality in both places; but the spinners in Lancashire who apply themselves to the production of fine yarn are comparatively few and selected from a greater number than find employment in Scotland, where the small proportion who attain the requisite sleight-of-hand are not able to produce fine yarns in sufficient abundance for the supply of the Scottish looms.

A great and increasing proportion of English spun yarn is every year exported to foreign countries. The exports since 1820 have been as follows:—

1820	23,032,325 lbs.	1828	50,505,751 lbs.
1821	21,526,369 „	1829	61,441,251 „
1822	26,595,468 „	1830	64,645,342 „
1823	27,378,986 „	1831	63,821,440 „
1824	33,605,510 „	1832	75,667,150 „
1825	32,641,604 „	1833	70,626,161 „
1826	42,189,661 „	1834	76,478,468 „
1827	44,878,774 „	1835	83,214,198 „

The table inserted under the head cotton manufactures, showing the exports of cotton goods generally in 1835, particularises the countries to which English spun yarn was sent.

COTTON MANUFACTURE AND TRADE. The use of cotton as a material for the production of woven fabrics was known in India and China for many centuries before its introduction into Europe. The earliest mention of cotton by the Greek writers is by Herodotus (iii. 106) in his brief notice of the usages of the Indi: he calls it (iii. 47) by the significant name of tree-wool (εἴριον ἀπὸ ξύλου), apparently not being acquainted with the native name. In the reign of Amasis, B.C. 563—525, cotton was known in Egypt, but it must have been imported, as there is no reason for supposing it was then grown in Egypt. Cotton cloths were, according to Arrian, among the articles which the Romans received from India, and there is no doubt the manufacture had been carried on in many parts of Asia, long before any extant notice of that quarter of the world being visited by Europeans. The perfection to which the weaving of cotton had then been brought by the natives of many parts of India, notwithstanding their rude and imperfect implements, attests at once their patience and ingenuity. In China, this manufacture is supposed not to have existed at all before the beginning of the sixth century of the Christian æra. The cotton plant was indeed known in that country at a much earlier period, but continued till then to be cultivated only as a garden shrub, and was not indeed propagated on a large scale until the eleventh century; at the present time nearly all the inhabitants of that populous empire are clothed in cotton cloths of home manufacture.

Before the discovery of the passage to India by the Cape of Good Hope, cotton wool is said to have been spun and woven in some of the Italian states, the traders of which were the channels through which the cotton fabrics of India were distributed to the different countries of Europe. Becoming thus acquainted with these goods, and having near at hand the raw material of which they were formed, it was natural that they should apply to the production of similar goods the manufacturing skill they had long possessed.

Baines has shown ('History of the Cotton Manufacture,') that the cotton plant was extensively cultivated, and its produce manufactured, by the Mohammedan possessors of Spain in the tenth century. This branch of industry flourished long in that country. In the thirteenth century, the cotton manufacturers formed one of the incorporated companies of Barcelona, in which city two streets received names which point them out as the quarter in which the manufacturers resided. The cloths made were mostly of coarse texture, and a considerable quantity was used as sail-cloth. The name *fustians*, from the Spanish word *fuste* signifying 'substance,' was borrowed from the Spanish weavers, and is still used to denote a strong fabric made of cotton. The intercourse between the Mohammedan possessors of Spain and the Christian inhabitants of other European countries was so small, owing to religious prejudice, that the arts which long flourished among the former, did not extend themselves to the latter; the traffic of Andalusia was all carried on with Africa and the East.

From Italy the art made its way to the Netherlands, and about the end of the sixteenth or the beginning of the seventeenth century was brought thence to England by protestant refugees. Lewis Roberts, in 'The Treasure of Traffic,' published in 1641, makes the earliest mention extant of the manufacture in England. He says, 'The town of Manchester buys cotton wool from London that comes from Cyprus and Smyrna, and works the same into fustians, vermillians, and dimities.'

There is abundant evidence to show that in the beginning of the sixteenth century, and probably before that time, cotton was cultivated and converted into clothing in most of the countries occupying the southern shores of the Mediterranean. The European conquerors of Mexico in their first invasion of that country found in use native manufactures of cotton, both unmixed and mixed with the fine hair of rabbits and hares. Some of these fabrics were sent by Cortes to Spain as presents to the Emperor Charles V. Cotton was cultivated and manufactured at an equally early period by different nations on the coast of Guinea, and it is stated by Macpherson in his 'Annals of Commerce,' that cotton cloths were imported into London in 1590 from the Bight of Benin.

It would be difficult to trace the introduction and progress of the cotton manufacture in the different countries of Europe where it is now established. Its growth has in every case been subsequent in point of time, and much inferior as regards its extent, to its progress in this country. Some idea of the relative importance of the manufacture in some foreign European states may be derived from the statement given in our account of the cotton trade of the shipments to those countries of the raw material from the principal country of its production, and to information thus derived we must for the most part restrict our notice of this branch of the subject.

In the notice of ARKWRIGHT (vol. ii., page 344), will be found a sketch of the various inventions and improvements to which the first great extension of our cotton manufacture must be attributed. Previous to the introduction of these inventions this manufacture was of small importance, as is evident from the quantities of the raw material then brought into the country. Arkwright's first patent for the mode of spinning by rollers was taken out in 1769, and the following account of the importations of cotton at different periods preceding and speedily following that event will show how rapid was the progress occasioned by it, and by the other inventions for which it prepared the way.

1697	1,976,359 lbs.	
1701 to 1705	1,170,881 „	average
1710	715,008 „	
1720	1,972,805 „	
1730	1,545,472 „	
1741	1,645,031 „	
1751	2,976,610 „	
1764	3,870,392 „	
1771 to 1775	4,764,589	average
1776 to 1780	6,766,613	
1790	31,447,605 „	
1800	56,010,732 „	

The system under which this manufacture was long carried on was very different from that which is now pursued. It was the custom for the weavers who were dispersed in cottages throughout the district to purchase the material with which they worked, and having converted it into cloths to carry their wares to market and sell them on their own account to the dealers; but about 1760, the merchants of Manchester began to employ the weavers, furnishing them with yarn for warp, and with raw cotton, which was spun by the weaver's family for the weft, and paying a fixed price for the labour bestowed in weaving.

The application of machinery to the preparation and spinning of raw cotton for weft preceded by some years the inventions of Arkwright. In the year 1760, or soon after, a carding engine not very different from that now used was contrived by James Hargreaves, an illiterate weaver, residing near Church in Lancashire; and in 1767 the *spinning-jenny* was invented by the same person. This machine as at first formed contained eight spindles, which were made to revolve by means of bands from a horizontal wheel. Subsequent improvements increased the power of the spinning-jenny to eighty spindles, when the saving of labour which it thus occasioned produced considerable alarm among those persons who had employed the old mode of spinning, and a party of them broke into Hargreaves' house and destroyed his machine. The great advantage of the invention was so apparent, however, that it was soon again brought into use, and nearly superseded the employment of the old spinning-wheel, when a second rising took place of the persons whose labour was thus superseded by it. They went through the country destroying wherever they could find them both carding and spinning machines, by which means the manufacture was for a time driven away from Lancashire to Nottingham.

The cotton-yarn produced both by the common spinning-wheel and spinning-jenny could not be made sufficiently strong to be used as warp, for which purpose linen-yarn was employed. It was not until Arkwright's spinning frame was brought into successful operation that this disadvantage was overcome. [ARKWRIGHT.] Yarn spun with Hargreaves' jenny continued for some time to be used for weft. At first, the manufacturers of cloths composed of cotton only were subject to much annoyance from the determination of the revenue officers to charge them with double the duty paid upon calicoes woven with linen warp and printed for exportation; and also by prohibiting their use at home. With some difficulty an act of parliament was obtained for removing these obstacles to the development of the manufacture, which from that time was prosecuted with a great and continually accelerated rate of increase.

The earliest attempts at producing muslins were made about the year 1780, but without much success, although India-spun yarn was substituted as weft for that produced by the spinning-jenny: the greatest degree of fineness to which yarn spun with Arkwright's frame had then been brought, was eighty hanks to the pound, and even this degree was not attainable by means of the jenny. This disadvantage was overcome by the invention of Mr. Samuel Crompton, which came into general use about the year 1786, and which partaking of the nature of both Hargreaves' and Arkwright's machines, was aptly called the *mule-jenny*. By means of this piece of mechanism, yarns were produced of a much greater fineness than had before been attained. Mr. Crompton's invention was made several years before it could be openly used, because of its interference with the patented invention of Arkwright; but when this patent was annulled, the mule-jenny was brought rapidly and extensively into use, so that in 1787, 500,000 pieces of muslin were made at Bolton, Glasgow, and Paisley, with yarn of British production. The price paid at that time by the manufacturers for these fine yarns was 20 guineas per lb.; but such have been the improvements since made in the machine and the manner of working it, that yarn of the same fineness has of late been sold at from 14 to 16 shillings per lb. Mr. Crompton did not secure to himself the benefit of his invention by taking out a patent: he carried on a spinning and weaving business on a small scale at Bolton, and worked his mule-jenny with his own hands in an attic. In a brief memoir of Crompton, Mr. Kennedy has stated, that about 1802 he, in conjunction with Mr. Lee, set on foot a subscription which amounted to 500*l*., and with this Crompton was enabled to increase his manufacturing establishment, and to set up several looms for fancy work in Bolton. In 1812 he made a survey of all the cotton manufacturing districts in the kingdom, and ascertained that the number of spindles then at work upon his principle amounted to between four and five millions: since that time the number has been doubled. The kind friends already named assisted him in making an application to parliament for some reward, and the great merit of his invention having been established before a Committee of the House of Commons, he received a grant of 5000*l*., which was paid to him in full without any deduction for fees or charges. This money was employed by Crompton in putting his sons into business, but they proved unsuccessful, and he was reduced to poverty, when Mr. Kennedy again interfered in his behalf, and raised a second subscription, with the produce of which a life annuity of 63*l*. was purchased. He lived only two years to enjoy this small provision. The first mule-jennies consisted of not more than thirty spindles each, but the number has been progressively increased, and they now frequently contain more than 600 spindles each. With one of these machines, a good workman can produce in a week consisting of sixty-nine working hours, thirty-two pounds of yarn of the fineness of 200 hanks to the pound, and as each hank measures 840 yards, the produce of his week's work if extended in a line would measure 3050 miles. This work, extraordinary as it may seem, does not afford a full conception of the degree of tenuity to which cotton is capable of being reduced, one pound of raw cotton having been converted into 350 hanks, forming a continuous thread 167 miles in length. It is said that a few mules have lately been put to work, carrying each 1100 spindles. The greatest recent improvement made in the construction of this machine has been effected by Messrs. Sharp, Roberts, and Co., machinists of Manchester. These machines, which are called self-acting mules, do not require the manual aid of a spinner, the only attendance necessary being that of children, called piecers, who join such threads as may be accidentally broken. Self-acting mules were contrived at different times by Mr. William Strutt of Derby, Mr. Kelly of Lanark, Mr. De Jongh of Warrington, and others; but none of these were brought successfully into use, owing no doubt, in some measure, to the inferior skill of the machine makers as compared with the perfection which they have since attained.

The first successful attempt to weave by means of machinery was made in 1785 by Dr. Cartwright, who secured the invention by patent. In a commercial point of view Dr. Cartwright did not draw any advantage from his power-loom; but in 1809 he obtained from parliament a grant of 10,000*l*. as a reward for his ingenuity. Mr. Monteith, of Pollokshaws, Glasgow, who fitted up 200 power-looms in 1801, was the first person who brought them to profitable use. A great obstacle to their success was presented by the necessity for the frequent stopping of the machine in order to dress the warp. This difficulty was removed in 1804 by the invention of a machine for dressing the whole of the warp before it is placed in the loom, which was made the subject of a patent by Mr. Radcliffe, the inventor. In the use of this machine the warp in its progress to the weaving beam is passed through a dressing of hot starch; it is then compressed between rollers to free it from the superfluous quantity of starch taken up, and is afterwards, in order to dry it, drawn over a succession of ten cylinders heated by passing steam through them; during this last part of the operation the warp is 'lightly brushed as it moves along, and is fanned by rapidly revolving fanners.' The flour used for this dressing operation throughout the cotton factories of this kingdom, amounts in the year to at least 650,000 bushels. The number of power-looms used in cotton factories throughout the kingdom at the end of the year 1835 was stated by the inspectors of factories in a return laid before parliament to be 109,626, which were thus distributed.

ENGLAND.		SCOTLAND.		IRELAND.	
Lancashire	61,176	Lanarkshire	14,069	Waterford	339
Cheshire	22,491	Renfrewshire	1,339	Wexford	67
Derbyshire	2,403	Dumbartonshire	534	Kildare	52
Yorkshire	4,039	Buteshire	94	Dublin	23
Staffordshire	836	Ayrshire	736	Antrim	840
Leicestershire	40	Kirkcudbright	90	Down	425
Middlesex	8	Perthshire	421	Armagh	170
Cumberland	186	Aberdeenshire	248		
Total	90,679	Total	17,531	Total	1,416

England	90,679
Scotland	17,531
Ireland	1,416
Total in the United Kingdom	109,626

Each of these looms, if of good construction and attended by a skilful weaver, is capable of producing 120 yards of cloth per week, or 6240 yards in the year, at which rate the annual productive power of the whole number of looms amounts to 684 millions of yards. It is not probable however that the productive power of these machines is in all cases carried to its utmost extent. Hitherto it has not been practicable to produce any but coarse or heavy goods by means of the power-looom; fine calicoes, muslins, and fancy goods are woven by the hand. The number of hand-loom weavers cannot be ascertained with the same correctness as the number of power-looms, the latter being collected together in factories which are under the superintendence of official inspectors, while hand-loom weaving is altogether a domestic manufacture carried on in the cottages of the artisans. Computations of the number of these domestic looms have been made by different intelligent persons conversant with the trade, who have estimated them variously; the lowest at 200,000 and the highest at 250,000.

The numbers given in the following table refer only to persons engaged in spinning and power-loom weaving, and exclude altogether both hand-loom weavers and persons employed in printing and dyeing, with hosiery, the bobbinnet manufacture, and the production of various small wares made of cotton. [HOSIERY, LACE.] Mr. M'Culloch estimates that, 'allowance being made for old and infirm persons, children, &c., dependant upon those actually employed in the various departments of the cotton manufacture, and in the construction, repairs, &c., of the machinery and buildings required to carry it on, the entire cotton manufacture must furnish, on the most moderate computation, subsistence for from 1,200,000 to 1,400,000 persons.'

The following statement of the Number of Cotton Factories in operation in the different parts of the United Kingdom, with the Number and Ages of the Persons employed therein, is abstracted from Returns made by the Inspectors of Factories in 1835.

Counties, &c.	Number of Factories.		Between 8 & 12 Years.		Between 12 & 13 Years.		Between 13 & 18 Years.		Above 18 Years.		Total Number of Persons employed.		
	AtWork.	Empty.	Males.	Fem.	Males.	Fem.	Males.	Fem.	Males.	Fem.	Males.	Females.	Total.
ENGLAND.													
Chester	109	7	425	406	1,448	1,206	3,672	4,315	9,971	10,069	15,516	15,996	31,512
Cumberland	13	..	8	4	57	38	169	332	392	658	626	1,032	1,658
Derby	92	3	182	192	504	564	1,073	1,924	2,855	3,556	4,614	6,236	10,850
Durham	1	..	. .	. .	. .	2	1	11	8	11	9	24	33
Lancaster	683	32	2,806	1,983	6,419	5,261	16,855	20,365	34,071	34,655	60,151	62,264	122,415
Leicester	6	..	9	. .	66	17	130	92	120	158	325	267	592
Middlesex	7	..	22	. .	24	. .	109	14	62	119	217	133	350
Nottingham	20	..	17	23	82	131	132	382	250	706	481	1,242	1,723
Stafford	13	..	72	78	67	113	201	403	409	705	749	1,299	2,048
York, W. Riding	126	..	489	387	529	533	1,632	2,031	2,537	2,773	5,187	5,724	10,911
Total, England	1,070	42	4,030	3,073	9,196	7,865	23,974	29,869	50,675	53,410	87,875	94,217	182,092
Wales, Flint	5	..	. .	. .	56	33	146	208	250	458	452	699	1,151
Scotland	159	..	454	538	1,258	1,832	2,845	7,597	6,168	12,403	10,529	22,051	32,580
Ireland	28	..	44	58	153	181	286	561	960	1,553	1,639	2,672	4,311
Total, United Kingdom	1,262	42	4,528	3,669	10,663	9,911	27,251	38,235	58,053	67,824	100,495	119,639	220,134

The total value of the cotton goods annually manufactured in Great Britain was stated by Mr. Huskisson to amount, in 1824, to 33,500,000*l*. This estimate was probably excessive at that time, but such has since been the extension of this branch of industry that it is now assuredly below the truth. Mr. M'Culloch, in the second edition of his 'Commercial Dictionary,' published in 1834, estimated the value of every description of cotton goods made in Great Britain in 1833 at 34,000,000*l.* Mr. Kennedy, who is considered a good authority on this subject, supposed the value in 1832, when the quantity of the raw material used was about 12 per cent. less than in 1833, was 24,760,000*l.* Mr. Baines, who has taken great pains to test the accuracy of his calculations in every possible way, has made the value amount, in 1833, to 31,338,693*l.* (*Hist. of Cotton Manufacture*, p. 412). If this calculation was correct for that year, the value in 1835 must, owing to the increased production, have somewhat exceeded 35,000,000*l.*, and according to custom-house returns, including 11 months of 1836, the amount during the year 1836 cannot fall much below 40,000,000*l.* The estimate made by Mr. M'Culloch calculates that the quantity of the raw material used is 240,000,000lbs., and its

value at 7*d.* per lb.	£7,000,000
Wages of 800,000 weavers, spinners, bleachers, &c., at 22*l.* 10*s.* per ann.	18,000,000
Wages of 100,000 engineers, machine-makers, smiths, masons, joiners, &c., at 30*l.* a year each	3,000,000
Profits of the manufacturers, wages of superintendents, sums to purchase the materials of machinery, coals, &c.	6,000,000
	£34,000,000

The quantity of raw material taken for use in 1835 was 333,043,464 lbs.; this, at the average price of 8*d.* per lb., which is certainly below the actual rate, amounted to 11,100,000*l.*, and assuming that through improvements in the processes of manufacture the wages and other expenses were no more than the estimate of Mr. M'Culloch, the value of goods manufactured in 1835 exceeded 38,000,000*l.* In the eleven months of 1836, from 5th January to 5th December, the quantity of cotton taken by the spinners has been 348,343,066 lbs., and although some little check to commercial operations was felt during a few weeks preceding and following the latter date, which may prevent the consumption for the whole year being proportional to that of the eleven months, it may be fairly assumed that the quantity manufactured throughout 1836 will amount to 370,000,000 lbs., which, at the average price of 9¾*d.* per lb., to which raw cotton has advanced through the year, will amount to 15,031,250*l.* There is no reason for believing that any material improvement in the spinning or weaving processes has been introduced within the last year, and on the other hand it is known that the prices of many articles auxiliary to the manufacture have increased, and that a continual accession has been made to the number of hands employed, while the wages of a part at least have been increased. Assuming then that the various items taken into the estimate by Mr. M'Culloch, as amounting to 27,000,000*l.*, would have been correct as applied to the quantity used in 1835, those items upon the increased quantity of 1836 will amount to 30,000,000*l.*, and the whole value of the manufacture will be 45,000,000*l.*

The declared value of cotton manufactured goods exported in 1835 was 16,421,715*l.*, and of yarn 5,706,589*l.* It has been said that no reliance is to be placed upon the value thus declared; but besides the fact that the merchants have no motive for disguising the truth in these declarations, their general accuracy has been tested and proved in various ways by Mr. Baines, and it may afford a further corroboration that the value declared in 1835 amounts in the average to only 6½*d.* per yard upon the quantity shipped. It has been held that the value of the cotton fabrics retained for use within the kingdom exceeds the value of the part exported by 30 to 40 per cent., but if we content ourselves with estimating the value of the home and the export demand to be equal, the whole value of the manufacture in 1835 exceeded the sum above mentioned of 38,000,000*l.*

The progress of this manufacture is shown by the following table, which contains a statement of the quantity of cotton used by the manufacturers and the value of cotton manufactures exported from 1801 to 1835.

Years.	Quantity of Cotton Wool taken for Consumption.	Value of Goods Exported.		Years.	Quantity of Cotton Wool taken for Consumption.	Value of Goods Exported.	
		Official.	Real, or Declared.			Official.	Real, or Declared.
	lbs.	£.	£.		lbs.	£.	£.
1801	54,203,433	7,050,809		1819	133,116,851	18,282,292	14,699,912
1802	56,615,120	7,624,505		1820	152,829,633	22,531,079	16,516,748
1803	52,251,231	7,081,441		1821	137,401,549	22,541,615	16,093,787
1804	61,364,158	8,746,772		1822	143,428,127	26,911,043	17,218,724
1805	58,878,163	9,534,465		1823	186,311,070	26,544,770	16,326,684
1806	57,524,416	10,489,049		1824	141,038,743	30,155,901	18,452,987
1807	72,748,363	10,309,765		1825	202,546,869	29,495,281	18,359,526
1808	41,961,115	12,986,096		1826	162,889,012	25,194,270	14,093,369
1809	88,461,177	19,445,966		1827	249,804,396	33,182,898	17,637,165
1810	123,701,826	18,951,994		1828	208,987,744	33,467,417	17,244,417
1811	90,309,668	12,013,149		1829	204,097,037	37,269,432	17,535,006
1812	61,285,024	16,517,690		1830	269,616,640	41,050,969	19,428,664
1813	50,966,000	Records destroyed by fire.		1831	273,249,653	39,357,075	17,257,204
1814	53,777,802	17,655,378	20,033,132	1832	259,412,463	43 786,255	17,398,392
1815	92,525,951	22,289,645	20,620,956	1833	293,682,976	46,337,210	18,486,400
1816	86,815,021	17,564,461	15,577,392	1834	308,602,401	51,069,140	20,513,585
1817	116,757,526	21,259,224	16,012,001	1835	333,043,464	52,333,278	22,128,304
1818	162,122,705	22,589,130	18,767,517				

The quantity and declared value of different descriptions of these goods exported in each year from 1820 to 1835 are given in the following table :—

Years.	White or Plain Cottons.		Printed or Dyed Cottons.		Hosiery and Small Wares.	Twist and Yarn.		Total Declared Value.
	Yards.	Declared Value.	Yards.	Declared Value.	Declared Value.	Pounds.	Declared Value.	
		£.		£.	£.		£.	£.
1820	113,682,486	5,451,024	134,688,144	7,742,505	496,580	23,032,325	2,826,639	16,516,748
1821	122,921,692	5,713,722	146,412,002	7,454,243	619,999	21,526,369	2,305,823	16,093,787
1822	151,162,131	6,317,973	150,999,157	7,480,634	722,535	26,595,468	2,697,582	17,218,724
1823	152,184,705	5,844,935	149,631,387	7,095,709	720,014	27,378,986	2,625,946	16,326,604
1824	170,091,384	6,437,817	174,559,749	8,010,432	869,336	33,605,510	3,135,396	18,452,987
1825	158,039,786	6,027,892	178,426,912	8,205,117	919,787	32,641,604	3,206,729	18,359,526
1826	188,159,783	4,477,942	128,897,111	5,388,592	735,497	42,189,661	3,491,338	14,093,369
1827	183,940,186	5,762,576	181,544,618	7,1-4,459	1,144,552	44,878,774	3,545,578	17,637,165
1828	189,475,956	5,623,802	173,852,475	6,859,447	1,165,763	50,505,751	3,595,405	17,244,417
1829	222,504,344	5,853,625	180,012,152	6,662,623	1,041,885	61,441,251	3,976,874	17,535,006
1830	244,799,032	6,562,397	199,799,466	7,557,373	1,175,153	64,645,342	4,133,741	19,428,664
1831	239,191,261	6,065,478	182,194,032	6,098,035	1,118,672	63,821,440	3,975,019	17,257,204
1832	239,493,096	5,854,924	201,552,467	5,645,706	1,175,003	75,667,150	4,722,759	17,398,392
1833	259,519,864	5,847,840	236,832,222	6,603,220	1,331,317	70,626,161	4,704,024	18,486,401
1834	283,950,158	6,514,173	271,755,651	7,613,179	1,175,219	76,478,468	5,211,015	20,513,586
1835	277,704,525	6,910,506	279,811,176	8,270,925	1,240,284	83,214,198	5,706,589	22,128,304

The course of this great branch of our export trade will be seen in the following statement for the year 1835 .—

An account of the *quantity* and *declared value* of *British cotton manufactured goods exported* from the United Kingdom, distinguishing the description of goods, and the various countries whereto the same were exported in the year 1835.

COUNTRIES TO WHICH EXPORTED.	White or Plain Cottons.		Printed or Dyed Cottons.		Hosiery and Small Wares.	Twist and Yarn.		Total Declared Value.
	Yards.	Declared Value.	Yards.	Declared Value.	Declared Value.	Pounds.	Declared Value.	
		£.		£.	£.		£.	£.
Russia	2,243,650	83,708	639,409	25,590	5,382	21,082,519	1,365,027	1,479,707
Sweden	44,336	1,407	11,705	637	926	840,774	60,751	63,721
Norway	176,330	5,578	514,940	12,338	1,715	104,351	6,234	25,805
Denmark	70,150	1,733	67,999	1,916	159	119,960	6,589	10,397
Prussia	240	20	. .	. .	251	16,753	1,427	1,698
Germany	13,857,147	324,539	29,714,601	866,524	217,968	27,866,013	1,746,893	3,155,924
Holland	10,675,371	263,004	11,071,368	332,588	50,598	13,869,141	1,194,651	1,840,841
Belgium	1,105,465	45,754	2,476,509	90,958	123,537	42,368	7,067	267,316
France	1,045,212	32,885	1,387,281	39,368	106,154	89,533	39,493	217,900
Portugal, Proper	16,832,595	312,169	17,878,068	483,833	20,998	161,438	13,338	830,338
,, Azores	395,293	8,559	546,992	13,254	997	14,955	726	23,536
,, Madeira	212,389	4,704	238,168	5,231	1,174	90	6	11,115
Spain and the Balearic Islands	146,618	3,958	275,435	7,069	1,293	1,820	248	12,568
,, Canaries	239,673	5,989	270,881	7,667	742	200	20	14,418
Gibraltar	8,824,726	196,470	8,378,813	252,670	11,701	26,145	2,466	463,307
Italy and the Italian Islands	21,280,891	527,267	13,401,443	423,691	37,289	7,024,588	427,875	1,416,122
Malta	1,228,532	21,220	591,320	16,695	3,190	306,360	18,883	59,988
Ionian Islands	698,941	14,432	524,393	13,998	962	131,080	8,382	37,774
Turkey and Continental Greece	18,901,025	543,987	12,966,023	426,046	3,344	1,575,400	89,404	1,062,781
Morea and Greek Islands	69,650	3,410	100,541	4,877	439	. .	. .	8,726
Egypt (Ports on the Mediterranean)	3,895,326	106,636	1,430,701	55,143	290	464,120	29,603	191,672
Tripoli, Barbary, and Marocco	1,097,514	22,537	80,200	1,555	125	. .	. .	24,217
Western Coast of Africa	456,939	11,506	3,448,219	113,271	467	1,149	316	125,560
Cape of Good Hope	1,996,866	48,986	2,126,279	64,374	9,357	12,612	780	123,497
St. Helena	53,953	1,535	78,450	3,008	325	. .	. .	4,868
Mauritius	973,900	27,592	1,369,261	42,838	7,092	35	11	77,533
Arabia	77,425	1,953	18,724	504	. .	. .	. .	2,457
East India Company's Territories and Ceylon	39,459,172	996,340	12,318,105	341,983	30,631	5,399,762	432,821	1,801,775
China	8,968.873	212,796	2,248,339	76,596	2,530	2,833,362	170,390	462,242
Sumatra, Java, and other Islands in the Indian Seas	7,017,618	182,558	2,531,265	86,123	3,948	213,935	15,166	287,795
Philippine Islands	1,421,036	36,746	637,881	26,649	450	. .	. .	63,845
New South Wales, Van Diemen's Land, and Swan River	1,233,912	34,313	1,079,297	38,056	11,404	4,820	338	84,111
New Zealand and South Sea Islands	7,759	294	7,360	155	. .	. .	. .	449
British North American Colonies	7,896,245	198,796	8,975,688	251,451	31,899	204,160	11,314	493,460
British West Indies	18,744,807	425,142	22,804,186	568,497	42,022	22,754	2,200	1,037,861
Hayti	2,041,371	58,668	4,446,417	128,395	11,003	. .	. .	198,066
Cuba and other Foreign West Indies	6,800,903	159,268	9,180,426	242,954	19,203	250	30	421,455
United States of America	25,415,034	787,844	49,547,891	1,605,147	327,910	126.888	8,529	2,729,430
Mexico	1,454,701	49,851	4,147,248	154,816	7,881	591,962	39,164	251,712
Guatemala	297,160	5,640	251,000	5,358	. .	12,620	1,610	12,608
Columbia	1,062,368	26,159	1,993,190	49,984	2,212	. .	. .	78,355
Brazil	28,399,127	624,724	30,431,795	813,918	62,066	10,198	981	1,501,689
States of the Rio de la Plata	7,457,260	157,091	5,396,027	155,309	26,488	34,560	2,824	341,712
Chile	9,038,270	194,748	7,776,496	226,132	15,390	2,360	263	436,533
Peru	3,579,087	92,827	6,306,988	190,180	9 873	5,400	380	293,260
Isles of Guernsey, Jersey, Alderney, Man, &c.	809,715	45,233	123,755	3,579	28,899	6,743	389	78,100
Total in 1835	277,704,525	6,910,506	279,811,176	8,270,925	1,240,284	83,214,198	5,706,569	22,128,304

The capital invested in this branch of industry has been estimated by Mr. Kennedy at 30,000,000*l.*, and by Mr. M'Culloch at 34,000,000*l.*, which greater amount is very moderate in the opinion of Mr. Baines. Mr. M'Culloch supposes that a capital of 4,000,000*l.* is engaged in the purchase of the raw material, in which case the same money must be employed nearly at the rate of four separate transactions during the year; capital employed in the payment of wages 10,000,000*l.*, which supposes that the wages have to be advanced 6 months before the goods are produced and sold. The remaining 20,000,000*l.* are supposed to consist of stocks of goods on hand and of capital fixed in spinning and weaving factories, power and hand-looms, workshops, warehouses, and machinery. This latter portion of the capital must have been greatly increased of late; but notwithstanding the great increase in the amount of the manufacture, it is probable that no great addition to the floating capital has been required, the briskness of the trade causing a quicker return, so that the same amount of capital suffices for the transaction of a larger amount of business.

COTTON, SIR ROBERT BRUCE, an eminent English antiquary, descended from an antient family, was the son of Thomas Cotton, Esq., and born at Denton, in Huntingdonshire, January 22, 1570. He was educated at Trinity College, Cambridge, where he took the degree of B.A. in 1585. His taste for antiquarian studies induced him to repair to London, where he became a member of a society of learned men attached to similar pursuits. He soon distinguished himself as a diligent collector of records, charters, and instruments of all kinds relating to the history of his country. The dissolution of monasteries, half a century before, had thrown so many manuscripts of every description into private hands, that Mr. Cotton enjoyed peculiar advantages in forming his collection. In 1600 he accompanied Camden, the historian, to Carlisle, who acknowledges himself not a little obliged to him for the assistance he received from him in carrying on and completing his 'Britannia;' and the same year he wrote 'A Brief Abstract of the question of Precedency between England and Spain.' This was occasioned by Queen Elizabeth desiring the thoughts of the Society of Antiquaries already mentioned upon that point, and is still extant in the Cottonian library. (*Jul.* C. ix. fol. 120.) Upon the accession of King James I. he received the honour of knighthood, and during this reign was not only courted and esteemed by the great, but consulted as an oracle by the privy councillors and ministers of state upon very difficult points relating to the constitution. In 1608 he was appointed one of the commissioners to inquire into the state of the navy, which had been neglected after the death of Queen Elizabeth, and drew up a memorial of their proceedings to be presented to the king, a copy of which is also preserved in the Cottonian library. (MS. *Jul.* F. iii.) In 1609 he wrote 'A Discourse of the lawfulness of Combats to be performed in the presence of the King, or the Constable and Marshall of England,' which was printed in 1651 and in 1672. He drew up also, in the same year, 'An Answer to such Motives as were offered by certain military men to Prince Henry, to incite him to affect Arms more than Peace.' This was composed by order of that prince, and the original manuscript remains in the Cottonian library. (*Cleop.* F. vi. fol. 1.) New projects being contrived to fill the royal treasury, which had been prodigally squandered, none pleased the king, it is said, so much as the creating a new order of knights, called baronets; and Sir Robert Cotton, who had been the principal suggester of this scheme, was, in 1611, chosen to be one, being the thirty-sixth on the list. His principal residence was then at Great Connington, in Huntingdonshire, which he soon exchanged for Hailey St. George, in Cambridgeshire. He was afterwards employed by King James to vindicate the conduct of Mary Queen of Scots, from the supposed misrepresentations of Buchanan and Thuanus. What he drew up on this subject is thought to be interwoven in Camden's 'Annals of Queen Elizabeth,' or else printed at the end of Camden's 'Epistles.' In 1616 the king ordered him to examine whether the Papists, whose numbers then made the nation uneasy, ought by the laws of the land to be put to death, or to be imprisoned. This task he performed with great learning, and produced upon that occasion twenty-four arguments, which were published afterwards, in 1672, among 'Cottoni Posthuma.' It was probably then that he wrote a piece, still preserved in the Royal Library, entitled 'Considerations for the repressing of the Increase of Priests, Jesuits, and Recusants, without drawing of blood.' He was also employed by the House of Commons when the match between Prince Charles and the Infanta of Spain was in agitation, to show, by a short examination of the treaties between England and the House of Austria, the unfaithfulness and insincerity of the latter, and to prove that in all their transactions they aimed at nothing but universal monarchy. Sir Robert Cotton wrote various other works, many of them small pieces in the shape of dissertations, too numerous to be mentioned here; some of them are among his Posthuma, others are printed in Hearne's 'Discourses,' and a few more still remain in manuscript.

As early as 1615, Sir Robert Cotton's intimacy with Carr, earl of Somerset, laid him under suspicion with the court of having some knowledge of the circumstances of Sir Thomas Overbury's death. He was even committed to the custody of an alderman of London; nor, although nothing could be proved against him, was he released from this confinement till the end of five months, during which time he appears to have been interdicted the use of his library. The perfidy of Gondomar, the Spanish ambassador, about the same time, drew upon him another imputation, his name having been, without foundation, inserted in a list suffered to go abroad of persons who had secretly received gratuities from the Spanish ambassador for sinister purposes. From this however his honour was perfectly vindicated.

Being a member of the first parliament of King Charles I., Sir Robert Cotton joined in complaining of the grievances which the nation was said, in 1628, to groan under; but was always for mild remedies, and zealous for the honour and safety of the king. In the next year an occurrence took place, the consequences of which shortened his days. A tract was handed about in manuscript, entitled, 'A Project how a Prince may make himself an absolute Tyrant.' The inquiries that were immediately made for the author of so pernicious a performance led at length to the Cottonian library. Sir Robert, perfectly conscious of his innocence, made strict inquiry into the transaction, and soon found that a copy of this tract, written at Florence, in 1613, by Robert Dudley, duke of Northumberland, under the less exceptionable title of 'Propositions for his Majesty's service to bridle the Impertinency of Parliaments,' had, unknown to him, found its way into his library, and that, equally without his knowledge, his librarian or amanuensis, as was suspected, for a pecuniary consideration, had suffered one or more copies of it to be taken, under the former of these titles. Although Sir Robert Cotton completely vindicated his innocence of having written or disseminated this tract, so destructive to the liberties of the people, yet under the renewed pretence that his library was not of a nature to be exposed to public inspection, it was again put in sequestration, and himself once more excluded from all access to it. He died at his house in Westminster, May 6, 1631. A short time before his death he requested Sir Henry Spelman to signify to the Lord Privy Seal, and the rest of the lords of the council, that their so long detaining of his books from him, without rendering any reason for the same, had been the cause of his mortal malady. From this, as well as other circumstances, it appears that his library was never restored to his possession. He was buried on the south side of the church of Connington, where a suitable monument was erected to his memory.

By his will Sir Robert Cotton directed that his library should not be sold, but should pass entire to his heirs; and it was much augmented by his son, Sir Thomas Cotton, and his grandson, Sir John Cotton. In 1700 an act of parliament passed for the better securing and preserving this library in the name and family of the Cottons, for the benefit of the public; the mansion house, in which the library was contained, to be preserved for the use of the descendants of Sir Robert Cotton, the founder, for ever, and the library to be made publicly accessible; and to be vested after Sir John Cotton's death in trustees. Sir John Cotton died in 1702. Another act of parliament was then framed, which passed in 1706, by which the purchase of the house was effected for the sum of 4500*l.*, and that and the library vested thenceforth in the queen, her heirs, and successors for ever: the management of the library being still settled in trustees. Whether it was for the purpose of erecting a new building for the reception of the library on the site of the said house—which indeed was directed by the last mentioned act—or for what other reason, does not at present appear; but we are informed in a subsequent report of a committee of the House of Commons, that the library was in the year 1712 removed to Essex House, in Essex-street, Strand, where it continued to the year 1730, when it was conveyed back to Westminster, and deposited in a house in Little Dean's Yard, purchased by the crown of the earl of Ashburnham. Here, shortly after, on the 23rd October, 1731, a fire broke out, in which 111 manuscripts (many of them of the greatest interest) were lost, burnt, or entirely defaced, and ninety-nine rendered imperfect. It had indeed nearly proved fatal to the whole library. What remained were removed, by permission of the dean and chapter, into a new building designed for the dormitory of Westminster school. In 1753, when the legislature was induced by the will of Sir Hans Sloane to found the British Museum, the Cottonian library was included in the act under which that institution was founded, and was transferred to the British Museum in 1757. The act directed that two trustees, to be nominated in succession by the representatives of the Cotton family, should be for ever added to those appointed by the same act for the general execution of its purposes.

Besides the library of manuscripts, the Cottonian collection contained a considerable number of valuable coins, chiefly Saxon and old English, and several antiquities Roman and English, all of which are now incorporated in the collection of the British Museum.

A catalogue of this library, in a thin folio volume, compiled by Dr. Thomas Smith, was printed at Oxford in 1696; and a more ample one, accompanied by a copious index, compiled by the late Joseph Planta, Esq., was published under the orders and at the expense of the Commissioners upon the Public Records, folio, 1802.

Sir Robert Cotton was liberal in communicating materials out of his collections in his life-time. Speed's 'History of England' is said to owe most of its value and ornaments to it; and Camden acknowledges that he received the coins in the Britannia from his collection. To Knolles, the author of the 'Turkish History,' he communicated authentic letters of the Knights of Rhodes, and the dispatches of Edward Barton, ambassador from queen Elizabeth to the Porte. Sir Walter Raleigh, Lord Bacon, Selden, and Lord Herbert, were all indebted to Sir Robert Cotton's library for materials. Lingard's and Sharon Turner's 'Histories of England,' and numerous other works, are proofs that its treasures continue at this day unexhausted.

CO'TTUS (Linnæus), a genus of fishes of the section Acanthopterygii and family Loricati[*] (Jenyns). Technical characters:—head large, depressed, furnished more or less with spines or tubercles; teeth in front of the vomer and in both jaws, none on the palatines, two dorsal fins; ventral fin small; body without scales; branchiostegous rays six.

The *Bull-head* or *Miller's thumb* (*Cottus gobio*, Linn.) affords an example of this genus. This little fish, which is found in almost all the fresh-water streams throughout Europe, is from three to four inches in length, and of a brownish colour above, more or less mottled and spotted, and whitish beneath. The head is very large in proportion to the body, and without spines; the preoperculum has a single curved spine on the posterior part; the eyes are small, and directed upwards. The number of fin-rays are—anterior dorsal 6 to 9, posterior 17 or 18; pectoral 15; ventral 3; anal 13; caudal 11. The bull-head more particularly frequents those streams in which pebbles abound, and feeds upon aquatic insects, &c.

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[*] We adopt the term Loricati, which is synonymous with the family of the Acanthopterygii, termed by Cuvier "celle des Joues Cuirassees."

The remaining British species of this genus inhabit the salt water, and together with others of the same habits, are distinguished from the fresh-water species by having the head armed with numerous spines.

The *Sea-scorpion* or *Short-spined Cottus* (*Cottus scorpius*, Bloch.) is very common on our coasts, and is found very frequently under stones or sea-weeds, in the little pools left by the retiring tide. It is thus described by Mr. Yarrell. 'The head large, more elevated than that of the river bull-head; upper jaw rather the longer; teeth small and sharp; eyes large, situated about half-way between the point of the nose and the occiput; irides yellow, pupils blueish black; one pair of spines above the nostrils, with an elevated ridge between them; the inner edges of the orbits elevated with a hollow depression above, but no occipital spines; preoperculum with three spines, the upper one the longest; operculum with two spines, the upper one also the longest, the lower one pointing downwards; there is besides a scapular and a clavicular spine on each side; gill-openings large; the body tapers off rapidly, and is mottled over with dark purple brown, occasionally varied with a rich red brown; the belly white; the first dorsal fin slightly connected with the second by an extension of the membrane; lateral line smooth; the ventral fins attached posteriorly by a membrane to the belly.' Length rarely exceeding eight or nine inches.

This fish feeds upon small crustacea and the fry of other fishes.

The *Father-lasher* or *Long-spined Cottus* (*Cottus bubalis*, Euphrasen), is about the same size and resembles the last both in appearance and habits; the two species, however, are seldom found in the same immediate neighbourhood. This species is distinguished from the last by its more perfectly armed head, the spines of which are longer in proportion, the space between the eyes is less, the crest above the eyes is more elevated, and the ventral fins are destitute of the connecting membrane observed in the short-spined cottus. There are several other points of distinction which will be found in detail in Yarrell's 'History of British Fishes.' *The four-horned Cottus* (*Cottus quadricornis*, Linn.) another species also found off the British coast, though less abundantly than either of the foregoing maritime species, may be distinguished, as its name implies, by the four tubercles which are situated on the top of the head, two on the nape, and two near the eyes; the preoperculum is furnished with three spines, and the operculum with one; length from ten to twelve inches.

Aspidophorus (Lacépède) being considered by Cuvier as a subgenus of Cottus, it may be well to notice it under this head. This genus, or subgenus, is thus characterized—head large and depressed, more or less armed with spines and tubercles; both jaws furnished with teeth, none on the vomer; body attenuated posteriorly, covered with angular plates; ventrals small; branchiostegous rays six.

Several species of this genus are known, one of which is found not uncommonly on our own coasts, and is known by the name of the *Armed Bull-head* (*Aspidophorus Europæus*, Cuvier). This little fish, generally about four or five inches in length, is frequently caught in the shrimping nets, and is called by the fishermen, in some districts, *the Hook-nose*. Its general covering is brown above and white beneath: there are however most commonly indications, more or less distinct, of several broad dark marks across the back; the nose is furnished with four recurved spines, the upper jaw extends beyond the lower; the infra orbitals have three blunt tubercles on their lower margin, and a sharp spine directed backwards; the preoperculum is also armed with a spine; the branchiostegous membrane and chin are each furnished with numerous fleshy filaments; the body is divided longitudinally by eight scaly ridges, those on the upper part being most produced.

The number of fin rays are: dorsal 5 to 7; pectoral 15; ventral 3; anal 7; caudal 11.

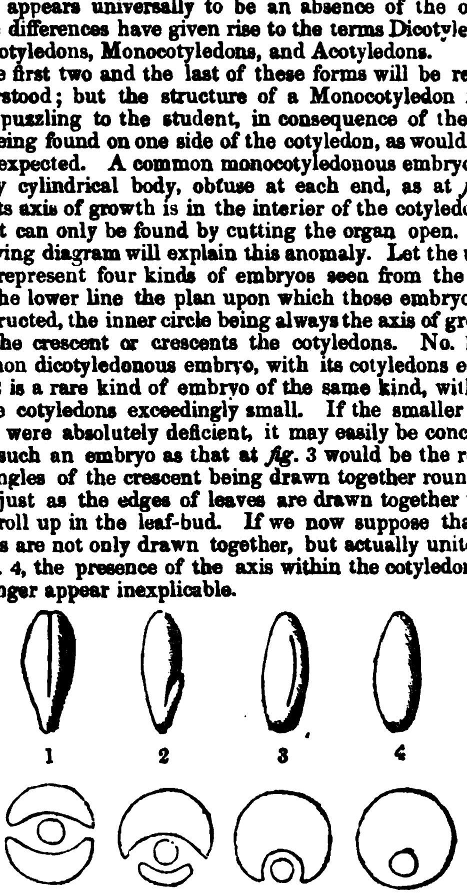
The habits of this fish appear in many respects to be the same as those of the Cottus scorpius, &c.

COTURNIX. [QUAIL.]

COTYLE'DON is the leaf of a seed; it is the part prepared by nature to enable the young plant, when it first springs into existence, and before it has been able to form organs of digestion and respiration, to perform both those functions. This usually takes place as follows: in its original state the cotyledon contains carbon in excess; as soon as vegetation commences, oxygen is absorbed, and carbonic acid is formed, with which the cotyledon freely parts, thus reducing the proportion of its carbon to that which is most conducive to the subsequent health of the individual. Connected with this is the development of saccharine matter which enters into the circulation of the young plant, and imparts vigour to all its nascent powers. Sometimes the cotyledon performs those functions under-ground during the whole period of its activity; but in many cases its subterranean life extends only to a few days or hours, after which it is elevated above the soil, and takes on the ordinary property of the leaves, decomposing carbonic acid and parting with oxygen. The latter case is commonly that of cotyledons containing but a small proportion of fæcula; the former is usually that of cotyledons in which amylaceous matter is copiously present, as in the common pea, the acorn, &c.

The situation of the cotyledon is on one side of the axis, of which the plumule is the apex, and the radicle the base. In the largest number of known seeds there are two cotyledons on opposite sides, on the same plane; in a few there are several opposite to each other in a whorl; in a considerable number there is only one; and among the lower plants there appears universally to be an absence of the organ. These differences have given rise to the terms Dicotyledons, Polycotyledons, Monocotyledons, and Acotyledons.

The first two and the last of these forms will be readily understood; but the structure of a Monocotyledon is far more puzzling to the student, in consequence of the axis not being found on one side of the cotyledon, as would have been expected. A common monocotyledonous embryo is a nearly cylindrical body, obtuse at each end, as at *fig.* 4, and its axis of growth is in the interior of the cotyledon, so that it can only be found by cutting the organ open. The following diagram will explain this anomaly. Let the upper line represent four kinds of embryos seen from the side, and the lower line the plan upon which those embryos are constructed, the inner circle being always the axis of growth, and the crescent or crescents the cotyledons. No. 1 is a common dicotyledonous embryo, with its cotyledons equal; No. 2 is a rare kind of embryo of the same kind, with one of the cotyledons exceedingly small. If the smaller cotyledon were absolutely deficient, it may easily be conceived that such an embryo as that at *fig.* 3 would be the result, the angles of the crescent being drawn together round the axis, just as the edges of leaves are drawn together when they roll up in the leaf-bud. If we now suppose that the angles are not only drawn together, but actually united as at *fig.* 4, the presence of the axis within the cotyledon will no longer appear inexplicable.



COUA. [CUCULIDÆ.]

COUCH GRASS (*Triticum repens*) is a common and most troublesome weed which infests arable land, especially that which is of a light and mellow nature. It is perennial, and propagated both by seed and by extension of the root, which is long and jointed; each joint produces a fresh shoot, which, in a favourable situation, soon becomes a new parent plant, creeping along under the surface of the ground, and spreading over a whole field with great rapidity. It appears above ground like a blade of grass, or young wheat, which, in its tender state, is readily eaten by sheep. A seed stem afterwards shoots up, bearing a spike, composed of a middle rachis and alternate floscules on each side. Each of these produces three or four seeds, protected by a long pointed chaff. Many of the seeds never come to perfection owing to the increase of the roots, but in stiff ground and permanent pastures the roots are prevented from spreading, and then the seeds ripen. The principal propagation of the plant is by the root. The destruction and extirpation of couch grass is one of the first things which an experienced farmer sets himself to on taking occupation of land which has been neglected by the preceding tenant.

There is no law in this country which obliges a tenant to keep his lands free from weeds. There is something of the kind in Belgium with respect to thistles and weeds which propagate by seed. An agricultural code is necessary to protect the landlord, and to prevent the woeful waste of labour produced by carelessness and bad management; and until such a code is established, agriculture will never make rapid progress.

To extirpate couch grass a dry time must be chosen in summer; the land must be ploughed with a deep furrow to bring the roots to the surface: when the land is dry, it must be rolled to break the clods, and all the roots which lie near the surface must be gathered by the harrows or the couch rake. Sometimes the roots are matted into tufts, which can only be got up by means of a fork or prong. In this case no manual labour should be spared, especial care being taken not to break the roots, but to get them out whole, with all their offsets, if possible. After this, Finlayson's harrows, described in vol. ii., page 226, may be used on light lands; or an instrument of a similar nature, called, from the shape of the tines, a *cat's claw*, and in Scotland a *grubber*, which will bring up all the roots that are within nine or ten inches of the surface. When all the couch has been apparently eradicated, there will still remain a sufficient number of pieces and joints, broken off by the instruments and left in the ground, to produce a fresh crop of couch grass, especially if the land is frequently stirred, and showers intervene. Hence the vulgar notion that some lands breed couch, and that it is useless labour to be at much expense to eradicate it. Such lands should be laid down with artificial grasses and kept in grass for several years, being depastured with sheep and cattle in preference to mowing them for hay.

In this case the couch grass will spring up above ground and gradually disappear, and when the land is broken up again not a vestige of it will remain. After this it may be kept clean for many years by hoeing and weeding.

In very stiff soils, as in Kent, the couch grass is got rid o. by ploughing very deep and burying it eight or nine inches under the surface. For this purpose the furrow slice must be large, and turned completely over, not merely set on end as is often the case. The old turn-wrist plough, drawn by four horses, does this most completely, and this is the principal reason why many practical farmers in that county prefer this ponderous and clumsy instrument to lighter and more scientific ploughs. In very heavy land couch grass is easily kept down if an opportunity be taken to plough it to the surface in dry weather. The stiff clods in which the roots are entangled contract in drying, and in contracting destroy the texture of the root; when they crumble after a shower the couch may be collected by hand and burnt or carried away. If the method of ploughing it in is preferred, it should be done by trench ploughing, by means of two ploughs following each other in the same furrow. The first may go six or seven inches deep, and the second four or five; thus the couch grass will be buried much deeper than with one ploughing, and four horses with two men will do the work well, which will not be much more expensive than the turn-wrist plough, with four horses, a man, and a boy. This can only be done to advantage in deep soils, such as occur in a few counties only.

When a quantity of the roots of couch grass has been collected, they are usually burnt in heaps on the ground: the ashes serve to enrich the land in some degree, but a much more profitable use may be made of them. When they are cleaned from the earth which adheres to them, they are found to be nutritious and farinaceous. Pigs eat them greedily; horses and cows will also eat them, especially when boiled or steamed; and weight for weight they contain not much less nutritious matter than potatoes; it is downright waste therefore to burn them. By maceration and washing, a good fecula is obtained, which, with hot water, forms a jelly-like arrowroot. The decoction of the root has been recommended as a cooling and demulcent beverage, and not without apparent reason; but if it be not thought worth while to wash and steam the couch for food, it is still more profitable to decompose it by means of lime than to burn it. For this purpose it should be gathered into a large heap and watered to induce fermentation. When it has heated, it should be turned over and mixed with quick lime in a considerable proportion; after two or three turnings with the spade, with an interval of a few weeks, it will be found converted into rich mould, which may then be spread over the land, either as a top-dressing for clover and artificial grasses, or ploughed in with the seed, where this method is practised.

To keep the land free from couch grass occasional summer tillage is necessary, which may be given when turnips are sown, or after an early crop, such as tares cut green, Trefolium incarnatum, or winter barley, without losing a crop. In a well-managed farm couch grass should no more appear than docks or thistles. In Belgium a slovenly farmer is called a couch grass farmer.

Dogs eat the blade of couch grass from instinct to purge and vomit, and hence it has been named, in French, *chiendent* or *dog's tooth;* but the shape of the young shoots from the root may also probably have led to that name, for they have a great resemblance to a canine tooth.

It has been doubted whether, in some situations, couch grass might not be cultivated to advantage for its roots: no experiments however have been made in cultivating this prolific plant, as far as we know; but it is not unworthy the attention of those who take a pleasure in increasing the resources of agriculture. In years of great scarcity the root of couch grass has been used, in northern countries mixed with flour, in making bread. It contains nothing unwholesome, and has a considerable resemblance in taste to the potato. The water in which the root of couch grass has been boiled may be used in the manufacture of bread; it would probably add considerably to the weight of the loaf when baked, but may perhaps communicate an unpleasant taste to it.

COUCHING. [CATARACT.]

COUGH, a violent expulsion of air from the lungs, attended, when the act of coughing recurs in rapid succession, that is, when there is a fit of coughing, with correspondingly rapid inspirations. Cough is a violent and sonorous expiration, during the effort of which a much greater quantity of air is expelled from the lungs than is returned by the corresponding act of inspiration.

The mouth, nose, fauces, pharynx, larynx, trachea, and bronchi, are lined by a highly irritable and exquisitely sensible membrane. That portion of this membrane which lines the air passages, properly so called, namely the larynx, trachea, and bronchi, possesses the properties of irritability and sensibility in so great a degree, that it cannot endure without the most violent excitement the slightest contact of a foreign body. It is necessary to the due performance of the function of the lung, one of the most important of the organic circle, that the tubes which lead to it should always be perfectly unobstructed; should invariably present to the air a free and uninterrupted passage. Among the expedients adopted to secure this purpose, one of the most important consists in the disposal and action of the membrane which lines the internal surface of the air-tubes. This membrane abounds with blood-vessels and nerves, by the action of which a large quantity of water is constantly separated from the blood, by which the tubes are kept in a state of perfect suppleness and moisture. A layer of the thick, tenacious, and viscid substance, called mucus, also separated from the blood by this membrane, is spread over its entire surface, by which it is defended from the irritating properties of the air, with which it must always be in contact. Moreover, the heat generated by the process of secretion [SECRETION] warms the air in its passage to the lungs; and so great is the degree of heat communicated to the air during its progress, that before it reaches the lung it is brought to the same temperature as that of the blood. Accordingly when the lining membrane of the air passages is sound, when the temperature of the air ranges within a certain limit, and when the air is pure, holding in solution or suspension no foreign and noxious body, the external cold exciting air passes deep into the interior of the body, into the very centre of the chest, not only without occasioning irritation, but even without producing sufficient sensation to induce consciousness. But when either of these conditions is changed, the state natural to the respiratory process is disturbed; irritation is excited; warning is given that some danger threatens the system; and an effort is made to remove the offending cause. The warning is announced, and an effort is made to remove the danger, by the act of coughing.

When the lining membrane of the air-tubes is exposed to any irritating cause, suppose, for example, to intensely cold currents of air, the first effect of this irritation is to occasion a sudden rush of blood to its capillary vessels. These vessels, with which every point of the membrane is thickly crowded, become preternaturally distended with blood. By this distension the membrane becomes thick and swollen, and this thickening and tumefaction may go on to such an extent as materially to narrow the calibre of the tubes, and of course proportionally to obstruct the passage of the air to the lungs. Hence the simple dilatation of the arterial capillaries of the air-tubes with blood, and still more the like dilatation of the venous capillaries, a state which constitutes the disease termed congestion [Congestion], may produce a high degree of irritation. This irritation induces the act of coughing, and the cough relieves the congestion in the following mode.

It may be shown that with every act of expiration a current of blood, that blood which has been acted upon by the air and converted from venous into arterial, issues from the lung, and is carried out to the system; that inspiration is the action during which venous blood flows to the lung; and expiration the action during which arterial blood flows from the lung: consequently, in any state of the system, transient or permanent, in which the inspirations preponderate over the expirations, the blood of the system partakes of a venous character; and on the contrary, when the expirations preponderate over the inspirations, the blood becomes of an arterial character. Cough, it has been stated, is a forcible expiration, during the effort of which a greater quantity of air is expelled from the lung than is returned by the corresponding act of inspiration; but during the same action a proportionate quantity of arterial blood is sent out to the system. Now the stimulating properties of this blood (for arterial blood is the proper stimulus of the capillary arteries of the system) excite those capillaries which, from any cause, have been thrown into a state of congestion, to increased action; and by this increased action the load of blood with which they were distended is forced onwards, and the exonerated vessels are restored to their natural state. In this manner the mere act of coughing oftentimes relieves a congested state of many organs of the system, and of the air passages and lungs in particular.

But whatever cause induces a sufficient degree of irritation in the lining membrane of the air passages to distend its capillaries with blood, is apt to increase the activity of its secretion. In the natural and healthy state of the membrane, the action between its secreting and absorbing vessels is so balanced, that only a certain quantity of mucus is allowed to remain in contact with the membrane; no more than is just sufficient to defend it from the irritating agent to which it is exposed. But under the influence of any unusual irritating agent, more mucus is poured out upon the surface of the membrane in a given time than the absorbents can remove, in consequence of which the mucus accumulates, and in the exact proportion to such accumulation must necessarily be the obstruction to the free passage of the air to the lungs. Further, whatever increases the quantity has also a tendency to change the quality of the secretion, rendering the mucus thin and acrid, or thick and sticky, and thus converting it from a bland and defending fluid, into a highly irritating substance. In order to remove this irritating substance cough is excited; that is, a column of air is violently expelled from the lung, and directed through all the air-tubes, carrying away by the force of the current whatever it meets with in its course. The creation of this current is the necessary effect of the action of coughing, and the removal of some irritation or obstruction is its ultimate object. Disagreeable, then, as a cough always is, it is a salutary action, not only conducive to the safety of the system, but often indispensable to the preservation of life. Death is sometimes the actual and the immediate consequence of its absence, or of its want of violence.

Cough is not a cause, but an effect; not a disease, but a symptom of disease. Without doubt there are states of the system in which it re-acts upon the malady of which it is the consequence, and greatly increases its severity and danger: it constantly requires regulation and control; but even if it were in the power of any remedies completely and suddenly to stop it, the result of their application would often be fatal.

Considered in relation to its causes, and as a sign of internal disease, cough presents a subject of inquiry of great practical interest and importance. While it is readily excited by trifling and transient causes of irritation, it is the invariable attendant of some of the most frequent and fatal diseases to which the human body is subject. It is also sometimes among the very first symptoms produced by those diseases; hence the early discrimination of its true character may give invaluable information of the danger which threatens, and lead to the adoption of preventive means, at the only time when such measures can be of the least avail.

From what has been stated, it is plain that cough may be induced by disease, or by any irritating cause affecting either the air-passages or the lungs. It is most frequently induced by irritation of the mucous membrane of the air-passages, and more especially by congestion or inflammation of this membrane, in any degree, and in any part of its course. There are few diseases of the lungs of which it is not an attendant: such as inflammation of their investing membrane, the pleura; inflammation of the cellular tissue which enters into their structure; effusion into their substance, &c. But the most important malady with which it is related is the deposition and action of that tubercular substance which lays the foundation of consumption. [Phthisis.]

But though the most frequent and important diseases of which cough is an early and obvious sign, are maladies which have their seat in the air-passages or in the lungs, yet it is very frequently excited by diseases of distant organs, which have only a remote and indirect relation with the respiratory functions. Thus it is sometimes produced by diseases of the stomach, but far more often by diseases of the liver; by the suppression of the secretion of bile, or by the secretion of bile of bad quality; by the over-distension of the gall-bladder with bile; by the irritation of worms in any part of the alimentary canal; by a disordered state of the organic nerves supplying the viscera which assist the stomach in carrying on the great process of nutrition; and by nervous irritation produced in any part of the body, as in dentition and some affections of the spinal cord. It is also readily induced, and is sometimes of very long continuance, in the nervous temperament, affecting especially hysterical and other irritable persons; and by the repulsion of cutaneous eruptions and the suppression of discharges to which the system has been long accustomed. When it is the result of hepatic disorder, the indications of disease of the liver may be so slight as to escape notice, unless the malady be carefully sought for; yet the cough all the time may be extremely violent, often presenting a spasmodic character, and very obstinate. The observant practitioner will detect its connexion with the liver partly by that very spasmodic character, and still more by the accompanying sense of fullness about the epigastric region, the loaded tongue, the loss of appetite, the constipated bowels, and other signs of indigestion. A short, dry, irritating, and very obstinate cough is often remotely connected with a disordered state of the digestive organs, immediately indicated by a relaxation and enlargement of the uvula, the elongated uvula producing considerable irritation about the root of the tongue and the epiglottis. In other cases, when the uvula is not particularly affected, the same troublesome cough equally accompanies a disordered condition of the soft palate and of the fauces. Local stimulants and other remedies may be applied to these parts without end and without avail; but their unhealthy condition, and the cough which accompanies it, completely disappear the moment the stomach, the liver, and the bowels are restored to a sound state.

The treatment of cough must of course be modified in every different case according to the causes on which it depends. If it be induced by cold congesting the air-passages, the remedies of catarrh [Catarrh] constitute the appropriate means of cure; if by inflammation of the lining membrane of the air-tubes, the remedies and the principles of their administration have been already described under Bronchitis. If it depend on diseases of the lung, the precise nature of the malady should be carefully and anxiously investigated; and the removal of the cough attempted only by the removal or prevention of the threatening or the actually existing disease. In like manner, if cough be induced by nervous irritation, by undue excitement in a nervous temperament, or by a disordered state of the stomach, liver, or bowels, it is absurd to attempt the removal of the cough in any other mode than by the cure of the disease of which it is the sign, and to the discrimination of which it should be the guide.

COUGUAR. [Felis.]

COUI. [Testudinata.]

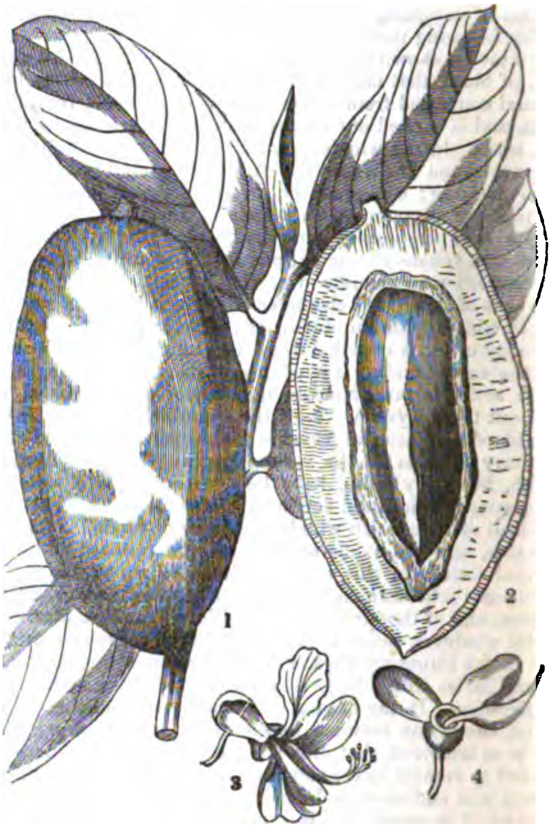
COUIA. [Coypou.]

COULOMB, CHARLES AUGUSTIN DE, was born at Angoulême in 1736, studied at Paris, and entered at an early age into the army. After serving with distinction for three years in the West Indies, he returned to Paris, where he became known by a treatise on the equilibrium of vaults (1776). In 1779 he was employed at Rochefort, where he wrote his 'Théorie des Machines Simples,' a treatise on the effects of friction and resistances, which gained the prize of the academy, and was subsequently printed separately in 1809. A project of navigable canals had been offered to the *Etats* of Bretagne, and Coulomb was appointed by the minister of marine to examine the ground. His report was unfavourable, which so displeased some influential persons that he was placed in confinement: the pretext was, that he had no order from the minister of war. The *Etats* afterwards saw their error, and offered Coulomb a large recompense, but he would accept nothing but a seconds' watch, which afterward served him in all his experiments. In 1784 he was *intendant des eaux et fontaines*; in 1786 he obtained the reversion of the place of *conservateur des plans et reliefs*, and was sent to England as a commissioner to obtain information on the hospitals. At the revolution he lost his public employments, and devoted himself to his domestic affairs. He was one of the first members of the Institute, and an inspector-general of public instruction. He died August 3, 1806, having supported a high moral and social character through life.

There are many men into whose biographies we are obliged to insert more account of their labours than will be necessary in the case of Coulomb. All his researches are of such permanent character, that it would be repetition to describe them in a work which must treat separately of mechanics and electricity. We have no prominent acts of mind to record which individualize his discoveries, though they were marked by a union of patient industry and experimental sagacity of no common order, accompanied by a strong sense of the necessity of mathematical experiment, or numerical determination of mechanical phenomena. He was, we may say, the founder of the school of experimental physics in France, a country which, till his time, had been by no means pre-eminent in that branch of discovery. His researches on friction, and resistances in general, were the first in which the subject had been pursued manually by one with the knowledge of mathematics necessary to combine or separate the results according to the subject and the method. In electricity he was the first who invented the method of measuring the quantity of action, and from it he deduced the fact of electrical attractions and repulsions, following the Newtonian law. He ascertained the non-penetration of these agents into the interior of solid bodies, and on these two conclusions the mathematical theory of electricity is now based. He even deduced the second phenomenon from the first. He extended in a great degree to magnetism his conclusions on electricity. The instrument by which these brilliant results were obtained was of his own invention, the Torsion Balance, the principle of which is a needle hanging from a flexible thread, in which the force of *torsion* necessary to produce a given effect in producing oscillations of the needle being first ascertained, the instrument remains a determinate measurer of any small forces; or, if the absolute force of torsion be unknown, it may be made to give comparative determinations. This construction, in the hands of Cavendish [Attraction], determined the mean density of the earth, and is now as much of primary use in delicate measurements of force, as the common balance in analytical chemistry. There is, perhaps, no one to whom either the determination of resistances in mechanics, or the theory of electricity, are so much indebted as to Coulomb. The account of his life is from the article in the 'Biog. Univ.,' by M. Biot. See also Electricity, Friction, &c.

COUMAROUNA ODORATA, also called **DIPTERIX ODORATA,** is the plant which yields the sweet-scented Tonga bean of the perfumers. It is a native of French Guiana, where it forms a large forest tree, called by the natives Coumarou; the trunk is said to be 60 or 80 feet high, with a diameter of three feet and a half, and to bear a large head of tortuous stout limbs and branches. The leaves are pinnated, of two or three pair of leaflets, without an odd one at the extremity. The flowers appear in axillary branches, and consist of a calyx with two spreading sepals, and five purple petals washed with violet, of which the three upper are the largest and most veiny. The stamens are eight, and monadelphous. The fruit is an oblong hard dry fibrous drupe, containing a single seed; the odour of its kernel is extremely agreeable. The natives string the seeds into necklaces; and the Creoles place them among their linen, both for the sake of their scent and to keep away insects.

The genus belongs to the tribe Cæsalpiniæ, of the natural order Fabaceæ, or Leguminosæ.



[Coumarouna odorata.]

1. A ripe drupe. 2. The same cut open. 3. A complete flower. 4. The calyx with a young drupe projecting from it.

COUNCILLORS. [Boroughs of England and Wales, p. 210.]

COUNSEL, an abbreviation of counsellor. In England a counsellor is a barrister [Barrister], or one who has kept twelve terms at one of the four inns of court, and obtained a certificate under the 9 Geo. IV. c. 49. The word has no plural number, and is used to denote either one or more counsel. The duty of counsel is to give advice in questions of law, and to manage causes for clients. They are styled common law, equity, or chamber counsel, according to the nature of the business they transact. They are supposed to plead gratuitously. [Advocate.] In the words of Mr. Justice Bayley, 1 Chit. R. 351,—'they are to be paid beforehand, because they are not to be left to the chance whether they shall ultimately get their fees or not, and it is for the purpose of promoting the honour and integrity of the bar that it is expected all their fees should be paid when their briefs are delivered. That is the reason why they are not permitted to maintain an action for their fees.' Counsel may be retained generally, that is, to advocate any cause in which the retaining party may be engaged, or specially with reference to a pending cause; and generally speaking, it is not optional for counsel to refuse a retainer; there are certain rules however by which their practice is regulated.

Counsel in a cause have the privilege of enforcing anything which is contained in their instructions and is pertinent to the matter in question, and are not bound to inquire whether it be true or false: they are also at liberty to make fair comments on the evidence adduced.

Formerly, in cases of felony, counsel for the prisoner were not allowed to address the jury on his behalf; they might however examine and cross-examine the witnesses, and argue points of law; but now by stat. 6 & 7 Wm. IV. c. 114, all persons tried for felony may make full answer and defence by counsel.

Counsel are punishable by stat. West. 1. 3 Ed. I., c. 28, for deceit or collusion, and are so far under the jurisdiction of the judges, that in the event of malpractice they may be prohibited from addressing the court; there are also certain rules established by each court for the regulation of its own practice, to which counsel are subject.

COUNT, through the French word *comte*, from the Latin *comes, comitis*, meaning companion. Considered in its original acceptation, this word might be translated by assessor, an officer who, during the Roman republic, was given as an assistant to the proconsuls or the propraetors sent out to govern the provinces. Cicero speaks of these comites in several passages of his works. Dion Cassius states that Augustus Cæsar called by that name all the officers of his imperial household. These comites pronounced judgment on all matters referred to them by the emperor, and their judgments had the same authority as the *Senatus Consulta*. The council of state instituted by Napoleon gives a very exact idea of the constitution of that court tribunal. Like the council of state, the latter was invested with judicial, legislative, and executive power. The emperors of the East followed the example of those of the West, with this difference only, that the comites created by Augustus and his successors were the counsellors of the emperor, and the title belonged to the office and not to the person; whilst at the court of Constantinople it was quite the contrary. The nomenclature of these counts fills a considerable place in the Glossary of Ducange. The monarchies of modern Europe have inherited the tributary spoils of the lower empire. By substituting the word *grand* for that of *count*, which was a title common to all the officers or ministers of the emperors of the East, it is easy to show the analogy of the titles of modern court dignities to the antient. Thus, the *comes sacrarum largitionum* has been called *grand almoner;* the *comes curiæ, grand master of ceremonies;* the *comes vestiarius, grand master of the wardrobe;* the *comes domesticorum, grand master of the royal household;* the *comes equorum regiorum, grand equery*, &c. The *comes marcarum*, counts of the frontiers, which were formerly called *marches* (a denomination still in use in the papal states), took subsequently the title of *marquis;* an innovation which raised long and serious discussions among the learned in feudal right and court etiquette.

Under the first two races of the Frank kings, the counts were, as under the lower empire, officers of various degrees. The count of the palace was the first dignity in the state, after the *maire* of the palace. He presided in the court royal when the prince was absent, and possessed sovereign jurisdiction. He also exercised a great influence in the nomination of the king's delegates, who, under the title of counts, administered the provinces. A count had the government of a small district, often limited to a town and its dependencies. He was at the same time a judge, a civil administrator, and a military commander. In case of war, he led in person the contingent of his county to the army. The learned Dutillet, in his 'Recueil des Rois de France, de leur Couronne et Maison,' &c., expatiates on the functions of antient counts. With the progress of time, the counts, as well as the other officers appointed to govern the provinces, the towns, and the frontiers, succeeded in rendering their places hereditary, and in making themselves sovereign masters of the districts of which they had only been created removable and revocable administrators. At first they contented themselves with securing the reversion to their sons, then to their collateral heirs, and finally they declared those places hereditary for ever, under Hugh Capet, the son of Robert, count of Paris, who himself only obtained the throne partly in consequence of that concession. It was feudalism that introduced inheritance instead of election as a permanent rule in political successions. The supreme chief of the antient Franks, *koning* (Lat. *rex*), was a magistrate, and as a magistrate he was elected, although always from the same family. The inferior chiefs, *heri-zoghe, graven, rakhen-burghe** (Lat. *duces, comites, judices*), were also elected. But when the feudal system attained its perfection, when men were no longer ruled by men, but lands by lands, and men by lands or by the legitimate heir of the lands, then no kind of election remained. One demesne made a king, as another made a duke, a count, a viscount, &c.; and thus the son of a count became a count, the son of a duke became duke, and the son of a king became king. Finally, to form a just idea of the formidable power of the feudal counts, we must refer to the period of the erection of the towns of the northern provinces of France into commonalties or republics, when their heroic population had to sustain a most deadly struggle, from the eleventh century to the middle of the fourteenth, before they could shake off the iron yoke of the counts and the bishops†. The term 'count' is now become in France a mere title, conferring no political importance. In the papal states, as well as in those of Austria, it may be bought with sums of money not at all considerable; and in the other monarchical states of the continent, it is granted as a mark of imperial or royal favour.

The title of *earl*, or, as it was often rendered in Latin, *comes*, companion, is of very high antiquity in England, being well known to the Saxons under the name of *ealdorman*, that is to say, *elder-man*, and also *shireman*, because each of them had the government of a distinct *shire*, or, as it is now generally called, *county*. The sheriff, under his latinized name, is called vice-comes, or viscount, which term [VISCOUNT] is now one of the titles of rank in the British peerage. The term count seems not to have been used in England as a title of honour, though the wives of earls from a very early period have been addressed by the title of countess. The king, in mentioning an earl in any writ or commission, usually styles him 'trusty and well-beloved cousin,' a peculiarity at least as antient as the reign of Edward III.

COUNTER-APPROACH, a trench leading from the covered way of a besieged fortress, at some point on either flank of the ground upon which the works of the besiegers are formed, and extending to any convenient distance towards the country: it is frequently terminated by a small redoubt or battery, from whence a fire of light artillery is directed into the trenches of the enemy. These trenches being always, if possible, disposed so that they cannot be enfiladed by the guns of the fortress, a counter-approach becomes necessary in order that the garrison may be enabled to silence the fire from them, or to impede the communications along them.

If counter-approaches are intended for more than a momentary purpose, the parapets of the redoubts should be strong enough to resist the fire of artillery, and those works should be secured against an attack at their gorges by lines of palisades.

COUNTER-FORTS, in military architecture, are buttresses of brick or stone built against the revetment walls by which the outward pressure of the rampart, or of the natural ground on the opposite side of the ditch, is resisted. The rectangular portions at N and M *fig.* 2, BASTION, are counter-forts so situated. They are intended to increase the strength of such walls, and are formed between them and the earth which the walls retain. Their depth is usually equal to the mean thickness of the revetment, and they are placed at intervals of about 18 feet from each other, along the walls. They are sometimes connected together by counter-arches. [REVETMENT].

COUNTER-GUARDS are outworks occasionally constructed on the exterior of the bastions or ravelins of a fortress in order to retard the formation of a breach in either of those works.

The counter-guard is in general merely a line of rampart surmounted by a parapet, and broken in direction so as to form two faces parallel to those of the work which it covers: it has less relief than the interior work, in order that the fire from the latter may have some superiority over that of the enemy in any lodgment which he may form in the counter-guard when he has taken it. Its breadth, in rear of the parapet, should not exceed about 18 feet, that, while there may be room for the defenders, the enemy may not have sufficient space for the establishment of a battery on its *terreplein;* and consequently, that he may not be able to breach the bastion or ravelin till, by mining or otherwise, he has destroyed the counter-guard.

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* *Hori-zoghe*, in its proper acceptation, means *leader of an army*, from the word *heer*, army, and the verb *ziehen*, to lead. *Grave, graf, gheref*, means, in all the Germanic dialects, the authority of a secondary magistrate. *Rakhen-burghe* means notable persons; they were employed as judges and guardians of public order.

† Chron. apud Script. Rer. Francic. tom. xii, p. 539, 541, 950, and tom. p. 476 and 534.

When counter-guards are constructed in front both of a bastion and of the collateral ravelin, the interval between their extremities unavoidably leaves a face of one of these works exposed; and, as a breach in the former would be more fatal to the defenders than one in the latter work, the lengths of the counter-guards must be determined by the condition that the exposed face be that of the ravelin.

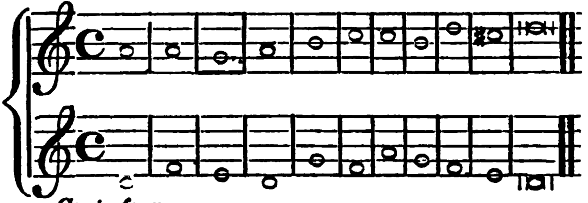
What are called counter-guards in the second and third systems of Vauban are, properly, bastions detached from the line of rampart called the enceinte. [See the work marked V, in *fig.* 3. BASTION.]

COUNTERMINE. [MINES, MILITARY.]

COUNTERPOINT, in music (*contrapunctum*), is a term now synonymous with harmony [HARMONY], and nearly so with composition; but the latter implies more of invention, of imagination, particularly as relates to melody, than counterpoint imports. Counterpoint in its literal and strict sense signifies *point against point.* In the infancy of harmony, musical notes or signs were simple points, or dots, and in compositions in two or more parts were placed on staves, over, or against, each other. Subsequently the term was applied to the parts added to a given melody, such melody taking the name of *cantus-firmus, canto-fermo,* or plain-song. [PLAIN-SONG.] Viewing it in this sense, the Padre Martini wrote his very elaborate and justly-celebrated *Saggio di Contrappunto sopra il Canto-Fermo* (1774), a work to which we refer every student who wishes to enter deeply into the subject. But Zarlino, in his *Institutione Harmoniche* (1589), ranks counterpoint as the principal part ('*soggetto principale*') in airs, &c., written in two parts. And many writers consider the word as applying generally to composition in parts, among whom are the learned Dr. Pepusch, the acute Spanish jesuit Eximeno, the industrious Dr. Lichtenthal, &c.; so unstable is musical language, so ill defined musical terms!

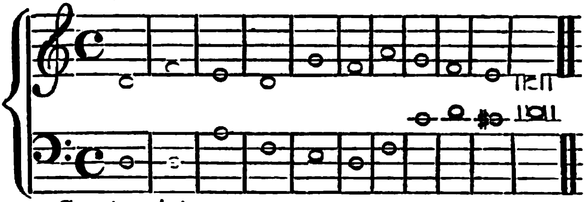
Counterpoint is divided into Simple, Florid or Figurate, and Double. *Simple Counterpoint* is a composition in two or more parts, the notes of each part being equal in value to those of the corresponding part, or parts, and concords. Johann Fux*, in his *Gradus ad Parnassum* (1725), furnishes us with the following examples of this species, calling one part *cantus firmus,* or the *canto fermo,* the other *contrapunctum,* or counterpoint, and taking each in turn as the melody. We have here substituted the treble for the c clefs.

Counterpoint.



Canto fermo.

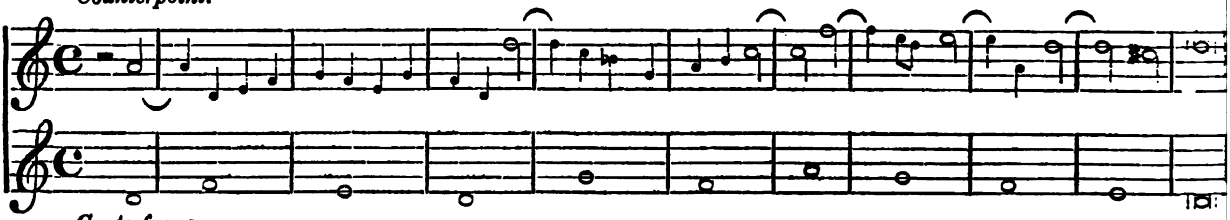
Canto fermo.



Counterpoint.

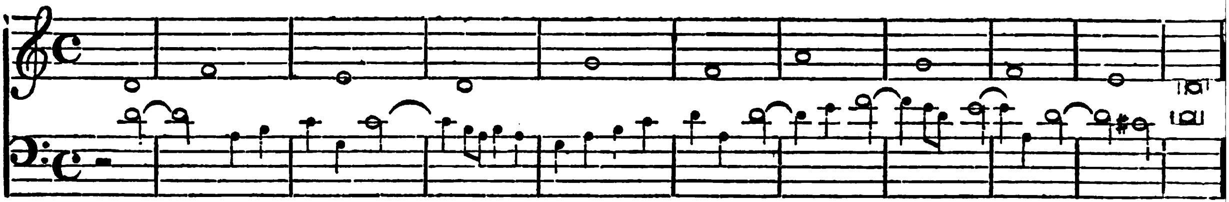
In *Florid Counterpoint* two or more notes are written against each note of the subject, or *canto fermo,* and discords are admissible. Examples from Fux.

Counterpoint.



Canto fermo.

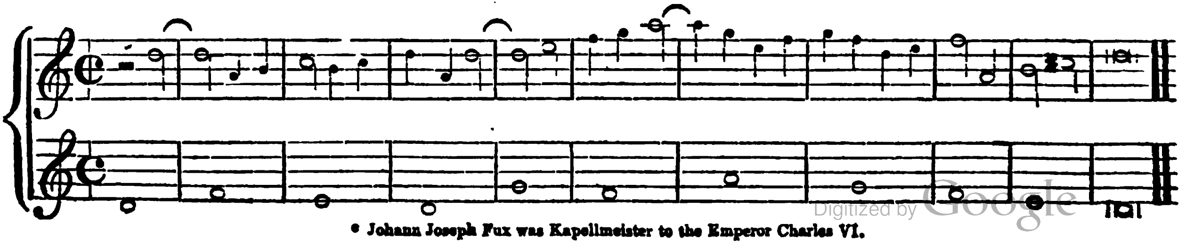
Canto fermo.



Counterpoint.

Double Counterpoint, says the German theorist whose examples we have quoted, 'is a species of composition in which any of the parts may be transposed into the tenth above or below, omitting some notes, the subject remaining stationary.' Or, in other words, it is an inversion of the parts, so that the base may become the subject, the subject the base, &c., thus producing new melodies and new harmonies, 'in an artificial and wonderful manner,' adds Pedro Corone, who seems to have been quite delighted with the contrivance; at a period, however, (1613) when subtleties of all kinds were more valued than in the present day. Fux gives the subjoined examples of double counterpoint, from which it will be seen that this is little more than an extension of florid counterpoint. In the first example the *canto fermo* is the base, the counterpoint the treble. In the second the *canto fermo* is the upper part, while the counterpoint is transposed a tenth lower, and becomes the base. In the third the *canto fermo* and counterpoint remain as in the first example, while the latter, transposed a tenth lower, is adopted as a base, as in Ex. 2; and thus is formed a composition in three parts.

Ex. 1.



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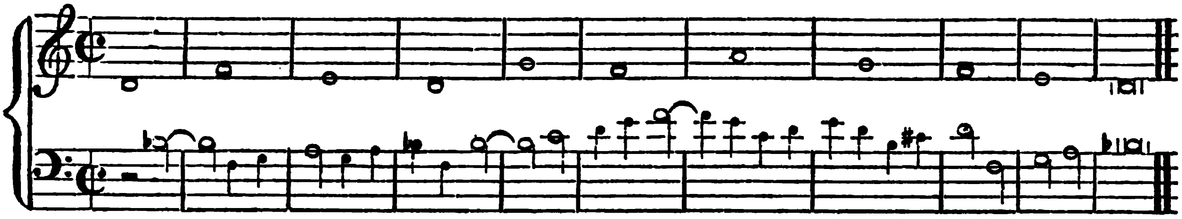
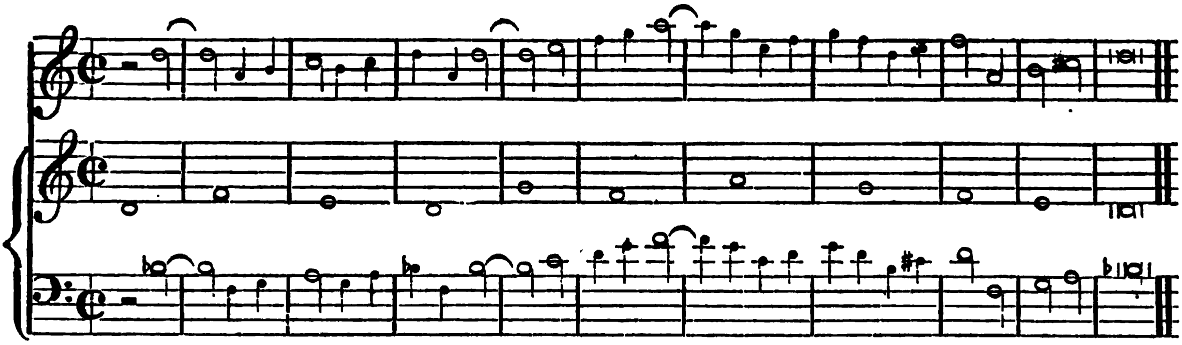
* Johann Joseph Fux was Kapellmeister to the Emperor Charles VI.

Ex. 2.



Ex. 3.



The study of Counterpoint is necessary as part of the education of a good musician, though now much neglected; it has, nevertheless, been sometimes carried to such a length as to become pure pedantry. For the principal rules of Counterpoint,—and also for some brief remarks on the question, 'whether the art of writing in parts,' was understood by the antients—see Harmony.

COUNTERSCARP, is that side of the ditch, about a fortress, which is opposite to the ramparts. The part which is in front of the salient angle of a work is in the form (on the plan) of a circular arc having the vertex of that angle as a centre; and, if the ditch be that of an outwork, the direction of the counterscarp is generally parallel to the rampart; the counterscarp of the main ditch is in the direction of a line which is a tangent drawn to the arc from the shoulder of the collateral bastion. [See the lines above FG, GE, *fig.* 1. Bastion.] This is intended, since the length of the flank is greater than the breadth of the ditch at the said angle, to allow the whole fire of the flank to be directed along the main ditch; and Cormontaingne suggests that the tangent should be drawn from the interior side of the parapet at the shoulder angle, in order that the fire of the man stationed there may more accurately graze the wall of the counterscarp.

A deep ditch, having the earth retained on the side of the country by a nearly vertical wall, is generally considered indispensable for a fortress, because the descent of the enemy into the ditch is thereby rendered difficult· the defence of the covered way is also thereby prolonged, since the enemy who may have entered it at one place is unable to advance on account of the traverses which are constructed across it. Carnot, however, recommends that the counterscarp side of the ditch should be formed in a gentle slope rising from the bottom to the level of the natural ground, in order that the garrison may with facility make those great sorties which he considers as one of the most powerful means of defence.

COUNTERVALLATION, a chain of redoubts executed about a fortress in order to prevent the sorties of the garrison: the works are generally unconnected with each other, but sometimes they are united by a continuous line of parapet. It has happened, during the continuance of a siege or blockade, that the investing corps has been menaced by an army coming up to relieve the fortress; in which case, when it is intended to act on the defensive without abandoning the siege, a chain of redoubts is constructed to strengthen that corps on the exterior: this is called a circumvallation; and originally, like the interior chain, it entirely surrounded the fortress.

According to Thucydides, the town of Platæa, when besieged by the Lacedæmonians, was surrounded by a line of palisades to prevent the egress of the garrison; and subsequently a circumvallation was added. At the siege of Alesia, the countervallation executed by Cæsar consisted of a rampart of earth, 12 feet high, which was surmounted by a parapet, probably of stakes, and by turrets, at the distance of 80 feet from each other. A triple ditch was formed between this line and the town. The Roman army was encamped beyond the line, and enclosed by a circumvallation of similar form; the latter was 14 miles in circumference. It is related in the continuation of the history written by William of Tyre, that, at the siege of Acre by Richard I. of England, the defenders made a sortie, and having forced the agger, began to plunder the camp; and it is added, that Saladin, being in the neighbourhood with an army, made a night attack on the lines: these circumstances sufficiently indicate that both countervallations and circumvallations were then in use.

The long duration of antient sieges rendered such works indispensable; but the use of artillery having greatly abridged the time to which the defence of a fortified place can be extended, they have become of less importance, and, in fact, it is only when the garrison is strong and the quarters of the besieging army are separated by the obstacles of the ground, that any works are considered necessary; and, in this case, instead of continuous lines of palisades and high towers of wood, a few simple redoubts and breast-works of earth are constructed at intervals. In general the besiegers are protected by an army of observation in the field when any effort on the part of the enemy to raise the siege is apprehended.

COUNTY. [Shire.]

COURANTE, or CORANTO, a quick dance in triple time. In Handel's, Mattheson's, and other lessons for the harpsichord, composed towards the end of the seventeenth and beginning of the eighteenth centuries, a *Courante* is generally introduced as one of the movements.

COURCELLES. [Hainault.]

COURIER, from the French *courir*, to run; a messenger sent in haste, or express; a bearer of despatches. The advantage of receiving the earliest intelligence, and of conveying orders with celerity, must have given rise to the employment of couriers at a very early period. Herodotus (viii. 98) gives a particular description of the speed of the Persian royal messengers who proceeded by relays. He says this mode of conveying intelligence was called by the Persians ἀγγαρήϊον (Angareïon); and the couriers themselves ἄγγαροι, (angaroi). Another description of couriers among the Greeks were called ἡμεροδρόμοι, who appear to have been armed with a light spear or dart, &c. (Suidas in voce.) Herodotus (vi. 105) says that a little before the battle of Marathon, Pheidippides (an ἡμεροδρόμος, a runner by profession) being sent by the Athenian generals, arrived at Sparta on the second day after leaving Athens, a distance not less than 140 or 150 miles. (See also Suidas, *v.* Ἱππίας.) The mode of employing couriers by Cyrus, as described by Xenophon (Cyri *Instit.* viii., 6), appears to be nothing more than the system already referred to as described by Herodotus. He ascertained the journey which a horse could fairly perform within a day, and placed stables at regular distances, so that messengers could receive or deliver letters from hand to hand.—Gibbon, in his 'Decline and Fall of the Roman Empire,' (chap. ii.) speaks of the swiftness and regularity of the Roman posts. The Romans called such messengers *cursores:* they were sometimes sent on foot and sometimes on horseback. The earliest couriers of the European nations were probably what have since been called running-footmen. In manuscripts of the thirteenth century such messengers are occasionally styled *trottarii* or trotters. The running-footmen or couriers, who accompanied John Duke of Marlborough in his wars, are several times represented in the tapestries at Blenheim-house.

COURIER, PAUL LOUIS, was born in 1774. His father was a substantial farmer, who gave him a good education. Courier made considerable progress both in classical and mathematical studies. He served in the French army in the campaign of Rome in 1798-9. In his letters written from that country to several friends, and especially in one dated Rome, January 8, 1799, published long after in his *Correspondance Inédite*, he gives a frightful account of the spoliations, plunder, and cruelties committed by the invaders in that unfortunate country. Courier's love of the arts and literature, which never forsook him during his military career, made him especially indignant at the rapacity with which precious sculptures, paintings, and MSS. were torn from public and private collections, and hastily and often ignorantly or carelessly huddled together and packed up for Paris, by which several valuable objects were injured or lost. He also describes the misery of the people of Rome, many of whom were absolutely starving, while the generals, commissioners, and other agents of the French Directory were revelling in luxury. On his return to France after the first peace, Courier published several translations from the Greek, such as Isocrates' Eulogy of Helena, Xenophon's treatise on the Command of Cavalry and on Equitation, and remarks upon Schweighæuser's edition of Athenæus. He also began a translation of Herodotus.

In 1806 he again served in Italy with the army that invaded the kingdom of Naples. He went into Calabria as far as Reggio, and witnessed the desultory but cruel warfare carried on in those regions. His letters from Naples, Calabria, and Puglia, 1806-7, give some valuable information concerning those times and events. Here again Courier spoke to his friends the language of truth; he was not more blinded by the proclamations of Napoleon the Emperor than he had been by those of the republican Directory. His testimony confirms what Colletta and other national writers have recorded of the atrocities of the Calabrian war. He comments severely on the judicial murder of Rodio, a colonel in the service of king Ferdinand, who was taken prisoner, tried by court-martial, acquitted, then tried again, Courier says by orders from Napoleon, condemned, and executed. He speaks also in the same letter, Naples, July 1807, of a courier from the queen being murdered near Naples, and his despatches sent to Paris, and other transactions of a similar nature.

Courier served with the rank of chef d'escadron in the Austrian campaign of 1809. After the battle of Wagram, he gave in his resignation, which was readily accepted; for his inquisitive turn of mind and independent temper made him looked upon as a troublesome person by the more thoroughgoing officers of Napoleon. On reaching Florence, he discovered in the Laurentian library an unedited MS. of Longus, of which he meant to avail himself for a translation of that author. Happening to upset an inkstand on the MS. by which accident a page was blotted, the librarian accused him of having done it purposely. Courier defended himself, but some persons in power at the Court of the Princess Eliza, Napoleon's sister, took part against him, and he was ordered out of Tuscany. Courier wrote a humourous account of the whole transaction, in a letter addressed to Mr. Raynouard, in which he did not spare his accusers. His translation of Longus was subsequently published in 1813 and was well received by the learned. Retiring to his farm at Veretz, in the department of Indre et Loire, he heard with no regret the fall of Napoleon, and expressed himself as satisfied with the charter given by Louis XVIII. if conscientiously fulfilled. He however began soon to find fresh matter for his satirical vein. His 'Livret,' or Memorandum-book, and his letters, give a curious picture of provincial politics, and of the state of society in the interior of France after the restoration. He exposes the petty absolutism and consequential tone of the local authorities, the prefects, sub-prefects, procureurs du roi, clerks, and all the departmental, district, and communal bureaucracy. One of his letters turns upon the style in which a procureur du roi writes to order the arrest of a man, the style, as Courier observes, of the imperial regime. His letters, several of which were published at the time in the 'Censeur,' have been compared for their power and humour to Pascal's celebrated Provinciales. He also directs his attacks against the priests, many of whom, by their intolerance, fanaticism, and meddling spirit, did infinite mischief to the cause of the Bourbons. When, in 1821, a subscription was opened all over France to purchase the estate of Chambord for the infant duke of Bordeaux, he wrote 'Simple Discours aux Membres de la Commune de Veretz,' for which he was tried, and condemned to one month's imprisonment. He published an account of his trial, under the title of 'Procès de Paul Louis Courier, vigneron.' Courier was now looked upon as one of the most formidable antagonists of the Bourbonist party. He was however by temper a grumbler, caustic and satirical rather than factious. At the beginning of 1825 he was found murdered near his house at Veretz, but no clue was discovered to the perpetrators of the crime. Some attributed it to political, others, perhaps with more reason, to private enmity. His works have been collected, and published in four volumes 8vo., Brussels, 1828. The fourth volume contains his unedited letters. They are valuable as sketches of actual life and manners, and as materials for contemporary history.

COURLAND, one of the Baltic provinces of Russia in Europe, is composed of the former duchies of Courland and Semigallia, of the old bishoprick of Pilton, and of Polangen, a district of Samogitia. It was until 1795 a possession of the Polish crown. The boundaries of Courland are, on the north, the gulf of Riga and Livonia; on the west, the Baltic sea; on the south, the province of Wilna, and Prussia; and on the east, the provinces of Vitepsk and Minsk. Its area, according to the inquiries of the Courland Society of Arts and Literature, is 9575 square miles, but according to Reymaim and Hassel, 10,689; and the population, which was 418,162 in 1790, may now be estimated, according to Arsenief, at about 450,000. The surface towards the sea coast is level, and presents a sandy plain about Mitau, Windau, and Goldingen, but its general character is undulating. It is intersected by two ranges of heights, one of which runs parallel with the Düna or Dwina, while the other takes a more westerly direction, and spreads its arms out in various directions. The most elevated points are the Huningberg, an agglomeration of sand, which is about 450 feet high, and the Silberberg. The coast is partly flat, and partly lined with sand-hills. The most northerly point is the dangerous promontory of Domes-Nüs, which is a continuation of the Blue Mountains, and stretches out between the Baltic and the gulf of Riga. Two-fifths of the soil are covered with forests or underwood, and a considerable part by moors of peat: nearly 15,000 acres are covered with marshes, or occupied by the 300 lakes and ponds and 118 small streams and rivulets which render the climate of Courland, though not unhealthy on the whole, raw, moist, and foggy. The largest of these lakes is the Usmaiten, in the western district of Goldingen, which is about twenty miles (thirty-five versts) in circumference; that of Sausken is ten miles long, and nearly two and a half broad; that of Angern is more properly a bay or 'haff' of the gulf of Riga. The principal river is the Düna, which skirts the eastern boundary of Courland, and of which the Aa or Bulleraa, one branch of which flows into it by a north-westerly course from the Livonian frontier, is a tributary. Besides these two rivers, Courland is watered by the Windau (which, entering it from the province of Wilna, takes a northerly course, forms a fine cataract near Goldingen, and falls into the Baltic at Windau), the Libau, the 'sacred' Aa, Anger, Bartau, &c. There is a canal of some importance near Goldingen; but that which, when completed, will be of far more essential benefit to the province, is the canal begun in 1825, which will unite the Windau and the Niemen. There are sulphurous springs at Smoden, Baber, and Baldanen.

The soil of Courland is in general light and sandy; it is most productive on the side towards Livonia. In the moors and morasses blocks of granite are occasionally found imbedded. Agriculture is the principal occupation of the inhabitants, who raise large quantities of rye, barley, and oats, but less in proportion of wheat, and less still of peas and beans. The crops of grain are more than adequate to the consumption, which is about 1,300,000 tshetverts (which is about 940,000 quarters). Flax and hemp are extensively cultivated, and of excellent quality; the seed of the first, which is sown in June, yields a crop in eight weeks. A little tobacco is raised, and some fruit is produced; but the ordinary sorts of vegetables are grown everywhere. Courland has not sufficient pasture land to make the rearing of cattle a common occupation. Horses and horned cattle are of an inferior kind, and the sheep yield but an indifferent quality of wool. The value of the fisheries along the coast does not exceed 1200*l.* or 1300*l.* sterling per annum. The supply of game is abundant. The extensive forests are in general situated on marshy ground, and consist principally of pines, firs, beeches, oaks, and elms, of low growth. Of minerals, Courland contains small quantities of bog-iron, lime, and gypsum. It has also coals and marble, but they have not hitherto been turned to much account. Amber is thrown up on the coast.

The population is of the same extraction as the Lithuanians, from whom the native Courlanders differ in no other respects than that they are more advanced in civilization, and use a slightly varied dialect. Independently of these native Courlanders (332,195 in the year 1828), there are several thousands of Livonians, Lithuanians, Jews, Germans, Krewincks (a race of Finnish descent), Russians, and Poles, scattered throughout the province. The inhabitants are mostly Lutherans; for out of the whole number returned in 1826, which was 384,789, there were not more than 23,627 who were not Lutherans. In 1825, the excess of births over deaths amounted to 7755. The Jewish community are about 10,000 in number.

The land belongs principally to the Courland nobility, who are either Germans or Poles; they are possessed of peculiar rights, such as their own civil jurisdiction, exemption from taxation, and not being liable to military service. These rights, where not in direct opposition to the Russian laws, were confirmed to them when the partition of 1795 transferred their country to Russia. Their numbers were 1126 in the year 1828. The towns are mostly inhabited by individuals of German extraction; they are free, and quite independent of the nobility. The peasant is by the law a serf in the strictest sense, and in vassalage either to the nobility or burgesses; he has no property which he can call his own, may be bought or sold, and is subject to the arbitrary chastisement of his owner. Of late however emancipation has been granted by many proprietors, and the lot of this unfortunate class has been greatly ameliorated. In fact, it is not probable that the Courland nobility will long hold out against the example set them by the landholders of Livonia and Esthonia.

The wants of each estate are mostly supplied by the serfs themselves, part of whom are brought up to mechanical arts; the peasant makes his own clothing, furniture, and domestic utensils, and constructs his own humble dwelling: he buys no manufactures. In 1831 the Courland manufactories were only one pottery, and one establishment for making copper wares; some lime-kilns and tile-houses, and three paper-mills, which employed but fifteen workmen. The only exception is the vast number of brandy distilleries.

Courland is under the general direction of the governor-general of the Baltic provinces, and the administrative duties devolve upon a civil governor, resident at Mitau; both are subordinate to the executive at St. Petersburg. The ecclesiastical affairs of the province, as respects the Protestants, are conducted by the consistory of Mitau, who have 141 churches in their jurisdiction; the Roman Catholics and Greeks together possess but 19 churches, the first being subordinate to the bishop of Samogitia, and the Greeks to the bishop of Pskof.

Courland is in general administered according to its own laws and usages; but in regard to fiscal and military affairs, it has been placed on the same footing as the other provinces of the empire. Dorpat is the university for this province; the only high school is the gymnasium at Mitau: the other establishments for education consisted, in 1832, of fifty-nine schools, conducted by 144 teachers, and attended by 1643 pupils, of whom 246 were females: thirty of those schools were maintained at the expense of private persons. The nobility continue to assemble at diets, and have a permanent committee at Mitau. The province is divided into head-captaincies, and each of these into two captaincies, besides the district of Pilten. Courland Proper, or the northern parts, contain the captaincies of Tuckum, of which Tuckum (about 1300 inhabitants) is the capital; and Goldingen, of which Goldingen, with about 2400, is the capital. Semigallia, or the southern parts, is divided into the captaincies of Mitau, of which Mitau on the Aa, the provincial seat of government, with about 13,000 inhabitants, is the capital; and Seelburg, of which Jakobstadt on the Düna, with about 1800 inhabitants, is the capital. The district or bishopric of Pilten lies in the south-west, and has Pilten for its capital, with about 400 inhabitants. This district is also known by the name of Hasenpoth, which is derived from that of the largest town in it, now become the capital: it has about 1100 inhabitants.

Courland has two shipping ports, Libau (about 5000 inhabitants) and Windau (1200), both situated on its western coast. The exports of native produce consist of grain, hemp, flax, linseed, skins, salted meat, &c., and average about 130,000*l.* a year; the imports scarcely exceed 50,000*l.* per annum. The inland trade is monopolised by the Jews.

COUROUCOU. [TROGON.]

COURSE OF EXCHANGE. [EXCHANGE.]

COURT-MARTIAL, a tribunal occasionally instituted for the purpose of trying military and naval men for the commission of offences affecting discipline in either of those branches of the public service.

Courts for the trial of rebels by martial law appear to have early existed in this country; and in the time of Henry VIII., the Marshal of England held one regularly for the trial of causes connected with military discipline. In the reigns of Elizabeth and her successor, those courts of war, as they were called, were superintended not by the marshal, but by a president chosen for the purpose. This president was probably a general or field-officer, but captains of companies were allowed to sit as members. The colonel of each regiment was charged with the duty of preparing the evidence relating to offences which fell under his cognizance, and of bringing it before the court. But courts-martial in their present form were instituted in the reign of James II.; and in the ordinances of war published in 1686 they are distinguished as general or regimental. Subsequently to the revolution, their powers have been expressly regulated by parliament, and are fully detailed in what is called the Mutiny Act, which is revised and renewed every year. Naval courts-martial are regulated by the statute 22 Geo. II., c. 33.

General courts-martial are assembled under the authority of the king, or of an officer having the chief command within any part of his Majesty's dominions to whom such authority may be delegated. Regimental courts-martial are held by the appointment of the commanding officer of the regiment. The East India Company's Mutiny Act empowers the governor-general in council, and the governor in council, at the presidencies of Fort William, Fort St. George and Bombay, and at St. Helena, to appoint general courts-martial, or to authorize any military man not below the rank of a field-officer to do so. What are called detachment courts-martial, may be either general or regimental, and their appellation is derived from the nature of the command with which the officer convening the court is invested.

The chief crimes of which a general court-martial takes cognizance are mutiny, abandonment of a fortress, post, or guard committed to the charge of an officer or soldier, disobedience of orders, and desertion: these crimes, if proved to their greatest extent, are punishable with death; and the penalty extends to any military man, being present, who does not use his best endeavours to prevent them. In desertion is included the fact of enlisting in any regiment without having had a regular discharge from that in which the offender may have last served. The practice of sending challenges between commissioned officers, is punished with cashiering; between non-commissioned officers and privates, with corporal punishment: and, in all cases, seconds and accessories are held to be equally guilty with the principals. Self-mutilation, theft, making false returns of stores, and neglect of ordinary duty, in non-commissioned officers and privates, are usually punished by the infliction of a certain number of lashes, not exceeding one thousand; and men of the former class may, in addition to other punishments, be suspended, or degraded to the ranks. There are many offences which might tend to the subversion of discipline, but which are hardly capable of being precisely defined, as immoralities, and behaving in a manner unbecoming an officer and a gentleman; of these the courts-martial take cognizance, and on conviction the offender may be dismissed from the service. At home, military men are not, in general, amenable to courts-martial for civil offences; but abroad, where there may be no civil courts, the case is different.

The provisions of the Mutiny Act affect not only the cavalry and infantry of the regular army, but extend to the officers and privates in the corps of artillery, engineers, and marines; to all troops in the employment of the East India Company, or serving in the colonies; to the militia during the time that it is assembled and being trained; and lastly, to the yeomanry and volunteer corps. All are subject, without distinction, to trial and punishment by courts-martial.

The rules of the service require that the president of every general court-martial should be a field-officer, if one of that rank can be obtained; but, in no case, must he be inferior in rank to a captain. And it should be observed, that none of the members are to be subalterns when a field-officer is to be tried. As the president has the power of reviewing the proceedings, it is prescribed, and the propriety of the regulation is manifest, that he be not the commander-in-chief or governor of the garrison where the offender is tried. A judge-advocate is appointed to conduct the prosecution in the name of the sovereign, and act as the recorder of the court.

No general courts-martial held in Great Britain or Ireland are to consist of less than thirteen or nine commissioned officers, as the case may require; but in Africa and in New South Wales the number may be not less than five; and, in all other places beyond sea, not less than seven. Commonly, however, a greater number are appointed, in order to guard against accidents arising from any of the members being found disqualified or falling sick. An uneven number is purposely appointed, in order that there may be always a casting vote; and the concurrence of two-thirds of the members composing the court is requisite in every capital sentence. No officer serving in the militia can sit in any court-martial upon the trial of an officer or soldier in the regular army; and no officer in the regulars is allowed to sit in a court-martial on the trial of an officer or private serving in the militia. Likewise, when marines, or persons in the employment of the East India Company, are tried, the court must be composed of members consisting in part of officers taken from the particular service to which the offender belongs. The members both of general and regimental courts-martial take rank according to the dates of their commissions; and there is a particular regulation for those who hold commissions by brevet. [Brevet.] They are always sworn to do their duty, and witnesses are examined upon oath.

In the accusation the crime or offence must be clearly expressed, and the acts of guilt directly charged against the accused; the time and place must be set forth with all possible accuracy; and, at a general court-martial, a copy of the charge must be furnished by the judge-advocate to the accused, that he may have full opportunity of preparing his defence. The accused has the power of challenging any of the members, but the reason of the challenge must be given, and this must be well founded, otherwise it would not be admitted; for the ends of justice might be often defeated from the impossibility of getting members to replace those who were challenged.

The court must discuss every charge brought against the accused, throwing out only such as are irrelevant; and judgment must be given either upon each article separately, or the decision of the court upon all may be included in one verdict. The evidence is taken down in writing, so that every member of the court may have the power occasionally of comparing the proceedings with his own private notes; and he is thus enabled to become completely master of the whole evidence before he is required to give his opinion. At the last stage of the trial the decisions of the several members are taken in succession, beginning with the junior officer on the court: a regulation adopted obviously in order to insure the unbiassed opinions of those who might otherwise be influenced by deference to the members who are superior to them in age or rank.

Regimental or garrison courts-martial are appointed by the commanding officer, for the purpose of inquiring into criminal matters of the inferior degrees; and they are empowered to inflict corporal punishments to a certain extent only. The articles of war require that not less than five officers should constitute a court of this nature, or three when five cannot be obtained. The practice is to appoint a captain as president, and four or two subalterns as the case may be; the court has no judge-advocate to direct it; therefore the members must act on their own responsibility. The proceedings are to be taken down in writing, and the sentence cannot be put in execution till it has been confirmed by the commanding officer, or by the governor of the garrison.

No commissioned officer is amenable to a regimental court-martial; but if an inferior officer or private should think himself wronged by such, he may, on application to the commanding officer of the regiment, have his cause brought before a regimental court-martial, at which, if the complaint is judged to be well founded, he may on that authority require a general court-martial to be held.

An appeal may be made from the sentence of a court-martial by the party who conceives that he has suffered injustice; the appeal lies from a regimental to a general court-martial; and from this to the supreme courts of law in the kingdom. It is easy to imagine, however, that the superior court will refuse to receive the appeal unless there should be very satisfactory evidence that the merits of the case have not been fairly discussed.

After the sentence of the court-martial has been pronounced, it is transmitted to the king, who may either confirm it, or, if sufficient reason should exist, may, on the ground that the process is not complete till the royal sanction has been given to the judgment, return it to the court for revision; or again, by virtue of his prerogative, he may remit the punishment awarded.

The chief distinction between the trial by court-martial and by jury is, that in the latter the verdict must be unanimous, while in the former the concurrence of a majority only in opinion determines the verdict. The writers on military law have endeavoured to show that the advantages in this respect are on the side of the court-martial: they contend that every member of such court delivers the opinion which he has formed from the evidence before him; while it may frequently happen in other courts that, in order to procure unanimity, some of the jury must surrender their own opinions. It may be observed, however, that in such a case the decisions are at least of equal value, since, in the event of a concession of private judgment, the verdict is in fact formed on the opinion of the majority.

(Grose, *Military Antiquities*; Tytler, *Essay on Military Law*; Samuel, *Historical Account of the British Army*; Simmons, *On the Practice of Courts-Martial*, with *Supplement*.)

COURT OF RECORD. [Courts.]

COURTESY OF ENGLAND is the title of a husband to enjoy for life, after his wife's decease, hereditaments of the wife held by her for an estate of inheritance, of which there was seizin during the wife's life, and to which issue of the marriage is born which by possibility may inherit. It is said to be called courtesy of England as being law peculiar to this country. In the law of Scotland however it is known under the title of 'jus curialitatis,' and it is also stated in a Rescript of Constantine, Cod. vi., 59, 1, and in the laws of the Alemanni, Lindenbrog, 'Codex Legum Antiquarum,' 1613, p. 387, 'Lex Aleman.' c. 92; though by the law of the Alemanni the husband took the inheritance under circumstances similar to those that establish the title to a life estate only in the English law. This title of the husband's tenancy of the estates of his wife depends upon a valid marriage, the seizin of the wife during marriage of the same estate respecting which courtesy is claimed, issue born alive during the wife's life capable of inheriting, and the death of the wife. Lands held by the wife descendible only to her sons would not, in case of the birth of a daughter, be subject to this title of the husband; nor would a child brought into the world by the cæsarean operation, after the mother's death, establish it. It differs from the similar rights of the wife to dower in several respects, the wife taking only part of the husband's estate, and being entitled to her tenancy though no issue is born; whereas the husband takes the whole estate, the caput baroniæ, and such indivisible rights out of which dower is not or cannot be assigned. By the custom of Gavelkind, a man may be tenant by the courtesy without having had issue by his wife.

COURTESY OF SCOTLAND, otherwise called in the law of that kingdom 'jus curialitatis,' or right of courtship is substantially the same with the courtesy of England. As in the latter kingdom, five things are necessary to it; namely, marriage, that the wife is an heiress and infeft, issue, and the death of the wife.

As to the marriage, it must indeed be a lawful marriage, but it is not necessary that it be regular and canonical; it is sufficient that it is valid in law, whatever be the precise form in which it became so. According to the ancient borough laws, c. 44, the courtesy extended only to such lands as the woman brought in tocher; but afterwards it was the lands to which she had right by inheritance, as the law still is. It was always the law that the wife must be heritably infeft and seised in the lands. The fourth requisite is, inheritable issue born alive of the marriage; that is to say, the child born must be the heir of the mother's estate, and it must have been heard to cry; for though it be otherwise in England, crying is here the only legal evidence of life. In the last place, by such issue the husband has during the life of the wife only *jus mariti*, as Skene says (*De verb. signif. voce Curialitas*); after her decease he has *jus curialitatis*; or as Blackstone speaks, with reference to the law of England, the husband by the birth of the child becomes tenant by the courtesy *initiate*, but his estate is not *consummated* till the wife's death; which is the fifth and last requisite to give the complete right of courtesy, the husband needing no seisin or other solemnity to perfect his title.

COURTRAY or COURTRAI—in Flemish Kortryk,—a fortified town of West Flanders, the chief place of the district of the same name, is about 16 miles east from Ypres and 25 miles south from Bruges, in 50° 49′ N. lat. and 3° 18′ E. long. The town occupies both banks of the river Lys, by means of which it has communication with the principal towns of Flanders. Courtray existed in the time of the Romans, under the name of Cortoriacum, and as early as the seventh century enjoyed the privileges of a municipal city. The fortifications were begun in 1290; the castle was built in 1385 by Philip the Bold, duke of Burgundy. The works were enlarged and perfected, chiefly by the French, who built a citadel in 1647. The Flemyngs, in 1302, commanded by John count of Namur, encountered a French army near to Courtray, and found on the field, after the battle, about 4000 gilt spurs, which caused it to be called the battle of spurs. The town was taken by the French successively in 1643, 1646, 1667, and 1683, and was restored to Spain by the peace of Ryswick. The French destroyed the fortifications in 1744; in 1793 they obtained a victory over the English near the town, of which they took possession a few days afterwards, and constituted it chief place of the department of the Lys.

The population of the town, on the 1st January, 1835, was 18,858, and that of the entire parish 19,124; its streets are wide, the houses well built, and it contains several fine buildings, among others the Town-hall, a Gothic structure, the churches of St. Martin and of Notre Dame. This last-mentioned was built by Baldwin count of Flanders. Courtray contains an exchange, a college, and two asylums for orphans. A great part of the working population is employed in spinning flax, and in weaving and bleaching linen cloths and table-linen. The fine linens, known under the name of Courtray cloth, are made in the surrounding districts, and sold unbleached in the weekly market held in the town, where the pieces are finished and prepared for sale to the consumers. The number of pieces of linen thus brought to the town annually amount to 30,000; about two-thirds of this quantity are bought by the dealers in Courtray, and the remainder are sold to brokers from Bruges, Ypres, Ghent, and Brussels, and even to English and French merchants. The dyers of Courtray imitate with success the colour known as Turkey-red. Thread-lace and silk-lace are among the branches of industry pursued.

(Van der Maelen's *Dictionnaire Géographique de la Province de la Flandre Occidentale; Statistical Papers printed by order of the Belgian government.*)

COURTS. The Courts of Common Law in this country, like most other branches of our constitution, have grown up gradually with the progress of the nation, and may be traced back, partly to the institutions of our Anglo-Saxon forefathers, and partly to the more artificial systems introduced under the government of the Normans. From the earliest times of which we have any account, we find the tribunals of the Germanic nations consisting of a presiding officer, called Graf Reeve or Earl, Comes or Count; together with certain assessors, whose denominations (and probably their functions also) were different among different tribes and at different periods. Of this nature were the earliest tribunals with which we are acquainted in this country. The most important of these, was that whose jurisdiction extended over a shire or county, in which the presiding officer was at first the Earl, Alderman, or Count; and subsequently, his deputy the Vice Count or Sheriff (Shire Reeve). This tribunal exercised ecclesiastical as well as civil jurisdiction, and the bishop sat as an associate to the earl or sheriff.

The judicial functions of this Court were divided into four distinct branches. The first included all ecclesiastical offenses; and in these the bishop was judge, and the count or sheriff his assistant, and if the delinquent disregarded the censures of the church, he enforced the sentence by imprisonment. The second branch (in which the sheriff was judge) included all temporal offences, such as felony, assaults, nuisances and the like. The third head included all actions of a purely civil nature: here the sheriff was the presiding officer, and executed the judgment; but the judges were the freeholders who did suit to the court. And fourthly, the sheriff's court held an inquest yearly of frank pledge. One branch of the jurisdiction of this tribunal was abolished by William the Conqueror, who separated the ecclesiastical from the civil power, and the bishop was no longer associated with the civil magistrate. The view of frank pledge now exists only as a form, but the other two branches of jurisdiction still subsist, though with diminished power and importance.

In order to exercise his criminal jurisdiction, the sheriff was required twice in every year to make a tour or circuit of his county. The power of determining felonies was taken away by Magna Charta, but the remains of this tribunal are still known as the sheriff's tourn, in which cognizance is taken of false weights, nuisance and other misdemeanors. The civil jurisdiction of the sheriff still continues in the county court, the powers of which were limited to cases under forty shillings, at least as early as the reign of King Edward I.: and that sum now (except in case of replevin) limits the ordinary jurisdiction of the county court.

The land over which the jurisdiction of the sheriff extended, is said to have been distinguished as reve land. The thanes or nobles had, in the lands granted to them, a similar jurisdiction of their own, as well civil as criminal. (1, Reeve's *Hist. of English Law*, 7.) The limits between the jurisdiction of the sheriff and that of the lord were strictly preserved. But when the lord had no court, or refused to do justice, or when the parties were not both subject to his jurisdiction, the suit was referred to the tribunal of the Reeve; and a suit commenced before the lord might be removed by the defendant before the higher tribunal.

The civil tribunal of the lord was similar to the county court in its constitution and its powers, except that the presiding officer was not a public functionary (as the Reeve was), but the bailiff of the lord. This tribunal still exists under the style of the court baron, and is incident to every manor in the kingdom. The judges are the freeholders who owe suit and service to the lord of the manor, and if there are not at least two such freeholders in the manor, the court is lost. This was formerly the proper court in which to commence real actions to try the title to lands within the manor. The lord's tribunal in criminal cases, in which he had the same powers that the sheriff exercised in his turn, was called the Leet.

The same powers which were exercised over a particular manor by the court baron and court leet, were also exercised over particular hundreds by the hundred court and the leet of the hundred. But the number of these courts was much diminished by stat. 14 Edward III., by which all hundreds, except such as were of estate in fee, were rejoined (as to the bailiwick of the same) to the counties at large.

Besides these courts of inferior jurisdiction, there was also a supreme tribunal, in which the king presided. In the Saxon age, and for some time after, the legislative, the administrative, and the judicial functions of the government had not been separated; and the Wittena-gemote, or meeting of the wise, was consulted by the monarch in all these departments indiscriminately. The Anglo-Saxon king had the same jurisdiction over his thanes that they had over their own vassals. He punished all enormous crimes committed against the king's peace. His court was likewise open to all those to whom justice had been refused in the inferior tribunals; and he had the power of punishing the judges if they pronounced an iniquitous sentence. It also seems probable that the king's court was a court of appeal, in which the judgments of all other tribunals, if erroneous, might be reversed.

The Norman Conquest does not seem to have produced any immediate change in the constitution of this national assembly, which thenceforth became more known as the Great Council. Its members exercised the same varied functions as under the Saxons; but when they sat in their judicial capacity, they had the assistance of the great officers of state and certain persons learned in the law, styled Justiciars, or Justices. William the Conqueror also created an officer to preside over judicial business, under the title of Chief Justiciar. The functions of this tribunal thus became gradually separated from the general business of the grand council; and from being held in the hall of the king's palace, it was distinguished by the style of Aula Regis. A great distinction was drawn between this and all the courts of Saxon origin, from the mode of authenticating its proceedings. There were at this time no written memorials of legal proceedings, and indeed of few other public acts; and when it was necessary to establish any judgment or statute which had been made by the king assisted by his council, it was usual to call the testimony of some of the nobles who were present, to bear *record* of the fact. In progress of time, all such proceedings were written down at the time on parchment, the nobles present signing their names as witnesses, and so bearing record of the truth of what was there alleged. The writing itself was called a record; and it was held to be evidence so conclusive, that when produced, nothing was allowed to be alleged in derogation of it. The entry of proceedings on record was adopted in the judicial, as well as in the other departments of the great council, and hence the Aula Regis became distinguished as *a court of record.* The power and importance of the Aula Regis rapidly increased. It not only maintained the former powers of the council in punishing offences against the public, in controlling the proceedings of inferior courts, and in deciding on questions relating to the revenue of the king, but it engrossed also a great portion of the 'common pleas,' or causes between party and party. And though we may suppose that it was only the more important causes that were taken into the Aula Regis, yet as early as the reign of Edward I., when the jurisdiction of the county courts was confined to 40*s*., all actions above that amount were brought into the king's courts

The Aula Regis seems at a very early period to have been distinguished as exercising three several capacities, according to the different natures of the causes that were brought before it, which are treated of in our earlier legal writers as pleas of the king, common pleas, and pleas of the exchequer. The bond of connexion between these several jurisdictions was the chief justiciar, who presided over all of them. But in the reign of Edward III., this office was abolished, and thus were finally destroyed the unity of the Aula Regis and its connexion with the grand council, which became henceforth essentially a legislative body; and though it still retains traces of its original functions in its title of the *High Court* of Parliament, yet it has ever since ceased to exercise any judicial powers, except in cases of impeachment, or as a court of ultimate appeal. On the dissolution of the Aula Regis, the three courts of the King's Bench, the Common Pleas, and the Exchequer, had each of them a perfectly distinct and separate existence. The Court of King's Bench had the control of all inferior tribunals and the cognizance of all trespasses against the king's peace; the Court of Exchequer had cognizance of all cases relating to the revenue; and the Court of Common Pleas was the only tribunal for causes of a purely civil nature between private persons. The Courts of King's Bench and Exchequer still retain each of them its peculiar jurisdiction; and the Common Pleas is still the only court in Westminster in which a real action can be tried; but the great mass of causes between party and party may now be brought indiscriminately in any of the three courts. The mode in which the King's Bench and the Exchequer originally contrived by fictitious proceedings to appropriate to themselves a share in the peculiar jurisdiction of the Common Pleas will be found in the accounts given of those courts.

There was likewise another court, of a more limited character, which though held in the Aula Regis does not appear ever to have been under the control of the chief justiciar, viz., the Court of the Marshalsea, which had jurisdiction where one of the parties at least was of the king's household. Charles I. created by letters patent a new court, styled the Court of the Palace, with jurisdiction over all personal actions arising within the verge of the palace, that is, within twelve miles of Whitehall. These courts are now held together every Friday. The Court of Marshalsea is, in fact, disused, but the Palace Court is in active operation.

The Saxon kings had been in the habit of making progresses through their dominions for the purpose of administering justice. This practice was not continued by William the Conqueror; but he annually summoned his great council to sit at the three feasts of Easter, Whitsuntide, and Christmas, in three different parts of the kingdom Winchester, Westminster, and Gloucester But when the great mass of the legal business of the country was brought into the king's courts at Westminster it became necessary to take some more efficient measures for the trial of causes in the country.

The first expedient adopted was to appoint itinerant judges, justices in Eyre, who travelled through the kingdom, holding plea of all causes civil or criminal, and in most respects discharging the office of the superior courts. These itinera or Eyres usually took place after an interval of seven years.

About the end of the reign of Edward III. this system was wholly discontinued, except as to pleas of the king's forests, the functions of the justices in Eyre being superseded by the justices of Nisi Prius. This system was first established by a statute of Edward I., which, in order to prevent the expense of bringing up the juries to the king's courts at Westminster, provided that certain judges of those courts should be appointed to make circuits twice a year for the trial of issues, upon which judgment was to be given in the court above. This system is still in operation. The justices appointed by the commission of Nisi Prius also receive commissions of Oyer and Terminer and of gaol delivery, to authorise them to try criminals; and a commission of assize, under which they used to try a peculiar species of action called assizes. These actions have long been obsolete; but the name of assizes is still given to the sittings of the justices on circuit under their several commissions.

Under the Norman kings the fines, amerciaments, and forfeitures in the king's courts constituted a considerable portion of the revenue, and the administration of justice was held to be an important branch of the royal prerogative. But, like other branches of the prerogative, we sometimes find it in the hands of a subject, either by grant from the crown, or by prescription, which, in the eye of the law, supposes a grant, though such supposition is often at variance with probability; within the counties Palatine and other royal franchises, the earls or lords had regal jurisdiction, saving the supreme dominion of the king. They had the same right as the king to pardon offences; they appointed judges of eyre, assize, and gaol delivery, and justices of the peace; all legal proceedings were made in their name, and offences were said to be committed against their peace, as in other places against the peace of the king. These royal prerogatives were, for the most part, re-annexed to the crown by stat. 27 Hen. VIII.; but the form of the judicial establishment still remained. The County Palatine of Pembroke was abolished by the same statute, and the County Palatine of Hallamshire shared the same fate in the reign of Elizabeth. The Counties Palatine of Chester and Lancaster are still in existence, but have long ceased to be in the hands of subjects: they are now vested in the king. The palatinate jurisdiction of Durham continued t our own day to be possessed by the bishop, but this also ha been, by statute of the year 1836, vested as a separat franchise in the king; and by another statute of the sam year the secular jurisdiction of the bishop of Ely has bee abolished.

But besides these palatinate jurisdictions, created t increase the power and gratify the pride of the nobles o whom they were conferred, the crown has also from tim to time erected courts, with a jurisdiction limited in poin of territory, and always under the control of the king' superior courts. If, in the Saxon times, the boroughs ha courts similar to those of the Hundreds, there are now n traces to be found of their existence; but however that ma be, it is certain that when commerce increased, it was found of the utmost importance to the boroughs to be relieved from the jurisdiction of the feudal lord, and at the same time to have some court of justice to apply to, less distant, dilatory, and expensive, than the king's courts at Westminster. And accordingly there has, at some time or other, been granted to almost every borough of any importance, the power of exercising civil and criminal jurisdiction within certain prescribed limits. These courts were in all cases courts of record, but in other respects were not modelled on any uniform system. There was the greatest possible variety in their constitution and the extent of their powers. But the mode of proceeding in all of them was founded on the common law and the practice of the superior courts, and a writ of error lay into the King's Bench, except from the courts of London and the Cinque Ports. By far the greater number of these courts have fallen into disuse. One of the causes of their inefficiency, viz., the want of competent judges and juries, has been partially removed by the Municipal Corporation Act, and a greater uniformity has been introduced by giving to all of them jurisdiction as far as 20*l.* But in order to bring these courts into active operation, it still remains for the legislature to provide some more simple machinery for carrying on their ordinary proceedings; to give them better means of executing process, and of compelling the attendance of witnesses; to secure the efficiency and responsibility of the inferior ministers, and to restrict the power of removing trifling suits into the superior courts. The general incompetency of inferior courts in carrying on the ordinary proceedings in a cause is attested by a plan which has lately been introduced by the legislature. Any of the courts at Westminster is authorized, when a cause commenced there has been carried through all its preliminary stages, to send it by writ of trial, to be tried before an inferior judge, and, after trial, the cause is returned, and judgment given in the superior court. If the borough courts should ever be brought into a state of activity, the system of writs of trial, which is merely a substitute for local tribunals, would probably fall to the ground.

Whenever that time shall arrive it will be a curious thing to trace the history of the administration of justice, which, under the Saxons, essentially local, rising from the smaller jurisdiction gradually to the higher, became, under the Norman dynasty, centered in one point, the monarch being the fountain of justice. This system of centralization, connected as it was with the principles of feudalism, which so long prevailed in this island with peculiar force, was elaborated, in the course of centuries, to a high state of perfection; it absorbed the remains of the antient local jurisdictions, and stunted all attempts at the establishment of new. But as the artificial systems and feudal associations, for which we are indebted to the Normans, gradually wear away, the public mind is prepared to revert to the simpler and more popular institutions which existed ages ago among our forefathers, and which seem to be peculiarly adapted to the character of the Germanic nations.

There is a great distinction between courts of record and courts not of record: courts of record are the king's courts, and have power to fine and imprison, which is not the case with courts not of record. From the judgment of a court of record there lies an appeal to the superior courts by writ of error; in courts not of record this is effected by a writ of false judgment. The county court, court baron, and hundred court, are courts not of record. The other courts of common law which we have mentioned are courts of record.

The great mass of the litigation of the kingdom is carried on by means of the superior courts of Westminster. In each of these courts there is a chief justice, and several puisne judges. In the Exchequer these are styled the chief baron and barons, no doubt bearing in their title traces of the time when their office was filled by the lords of parliament. Another remnant of the original constitution of the courts appears in the appellation of 'my lord,' which is always given to the judges in their official character.

The number of puisne judges has varied at different times. During the reigns of the Stuarts there were frequently four, but after the revolution the number seems to have been constantly three, in each court, constituting, together with the two chief justices and the chief baron, the twelve judges of England. By an act of parliament of the year 1830, a fourth puisne judge was added to each court, making the total number of the superior judges of common law fifteen instead of twelve. But the five judges never sit all together, the full court consisting as formerly of four only.

During the terms, which are four periods in the year of about three weeks each, the three courts sit at Westminster for the determination of all questions of law; and twice a year fourteen of the judges make their circuits through England and Wales, to try, with the assistance of juries, all disputed questions of fact that arise in the country. Actions brought in Middlesex or London are tried in the same manner at the sittings which are held on certain days in and immediately after every term.

From each of the three courts there lies an appeal by writ of error to the Court of Exchequer Chamber. This is not a permanent court, consisting always of the same members; but from whichever of the three courts the appeal is made, it is brought before the judges of the other two. From the constitution of this tribunal, it is evident that where any considerable difference of opinion exists among the fifteen judges, it is incapable of effecting one of the chief purposes of a court of appeal—that of producing uniformity of decision: and, accordingly, a further appeal lies by writ of error to the House of Lords.

For the history of the courts, see Reeve's *History of the English Law;* Maddox's *History of the Exchequer;* Palgrave's *Progress of the English Commonwealth;* Allen's *Inquiry into the Prerogative.*

COUSERANS, or COUZERANS, or as it was written in the last century, CONSERANS, a district of the former province of Gascogne in France, is bounded on the east by the county of Foix, on the north and west by the district of Comminges, and on the south by the Pyrenees, which separate it from the province of Catalonia in Spain. Couserans is a mountainous district: it is watered by the Aubouigane, the Lez, the Orle, the Bordes, the Riverol, the Balameig, the Eschint or Eshint, the Aleth, the Ercé, the Courtignon, the Arac, and the Bau, all of which fall ultimately into the Salat, which carries off the whole drainage of the district into the Garonne. Couserans is now included in the department of Arriège. [ARRIÈGE.]

This district derives its name from its antient inhabitants the *Consoranni*, or *Consuarani*. Both these names are found in Pliny, who appears to be the first Roman writer that has mentioned them: they are not noticed by Cæsar. From the difference of the names some writers have supposed the existence of two people, but M. D'Anville, with apparently good reason, rejects this supposition. It is difficult to say whether, under the Roman division of Gaul, they were comprehended in the province of Novempopulana, or that of Narbonensis Prima: perhaps they were divided between them. Their chief town, Austria, or Consoranni, has assumed, from one of its bishops, its modern designation of St. Lizier. Upon the downfal of the Roman empire, Couserans came successively into the hands of the Visigoths and the Francs. In the feudal times it ranked first as a county, afterwards as a vice-county. It does not appear to have been included in the cession of Gascogne to the English by the treaty of Bretigny. The bishopric in which this district was comprehended originated probably about the end of the fifth century: the bishop was a suffragan of the archbishop of Auch. St. Lizier, from whom the episcopal town took its name, was elected bishop about A.D. 698, and died A.D. 742. The diocese is now merged in that of Pamiers, the bishop of which is a suffragan of the archbishop of Toulouse and Narbonne.

The town of St. Lizier has a population of about 1100, according to the last edition of Malte Brun. The bishop's palace has been converted into a *dépôt de mendicité*, or poor-house. There are in the neighbourhood of the town mines of copper and lead, and beds of grey, white, and black marble. The other towns are St. Girons (population 3634 for the town, 4381 for the commune), Castillon, at the junction of the Lez and Aubouigane; and Rimont, near the Bau: with the bourgs of Seix (pop. 1564 for the town, 3822 for the whole commune) and Massat (pop. 1635 for the town, and 9322 for the whole commune). (Malte Brun; D'Anville; Prudhome, *Dictionnaire Universel de la France.*)

COUTANCES, a city in the department of Manche in France, on the banks of the little river Soulle, 188 miles from Paris by Evreux, Caen, Bayeux, and St. Lo: in 49° 4′ N. lat., and 1° 28′ W. long. This city owes its name, and probably its origin, to the Romans. according to the tradition of the country, it was built by the Emperor Constantius Chlorus (father of Constantine the Great), who called it after his own name Constantia, or, according to Ammianus Marcellinus, Castra Constantia, from whence by corruption is derived the modern name Coutances. Before the division of France into departments, this place was the capital of the district of Cotentin [Cotentin], to which it gave name. There are no Roman antiquities at Coutances, except an aqueduct, said to be of Roman original, but which has been repaired since their time. The cathedral (Notre Dame) is one of the finest Gothic buildings in France; the church of St. Pierre is also worthy of notice. The population of the town in 1832 was 8957. The inhabitants carry on considerable trade in agricultural produce (especially horses); and manufacture bed-ticking, tape, and parchment.

The bishopric of Coutances originated in the fourth century. It comprehends the department of Manche. The bishop is a suffragan of the archbishop of Rouen.

Coutances is the capital of an arrondissement, having a population (in 1832) of 136,847. It has a *tribunal de commerce*.

COUTHON. [Committee of Public Safety.]

COUTRAS, a small town in the department of Gironde, at the confluence of the Dronne and the Isle. Here the Huguenots, under Henri of Navarre, afterwards Henri IV. of France, defeated the army of the French King Henri III., under the duke of Joyeuse, who fell in the action, 20th October, 1587.

COUVIN. [Namur.]

COVE, is a small inlet on a rocky coast. When the indentation is wide and deep enough to admit vessels of fifty tons burden and upwards, it is called a harbour; but when it is too narrow for that purpose, and can only be entered by small craft, it is called a cove.

COVENANT is a written agreement, by deed under seal, between two or more persons, whereby some act is agreed to be done; or, upon the happening of some event, some charge or liability is agreed to be borne by some party thereto. The person entering into the agreement, and subjecting himself to the penalty of its breach, is called the covenantor, and the person with whom it is made, the covenantee. The portion of the agreement which expresses the character of the liability of the covenantor is called the lien.

Covenants take many varieties of forms, and are variously stated. They usually arise from the express words of the parties, but any words denoting the intention are sufficient; as, 'I agree,' 'I am content.' They are sometimes inferred, by law, from the relation of the parties or from the nature of their contract. Thus a demise for a term of years, will sustain, upon an implied covenant, an action for quiet enjoyment.

The lien of covenants usually contains introductory words, declaring the extent of the covenant. If there are several covenantors, it usually declares the covenant to be several, or joint, or joint and several. In case the covenant is several, each of the covenantors covenants for himself alone, and may be sued alone; if joint, each of the covenantors covenants for himself as well as for each other, and all must be sued together; if joint and several, each party covenants for himself, and as a surety for those with him, and an action, in this case, may be brought against one of the covenantors only, or, against all. The courts however, even in these cases, regard the interests of the parties; and if the interest, or cause of action, is joint, the action must be brought against all the covenantors, though the terms of their covenant may be joint and several; and if the interest, or cause of action, is several, though the covenant is joint, the parties must be severally sued. The reason is, that difficulty would arise if judgment in distinct actions should be asked for one and the same cause against several persons, or against persons whom there is no cause of action to affect. The mere terms of a covenant are not therefore a sufficient guide to determine the propriety of joining parties in an action upon it.

Covenants are divided into real and personal, though, as now used, they are as to remedy, chiefly personal.

The former affect realty, and may bind the real estate of the covenantor in the hands of the heir and of his assigns. Personal covenants bind only the covenantor, or his executors and administrators, that is, his personal estate in their hands. The objects of real covenants are generally to afford some specific advantage or protection to those into whose hands the realty to which they relate shall pass; or, to secure the performance of some specific duty by those who may possess the realty to which they relate.

In the construction of all covenants the intention of the parties is regarded. The general rules usually laid down for this purpose depend upon the presumed intention of the parties; and for this reason, a statute declaring the effect of certain covenants, and enabling them to be stated in a few words, has long been desired, in order to shorten the length of conveyance and to avoid litigation. By such a measure the express intention of the parties would always appear in deeds, by their adoption of the abbreviated language of the law, or by their restraining its general effect. Indeed, in the statutes relating to the registry of deeds in Yorkshire, it is declared that the words 'grant, bargain, and sell' are to operate as covenants for title, for farther assurance, and for quiet enjoyment.

The intention of the parties, however, is not always sufficient, in the case of real covenants, to secure their object. It is frequently desirable, when the possession of land is parted with, that the purchaser and his assignees should always be able to resort to the vendor or to his heirs for protection, or that the purchaser and his assignees should perform certain duties, and that the covenants for these purposes should always be connected with the party enjoying the land, or, in other words, that such covenants shall 'run with the land.' In order that this shall occur, the mere intention of the parties, however definitely expressed, is insufficient; there must also be privity of estate. When land mortgaged in fee was demised by the mortgagor, a covenant entered into with him was merely personal; for though in equity the owner of the estate, at law the mortgagor is a mere stranger to it: there was no privity of estate between the lessor and lessee. (*Webb* v. *Russell*, 3 Term Rep., 402, 678; 1 Hen. Blackstone, 562.) The assignee also must come in of the same estate as his assignor, or the covenant will also be merely personal. Thus, a covenant to pay a fee farm rent, in a deed enabling the purchaser to appoint his estate to uses, became a mere personal covenant by the exercise of the power to appoint, for the appointment did not convey the same estate that the purchaser had acquired. (*Roach* v. *Wadham*, 6 East. 289.) [Uses.] The Real Property Commissioners have stated three rules respecting covenants running with the land.

1. A covenant to run with the land so as to bind the assignee, or to give to him the benefit of it without his being named, must relate directly to the land, or to a thing parcel of the demise: such is a covenant to pay rent, to keep buildings in repair, or to observe particular modes of cultivation. 2. When it respects a thing not in existence, but which, when it comes into existence, will be annexed to the land, the covenant will bind the assigns by naming them, but will not bind them unless named: such is a covenant to erect buildings, or to plant trees. 3. When it respects a thing not annexed, nor to be annexed, to the land, or a thing merely collateral, or in its nature merely personal, the covenant will not run, that is, it will not bind the assignee, nor pass to him, even though named: such as a covenant to haul coals to the lessor's house, to grind corn at his mill, or to buy or sell stock in a certain manner. These rules, however, though originally laid down with reference to leases, have been treated as applying to cases not involving the relation of landlord and tenant. They involve many subtle distinctions, and it has been proposed that all covenants, of whatever nature or for whatever purpose, should, unless a contrary intention is expressed, or may be inferred from the instrument, bind the assignee of terms.

The Law Commissioners also divide covenants where the relation of landlord and tenant, or lessee and reversioner, does not exist, into three classes. 1. Covenants made *with* the owner of the land to which they relate; as covenants for title, to indemnify from existing charges, for farther assurance, &c., which supply the old remedy of warranty, with the difference, that pecuniary damages, instead of the recompense of land, are obtained under them. 2. Covenants made by the owner of the land to which they relate; as to build on certain land, to keep up a road, to keep a space of ground open. 3. Covenants relating to the production of writings and title-deeds; as in cases where an estate is divided into fractions and sold to different persons, one of the purchasers, usually the purchaser of the most valuable share, holding the deeds and writings. It has been contended that a covenant by the owner of land respecting the land should always run with the land; but this doctrine has not been established, and if sanctioned, might give an injurious control over property for an indefinite period.

At common law, none but parties or privies, by contract or estate, could take advantage of covenants, or be bound by them. Upon the dissolution of monasteries, great evils were found to follow from this state of the law, the lands then seized by the crown, and afterwards transferred to patentees or grantees of the crown, being leased under covenants, which ceased to be binding by the absence of any privity between the lessees of the church lands and the new owners of such lands. To correct these evils the 32 Hen. VIII. c. 34, was passed, which gave to the grantees of reversions generally, and to the grantees and patentees of the crown the same advantages and remedies as were possessed by the original lessors or grantors of the land. The statute placed the parties to whom it applied in the position of those who were privy to the original contract. To covenants, however, merely collateral, the statute does not apply; that is, if the covenant is beneficial to the lessor, without regard to his continuing the owner of the estate, it is a collateral covenant, upon which the assignee of the reversion cannot sue. The assignee of the reversion, however, is entitled to the benefit of all covenants entered into by a lessee with the lessor, his heirs and assigns, provided such assignee be the owner of the reversion immediately expectant on the term, and provided the estate he has be the same estate which, or a portion of which, the lessor had at the time of granting the lease. If there be a title paramount by escheat or otherwise, the covenant is at an end, if such title defeats the lessor's estate.

It was a common practice, in order to secure the performance of a covenant, to take a bond as an additional security. It enabled the obligee to elect between an action of debt for the penalty of the bond, or to proceed upon the covenant. The reason of the practice was, that at common law a devisee of the real estate of the covenantor was not liable to an action for a breach of covenant, though by the statute of fraudulent devises (3 W. and M. c. 14), he was liable to an action for breach of the condition of the bond. This is now remedied by the 1 W. IV. c. 47, which extends the provisions of the 3 W. and M. to the case of a covenant.

By the 3 and 4 W. IV. c. 42, actions on covenants must be brought within twenty years after the cause of action has arisen.

Covenants may be discharged by a release, by their performance, by the destruction of the seal, or by the destruction of the interest upon which the covenant depends. They may be void at the time of their creation upon account of the personal incapacity of one of the parties to contract, as being an idiot or a lunatic, or upon account of their object being illegal, as relating to bribery, gaming, illegal insurances, lotteries, sales of offices, simony, smuggling, stock-jobbing, usury, or to wagers. They will also be void if opposed to public policy, as not to trade generally, though a covenant not to trade in a particular place, or with a particular person, would be valid.

COVENANT and COVENANTERS. [CAMERONIANS.]

COVENTRY, a city locally situated in the hundred of Knightlow, in the county of Warwick, of which however it forms no constituent portion; having been made, with several adjacent villages, a separate county, by an act of Henry VI. in 1451, and entitled the County of the City of Coventry. The city, exclusive of the suburbs, is about three quarters of a mile in length, and stands on a small elevation which slopes gradually towards the east and west. The situation is nearly in the centre of the kingdom, on a level tract, which, near Coventry, is about 300 feet above the sea level; 91 miles N.N.W. from London, and 10 N.N.E. from Warwick. It is a place of great antiquity, but its origin appears to be only obscurely known. By some writers it is asserted and by others denied that the name is derived (as Covent Garden from Convent Garden) from a spacious convent which was founded, says Leland, by king Canute, and was destroyed by the traitor Edric in 1016. However this may be, it is certain that in the reign of Edward the Confessor, in 1044, earl Leofric, a powerful lord of the large territory of Mercia, with his wife, the lady Godiva, founded at Coventry a magnificent Benedictine monastery, and appropriated to it half the town and twenty four lordships, besides enriching it with a profusion of rich presents. The capacious cellar of the monks still exists, measuring 75 yards in length by 5 in breadth. From the date of this religious establishment the prosperity of the place appears to have taken its rise. After the Conquest the lordship of Coventry came to the earls of Chester. Leland, writing in the reign of Henry VIII., says that the city was begun to be walled in in the time of Edward II., and that it had six gates, many fair towers, and streets well built with timber. Other writers speak of thirty-two towers and twelve gates. The walls were demolished by Charles II. in consequence of the active part taken by the citizens in favour of the parliamentary army. During the monastic ages Coventry had a large and beautiful cathedral, similar to that at Lichfield. At the Reformation it was levelled to the ground by order of Henry VIII., and only a fragment or two now remain. There are three antient churches, of which St. Michael's is by far the most remarkable for architectural beauty and ornament. It was originally built in 1133, in the reign of Henry I., and was given to the monks of Coventry by Ranulph earl of Chester, in the reign of Stephen. Sir Christopher Wren is said to have considered this church a masterpiece of the lighter Gothic style. The spire rises finely tapering out of an octagonal prism upon the tower, and its summit is 303 feet from the ground. The interior is lofty and finely ornamented with rows of clustered pillars and arches, with a roof of curiously carved oak and numerous windows of antient coloured glass. (*Description of St. Michael's Church*, by William Reader, Coventry.) Trinity church is a Gothic edifice, but heavier and less elegant than St. Michael's. The height of its spire is 237 feet. St. John's is a plain cruciform structure, founded in the reign of Edward III. A handsome new church has been built under the parliamentary commission. One of the richest and most interesting vestiges of the ornamental architecture of the fifteenth century in Coventry, and perhaps in England, is a capacious building called St. Mary's Hall, erected in the reign of Henry VI. The principal room is 63 feet by 30, and 34 feet in height. Its grotesquely carved roof of oak, the gallery for minstrels, the armoury, the chair of state, and especially the great painted window facing the street, are admirably suited to furnish a vivid idea of the manners of the age in which Coventry was the favourite resort of princes. A tapestry made in 1450, measuring 30 feet by 10, and containing 80 figures, is a curious and beautiful specimen of the drawing, dyeing, and embroidery of that period. This hall is the property of the corporation, and is used as a council chamber, and for civic festivities. (*Guide to St Mary's Hall*, by William Reader, Coventry.) In the market-place a richly ornamented Gothic cross, considered one of the finest in the country, was erected in the sixteenth century, and taken down in 1771 to gratify the bad taste of the inhabitants. It was hexagonal, 57 feet high, with eighteen niches of saints and kings. (Gough's *Brit. Topog.*, vol. ii., p. 303.) The hospital in Gray Friars' Lane is very antient, and richly ornamented with carved oak. The building called the Mayor's Parlour is of the sixteenth century: it is used for judicial purposes.

Coventry has been the seat of two parliaments; one held by Henry IV. in 1404, called *Parliamentum Indoctum*, from being composed of laymen inimical to the interests of the clergy, or, as some writers say, from the fact of lawyers being excluded. The other by Henry VI. in 1459, called *Parliamentum Diabolicum*, from the numerous attainders it issued against the Duke of York and his adherents.

Froissart and Holinshed give a graphic account of the combat at Coventry of the Duke of Norfolk and the Duke of Hereford, afterwards Henry IV. See also Shakspeare's *Richard II.*

Coventry has been always renowned for its exhibition of pageants and processions; and in the monastic ages it was remarkable for the magnificent and costly performance of the religious dramas called Mysteries. Accounts are extant of these solemn shows as early as 1416. They were performed on moveable street-stages chiefly by the Gray Friars, on the day of Corpus Christi. The subjects were the Nativity, Crucifixion, Doomsday, &c., and the splendour of the exhibitions was such that the king and the royal family, with the highest dignitaries of the church, were usually present as spectators. (See *A Dissertation on the*

Pageants or Dramatic Mysteries antiently performed at Coventry, and other Municipal Entertainments, by Thomas Sharp, 4to., 1825.) The plates in this work are extremely interesting, and the facts are valuable as indicating the great progress of society since the time when kings and prelates witnessed with gratification and applause what would now shock the feelings and be condemned by the judgment of the humblest member of society. The following items from a bill of expenses inserted in the work just mentioned, will give an idea of these dramatis personæ:—'Payd for 2 pound of hayre for the divill's head, 3*s.*; mending his hose, 8*d.* Black canvas for shirts for the damned, 4*s.* Red buckram for wings of angels (represented by naked children), 7*s.* Paid for a cote for God, and a payre of gloves, 3*s.*' The following work also contains much curious information: 'The Pageant of the Company of Sheremen and Taylors in Coventry, as performed by them on the festival of Corpus Christi, with other Pageants at Coventry, on the visit of Henry VI. and his Queen in 1455; of Prince Edward in 1474; of Prince Arthur in 1498, &c.; with the Verses recited in character on those occasions.' By W. Reader, Coventry. Other writers give descriptions of the costly pageants exhibited to Henry IV., Henry VII., and several other kings. Coventry was the favourite residence of Edward the Black Prince. Here also Queen Elizabeth delighted to see 'The game of Hock Tuesday,' which represented the massacre of the Danes by the English in 1002, and it was for her especial amusement that, in addition to a ring for baiting bulls, another was put down for badger-baiting, her favourite sport. The peculiar predilection of the people of Coventry for gorgeous pageantry is still displayed in the celebrated processional show at the great fair on the Friday in Trinity week, when many thousands assemble to see the representative of lady Godiva. The legendary origin of this singular exhibition is as follows: Earl Leofric had subjected the citizens of Coventry to a very oppressive taxation, and remaining inflexible against the entreaties of his lady for the people's relief, he declared that her request should be granted only on the condition that she should ride perfectly naked through the streets of the city; a thing which he supposed to be quite impossible. But the lady's modesty being overpowered by her generosity, and the inhabitants having been enjoined to close all their shutters, she partially veiled herself with her flowing hair, made the circuit of the city on her palfrey, and thus obtained for it the exoneration and freedom which it henceforth enjoyed. The story is embellished with the incident of Peeping Tom, a prying inquisitive tailor, who was struck blind for popping out his head as the lady passed. His effigy is still to be seen protruded from an upper window in High Street, adjoining the King's Head tavern. In Gough's edition of Camden's 'Britannia,' (vol. ii. p. 346) it is stated that Mathew of Westminster, who wrote in 1307, that is, 250 years after the time of Leofric, is the first who mentions this legend, and that many preceding writers who speak of Leofric and Godiva do not notice it. In Rudder's 'Gloucestershire,' p. 307, a similar legend is said to be related of Briavel's Castle. The Coventry procession, as at present exhibited, began only in the reign of Charles II., in 1677: it consists principally of Saint George of England on his charger, lady Godiva, a female who rides in a dress of flesh-coloured muslin, with flowing hair, on a beautiful gray horse; then follow the mayor and corporation, the whole of the city companies, the wool-combers, knights in armour, Jason, bishop Blaize, &c. &c., all in splendid dresses, with a great profusion of brilliant ribands, plumes of feathers, and numerous bands of music. (*The History and Description of Coventry Show Fair, with the History of Leofric and Godiva.* By W. Reader.)

The county from N.E. to S.W. measures about eight miles, and from E. to W. about seven miles, containing an area of 18,161 acres. The soil is fertile, and chiefly laid out in pasturage. It is of a red colour, and rests on the red sand-stone of the district. The county, besides the city and suburbs, consists of the parishes of Foleshill, Exhall, Anstey, Stoke, Stivichall, with part of Stow and Shelton. These parishes include a total of nineteen villages and hamlets, some of which are very populous, but they have no share in the civil and political privileges of the city. The city, under the Municipal Corporation Act, is divided into six wards, governed by a mayor, twelve aldermen, and thirty-six councillors.

The assizes are regularly held in the city, and quarter-sessions are held, of which the recorder is sole judge, besides which there are various other courts.

Besides the patronage of many important appointments, the corporation had formerly the distribution of charitable funds amounting to 7300*l.* per annum. The following are the principal institutions of this kind, which in Coventry are very numerous. Sir Thomas White's charity, founded in the reign of Henry VIII., produces annually between 2000*l.* and 3000*l.* The Bablake Men's Hospital, of which an income of about 1500*l.* is devoted to the maintenance of poor and aged men, was founded by the will of Thomas Bond, in 1506. The Bablake Boys' Hospital has an income of about 940*l.*, appropriated to the maintenance and education of young and poor boys. Besides these, there are twelve other considerable charities, and several minor ones. A full account of these charities is given in the 'Reports on Charities.'

The free school is a richly endowed institution founded by John Hales in the reign of Henry VIII. Here Sir William Dugdale and several other eminent men were educated. The income is about 900*l.* per annum; and the school has two fellowships at St. John's Coll., Oxford, one at Catherine Hall, Cambridge, and six exhibitions at either university. It appears from the Charity Commissioners' Reports, that the school was grossly mismanaged at the time of the inquiry; the fine school-room was locked up, and the books of its library, which had not been used to light the fire with, were missing or torn and covered with mould. Since that time a new head-master has been appointed, and at present the school is again attended by a number of pupils. There is a large Lancasterian school, Sunday schools, and several good private academies; with places of worship for Catholics, Presbyterians, Unitarians, Independents, Baptists, Methodists, and Quakers. The general appearance of the town is gloomy and crowded; many of the streets being narrow, and darkened by the projection of the upper stories of houses built in the fifteenth and sixteenth centuries. The city retains its antient limits; any enlargement of which is prevented by the surrounding commons, called the Lammas Lands, on which the freemen have the right of pasturing their horses and cows. The streets are lighted and watched at night, but are not generally paved, or supplied with public sewers. In addition to the buildings already noticed, may be named the County Hall, a stone edifice erected in 1785, and the Draper's Hall, which is ornamented with Tuscan pilasters, and is elegantly fitted up for assemblies and other public entertainments. The gaol has recently been rebuilt by the corporation at an expense of above 16,000*l.*

In the time of the Edwards and Henries the tradesmen of Coventry were famed for their affluence. In 1448 they equipped 600 armed men for the public service. Until the war between England and France in 1694, the staple manufacture was woollens, broad-cloths, and caps; and previous to 1580 there existed a famous manufacture of blue thread, the water of the small river Sherbourn, which passes through the city, being an excellent menstruum for dyeing this colour. During the eighteenth century there was a flourishing manufacture of tammies, camlets, shalloons, calimancoes, gauzes, &c., but it is no longer continued. At present the staple manufactures are ribbons and watches. The former was introduced about 1730, and in 1830 the number of individuals to whom it afforded employment in the city and adjacent villages is said to have been about 16,000, the number of looms being nearly 3000. Of late years this manufacture has not been so prosperous, for which one of the reasons assigned is the fact of a great portion of the proprietary manufacturers residing in London. (See *Report on Manufactures.*) The manufacture of watches was introduced about 1800, and has become so extensive that the annual number manufactured is equal to that of London. The local position of Coventry is favourable for commercial operations, being nearly central between the four greatest ports of England—London, Bristol, Liverpool, and Hull; possessing great facilities of water communication by the Coventry and Oxford canal, which opens into the Grand Trunk navigation, and having one of the main roads from London to Birmingham passing through its streets.

There are several guilds, or incorporated trading companies, some of which are possessed of considerable property, which they spend in charity and festivities. The city of Coventry sends two members to parliament. The elective franchise was first granted in the reign of Edward I. The number of electors since the Reform Act, is 5000. The population of this city in 1377 was 7000, at which time there were only 18 towns in the kingdom having 3000 inhabitants. In 1831 the population was 27,070, of whom 204 families were employed in agriculture, and 4913 in trade and manufactures. There is a weekly market on Friday, and fairs on the second Friday after Ash Wednesday, May 2nd, Friday in Trinity week, August 26th and 27th, and November 1st, for the manufactures of the city, and for cattle.

(*Antiquities of Warwickshire*, by Dugdale; *History and Antiquities of Coventry*, 12mo., 1810; *New Coventry Guide*, by W. Reader.)

COVERDALE, MILES, bishop of Exeter, a native of Yorkshire, was born in 1487. He was educated in the house of the Augustine friars in Cambridge, of which Dr. Barnes, afterwards one of the Protestant martyrs, was then prior. Whether he took a degree at the University of Cambridge in early life seems uncertain; but Godwin says he afterwards received the degree of D.D. from the University of Tübingen, and was, though later in life, admitted *ad eundem* at Cambridge. Being in his early years attached to the religion in which he was brought up, he became an Augustine monk. In 1514 he entered into holy orders, and was ordained at Norwich; but he afterwards changed his religious opinions. Bale says he was one of the first who, together with Dr. Robert Barnes, his *quondam* prior, taught the purity of the gospel, and dedicated himself wholly to the service of the Reformation. About this time, probably 1530 or 1531, the reformed religion began to show itself at Cambridge, where various eminent men, and Miles Coverdale amongst them, began to assemble for conference on those points which had been discussed by the reformers abroad. In 1532 he appears to have been abroad, and assisted Tyndale in his translation of the Bible; and in 1535 his own translation of the Bible appeared, with a dedication to King Henry VIII. It formed a folio volume, printed, as Humphrey Wanley (Lord Oxford's librarian) thought, from the appearance of the types, at Zürich, by Christopher Froschover. He thus had the honour of editing the first English Bible allowed by royal authority, and the first translation of the whole Bible printed in our language. The Psalms in it are those now used in the Book of Common Prayer. About the end of the year 1538 Coverdale went abroad again on the business of a new edition of the Bible. Grafton, the English printer, had permission from Francis I., at the request of King Henry VIII. himself, to print a Bible at Paris, on account of the superior skill of the workmen, and the goodness and cheapness of the paper. But, notwithstanding the royal license, the Inquisition interposed by an instrument dated December 17, 1538. The French printers, their English employers, and Coverdale, who was the corrector of the press, were summoned before the inquisitors, and the impression, consisting of 2500 copies, was seized and condemned to the flames. The avarice of the officer who superintended the burning of the copies, however, induced him to sell several chests of them to a haberdasher, for the purpose of wrapping his wares, by which means a few copies were preserved. The English proprietors, who had fled at the alarm, returned to Paris when it subsided; and not only recovered some of the copies which had escaped the fire, but brought with them to London the presses, types, and printers. This importation enabled Grafton and Whitchurch to print, in 1539, what is called Cranmer's, or 'The Great Bible,' in which Coverdale compared the translation with the Hebrew, corrected it in many places, and was the chief overseer of the work. Coverdale was almoner, some time afterward, to Queen Catherine Parr, the last wife of Henry VIII., at whose funeral he officiated in the Chapel of Sudeley Castle in Gloucestershire in 1548. On August 14th, 1551, he succeeded Dr. John Harman, otherwise Voysey, in the see of Exeter. On his appointment to this bishopric, Coverdale was so poor as to be unable to pay the first fruits, which therefore the king, at the solicitation of Archbishop Cranmer, excused. On the accession of Queen Mary, and the consequent re-establishment of Catholicism, he was ejected from his see, and thrown into prison, out of which he was released after two years' imprisonment, at the earnest request of the king of Denmark, whose chaplain, Dr. John Machabeus, had married the sister of Coverdale's wife. On his release, which was on the condition of banishing himself, Coverdale repaired to the court of Denmark; he went afterwards to Wesel, thence to Bergzabern, and finally to Geneva, where he joined several other English exiles in producing that version of the English Bible which is usually called 'The Geneva Translation;' part of which, the New Testament, was printed at Geneva in 1557, by Conrad Badius, and again in 1560, in which last year the whole Bible was printed in the same place by Rowland Harte. On the accession of Queen Elizabeth, Coverdale returned from exile; but having imbibed the principles of the Geneva reformers, as far as respected the ecclesiastical habits and ceremonies, he was not allowed to resume his bishopric, nor was any preferment offered to him for a considerable time. In 1563 Bishop Grindal recommended him to the bishopric of Llandaff; but it is supposed that Coverdale's age and infirmities, and the remains of the plague, from which he had just recovered, made him decline so great a charge. In lieu of it, however, the bishop collated him to the rectory of St. Magnus London Bridge. He resigned this living in 1566. The date of his death has been variously stated. The parish register of St. Bartholomew, behind the Royal Exchange, however, proves that he was buried February 19th, 1568, in the chancel of which church a Latin epitaph remained for him, till it was destroyed along with the church in the great fire of 1666. Coverdale was the author of several tracts calculated to promote the doctrines of the Reformation, and of several translations from the writings of the foreign reformers: a list of no fewer than seventeen of these will be found at the end of Coverdale's life in Chalmers's *Biographical Dictionary*, which is our authority for the greater part of the facts here mentioned. (See also Strype's *Lives of Cranmer*, *Parker*, and *Grindal;* his *Memorials* and *Annals;* and Tanner's *Bibliotheca Britannico-Hibernica*.)

The third centenary of the publication of Coverdale's Bible was celebrated by the clergy throughout the churches of England, October 4th, 1835· and several medals were struck upon the occasion.

COVERED-WAY, a road surrounding a fortified post along the side of the ditch which is opposite to the ramparts. It is usually about 30 feet broad, on the level of the natural ground, and is protected by the mass of earth called the glacis. Its situation is indicated by the unshaded space above the line R R in the article BASTION (*fig.* 1). As the works of a fortress form a series of angles which are alternately re-entering and salient, the covered-way necessarily changes its direction at each angle; and the spaces which are there formed by its branches (as at L and above the curve line at E in the article and figure above cited) are respectively designated 're-entering and salient places of arms.'

Under the name of *orlo* the covered-way is met with in the writings of the first Italian engineers, and it is said to have been invented by Tartaglia in the 16th century.

In the defence of a fortress this work is of great importance. A constant fire may be kept up from thence while the trenches of the besiegers are being slowly executed on the surface of the glacis; and in the systems of Vauban and Cormontaingne it is purposely made so narrow as to render the construction of a breaching battery upon it impossible, except by the tedious operation of removing a large part of the glacis.

Without the covered-way, troops making a sortie would, after having crossed the ditch, be scarcely capable of deploying under the fire of the enemy; and, in retreating, if pursued, they might be cut in pieces on the counterscarp before they could descend into the ditch, or gain, by the bridges, the posterns of the fortress; whereas by the sally-ports, or by steps temporarily formed along the interior side of the glacis, the departure from, or the return to, the covered-way is readily accomplished by a large body of troops.

An attack on the covered-way is, moreover, a difficult enterprise, and is usually attended with great loss to the besiegers: the thickness of the glacis renders it impossible to facilitate the assault by forming a breach in it; a grazing fire of musketry from the covered-way disorders the assailants during their approach; and, when arrived at the crest of the glacis, one, and sometimes two rows of palisades form a serious impediment to a descent into the work. Even if an entrance should be gained, the assailants are confined between the traverses and annoyed by the fire of the defenders who have retired behind them, or by a plunging fire from the parapets of the fortress. It is easy to conceive, therefore, that such an attack will scarcely be made unless those fires have been previously in part silenced, and the palisades in the covered-way deranged by a fire of guns or howitzers from the enfilading batteries.

COVERTURE. [WIFE.]

COW, one of the most useful of the domestic animals. Her milk is peculiarly adapted to nourish infants and invalids, and requires no preparation to make it palatable or wholesome. In the article CATTLE we have given an enumeration of the various breeds of cows; and under BUTTER and CHEESE an account of their principal produce. We shall here confine ourselves to the proper management of a cow, so as to make her most productive; and to the most common diseases to which this animal is subject.

Where only one or two cows are kept, especially where they are to be maintained on a limited portion of pasture, it is of great importance that a good choice be made when they are purchased or reared. Some breeds no doubt are much superior to others; but as a general rule, there is a better chance of having a profitable cow, if she be reared on the land on which she is to be kept. When the common breed of the country is decidedly inferior, it may be profitable to bring a cow from a distance, in which case it should be from some district of which the pasture is rather inferior to that to which she is brought, or at least not better. The best breeds are found in the richest pastures, but they do not thrive on worse. On poor land a small active cow will pick her food and keep in condition, where a fine large cow would starve, or at least fall off rapidly. This is particularly the case in the mountains, near the tops of which no domestic animal will live but the goat, and next to it the smallest breed of cows. Where the pastures are poor but extensive, cows give little milk, and the number which can be kept must make up for the produce of each. Where, on the other hand, cows are stalled, as in Flanders, and fed on artificial food brought to them in sufficient quantity, large bulky cows give the best return for the food; at least this seems to be the opinion of the Flemish farmers in general. In France, where the cows are led along the roads to pick up the herbage growing by the road-side, or are tethered on a small portion of clover or lucern, a small lean cow is preferred; and in general the cows commonly met with, and which are bred in each district, seem the best adapted for the mode in which they are fed. Whatever be the breed or quality of a cow, she should always have plenty of food, without which no considerable produce in milk can be expected. This food should be succulent as well as nourishing, or else fat will be produced instead of milk. A cow well fed may be safely milked till within a month of her calving. It is better that she should be dry before the new milk begins to spring in her udder. A little attention will readily prevent her becoming dry too soon, or being milked too long. Heifers with their first calf should be allowed to go dry sooner than older cows; because their growth would be impeded by the double drain of the milk and the calf. It is best to let a heifer go to the bull when nature prompts her to it, provided she be not less than fifteen or eighteen months old; for if they are thwarted in their first heat, they are apt to become irregular ever after; and it is advantageous for a cow to calve regularly at the same season of the year. The best time is May, when the grass begins to be succulent. In some countries, such as Switzerland, the cows calve regularly in April or May, and are then sent to the pastures among the mountains. The calf is killed almost immediately, unless it be reared for stock, veal being of little value. In populous countries where veal is considered a luxury, the calves are kept and fattened by letting them suck the cows, or by giving them warm milk to drink. Near large towns this is a profitable mode of employing the milk, when it cannot be sold for immediate consumption. [CALF.]

A cottager with two or three acres of moderate land may keep a cow, and thus add much to his earnings as a labourer. For this purpose he will require a small portion of permanent grass fenced off, to allow the cow to take exercise, which is necessary to her health. Her food must be raised in regular succession, and cut for her. The earliest green food is rye; then tares; then clover, which may be made so to succeed each other as to give an ample supply. Cabbages, beet-root, parsnips, potatoes and turnips, will continue the supply during winter; and the dung and urine of the cow carefully collected, will be sufficient to keep the land in condition. This system, lately introduced into some parts of Ireland, has already greatly improved the condition of the industrious poor. There is very good advice on this management in Cobbett's *Cottage Economy*, a useful little publication.

Where cows are allowed to be in the open air, with proper shelter in case of stormy and wet weather, they are subject to few diseases. They must be carefully looked to at the time of calving, but except in urgent cases nature must be allowed to perform her own office. A little common sense and experience will soon teach the possessor of a cow to assist nature, if absolutely necessary; and in case of difficulties the safest way is to call in an experienced person. Drinks and medicines should be avoided; a little warm water, with some barley or bean meal mixed with it, is the most comfortable drink for a cow after calving. The calf, and not the cow, should have the first milk, which nature has intended to purge its intestines of a glutinous substance which is always found in the new-born calf. A very common disease with cows is a disordered function of the liver, producing a yellowish tint in the eyes, and sometimes in the skin. A gentle purge, consisting of half a pound of Glauber salts, an ounce of ginger, and two ounces of treacle, with two quarts of boiling water poured over them, may be given when it is milk-warm, and repeated every other day · keeping the cow warm, if it be in winter, by a cloth over the loins, and in a shed. This will in general restore her health. Should the cow appear to have a chronic affection, the safest course for a cottager is to part with her at any price to those who may be better skilled in curing diseases; for it is seldom that a cow is worth the expense of the farrier's attendance in such cases. The symptoms of a diseased liver or lungs in a cow are leanness, with a staring coat, a husky cough with loss of appetite, a difficulty of breathing, and a great diminution in the secretion of the milk. The first loss by the sale of the cow is always the least in the end. In accidents, or acute diseases, the attendance of a clever veterinary is indispensable.

Nothing is more prejudicial than the idea that medicines are necessary to keep cows in health; and the practice of keeping advertized medicines at hand to give to an animal whenever it is fancied to be ill, is very detrimental to their health. Attention to food and exercise, giving the first regularly and in moderate quantities at a time, and allowing the cow to use her own judgment as to the latter, are the great secrets of health; and a healthy young cow reared at home, or purchased of a conscientious dealer, will probably live to old age without ever having had any disease. A cow is old and unprofitable when she reaches twelve or fourteen years. She should then be sold and a young one purchased. If the cottager have the means of rearing a cow-calf to succeed the old mother, he will do well; if not, he must lay by a portion of the cow's produce every year to raise the difference between the value of the old cow and a young one. The saving banks are admirable institutions for this purpose: a few shillings laid by when the produce of the cow is greatest, will soon amount to the sum required to exchange an old one for a younger.

COW-TREE, a plant little known, belonging to the natural order Urticaceæ, and apparently to the genus Brosimum, from which, when wounded, a milky nutritious juice is discharged in such abundance as to render it an important object to the poor natives in whose country it grows. It is described by Humboldt as being peculiar to the Cordilleras of the Coast of Caracas, particularly from Barbula to the lake of Maracaybo, near the village of San Mateo, and in the valley of Caucagua, three days' journey east of Caracas. In these places it bears the name of *Palo de vaca* or *arbol de leche*, and forms a fine tree resembling the star apple of the West Indies. 'Its oblong pointed leaves, rough and alternate, are marked by lateral ribs, prominent at the lower surface and parallel; they are, some of them, ten inches long.' Its flowers and fruit have not been seen by any botanist. From incisions in its trunk flows a glutinous milk, similar in consistence to the first milk yielded by a cow after calving. It has an agreeable balsamic smell, is eaten by the Negroes, who fatten upon it, and has been found by Europeans perfectly innoxious. In chemical characters it is remarkably similar to the milk of animals, throwing down a cheesy matter, and undergoing the same phenomena of putrefaction as gelatine.

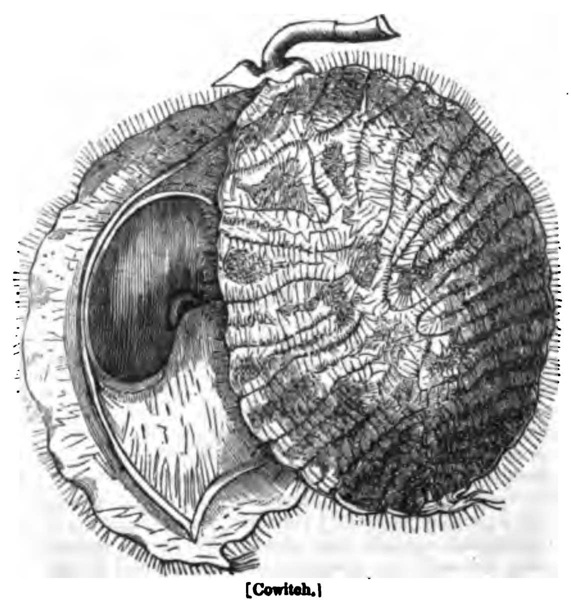
Humboldt supposed the cow-tree to belong to the Sapotaceous order, but, though little has been added to our knowledge of it since his visit to the Caracas, it is at least certain that it is either a species of Brosimum or very nearly related to it, and consequently a member of the Urticaceous order.

The latter circumstance renders the cow-tree still more interesting; for the milky juice of Urticaceous plants is in other cases highly poisonous. But botanists are now acquainted with many instances of innocuous plants in poisonous orders; thus the hya-hya tree of Demerara, for instance, belonging to the deadly Apocynaceous family, yields a thick rich milky fluid destitute of acrimony; and the Kiriaghuna plant of Ceylon is a sort of East Indian cow-plant, notwithstanding it belongs to the Asclepiadaceous order which is acrid and dangerous. In the absence of precise information as to the circumstances under which the cow-trees are milked, it is impossible to say what is the cause of their harmlessness; but every physiologist will see that it is capable of being explained without difficulty in more ways than one.

COWES. [WIGHT, ISLE OF.]

COWITCH, or COWAGE, a word of unknown derivation, unless it be a corruption of Al Kooshee, the Bengâli name of one of the plants that produces it, consists of the hairs found upon the pods of different species of *Mucuna.* They are exceedingly slender, brittle, and easily detached, and the fragments readily stick into the skin and produce an intolerable itching; hence they are frequently employed for mischievous purposes. Cowitch is also used medicinally as a vermifuge, by being mixed with syrup till of the consistence of honey, and given in doses of two or three teaspoonsful.

The plants that bear these pods are large twining annuals or perennials, with leaves like those of kidney beans, dark purple papilionaceous flowers, with a short standard lying close upon the wings and keel, and diadelphous stamens, half of which have round and half arrow-headed anthers. The pods contain from one to six seeds, and are covered by a very wrinkled shrivelled skin, which even stands up in little plates. Before they are ripe and their hairs hardened, the pods are employed as a vegetable, like kidney beans, and are described as being delicious. The species are found in hedges, thickets, on the banks of rivers, and about water-courses in both the East and West Indies, and America within the tropics. Mucuna urens and pruriens usually furnish the substance; but that from M. monosperma, called by the Telingas Enooga doola gunda, or Elephant's Scratch-wort, is said to exceed the others in the irritating burning property of its hairs. Dr. Roxburgh states that M. pruriens was one of the plants formerly used in India to poison wells; 'it has turned out however not to be the poison it was taken for, and it is more than likely that the other plants employed for the same base ends are fortunately much less dangerous than those who employ them imagine.'



[Cowitch.]

pened pod of M. monosperma, the Elephant's scratch-wort—natural size.

COWLEY, ABRAHAM, the son of a grocer resident in Fleet Street, London, was born in 1618, and educated at Westminster School, and Trinity College, Cambridge. He was an early poet, and attributes the direction of his genius to the perusal of Spenser, whose works, he says, 'were wont to lye in his mother's parlour;' and with which he made himself familiar before he was twelve years old. At the age of fifteeen (not thirteen) he published a volume called 'Poetic Blossoms,' containing, among other things, 'The Tragical History of Pyramus and Thisbe,' written when he was ten years old. At college he increased his reputation by the elegance of his exercises: and not to mention minor works, composed the greater part of his 'Davideis,' an unfinished epic, in four books, on the troubles of David. Being attached to the court party, he was ejected in 1643, after he had taken his degree of M.A.; and he then settled in St. John's College, Oxford, where he became known and esteemed by some leading men, and being appointed secretary to lord Jermyn, afterwards earl of St. Alban's, was employed in the honourable and confidential office of cyphering and decyphering the correspondence of the king and queen. He followed the latter to Paris in 1646, and remained abroad ten years. Returning in 1656, as a sort of spy, 'to take occasion of giving notice of the posture of things in this nation,' he was seized, and obliged to give heavy security for his future behaviour. In the same year he published an edition of his poems, with a preface, in which he seems to have inserted something suppressed in subsequent editions, which was interpreted to denote some relaxation of his loyalty. He also obtained, Wood says, through the influence of the men then in power, the degree of M.D. at Oxford in 1657: having professed the study of physic, in order, it is said, to cloak the real motive of his visit to England. He does not appear ever to have practised, and the only fruit of his studies was a Latin poem upon Plants, in six books. Upon Cromwell's death he returned to France, and resumed his office. At the Restoration he expected to obtain the mastership of the Savoy, which had been promised to him both by Charles I. and II. In this, to his great mortification, he was disappointed; but some amends were made him by a beneficial lease of the queen's lands at Chertsey, in Surrey, whither he retired in 1665, and died in July, 1667, in his 49th year. He was buried near Chaucer and Spenser, in Westminster Abbey, where in 1675 the duke of Buckingham erected a monument to his memory.

Cowley is characterized by Dr. Johnson as 'the last and undoubtedly the best' of the metaphysical authors, a curious class, of whom the biographer, in his Life of Cowley, has given a critical account. 'In his own time he was considered of unrivalled excellence. Clarendon represents him as having taken a flight beyond all that went before him; and Milton is said to have declared that the three greatest English poets were Spenser, Shakspeare, and Cowley.' For a long time he was an object of supreme admiration, and his Pindaric Odes were imitated to weariness by those who could emulate his extravagance, but not his learning, wit, and fertility. This fashion has long been at an end: and while the simpler of our older poets have of late years been increasing in popularity, Cowley, we conceive, is scarcely known to a majority even of the poetical readers of this country. His merits are summed by Johnson in the following passage:—'He brought to his poetic labours a mind replete with learning, and his pages are embellished with all the ornaments which books could supply: he was the first who imparted to English numbers the enthusiasm of the greater ode and the gaiety of the less; he was qualified for sprightly sallies and for lofty flights; he was among those who freed translation from servility, and instead of following his author at a distance, walked by his side; and if he left versification yet improvable, he left likewise from time to time such specimens of excellence as enabled succeeding poets to improve it.' His faults are, negligent and sometimes vulgar diction, rugged and prosaic versification, pedantry, hyperbolical exaggeration, and an abundance, unchecked by judgment, of that particular sort of wit which Johnson defines to be the discovery of occult resemblances in things apparently unlike. His poetry proceeds from the head more than the heart, and dazzles oftener than it touches. This applies especially to his amatory poems: 'Considered as the verses of a lover, no man that has ever loved will much recommend them. They are neither courtly nor pathetic, have neither gallantry nor fondness.' And this is not wonderful, when we are told that he never loved but once, and then wanted resolution to tell his passion. His Miscellanies have gained high praise from the same critic, as containing 'great variety of style and sentiment, from burlesque levity to awful grandeur.' The style of his prose is also highly commended.

COWPARSLEY, a wild umbelliferous plant, called *Chærophyllum temulum*.

COWPARSNEP, a wild umbelliferous plant, called *Heracleum Sphondylium*.

COWPER, WILLIAM, was born at Great Berkhamstead in Hertfordshire, of which place his father, the Rev. John Cowper, was rector, on the 15th of November (old style), 1731. He was first placed, when he was but six years old, at a school kept by Dr. Pitman, at Market Street in Hertfordshire. The cruelty of an elder boy rendered the two years which he spent here two years of misery. He was next placed in the house of an oculist, apprehensions being then entertained that he would lose his sight; and under the care of this oculist two more years of his boyhood were passed. At the age of ten he was sent to Westminster School, where he stayed till he was eighteen; applying during these eight years with diligence to his studies, and entering with spirit into boyish sports.

After leaving Westminster, Cowper was articled for three years to a solicitor; in whose office he had for a fellow-clerk the future Lord Thurlow. When the three years for which he was articled, during which however he gained no great stock of legal knowledge, expired, he took up his abode in chambers in the Middle Temple. In 1754 he was called to the bar; and in 1759 he was appointed a commissioner of bankrupts. One reason, and doubtless a principal reason, why the law had been fixed upon as Cowper's profession, was the existence of a certain amount of legal patronage in the hands of some of his relations. It was not certainly from any enthusiasm for the law evinced by Cowper; though it has not been made out that his profession had been determined upon by his friends in the teeth of convincing proof that he was unfit for it. Having however a small patrimony, and looking forward to the exercise in his favour of the family influence which has been mentioned, he cared not for that to which application would lead, any more than he liked the subject to which he was to apply; and accordingly he neglected the study of law. While residing in the Temple, he made love to his cousin, Theodora Cowper, the sister of his correspondent, Lady Hesketh, and dallied with literature. He was a member of a club called the 'Nonsense Club,' consisting entirely of Westminster men, among whom were Bonnell Thornton, Colman, and Lloyd; and he contributed a few papers to the 'Connoisseur,' of which Thornton and Colman were the joint projectors and writers.

His residence in the Temple extended through eleven years. In 1763, the last year of that residence, the offices of clerk of the journals, reading clerk, and clerk of the committees in the House of Lords, all which offices were at the disposal of a cousin of Cowper's, became vacant about the same time. The last two were conferred on Cowper. His patrimony was by this time well nigh spent, and the gift was therefore so far acceptable. But the duties attached to the offices of reading clerk and clerk of the committees were duties which required that he should frequently appear before the House of Lords; and to him, who suffered from extreme nervousness, a public exhibition of any kind was, as he himself expresses it, 'mortal poison.' He therefore, almost immediately after having accepted them, resigned these offices; and took that of clerk of the journals. But here again, his cousin's right of nomination having been questioned, Cowper was unexpectedly required to submit himself to an examination at the bar of the house, before being allowed to take the office. Thus the evil from which he seemed to have escaped again met him. 'A thunderbolt,' he writes in his memoir of himself, 'would have been as welcome to me as this intelligence....To require my attendance at the bar of the House, that I might there publicly entitle myself to the office, was in effect to exclude me from it. In the mean time, the interest of my friend, the honour of his choice, my own reputation, and circumstances, all urged me forward; all pressed me to undertake that which I saw to be impracticable.' Unceasing was the anguish which he now suffered. He even looked forward anxiously to the coming of insanity, a constitutional tendency to which had manifested itself some years before, that he might have a reason for throwing up the office; and when the dreaded day drew near, and he found himself still in possession of his senses, he determined on the commission of suicide. His many attempts to destroy himself all failed of success, owing, as he is pleased to explain it in his memoir, to direct interpositions of Providence. The office was ultimately resigned on the very day appointed for the examination; and shortly afterwards he became insane. He was immediately placed under the care of Dr. Cotton at St. Alban's, with whom he stayed until his recovery, which took place about eighteen months after, in June, 1765.

The form which Cowper's madness assumed was that of religious madness. A belief that he had been irrevocably cut off from a state of grace in this world, and of salvation in the next, was that which preyed upon his mind previous to the coming of the shock, and was predominant while it lasted. In the three subsequent periods of his life during which madness returned to him, from 1773 to 1776, for about six months in 1787, and during the six years preceding his death, its form was the same.

On Cowper's recovery in 1765, he took up his residence in Huntingdon, solely that he might be within reach of a younger brother who was then at Cambridge. Here he became acquainted with the family of Mr. Unwin, the beneficial influence exercised by whom on Cowper's subsequent life is well known. Finding that his spirits were sinking in the solitude in which he lived, and also that his scanty means were not sufficient to maintain a separate establishment, he became a boarder in Mr. Unwin's house. On Mr. Unwin's death in 1767, Cowper and Mrs. Unwin removed to Olney in Buckinghamshire, attracted thither by their esteem for Mr. Newton, who was then curate of the place. Mr. Newton, a man greatly to be respected for moral worth, was of that religious class which is commonly called evangelical; and Cowper now entered upon what is styled by a biographer belonging to the same class of pietists 'a course of decided Christian happiness, substituting frequent evangelical worship for the daily form of prayer with which he had hitherto contented himself, and enjoying the advantages of a more extended religious intercourse.' It is probable that Cowper, with his constitutional nervousness and predisposition to mental derangement, did not derive unmixed good from the excitement of frequent prayer-meetings and an unremitting attention to religious subjects. Mr. Newton had formed a plan of publishing a volume of hymns, and prevailed on Cowper to assist in composing them. They were afterwards published in 1776, under the title of Olney Hymns; but Cowper, before he had proceeded far in their composition, was visited with his second attack of madness, which lasted nearly four years.

In 1776, after Cowper's recovery, Mr. Newton removed from Olney. By Mrs. Unwin's advice he was now induced to commence a poem, taking, upon her suggestion, the Progress of Error for his subject; and he immediately went on to write three more moral satires, intitled 'Truth,' 'Table Talk,' and 'Expostulation.' These, together with the poems intitled 'Error,' 'Hope,' 'Charity,' 'Conversation,' and 'Retirement,' and some smaller pieces, were formed into a volume, which was published in 1782. He published a second volume in 1785, containing the 'Task' and 'Tirocinium,' the former of which poems had been commenced on the suggestion of another female friend, Lady Austen. It is to the same lady that we are indebted for the 'History of John Gilpin.' He had begun in 1784, so soon as the 'Task' and 'Tirocinium' had been written, his translation of Homer, which occupied him for the next six years. The translation was published in 1791 During its progress he had changed his place of residence from Olney to the neighbouring village of Weston, on the recommendation of his cousin, Lady Hesketh, with whom he had recently renewed a correspondence which had been long suspended, and whose attentions contributed much to the comfort of his later years. Almost immediately after the translation of Homer was completed, he undertook to superintend a new edition of Milton's Works, and to furnish translations of the Latin and Italian poems. In 1792 he paid a visit to Hayley at Eartham, in Sussex, not having made a journey for twenty years before. Symptoms of his constitutional malady had occasionally shown themselves during the eight or ten preceding years; and in the beginning of 1794 he was again afflicted with madness. A change of scene being judged desirable, he was removed first to North Tuddenham in Norfolk, thence to Mundsley, and afterwards to East Dereham; and he succeeded in obtaining short intervals of comparative tranquillity, during which he composed one or two small pieces and revised his translation of Homer. Mrs. Unwin, his faithful companion, died on the 17th of December, 1796; and after three dreary years, Cowper followed her to the grave on the 25th of April, 1800. He died in his 69th year.

Cowper's merits have been summed up by Mr. Southey in the words—'the most popular poet of his generation, and the best of English letter-writers.' His letters are written in a genuine unaffected English style, and are marked for the most part by a playfulness and humour which effectually prevent the weary feeling that usually attends a long continuous reading of epistolary correspondence. Absence of affectation is again a chief characteristic of his poems. They are free from all sickly sentimentality or mannerism in language. As regards freedom from the first, the manliness of the poet presents a striking contrast to the feminine character of the man; while, with reference to the second point, Cowper has the merit of having done much towards that improvement in poetic diction which has since received a mighty impulse through the poems of Mr. Wordsworth. He was an enthusiastic lover of nature; and some of his descriptions of natural objects are such as Wordsworth himself might be proud to own. His poems contain also, as it is not too strongly expressed by Hazlitt, 'a number of pictures of domestic comfort and social refinement which can hardly be forgotten but with the language itself.' (*Lectures on the English Poets*, p. 182.) There is a striking amount of variety in his poems, or, taking but one of them, in the 'Task' alone. Some of his smaller pieces, as for instance the Lines on receiving his Mother's Portrait, and those addressed 'to Mary,' are exquisitely pathetic.

It is necessary to say a few words concerning his translation of Homer. Its execution is unequal, as might be expected in the case of a work of such length, and of an author subject to attacks of melancholy as Cowper was. But taken as a whole, and judged by those rules which should be applied to translations, it must be pronounced the best translation of Homer which we possess. He set out with a determination to seize, so far as he could, the real spirit of Homer; whereas Pope, who, it is well known, translated not from inclination, but for money, had thought of any thing else; and having adopted blank verse, he had to make no sacrifices of meaning or language to the tyranny of rhyme. From Cowper too, a man gifted with a decidedly poetical temperament, a more genial appreciation of Homer was to be expected than from one whose merits chiefly consist in powers of wit which are certainly great, and in a facility of rhyming which is certainly extraordinary. Cowper himself said of his predecessor—'There is hardly the thing in the world of which Pope was so destitute as a taste for Homer.'

There are numerous Lives of Cowper. It is unnecessary, since all that is peculiar in the views taken by preceding biographers is either embodied or discussed in these two, to mention more than those by Mr. Grimshawe and Mr. Southey. Each of these Lives is prefixed to a Collection of Cowper's Letters and Poems. Mr. Grimshawe announces that he presents a 'complete edition of the Works of Cowper, which it is not in the power of any individual besides himself to accomplish, because all others are debarred access to the "Private Correspondence."' The '*Private* Correspondence,' it appears, is a collection of Cowper's Letters, which was *published* in 1824 by Dr. J. Johnson, and the copyright of which is in the hands of Mr. Grimshawe's publishers. Though Mr. Southey is thus debarred from inserting the whole of this collection in his edition, he has embodied in the Life all that is material therein; while, by the kindness of many of the surviving relatives of Cowper's friends, he has obtained access to much of his correspondence that had never seen the light. He has also been enabled, through the same sources, to shed new light on many incidents of Cowper's life; for instance, his connexion with the ignorant enthusiast Teedon (vol. iii., chap. 16, 17,), and the breach with Lady Austen, which preceding biographers have invented many gossiping stories to explain, and which, by showing that Cowper gradually got tired of her society, he has divested of its former mysterious importance. A poem entitled 'Anti Thelyphthora,' being a satire against those who would do away with the institution of marriage, appears among Cowper's poems for the first time in Mr. Southey's edition.

COW-POX. [Vaccina.]

COWRY SHELLS are called by conchologists *Cypræa*. Their beauty has procured them a place among the ornaments of our chimney-pieces, and they have been in demand among civilized and uncivilized nations time out of memory. Like the precious metals, they are not only used for ornament, but they have also the qualities necessary to constitute them a species of currency. In fact, cowries are used as small coin in many parts of Southern Asia, as in India, the Burmese empire, Siam, &c., and especially on the coast of Guinea in Africa. Their great multiplication in these countries has however depressed their value much below that of the precious metals. In 1740 a rupee in Bengal was worth 2400 cowries; in 1766, 2560 cowries; and now, we believe, 3200 may be had for it.

The shells used as currency occur principally in the Philippine Islands, and on the coast of Congo, but particularly among the Maldive Islands, of which they constitute the principal article of export. They are fished for three days after the high tides, by the women, with baskets, in which they take up a quantity of sand containing cowries. When the sand is washed out, the shells are heaped up on the shores, and the fish soon die; they are then ready for the market. (Sonnerat, Beckmann.) [Cypræidæ.]

COXE, WILLIAM, archdeacon of Wilts, was born in London, March, 1747. In 1768 he was a fellow of King's College, Cambridge. In 1771 he was appointed to the curacy of Denham, near Uxbridge, but soon after he went to travel on the continent as tutor to the marquis of Blandford, son of the duke of Marlborough, with whom he remained two years. In 1775 he accompanied in the same capacity lord Herbert, son of the earl of Pembroke, with whom he visited a considerable part of Europe. His 'Sketches of the Natural, Civil, and Political State of Switzerland, in a series of Letters to W. Melmoth,' 8vo. 1779, was translated into French with considerable additions by M. Ramond, a French traveller of taste and information, who rendered Coxe's work, which was rather dry and prosy, more attractive by adding many entertaining details. Coxe's attention had been chiefly directed to the political institutions of the numerous republics of the old Helvetic Confederation, a subject which had been already in some measure treated by Stanyan half a century before. Ramond travelled as a pedestrian through the most remote Alpine districts: he understood the dialects of the country, and in this respect had a great advantage over Coxe. He added to Coxe's work several entire letters, among others one in which he describes the striking scene, which few travellers have witnessed, of a general landsgemeinde, or assembly of the whole sovereign people of the canton of Glarus. Ramond's book is still one of the most interesting works upon old Switzerland, such as it was before the French invasion and subsequent changes. (*Lettres de Mr. W. Coxe sur l'Etat Politique, Civil, et Naturel, de la Suisse, augmentées des Observations faites dans le même Pays par le Traducteur,*' 2 vols. 8vo., Paris, 1781.) In 1789 Coxe published a second edition, much enlarged, of his own work, under the title of 'Travels in Switzerland,' 3 vols. 8vo. The third volume is entirely engrossed by a description of the Grisons. Meantime in 1784, having visited the northern kingdoms of Europe, he published 'Travels into Poland, Russia, Sweden, and Denmark,' in 5 vols. 8vo., which were translated into French. Soon after the publication of this work he accompanied Mr. Samuel Whitbread on a tour on the continent, and in 1786 he went there again with the son of Mr. Portman, of Bryanston, Dorset. In 1788 he was presented to the rectory of Bemerton by the earl of Pembroke. In 1794 he again visited the continent with lord Brome, eldest son of the marquis Cornwallis; and on his return was made chaplain of the Tower.

Coxe had collected a considerable store of information during his travels, of which he availed himself in writing several historical works, the most important of which is the 'History of the House of Austria from the foundation of the Monarchy by Rudolf of Habsburg to the death of Leopold II. in 1792,' 3 vols. 4to., London, 1807. It is a work of considerable labour and research, and conscientiously written. The author quotes in his preface and in the body of the work, his authorities both printed and MS;

he also availed himself of oral information which he collected in his travels. 'I have endeavoured,' he says in his preface, 'to divest myself of party and local prejudices; I have weighed every evidence with candour and impartiality, and have given the result of a laborious investigation by presenting a faithful and consistent picture of times, characters, and events, without trespassing on the patience of the reader by disquisitions on the innumerable contradictions and clashing testimonies which impeded my progress at every step.'

The author has confined himself to the German branch of the house of Austria, leaving out the Spanish branch from Philip II. The work was translated into German, and seems to have been well received at Vienna. Coxe also wrote—1. 'History of the Kings of Spain of the House of Bourbon, from 1700 to 1788,' 3 vols. 4to., 1813. 2. 'Memoirs of John Duke of Marlborough, with his Original Correspondence,' 3 vols. 4to., 1817—19;' an elaborate and valuable work. 3. 'Memoirs of Sir Robert Walpole, Earl of Orford, illustrated with Original Correspondence and Authentic Papers,' 3 vols. 4to., 1798. 4. 'Account of the Russian Discoveries between Asia and America; to which are added, the Conquest of Siberia, and the History of the Transactions and Commerce between Russia and China,' in 4to. Gmelin, Pallas, Müller, and others had already treated these subjects, but Coxe has added more complete information which he collected at Petersburg. 5. 'Private and Original Correspondence of Charles Talbot, Duke of Shrewsbury, with King William III., the Leaders of the Whig Party, and Others.' 6. 'An Historical Tour in Monmouthshire, illustrated with plates from the drawings of Sir R. C. Hoare,' 2 vols. 4to. 7. 'An Account of the Prisons and Hospitals in Russia, Sweden, and Denmark, with Remarks on the Different Modes of Punishment in those Countries,' 8vo. 8. 'Literary Life and Select Works of Benjamin Stillingfleet,' 3 vols. 8vo.; besides several minor works.

In 1803 he married Eleanora, daughter of Walter Shairp, consul-general of Russia. In 1805 he was appointed archdeacon of Wilts. After publishing the 'Memoirs of Marlborough,' in 1819 his sight failed him, and he became gradually blind. He died at Bemerton at an advanced age, in June, 1828. Coxe occupies a respectable place among modern historians: the subjects that he has treated are numerous and important; and he spared no pains to collect the best information, for obtaining which he had facilities of access to some important private collections. The following work was published after his death: 'Memoirs of the Administration of the Right Honourable Henry Pelham, collected from the Family Papers,' 2 vols. 4to., London, 1829.

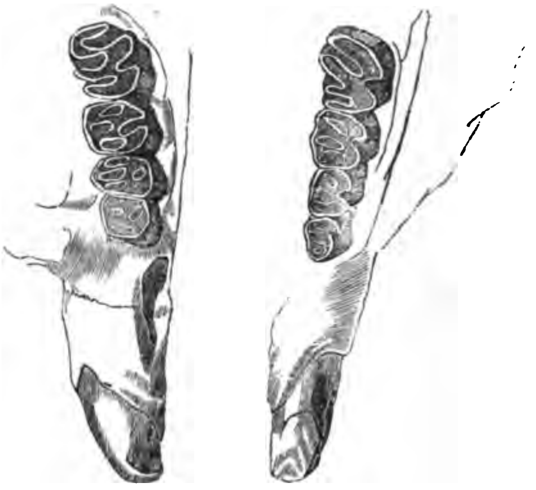
COYPEL, the name of a family of painters. Noel, the first of the family who attained any reputation, was the son of Guyon Coypel, a younger son of a Norman family, and was born in 1628. Guyon practised painting, but apparently with little success. He placed his son at an early age with Vouet, a painter at Orleans, and afterwards under a painter named Quillerier. Noel rose rapidly in reputation, and was received into the Academy at Paris in 1663. He was appointed by the king director of the Academy at Rome, where he resided some time, enjoying the acquaintance of Bernini, Carlo Maratti, and other eminent painters of the day. Noel Coypel was a diligent student, and the French Academy in Rome profited greatly by his assiduous example. Having returned to Paris, he was successively made rector and director of the Academy. He died in 1707, working at his art to the last. Noel was married twice, and left two sons, Antoine and Noel Nicholas, and many daughters. Antoine, his father's pupil, was born in 1661, and accompanied his father to Rome, where he studied the works of the old masters. He afterwards travelled for improvement into Lombardy. He left Rome at too early an age to profit as he might have done by his studies from the Italians, being then no more than eighteen years of age. He made such progress in his profession, that at the age of twenty he was received into the Academy. In 1707 he was made professor and rector, and in 1714 director. He was married, and at his death in 1722 left one son, Charles, also a painter, and his father's pupil, who successively passed all the ranks to the highest in the Academy. Noel Nicholas, the second son and pupil of Noel, was born in 1692. He was received into the Academy in 1720, during his brother's rectorate. He did not attract much notice until after his brother's death, but then rose rapidly in reputation till the time of his own death, in 1673.

Noel Coypel is skilful and spirited in design, and a lively colourist, but somewhat affected. Antoine, the most famous of the family, has much power and variety in his design; but the mannered style of the French school was not corrected by his study of the Italian, since he was too ready to adopt the artificial graces of Bernini, his friend and adviser. Noel Nicholas, although not free from the factitious elegance of his relatives, possesses a considerable feeling for pastoral enjoyment, which is evinced in some rustic compositions. The principal works of all the Coypels are at Paris. (Argenville.)

COYPOU, or **COYPU**, Molina's name for a rodent quadruped, the *Quoiya* of D'Azara, the *Coui*, *Mus Coypus* of Molina and Gmelin, *Hydromys Coypus* of Geoffroy, *Myopotamus Bonariensis* of Commerson. Lesson alters the name to *Potamys*, but *Myopotamus* is the term usually current among zoologists.

Generic Character.—*Head* large; muzzle obtuse; ears small and round. *Feet* five-toed; thumb of the fore-feet very short, the four fingers free; posterior feet palmated. *Tail* long, conical, strong, scaly, and sprinkled with scattered hairs.

Dental formula. Incisors, $\frac{2}{2}$. Molars, $\frac{4-4}{4-4}=20$. The molars gradually increase in size from the first to the last, and approximate to those of the beavers.



[Teeth of Coypu, rather less than natural size, from F. Cuvier.]

Mr. Martin, in the 'Proceedings of the Zoological Society' (1835), has given an interesting account of the anatomy of an individual that lived and died in the gardens of the Society. The skull, although it agreed in many points with that of *Capromys*, approximated nearest to that of the *Capybara*. 'The main outline and contour of both are very similar; they both agree in the flatness of their upper surface, in the elongation of their form, in the magnitude of the suborbital *foramen*, and in the development of the processes of the occipital bone, continued from its transverse crest. When, however, we descend to details, numerous and striking points of difference are immediately observable. In the *Capybara*, for instance, the margin of the orbit is circular or nearly so, and the zygomatic arch, broad and strong, has its lower edge brought down considerably below the level of the molars, though it advances much farther than either in the *beaver* or *water-rat*: in which animals the orbits, of an oval shape, have a less lateral and more vertical aspect. In the *Coypus* the temporal *fossæ* are deeper than in the *Capybara* or the *beaver*, and the external auditory *foramen* runs obliquely forwards and downwards, while in the *Capybara* it runs obliquely downwards and inwards, and in the *beaver* downwards and backwards. The frontal bone is divided by a permanent longitudinal suture, as it is also in *Capromys*; whereas in the *Capybara*, the *water-rat*, and the *beaver*, no trace, at least in adults, of such a separation is visible. The *beaver*, when semi-adult, exhibits, however, a slight appearance of it.' The number of the vertebræ, according to the same author, is as follows:—Cervical, 7; dorsal, 13; lumbar, 6, sacral, 4; caudal, 23. The ribs are short, thin, and flexible.

and the capacity of the chest is small. The dentition, he observes, differs widely from that of *Hydromys*, with which the animal was associated generically by M. Geoffroy St. Hilaire. Baron Cuvier, he remarks, states that the skull of the *Coypus* has a resemblance to that of *Hystrix dorsata*, but he adds that he has not seen the skull of that animal, and therefore cannot judge; though certainly the teeth, as given by M. F. Cuvier, and those of the *Coypus* differ materially. 'The *incisores* are large and strong, and of a deep orange yellow on their outer surface; the alveoli of those of the upper jaw pass through the intermaxillary into the true maxillary bones. In the lower jaw they extend beneath the whole of the molares.' The *scapula*, it appears, agrees closely with that of *Capromys*, but differs considerably in shape from that of the *beaver*. Its anterior edge runs out into an angle, at a greater comparative distance from the spinous ridge than either in the *beaver* or the *porcupine*, and the same may be said of the posterior angle; so that the total breadth of this bone is comparatively greater than it is in those two animals. The *clavicle* is slender. The *humerus* presented nothing extraordinary. The *pelvis* was long and narrow. The *femur* was thin and small, and had both a *trochanter major* and a *trochanter minor*.

But the following would seem to be the most remarkable part of the osseous structure of the Coypou.

'In the motions of the hinder limbs of the *Coypus* when alive,' says Mr. Martin, 'I observed not only an awkwardness but a want of firmness, which gave something of a crawling character to the progression of the animal on the floor. A recollection of this circumstance, which struck me when I first saw the animal, led me to open the capsule of the hip-joint with care: on doing this, I was surprised to see no *ligamentum teres;* on opening the other, still none appeared. I am convinced that I did not destroy or rupture the ligament, for no ruptured fibres were at all visible; and on opening the *acetabula* of other animals at the same time, the ligament was found strong and large; in this, however, nothing of the kind was visible. There is on the head of the *femur* a very slight depression, but it is covered, as the rest of the head, with smooth cartilage. I believe therefore that the *Coypus* may be added to the list of the few *Mammalia* in which this ligament is absent; but it would be desirable that another specimen should be examined before this peculiarity is insisted on as an ascertained fact.'

Mr. Martin was unable to examine all the bones of the extremities, which he regrets, as Cuvier notices a peculiarity in those of the *carpus;* viz., in there being no separation between the *os magnum* and *trapezoides*.

Of the viscera, the spleen presented the same figure as in the *Ondatra*, the *Capromys*, and some other rodents. The stomach closely resembled that of *Capromys*. The *duodenum* commenced with a large *sacculus* projecting towards the *œsophagus* like a *cœcum*, in which respect it resembles *cœlogenus* as described by Sir E. Home. A similar dilatation, Mr. Martin remarks, has been noticed in *Capromys*, *Anœma*, and *Dasyprocta*, but not so considerable. There were several other resemblances to *Capromys*, in the intestines, in some of the abdominal muscles, and in the urethra; but we must refer the reader for the details to the paper itself, which is of considerable length, and well worth perusal.

Description.—Less than the beaver, which however it resembles in many points. *Head* large and depressed; ears small and rounded; muzzle sharper than that of the beaver, with very long and stiff whiskers. *Neck* stout and short. *Limbs* short; fore-feet not webbed, fingers on each five, the thumb very small; hind-feet with the same number of toes, the great-toe and three next joined by a web which extends to their ends, little-toe free, edged with a membrane on the inner side; nails compressed, long, crooked, and sharp. *Tail* round and thinly hairy, the hairs permitting the scaly texture of the skin to be seen. *Back* brownish-red, becoming redder on the flanks. *Belly* of a dirty red. Edges of the *lips* and extremity of the *muzzle* whitish.

Geographical Distribution.—South America. Very common in Chile, Buenos Ayres, and Tucuman: more rare in Paraguay.

Habits, much resembling those of the generality of aquatic rodents It swims with great ease, affects the neighbourhood of water, and burrows in the ground. Its principal food in a state of nature is vegetable. The female brings forth from five to seven, and the young always accompany her till they are well grown.

The French authors say that the coypou is easily domesticated, and that its manners in captivity are very mild. The individual kept in the garden of the Zoological Society in the Regent's Park did not show much sociability of disposition, but it was confined in a cage of no large dimensions, and there was not much opportunity for making it familiar.

[Myopotamus Coypus.]

Utility to man.—The coypou, like the beaver, has two kinds of fur. The long ruddy hair gives the tone of colour, and the brownish ash-coloured fur at its base is, like the down or wool of the beaver, the cause of the animal's commercial value, and used largely in the manufacture of hats. In France the skins were, and perhaps still are, sold under the name of Racoonda. M. Geoffroy mentions that, in certain years, a single French furrier, M. Bechem, has received from 15,000 to 20,000 skins. They are imported into Great Britain to a large amount—from 600,000 to 800,000 have been stated as the importation of one year, principally from the Rio de la Plata—under the name of Neutria or Nutria skins, an appellation probably derived from some supposed similarity in the appearance and habits of the animal which produces it to the otter, the Spanish name of which is Nutria.

CRAB (Zoology), *Cancer*, Leach; *Platycarcinus*, Latreille, Edwards. Dr. Leach restricted the genus *Cancer* to the form of *Cancer pagurus*, Linn., the large eatable crab of our coasts, which was, when he defined the genus, the only species known.

Generic character. External antennæ with the basilar joint broad, very long and thick, filling the hiatus between the inner *canthus* of the orbit and the front, and terminating forwards in a strong, angular, tooth-like projection, directed forwards and a little inwards, reaching beyond the frontal line. The terminal or moveable portion is slender, very short, and arises from the internal part of the basilar joint, nearer to the cell of the internal *antennæ* than to the orbit. The internal antennæ, instead of lying obliquely outwards or transversely, as in most other genera of this section, are directed forwards; a character by which *Cancer* may at once be distinguished from *Platypodia*, *Carpilius*, *Xantho*, &c. The second joint of the inner footstalk of the external pedipalps is excavated at the anterior part of the inner margin; in some species the notch is confined to the angle, in others it extends half way down the side of the joint. The first pair of feet is nearly equal; in some specimens of each species, the difference in size being scarcely appreciable. They are, generally, very robust. The remaining feet have no spines, but are in most species more or less hairy. The abdomen of the male has five, that of the female seven joints. (T. Bell.)

Geographical Distribution. With the exception of our indigenous species, *Cancer pagurus*, they are all, as far as their localities are known, exclusively natives of the coasts of the hotter parts of America. (T. Bell.)

Mr. Bell in his interesting paper on the genus *Cancer*, (Zool. Trans. i. 335.) gives three new species, viz. *Cancer longipes*, *Cancer Edwardsii* and *Cancer dentatus* brought home by Mr. Cuming and Mr. Miller, besides *Cancer irroratus* of Say, and *Cancer pagurus*, which last, as it was considered the type by Dr. Leach, we select as an example.

Carapace transversely oblong, flattened, but little higher in the middle than at the sides, somewhat rounded before and behind; the surface minutely granulated, smooth, with the regions but slightly marked. Latero-anterior margin slightly recurved, divided into ten quadrate lobes, the sides of which are contiguous, and the margins entire; the last lobe inconspicuous, and passing into the posterior marginal line, which terminates immediately anterior to the posterior transverse ridge. Front trifid, the teeth of nearly equal length and size. Orbits round, with a strong triangular tooth over the inner *canthus*, which does not project so far as the front; and a smaller one filling the space between the two superior fissures. External *antennæ* with the basilar joint much elongated, and terminating forwards in an obtuse tooth; the first joint of the moveable portion club-shaped, the second cylindrical, the remaining portion setaceous. Internal *antennæ* directed forwards, the anterior half doubled directly backwards in a state of rest. The basilar joint broad, cup-shaped, its outer edge projecting forwards; the second joint (the first of the moveable portion) cylindrical, the penultimate with a small, hooked, and recurved process at the *apex*. Pedipalps as in the rest of the genus. *Sternum* minutely punctated, and furnished with small patches or lines of short scanty hair. *Abdomen* in the male with the margin fringed with short hair; the last joint forming an equilateral triangle. Anterior feet, large, robust, smooth, without spines or tubercles, minutely granulated, the hand rounded, without crest, the inner surface exhibiting only the rudiments of the five lines of *puncta*, so conspicuous in other species of the genus. The remaining feet furnished with numerous *fasciculi* of stiff hairs, the last joint in all furrowed, and terminated by a short strong nail. Colour above, reddish brown, the legs more red, the claws deep shining black; beneath whitish. *Locality*. Coasts of Great Britain, &c. and of western Europe. (T. Bell.)

Pennant states that this species inhabits rocky coasts, and is the most delicious meat of any, and that it casts its shell between Christmas and Easter. 'There are some species,' says Mr. H. Milne Edwards, in his article *Crustacea* (Cyclopædia of Anatomy and Physiology) 'such as the crabs and the Brachyura generally, in which the carapace presents a considerable expansion on either side, forming two large compartments, in which the greater mass of the thoracic viscera is contained. Under these circumstances, it would be impossible for the animal to escape from its dorsal covering by the relatively inconsiderable opening which this part presents on its inferior aspect. This renders it necessary that the carapace, instead of being cast off by simply rising in a single piece, should give way and separate in some direction or another, and this it does by splitting along the curved lines, extending on either side from the mouth to the origin of the abdomen, in the course of which the epimeral pieces cohere with the dorsal one.' (Collinson, Phil. Trans. 1746 and 1751; Hist. Nat. des Crustacés, t. 1. p. 56.) Mr. Lyell says (Principles of Geology, vol. 3.) 'A large female crab (*Cancer Pagurus*) covered with oysters, and bearing also *Anomia Ephippium* and *Actiniæ*, was taken in April 1832, off the English coast. The oysters include individuals of six years' growth, and the two largest are four inches long and three inches and a half broad. Both the crab and the oysters were seen alive by Mr. Robert Brown. This specimen is in the collection of my friend Mr. Broderip, who observes that this crab, which was apparently in perfect health, could not have cast her shell for six years, whereas some naturalists have stated that the species moults annually, without limiting the moulting period to the early stages of growth of the animal.'

The term *Crab* is in common parlance applied to the great bulk of the Brachyurous crustaceans. The different genera will be found under their appropriate titles, CORYSTES, HERMIT-CRAB, GECARCINUS (Land-crab), &c. &c. for example.

For the blood-spotted crab of the Asiatic seas, *Cancer maculatus*, Linn. &c. and the coralline crab, *Cancer corallinus*, Fabr. Dr. Leach instituted the genus *Carpilius*, characterized by the existence of a single tooth on the border of the carapace, and by the tridentated front; and, for the eleven-toothed crab, *Cancer undecimdentatus*, Fabr, the carapace of which is smooth, with eleven crenelated teeth on each antero-lateral border, and black toothed fingers, spoon-shaped at the end, he founded the genus *Clorodius* or *Chlorodius*. Mr. Milne Edwards enumerates four species of *Carpilius* and seven of *Chlorodius*. He considers the fossil *Crabe aux grosses pinces*, *Cancer macrochelus*, Desm. (Hist. Nat. des Crustacés Fossiles, p. 91. pl. vii. fig. 1—2) *Cancer Lapidescens*, Rumph. (Amb. Rariteit Kamer, pl. 60. f. 3.) as referable to the genus *Carpilius* rather than to the division of crabs properly so called. It should be remembered that Mr. Milne Edwards's genus *Cancer* (*crabe*) differs from that of Dr. Leach. The former includes under that name such forms as *Cancer roseus* (*Carpilius roseus* of Rüppell) *Cancer lobatus*, *Cancer esculptus*, *Cancer limbatus* (*Xantho granulosus*, Rüp.) *Cancer Savignii* and *Cancer Acanthus*, excluding Dr. Leach's *Cancer*, the type of which is the eatable crab of our coasts, to which form Mr. Milne Edwards gives the name *Platycarcinus*. For the reasons assigned by Mr. T. Bell, we retain Dr. Leach's arrangement. It does not appear that any species of *Cancer*, Leach, *Platycarcinus*, Milne Edwards, has been found in a fossil state.

CRABBE, GEORGE, was born at Aldborough, in Suffolk, on the 24th of December, 1754. His parents were in an humble condition of life, the father being a warehouse-keeper, and collector of the salt-duties, or saltmaster, at Aldborough. The future poet showed, at a very early age, a taste for reading, and a delight in aught that bore the shape of poetry; and his father was thus led to give him an education better than he could well afford. It was determined that he should follow the profession of a surgeon; and having made some progress in mathematics at school, and also, as his son expresses it, 'laid the foundations of a fair classical education,' he was in his fourteenth year apprenticed to a surgeon at Wickham Brook near Bury St. Edmunds. He stayed with this surgeon three years, and, not having been well treated, was, in 1771, transferred to another at Woodbridge in Suffolk, with whom he finished his apprenticeship. His father had been in the habit of taking in a periodical, called Martin's Philosophical Magazine, the last sheet of which was always devoted to 'occasional poetry;' and when, at the end of the year, he sent the magazines to be bound, these sheets of poetry were contumeliously cut out, and became the property of George. He read them over and over again, and when yet very young tried to write pieces of poetry himself. Neither school nor surgery deprived him of the taste formed thus early. While at Wickham Brook he filled a drawer with verses, and at Woodbridge, having written a poem on Hope for a prize offered in Wheble's Lady's Magazine, and having been successful, he was induced to go on contributing to the publication in which he had gained his first laurels, and before his return home published in a separate form, but anonymously, a poem entitled 'Inebriety.'

He returned home at the close of 1775, and had now for a time to submit to the drudgery of the warehouse, until his father could afford to send him to London in order to complete his medical education. When at last he went, it was with means too scanty to allow of his gaining any real advantage; and he returned before a year had expired, but not till his resources, though carefully husbanded, had been exhausted. Shortly after, he was encouraged by his friends to set up as a surgeon and apothecary. He had never, it appears, liked his profession, though, impelled by a sense of duty, he had made more than one effort to apply himself to it with diligence. His preparation for the duties which he was now liable to be called upon to perform had been inadequate; and added therefore to dislike of those duties was uneasiness under the responsibility which attached to him. He was in love, and the object of his attachment was (we quote his son's words) 'too prudent to marry, where there seemed to be no chance of a competent livelihood; and he, instead of being in a position to maintain a family, could hardly, by labour which he abhorred, earn daily bread for himself. He was proud too: and, though conscious that he had not deserved success in his profession, he was also conscious of possessing no ordinary abilities, and brooded with deep mortification on his failure.' After a short struggle with himself, he resolved to abandon his profession, and proceed to London as a literary adventurer. Being without money, he wrote to Mr. Dudley North, whose brother, Mr. Charles Long, had been a candidate for Aldborough, requesting the loan of five pounds. 'A very extraordinary letter it was,' said Mr. North some years afterwards to Crabbe, when they met on terms of equality; 'I did not hesitate for a moment.' Thus provided with money he embarked on board a sloop at Aldborough, and, working his way, arrived in London in April, 1780.

He took lodgings near the Exchange, and set about authorship with vigour. He projected the publication of a prose work, entitled 'A Plan for the Examination of our Moral and Religious Opinions;' but thought it expedient, before publishing this, to make himself known by a poem. Two poems, prepared with this view, were rejected by the booksellers to whom they were offered. He now published, on his own account, a poem entitled 'The Candidate;' but, almost immediately after it appeared, the publisher failed, and all hopes of profit from this attempt were thus taken away. His stock of money meanwhile had gradually disappeared, and he was reduced to great distress. He had been advised at Aldborough to apply for assistance to Lord North; he did so, and received none. He then applied to Lord Shelburne and Lord Thurlow, enclosing some of his poems to both; but these applications were equally unsuccessful with the former. At last, and not till after he had been threatened with arrest, he bethought himself of Burke. The letter which he addressed to Burke is a beautiful piece of writing, simple, dignified, and pathetic. 'The night after I delivered my letter at his door,' he told Mr. Lockhart some years after, 'I was in such a state of agitation, that I walked Westminster bridge backwards and forwards until day-light.' Burke immediately appointed a time at which he would see Crabbe; he received him with great kindness, and encouraged him to show him all his compositions. Having selected 'The Library' and 'The Village,' and having suggested in them many alterations which Crabbe assented to, he took these poems himself to Mr. Dodsley. 'The Library' was in consequence published in 1781. But Burke's attention did not stop here. He assisted him with money, and gave him a room at Beaconsfield, where he was treated in every way as one of the family; he introduced him to Fox, Sir Joshua Reynolds, Lord Thurlow, and other distinguished friends; and having advised Crabbe to think of entering the church, towards which he found him by no means disinclined, he exerted all his influence to get him ordained. His conduct towards Crabbe is indeed a brilliant chapter in the history of Burke.

Crabbe was admitted to deacon's orders in December, 1781, by Dr. Yonge, bishop of Norwich, and was ordained a priest in August of the year following. He commenced his clerical life as curate of his native town. Shortly after he obtained, through Burke's influence, the situation of domestic chaplain to the duke of Rutland, and resided in consequence at Belvoir Castle. 'The Village' appeared in 1783, having been revised by Dr. Johnson: its success was great, and Crabbe's reputation was now fully established. In the same year Lord Thurlow, who had taken a previous opportunity of apologizing for his first repulse of Crabbe, presented him with two small livings in Dorsetshire, telling him, as he gave them, that, 'by God, he was as like Parson Adams as twelve to the dozen.' Crabbe now married Miss Sarah Elmy, the object of his first love. The duke of Rutland had been, in the meantime, appointed lord-lieutenant of Ireland. Crabbe did not accompany him to Ireland, but apartments in Belvoir Castle were assigned to the young married couple. In 1785 Crabbe took the neighbouring curacy of Strathern, and removed from the castle to the parsonage of that parish.

It appears, that though Crabbe was treated most kindly by every member of the Rutland family, and felt for them in return great affection and esteem, especially for the duke, a man of amiable character and literary tastes, he found his situation at Belvoir Castle an irksome one. He liked not to 'eat the bread of dependence;' and cared not 'to bask in the sunshine of a great man's smile.'

Crabbe published 'The Newspaper' in 1785. He did not come forward again as an author until 1807, when, after an interval of twenty-two years, appeared 'The Parish Register.' He resided in the meanwhile successively at Strathern, at Muston in Leicestershire (Lord Thurlow having in 1789, at the duchess of Rutland's earnest request, exchanged his two small livings in Dorsetshire for those of Muston and Allington, both situated in the Vale of Belvoir); from 1792 to 1796 at Parham in Suffolk, taking charge of the neighbouring curacies of Sweffling and Great Glemham; then in Great Glemham Hall, a house belonging to Mr. Dudley North, his early benefactor; until at last, in 1805, he returned to his rectory at Muston. Though during this long period Crabbe published no poetry, he was not idle. He studied botany, which had always been a favourite pursuit, with great ardour; and wrote an essay on botany in English, which he was on the point of publishing when, yielding to the remonstrances of a vice-master of Trinity College, Cambridge, against degrading the science by treating it in a modern tongue, he consigned his manuscript to the flames. He also pursued entomology and geology. He taught himself French and Italian, and superintended the education of his sons. He was also, according to his son's account, continually writing; and among his compositions during this period were three novels, which, upon his wife's suggesting that the tales would have been better in verse, he consigned to the same fate with the essay on botany.

Together with 'The Parish Register' there appeared, in 1807, 'Sir Eustace Grey' and other smaller pieces, and a reprint of his earlier poems; the object of the publication being to enable him to send his second son to Cambridge. Three years after, he published 'The Borough.' In 1813 he sustained a heavy affliction in the loss of his wife; and it was a fortunate circumstance, at a time when every scene at Muston would excite a painful remembrance, that the duke of Rutland, the son of his former patron, gave him the living of Trowbridge in Wiltshire. The incumbency of Croxton near Belvoir was added shortly after.

The remainder of Crabbe's days were, with the exception of occasional visits to his friends in London and elsewhere, passed at Trowbridge, where his conscientious discharge of his duties and his amiable character gained for him the love of all his parishioners. When in London he was much courted by those among the great who are studious to derive distinction from the patronage of literary men: and, what is more to the point, he now made the acquaintance of most of those who, during his retirement, had earned for themselves fame in his own vocation—Rogers, Moore, Campbell, Wordsworth, Southey, and Sir Walter Scott. His 'Tales of the Hall' were published in 1819 by Mr. Murray, who gave him 3000*l.* for them and the remaining copyright of his previous poems. In the autumn of 1822 he visited Sir Walter Scott at Edinburgh. From 1828 there was a perceptible change in his health, and though his mind retained its wonted cheerfulness, his strength of body gradually declined. He died on the 3rd of February, 1832, in his 78th year. The shops in Trowbridge were closed as soon as his death was known, and again on the day of his funeral; and a subscription was immediately set on foot among his parishioners for a monument to their departed rector, which has since been placed in Trowbridge church.

The moral character of Crabbe is an almost perfect model. Its greatest fault was an excess of gentleness. Thus, though he was not deficient in what is called moral courage, and though he heeded not rank or power or even physical force, when any of these threatened him in the performance of what he deemed his duty, he sometimes, in the common intercourse of the world, cowered at the roughness of ruder natures. Rising from a very low situation in life, he came to associate much with those whom the world sets up for worship; but, under circumstances whose corrupting influence few have withstood, he never lost that habit of self-dependence without which there is neither dignity nor happiness. If it be said that his many applications in early life to the great by rank and office indicated a disposition to place trust in nobles, it can be answered that accident first led him to Lord North, and that he persisted in his applications to him and others similarly situated, because he thought the encouragement of literature to be one great duty of those who fill the first offices of state. Joined with an indifference to factitious distinctions, was an absence of all pride occasioned by his own intellectual eminence. He was meek, observant of merit in others, and eager to impart to those who were, as he had been, distressed, a share of the advantages which his own good fortune had procured for him. As a husband, father, and friend, he was without reproach. His son's account of the manner in which his days were passed at the parsonage presents a delightful picture of domestic happiness.

The distinguishing excellences of Crabbe's poetry are simplicity, pathos, force, and truth in describing character. He has said himself that all his characters were taken from persons whom he had seen and known. Observing these closely, and specifying each *trait* and minute circumstance, he presents his readers with representations, not of classes of men, but of individuals. It is the minute accuracy of these representations that constitutes their charm. Who can forget Isaac Ashford? The celebrated descriptions of the parish workhouse, and of the 'disputatious crew' of thieves and smugglers in 'The Parish Register,' show the same faculty of minute observation, and have the same charm of faithful delineation. There are also in his poems some good descriptions of natural scenery, for instance, at the commencement of 'The Village;' but then it is only scenery of the sort for which what Mr. Jeffrey called his 'Chinese accuracy' is fitted. Crabbe was entirely without the power of invention. Viewing him, moreover, not merely as a poet whose business it is to please, but as one possessing powers above the common herd, which it is his duty to employ for the improvement of his fellow men and the increase of social happiness, we object to him that he has not gone beyond the representation of existing evil,—that he has revelled as in a luxury in descriptions of vice and woe, and has never cared to teach how the poor, of whom he is emphatically called the poet, may be made wiser and better and happier.

An edition of Crabbe's poems in eight volumes was published by Murray in 1834. The eighth volume consists of a collection of tales in verse, then published for the first time, which will not add much to the author's reputation. The Life by his son, the Rev. George Crabbe, a very pleasing piece of filial biography, occupies the first volume.

CRABRO'NIDÆ (Leach), *Crabronites* (Latreille), a family of Hymenopterous insects of the section *Aculeata* and subsection *Fossores*. Technical characters:—Head large, and appearing almost square when viewed from above; body oval or elliptical, narrowed more or less at the base, and joined to the thorax by a peduncle; antennæ short and generally thickened towards the apex.

According to Latreille, the following genera are included in this family:—*Tripoxylon, Gorytes, Crabro, Stigmus, Pemphredon, Mellinus, Alyson, Psen, Philanthus,* and *Cerceris.*

The species of the genus Crabro are chiefly distinguished by their having but one perfect cubital cell to the anterior wing; the mandibles terminating in a bifid point, and the antennæ being distinctly geniculated, they are sometimes filiform, and sometimes slightly serrated. The palpi are short, and almost equal. The clypeus is frequently clothed with a fine down of a glossy silver-like hue.

These insects are extremely active in their movements, and may be frequently seen settling on the flowers of umbelliferous plants, on palings, or on the leaves of plants, when the sun is shining upon them, lying wait in such situations, for the approach of other insects, which they seize and carry to their nests for the purpose of feeding their larvæ. The larger species of this country are mostly of yellow and black colours, the body being adorned with rings of the former colour, the smaller species are for the most part black.

Crabro cephalotes, is upwards of half an inch in length; black; the body is adorned with five yellow rings; the basal joint of the antennæ, and the tibiæ and tarsi are also yellow.

Crabro patellatus (Panzer), and several other species of this genus, are remarkable in having a large appendage attached to the external part of the anterior tibiæ; this is a thin plate of a somewhat rounded form, convex above and concave beneath, and is undoubtedly used in removing the soil whilst these insects are forming their burrows in the ground. Each burrow is stored with flies or other insects (depending upon the species of crabro to which it belongs); the eggs are then deposited with these flies, which constitute the food of the larvæ when hatched. Many species of Crabro form their cells in rotten trees or posts. Much that relates to the habits of these insects, however, remains to be discovered.

CRABTREE, WILLIAM. [See HORROX, JEREMIAH], as very nearly all that is known of Crabtree arises from the correspondence of the two.

CRA'CIDÆ, Mr. Vigors's name for a family of rasorial or gallinaceous birds (*Rasores*), which he considers to be connected with the Struthious birds, *Struthionidæ* (Ostrich family), by means of the *Dodo*, generally supposed to be now extinct, the foot of which, he observes, has a strong hind toe, and which, with the exception of its being more robust, in which character it still adheres to the *Struthionidæ*, corresponds exactly with the Linnean genus *Crax*. The bird, says Mr. Vigors, thus becomes osculant, and forms a strong point of junction between these two conterminous groups, which, though evidently approaching each other in general points of similitude, would not exhibit that intimate bond of connexion which we have seen to prevail almost uniformly throughout the neighbouring subdivisions of nature, were it not for the intervention of this important genus.

'The family of *Cracidæ*,' continues Mr. Vigors, 'thus connected with the *Struthionidæ*, are separated from the typical groups of the order by the length and robustness of the hinder toe, and by its being situated more nearly on a level with those in front. These birds placed in this manner at the extreme of the present order, assume more of the habits and appearance of the preceding order of *Perchers* than the other *Rasores*, with the exception of the family of *Columbidæ*. They are found most frequently to make their abode in trees, and to resort to the neighbourhood of forests · in the lesser number of their tail-feathers they evince an equal deviation from their more typical congeners, and they never possess a spur. This family contains the *Ourax* of M. Cuvier, and the true *Crax*, Linn, together with the *Penelope* and *Ortalida* of M. Merrem. The two latter genera have their hind toe articulated on a level with the front toes, and thus reconduct us to the *Columbidæ*. Their bills also, more lengthened than those of *Crax*, approach most nearly to those of the *Pigeons*, which, on the other hand, seem to meet them by the stronger form and curvature of the bill of *Vinago*, which deviates in these particulars from the general structure of its own family. The genus *Ortalida*, in particular, the feathered cheeks of which are distinguished from the naked face of *Penelope*, brings us in immediate contact with that family. Here it is, in this extreme of the order, that I would assign a place to the beautiful New Holland genus *Menura*, Lath., a group that has hitherto afforded more difficulty to the systematic writer than any other in the class. By modern authors it is generally placed among the *Perchers* on account of the length and low position of the hind toe. But its habits and manners are gallinaceous, as far as we can ascertain, and its general appearance decidedly evinces an affinity to the *Rasores*. The deviation in the structure of the foot from that of the typical *Rasorial* groups only indicates its being placed at a distance from them, and in that extreme of the order which connects itself with the conterminous order of *Perchers*. The same deviation, it has been seen, is found in other groups of its own family, and in the adjoining family of *Columbidæ*. A group newly discovered in some islands of the Eastern Archipelago, the *Megapodius* of M. Temminck, serves strongly to illustrate these principles and to corroborate my opinion as to the situation of the singular New Holland genus before us. The *Megapodius* brought home to France by one of her late expeditions, is confessedly gallinaceous in its habits, and as such has been placed, without hesitation, among the true *Rasores*, and yet its foot is precisely of the same construction as that of *Menura*.* The bill also shows no very material difference from those of the extreme groups of the *Cracidæ*. To return however to the general affinities of the family, it may again be repeated, that all the latter genera, thus united among themselves, evince an evident approach to the *Columbidæ*, from which, it may be remembered, we commenced our observations on the order. The whole of the groups of the *Rasores*, thus following each other in continued affinity, preserve their circular succession without interruption.' [MENURA.]

Character of the family.

Three *toes* before, one behind, the latter touching the ground throughout. *Head* feathered, generally crested · there is often a cere or naked skin at the base of the bill.

Mr. Swainson, 'Natural History and Classification of Birds,' vol. i., p. 153, states, that 'in the family of the *Cracidæ*, which connects the *Insessores* with the *Rasores*, the hinder toe is nearly as long as in the cuckoos, and is considerably more developed than in any other group of rasorial birds. We will say nothing of the genera *Megapodius, Palamedea,* and *Menura*, whose feet are well known to be enormous; or of *Opisthocomus*, because specimens of these

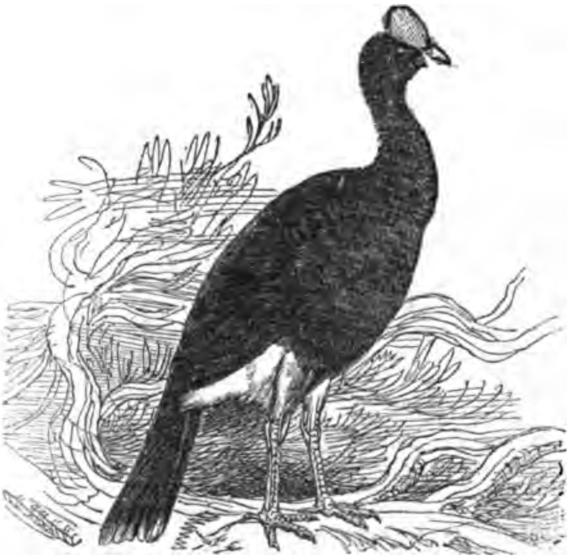
* But see post, Megapodius, p. 128.

large and rare birds are not upon our table. Confining ourselves to the genus *Penelope*, we may remark that the toes, considered by themselves, might be taken for those of a cuckow, if the outer one was only versatile; it is evident also, from the structure of the claws, that these birds are much more arboreal than their congeners, for their claws are more curved; and from their *lateral* and not *horizontal* compression, as well from their acuteness, we conclude that they are very little, if at all, employed in scratching the ground, their structure being similar to those of perchers, and adapted only for clinging. The foot, in fact, of the *Penelope*, is not a rasorial but an *insessorial foot*, for it does not possess any one of the rasorial characters. Even the hind toe, which, in all other rasorial birds, is raised above the heel, is here *placed upon the same level as the anterior toes*. That no ambiguity should rest on this fact, we beg to call the ornithologist's attention to the particular species now before us, the *P. Aracuan* of Spix, one of the most common of the same genus. How this remarkable formation in the foot of the typical *Cracidæ* should hitherto have been completely overlooked, even by those who have speculated so much on the mode by which the *Rasores* and *Insessores* are united, is somewhat extraordinary*; we can only account for it by the custom of examining specimens set up in cases, or on branches, instead of preserving them in skins, in which state they can be handled in all directions. But however this may be, the fact itself decides the long-contested question as to which family of the *Rasores* makes the nearest approach or rather forms the passage to the *Insessores*; while, if this question be reversed, and it is asked which of the *Insessores* makes the nearest approach to the *Rasores*, we need only direct our search among some of the long-legged Brazilian cuckoos, or at once point to the singular genus *Opisthocomus*.'

Genera, Ourax. (Pauxi, Temm.)

Generic character. — *Bill* short, strong, compressed, vaulted, convex, dilated at the base of the upper mandible into a horny, oval, hard, and elevated substance. *Nostrils* basal, pierced near the front, hidden, open beneath; *head* covered with short and close-set feathers. *Feet* (tarsi) long and smooth.

Example.—*Ourax Pauxi*. Cuv. *The Galeated Curassow.*



[Ourax Pauxi.]

Size about that of a small hen turkey. *Head* and *neck* covered with short velvety feathers of a rich black. All the rest of the plumage, with the exception of the white abdomen and under tail-coverts, brilliant black, exhibiting in certain positions a slight tinge of green. *Tail-feathers* tipped with white. *Legs* red, claws yellow. *Iris* brown. *Bill* bright red: the protuberance with which it is surmounted (which is rounded in the young birds, and pear-shaped with the narrow end directed forwards in the adult males) of a livid slate colour; it is more than two inches in length when fully developed, hard and bony externally, and internally cellular, the cells communicating with the cavity of the mouth. This protuberance is not visible till after the first moulting, when it first appears in the form of a small tubercle, and becomes much larger in the male than in the female. In other respects there is little difference between the sexes, and the young are only distinguished by a browner tinge. The windpipe descends for a considerable distance in front of the sternum, immediately beneath the skin, and makes no less than three distinct convolutions before passing into the cavity of the chest. (E. T. Bennett.)

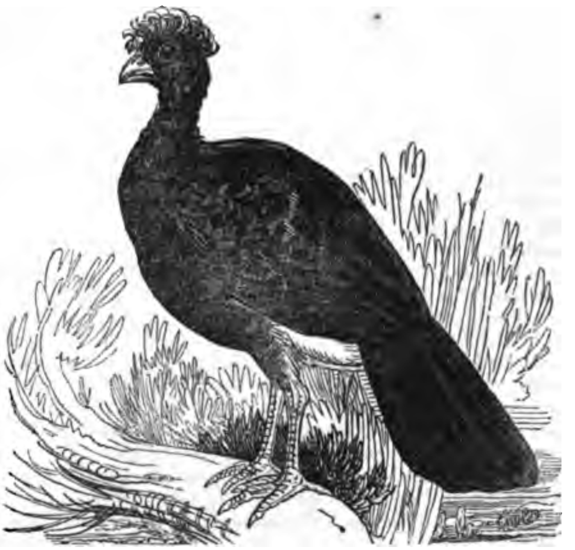
Locality.—Mexico, where the species lives in large companies perching upon the trees. Nest generally made on the ground. The young are led about by the female in the same manner as the hen pheasant or the common hen lead theirs. The first food of the chicks consists of worms and insects, but as they advance, fruits and seeds are added. Hernandez gives a very good description of the bird in his *Historia Avium Novæ Hispaniæ*, cap. ccxxii. The Galeated Curassow is easily domesticated and is enumerated by M. Temminck among the birds which bred abundantly in the menagerie of M. Ameshoff before the French Revolution.

In April, 1831, Mr. Yarrell pointed out at a meeting of the Zoological Society the peculiarities of the very elongated trachea of another species, *Ourax Mitu*, Cuv. This organ is produced between the skin and the muscles beyond the sternum, and reaches almost to the vent. It has been figured by Dr. Latham, M. Temminck, and others. The sterno-tracheal muscles extend along the whole of the tube, a disposition which, Mr. Yarrell remarked, prevails with one or two exceptions in all birds in which the fold of the trachea is not included in the bone. (*Zool. Proc.* 1830-31, part 1.) Mr. Bennett (*Gardens and Menagerie of the Zoological Society*) observes that the nostrils in *Ourax Pauxi* are seated behind the protuberance, and are perpendicular in their direction: the membranous cere which surrounds them, he adds, is covered with short velvety feathers.

Crax.

Bill moderate, long, compressed, higher than it is broad at the base, thick, carinated above, curved towards the end, surrounded at the base with a membrane; lore naked; nostrils lateral, longitudinal, pierced in the cere, and partially covered. *Head* crested with curled feathers. *Tail* spread out, inclined; tail-feathers, fourteen. Sixth quill the longest. *Hallux* reaching the ground with the first phalanx.

Example.—*Crax Alector*, Linn. *Crested Curassow.*



[Crax Alector.]

Description.—The plumage of the *Crested Curassow* is of a deep black, with a slight gloss of green upon the head, crest, neck, back, wings, and upper part of the tail; it is of a dull white beneath and on the lower tail-coverts. Its crest is from two to three inches in length, and occupies the whole upper surface of the head: it is curled and velvety in its appearance, and capable of being raised or depressed at will. The eyes are surrounded by a naked skin, which extends into the cere, and there assumes a bright yellow colour. Size about that of *Ourax Pauxi*. (E. T. Bennett.

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* But see ante p. 128, 2nd column.

Locality and haunts.—'This species,' says Mr. Bennett, 'is a native of Mexico, Guiana, and Brazil, and probably extends itself over a large portion of the southern division of the American continent. In the woods of Guiana it appears to be so extremely common that M. Sonnini regards it as the most certain resource of the hungry traveller whose stock of provisions is exhausted, and who has consequently to trust to his gun for furnishing him with a fresh supply. They congregate together in numerous flocks, and appear to be under little or no uneasiness from the intrusion of men into their haunts. Even when a considerable number of them have been shot, the rest remain quietly perched upon the trees, apparently unconscious of the havoc that has been committed amongst them. This conduct is by no means the result of simplicity, but proceeds rather from the natural tameness and unsuspiciousness of their character. Those however which frequent the neighbourhood of inhabited places are said to be much wilder and more mistrustful, being kept constantly on the alert to avoid the pursuit of the hunters, who destroy them in great numbers. They build their nests on the trees, forming them externally of branches interlaced with the stalks of herbaceous plants and lining them internally with leaves. They generally lay but once a year, during the rainy season; the number of their eggs being, according to Sonnini, from five or six, and to D'Azara, as many as eight. They are nearly as large as those of a turkey, but are white like a hen's, and with a thicker shell.' (*Gardens and Menagerie of Zool. Soc.*, vol. ii.)

Mr. Yarrell, in February, 1831, placed on the table of the Zoological Society the *trachea*, among others of *Crax Yarrellii*, *Red-knobbed Curassow*, a new species described from the Society's menagerie, and which had recently died. The trachea of this species differs from all those previously known, but most resembles that of *Crax alector*, Linn., while in external characters the bird approaches *Crax globicera*, Linn., from which it is distinguished by the redness of its cere, and by a prominence on each side under the base of the lower jaw in addition to the globose knob near the base of the upper. The tube in *Crax Yarrellii* is straight throughout its whole length, except a short convolution imbedded in cellular membrane placed between the shafts of the *os furcatorium*. The *trachea* is narrow, and the fold, invested and supported by a membranous sheath, gives off one pair of muscles, which are inserted externally below the apex of the *os furcatorium*. The lower portion of the tube immediately above the bone of divarication, sends off a pair of muscles to be inserted in the *sternum*. The upper pair of muscles (furculo-tracheal) influence the length of the tube above the convolution. The inferior pair (sterno-tracheal) have the same power over the bronchial tubes and that portion of the trachea which is below the convolution. (*Zool. Proc.*, 1830—31, part 1.)

We cannot take leave of the Curassows, properly so called, without drawing the attention of the rural economist to the following observations of the late lamented Mr. Bennett. Speaking of the Zoological Society's menagerie, that excellent practical zoologist says, 'Of all the gallinaceous birds in the collection, the most interesting are those which hold out to us a prospect of supplying our farm-yards with new breeds of poultry of a superior kind. Such are especially the Curassows. In many parts of South America these birds have long been reclaimed; and it is really surprising, considering the extreme familiarity of their manners, and the facility with which they appear to pass from a state of nature to the tameness of domestic fowls, that they have not yet been introduced into the poultry-yards of Europe. That with proper treatment they would speedily become habituated to the climate we have no reason to doubt; on the contrary, numerous examples have shown that they thrive well even in its northern parts; and M. Temminck informs us that they have once at least been thoroughly acclimated in Holland, where they were as prolific in their domesticated state as any of our common poultry. The establishment however in which this had been effected, was broken up by the civil commotions which followed in the train of the French revolution, and all the pains which had been bestowed upon the education of these birds were lost to the world by their sudden and complete dispersion. The task which had at that time been in some measure accomplished, still remains to be performed; and it may not be too much to expect that the Zoological Society may be successful in perfecting what was then so well begun, and in naturalizing the Curassow * as completely as our ancestors have done the equally exotic, and in their wild state, much less familiar breeds of the turkey, the Guinea-fowl, and the peacock. Their introduction would certainly be most desirable, not merely on account of their size and beauty, but also for the whiteness and excellence of their flesh, which is said by those who have eaten of it to surpass that of the Guinea-fowl or of the pheasant in the delicacy of its flavour.' (*Gardens and Menagerie*, &c., vol. ii.)

Lieutenant Maw, who appears to have shot a *Red-knobbed Curassow*, on his passage from the Pacific to the Atlantic down the river Marañon, says that the native Peruvian name for the bird is *Peury*.

Penelope.

Bill moderate, naked at the base, entire, convex above, wider than it is high, bent at the point; lore and base of the bill naked. Under the *throat* a naked skin which is capable of being inflated or swollen. *Nostrils* pierced in the cere towards the middle of the bill, half closed. *Foot* (tarsus) slender, longer than the intermediate toe; nails somewhat curved, strong, compressed, and pointed. Fifth and sixth *quill* longest. *Tail-feathers* twelve.

Example.—*Penelope cristata*, Gmel. The *Guan*.

Description.—Length about thirty inches, the tail being thirteen or fourteen. Upper parts dusky black or bronze, glossed with green, changing to olive in certain lights. A black stripe passes from the under part of the bill backwards and surrounds the ear. Fore part of neck and breast spotted with whitish, each of the feathers being bordered by white; belly and legs, lower part of the back, and under tail-coverts, reddish. Cheeks naked and violet purplish. Iris reddish brown. Bill blackish. Feathers of the back of the head long, forming a thick tufted crest, which the bird can raise or depress at pleasure. Naked part of the throat scarlet, with a contractile and extensile fold of depending skin. Mr. Bennett observes that this fold retains its elasticity after death. The female differs from the male principally in having her plumage, especially her under parts, more decidedly tinged with red.

Mr Yarrell (*Zool. Proc.* 1833, part i.) states that the *trachea* of the *Guan* is uniform in size and substance throughout its whole length. After descending by the neck in the usual way, it is extended and passes downwards under the skin, but over the outer surface of the pectoral muscle on the right side, to the extent of two inches beyond the angle formed by the junction of the two portions of the *os furcatorium*. The tube of the *trachea* is then reflected, and ascending to the cavity of the thorax, again turns to be carried to the lungs as in other birds, and is provided with one pair of true muscles of voice, which have the usual origin and insertion. The loop or fold of the tube formed on the surface of the pectoral muscle is imbedded in cellular tissue, and further retained in its place by a strong ligament, which firmly adhering to the loop, passes backwards to be first attached to the posterior angle of the *sternum*, and afterwards dividing once, and passing still further backwards, the two slips are inserted on the two elongated pubic points of the *pelvis*. This structure in the *Guan*, Mr. Yarrell observes, has been noticed and figured by Mr. Temminck, in his 'Histoire des Pigeons et Gallinacés.'

Mr. Bennett remarks that the manners of the Guan have little to distinguish them from those of the curassows. Although to all appearance equally capable of domestication, they have not yet been introduced into Europe in equal numbers with the curassows, nor has the same success attended the attempts to propagate them in this quarter of the globe. 'We are told however,' continues Mr. Bennett, 'by M. Temminck, that the proprietor of a menagerie in the neighbourhood of Utrecht had bred them for several years; and there can be little doubt that with proper care and attention these birds might be added to the stock of our domesticated fowls. They are spoken of as furnishing an excellent dish for the table. In a wild state they inhabit Guiana and Brasil, and perhaps extend still further to the north. Their food consists principally of seeds and fruits, which they search for and eat upon the ground: but the greater part of their existence is passed upon the trees, on the tops of which they perch, and in which they build their nests. They are often found in large bands, but generally pair together with the strictest constancy. The females lay from two to five eggs. Their flight, like that of most gallinaceous birds, in consequence of the shortness of their wings, is low and heavy; and in the performance of this action they derive much assistance from their tail, the feathers of which may be expanded in the shape of a fan. All the birds of this genus appear to be known in Brazil by the name of *Jacu*, pronounced *Yacou*, derived, according to Marcgrave, from their note. This, as might be expected from the conformation of their trachea, is extremely loud, insomuch that when a considerable number are collected near the same spot, the very woods, to use the expression of the scientific traveller just quoted, re-echo with their clamorous cries.' The same author observes that M. Spix added very considerably to the difficulties that previously existed in distinguishing the species of this interesting group, by the publication, in his 'Brazilian Birds,' of a series of figures representing apparently very slight modifications of the common form, but to each of which he has prefixed a peculiar specific name. Mr. Bennett expresses his belief that most of these will be found on further examination to be referable to the present species, which, from its long domestication in the poultry-yards of South America, must necessarily be subject to very extensive variations. (*Gardens and Menagerie of the Zool. Soc.*, vol. ii.)

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* One of the six medals offered as premiums by the Zoological Society of London is 'to the breeder of the greatest number of curassows in the year 183[illegible] This is as it should be.

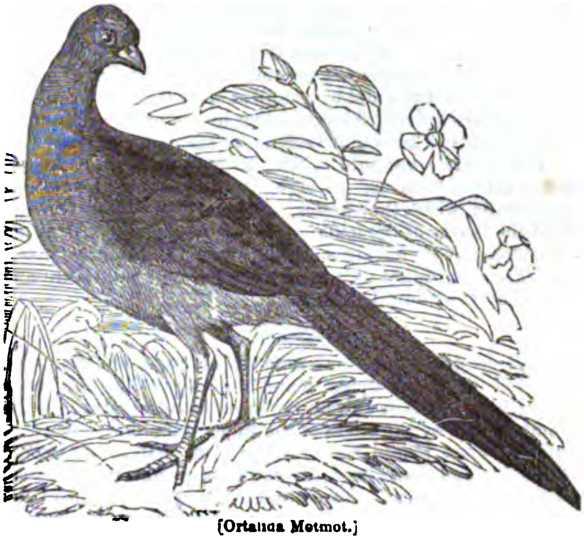
[Penelope cristata.]

M. Lesson, on the authority of M. Goudot, mentions a species, *Penelope Aburri*, Goud., two feet three inches (French) long, the tail being ten inches. M. Goudot states that this species seems peculiar to the mountains of New Grenada, inhabiting temperate and cold districts; it is, he says, unknown in the great warm valleys and by the rivers. In the environs of the city of Muzo, celebrated for its mine of emeralds, this bird, he states, is known under the name of *Pavo-ò-guali*. The inhabitants of the neighbourhood of Bogota and of the valley of Cauca designate it by the term *Pava Burri*, or *Aburri Aburrida*, which when slowly pronounced well expresses its cry. The male does not differ from the female; and those which M. Goudot opened had two cœcums analogous to *Penelope Parakona* and *Pavita* (*superciliaris?*). The *trachea* descended without any fold to the lungs. There was no gravel in the gizzard, the walls of which were thin, and nearly entirely covered by the proper muscles. M. Goudot states that the species lives solitary, perches upon high trees, flies but little, and suffers the hunter to approach easily within shot. It is never seen on the ground. The berries of trees compose its food. Its nest is formed in a mass of dry leaves, disposed between the forks of trees. The eggs are three in number, white, and one inch eight lines in diameter. These birds, adds M. Goudot, are very common in the mountains of Quindiu, between Ilague and Carthagena. Their notes are the last that are heard on the approach of night, and the first that announce the dawn of day.

Ortalida.

Characters the same as those of *Penelope*, excepting that the head is completely feathered, and that there is no nakedness about the throat or round the eyes.

Example.—*Ortalida Motmot*, *Phasianus Motmot*, Gmel., *Phasianus Parraqua*, Lath. Colour red brown, bronzed above. Tail moderate. *Locality.*—Guiana.



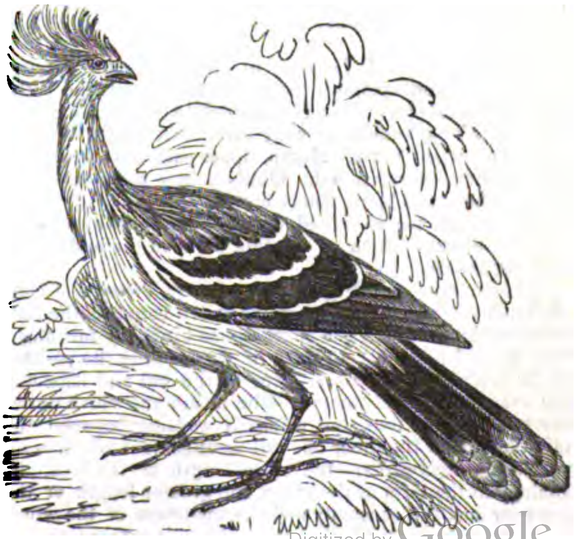
[Ortalida Motmot.]

M. Goudot describes a new species from Santa-Fé de Bogota, which M. Lesson names *Ortalida Goudotii*. The bird, it appears, is found in the same places with the *Penelope Aburri*. Total length 23 inches, of which the tail is 9. Feet red; tarsus 2 inches 5 lines; middle toe 2 inches 4 lines, the claw being 5 lines and a half (French). The bill is blackish, brown at its point; the upper mandible 1 inch 5 lines; cere and naked membrane round the eyes blue. All the upper plumage brown, with deep green reflections, or rather of a very deep greenish. Feathers of the throat grey. Bottom of the neck, belly, and abdomen, as well as the thighs, covered with ruddy. No crest nor nakedness about the throat. No fold of the *trachea* in either sex. *Locality.*—The mountains of Quindiu.

M. Lesson observes that this bird approaches nearly to the last, but is clearly distinguishable from it, especially by the *trachea*, which does not descend upon the abdomen

Opisthocomus, Hoffm. (Hoazin, Buff.; Orthocorys, Vieill.)

Bill thick, robust, short, convex, bent at the point, which is suddenly compressed, furnished with diverging bristles at the base, which is dilated laterally; lower mandible strong, terminated in an angle; edges dentelated towards the origin. *Nostrils* mesial on the surface of the bill, pierced (*de part en part*), covered above by a membrane. *Feet* robust and muscular; tarsus shorter than the middle toe, the lateral toes long, equal, entirely divided; sole broad; toes bordered with rudiments of membranes. *Wings* moderate, the first quill very short, the four following graduated, and the sixth the longest. *Tail-feathers* ten. Example.—*Opisthocomus cristatus.*



[Opisthocomus cristatus.]

This species, which appears to be the only one belonging to the genus, is the *Hoatzin* and *Hoactzin* of Hernandez; who describes it (p. 320) as an inhabitant of warm districts, where it was seen sitting on trees by the sides of rivers, and as having received its name from a supposed similarity of the shrieking cry of the bird to the intonation of the word *Hoatzin*. Hernandez relates some strange stories of cures effected by its bones and by a suffitus of its feathers; but says that the bird is deemed inauspicious by the natives. Sonnini states that it is known in Guiana by the name of *Sasa*.

The *Hoazins* are said to live in pairs or in small troops, consisting of from six to eight individuals, in the flooded savannahs, which they prefer, and where they seek for their food the leaves of the *arum arborescens*. Their flesh is not considered good, having a strong smell of *castoreum* about it. These birds are by no means timorous: in stature and gait they resemble the peacock.

Megapodius.

Bill slender, straight, as wide as it is high, and flattened above at the base; upper mandible longer than the lower, slightly curved at its extremity; lower mandible straight, the point hidden by the edges of the upper mandible. *Nostrils* suboval, open, placed nearer to the point than to the base of the bill, nasal fossæ long, covered by a membrane furnished with small feathers. Space round the eye naked, head and neck well feathered. *Feet* large and strong, placed far backwards; tarsus large and long, and covered with large scales, compressed posteriorly; four very elongated toes, the three anterior ones nearly equal, united at their bases by a small membrane, which is more apparent between the inner and middle toe than between it and the outer one; posterior toe horizontal, touching the ground throughout its length; claws very long, very strong, flattened above, very little curved, triangular, obtuse at the point, nearly like those of *Menura*. *Wings* moderate, concave, rounded; third and fourth quills the longest. *Tail* small, wedge-shaped, scarcely exceeding the wings in length, and formed of twelve feathers. (Quoy and Gaimard, with slight alteration.) Example.—*Megapodius Duperreyii.*

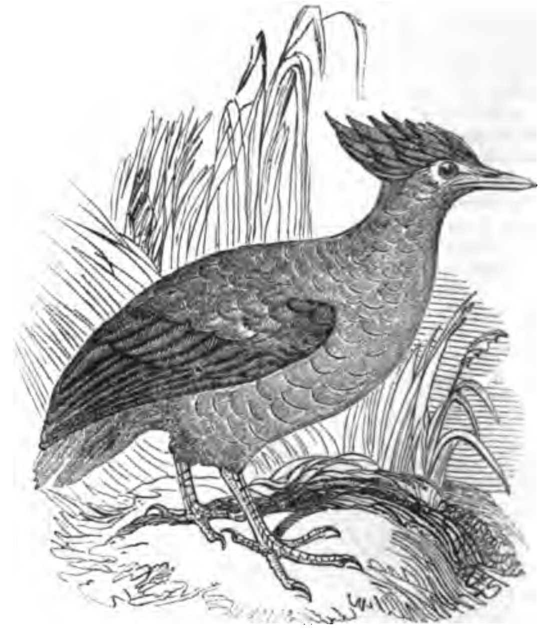
Description.—In size hardly so large as a partridge. Tarsi less elevated than they are in *Megapodius Freycinetii* and *M. rubripes*. The bird is, moreover, altogether better proportioned. Total length, from the extremity of the bill to that of the wings, which are longer than the tail, rather less than a foot (French). Tarsi strong, covered with scales, and 20 lines in length; middle toe, including the claw, 17 lines, hind toe 14, posterior claw 7. Bill slightly swollen towards its extremity, yellow, 8 lines in length. Nostrils suboval, covered with a membrane clothed with very small rudimentary feathers. Space round the eyes naked, but less than in the other two species. Neck well clothed with feathers. Iris reddish. A very thick crest covers the head; the feathers which compose it are raised (se redressent) towards the occiput. The wings are concave, an inch longer than the tail, and terminated in a point: the fifth quill the longest. Tail suboval, pointed, very short, composed of ten small feathers. Legs greyish, and feathered down to the tarsi; the claws slightly curved, pointed at the end, flat below, and of a brown colour. (Lesson.)

'The tuft,' says M. Lesson, 'of our *Megapodius Duperreyii* is of a brown yellow; the neck, the throat, the belly, and the lateral parts, are of a grey slate colour. The feathers of the back and the wing-coverts are large, and of a ruddy yellowish brown. Rump, upper part of the tail, and vent-feathers ochreous red. Quills yellow without, brown within, the shafts being ruddy brown.

'The middle toe is united to the inner one by a membranous border, which is wanting between the middle toe and the external one.

'In comparing our *Megapodius* with the *Menura* of New Holland, we cannot fail to perceive that it connects the last-mentioned genus with the gallinaceous birds, by forming a very natural passage. In fact, if we examine the position of the nostrils, the general form of the bill and legs, and the nakedness round the eyes—the membrane which unites the two external toes, but which is wanting between the middle toe and the inner one (an arrangement which is reversed in *Megapodius*)—the same length of the toes, the analogy in the form of the claws, the greater length of the posterior one, the concavity and the smallness of the wings—all these characters, in fine, coincide to confirm this passage, if we except the extraordinary grandeur and luxuriant form of the tail of *Menura*, a form without analogy among the other birds. *Megapodius* would thus belong to a small natural group, the *Lyriferi* of Vieillot (27th family); the name of which, in consequence of its having become improper, would have to be changed.'

Locality.—'*Megapodius Duperreyii*, the *Mangoipe* of the Papuans, inhabits the umbrageous forests of New Guinea, in the neighbourhood of the harbour of Doréry. The bird is timid, runs very fast among the bushes, like a partridge in standing corn, and utters a feeble cluck (un petit gloussement).' (Lesson.)



[Megapodius Duperreyii.]

M. Lesson states that he only observed *Megapodius Freycinetii* in the Island of Waigiou, and that the attempt to preserve it alive in cages was vain, for the birds soon died. Their flesh, he says, is black, very hard, and not very agreeable as food, although possessing a *fumet* which the cooking developes. The Papuans brought them on board the *Coquille* daily, and called them (those of the harbour of Offack at least) *Manesaqué*.

Both Pigafetta and Gemelli Carreri speak of the *Tavon* (*Megapodius*), and it would seem that this, the *Megapodius* of the Philippines, leaves its eggs to the fostering heat of the sun. The habits of the *Megapodii* of New Guinea and the neighbouring islands are, according to M. Lesson, entirely unknown.

Alecthelia.

The characters of the genus *Megapodius*, observes M. Lesson, established by MM. Quoy and Gaimard in the Zoology of the voyage round the world performed by the Uranie, are in great measure applicable to the subgenus *Alecthelia*, formed by M. Lesson for the position of a bird which differs from the true *Megapodii* or *Tavons*, by many distinctive characters.

Bill short, compressed, pointed: the upper mandible prolonged, the lower mandible a little swollen and very short. *Nostrils* at the base of the bill separated by a straight ridge. *Head* and forehead abundantly covered with feathers down to the nostrils. Space round the *eyes* furnished with short and close-set feathers. Inner *toe* rather the shortest, membrane which unites the middle toe to the inner one almost absent. No *tail*. All the feathers of the body, except those of the wings, composed of loose barbs, very finely ciliated on each of the shafts.

Example.—*Alecthelia Urvillii*, Lesson, the only species known.

Description.—Total length from the extremity of the bill to that of the wings, 5 inches 4 lines. Tarsi 14 lines; middle toe 10, hind toe 8, claws 5, bill 6 (French). The bird is covered with loose and scanty feathers, but has upon the occiput a thick bunch of feathers. The general tint is brown, fuliginous, deepest above. Belly and throat brown, slightly tinged with ruddy colour; throat ash-coloured, Wings concave, rounded, the feathers entirely brown, the second, third and fourth being equal; the upper part is brown sprinkled with zigzag or irregular lines, not well defined, of ruddy yellow. Place of the tail-feathers supplied by very loose plumes, composed of very fine barbs, bristled with very slender approximated barbules, presenting much analogy with those of the Cassowary (No. 6, pl. 67, *Atlas de Peron*), and which, implanted in the rump in the same manner, form a feathery tuft as in the Cassowary; all the feathers of this bird, except those of the wings, are composed of multiple stems, very slender and soft, furnished with equal and very fine barbules which may be called *multirachid*. The bill is greyish, and so are the feet. The inner toe is a little more united to the middle one than to the external one. The claws are slightly curved, sharp, convex above, concave below, and of a brown colour. The iris is reddish.

Locality.—This species, which comes from the Isle of Guebé, placed immediately under the equator, is, no doubt, proper to the neighbouring lands such as the great and beautiful Isle of Halamiva or Golilo, so little known and so little studied by naturalists. (Lesson.)

[Alecthelia Urvillii.]

CRACOW, a republic in the north-eastern part of central Europe, formerly part of the woywodship or palatinate of the same name in the kingdom of Poland. It lies between Austrian Galicia, Prussian Silesia, and the south-western part of Russian Poland. With regard to size, it is the fortieth, to population the thirty-seventh, and according to density of population the seventh, in the series of European states. It is the only vestige that remains of Polish independence.

Cracow lies on the northern bank of the Vistula, and contains an area of about 490 square miles. The surface consists of an undulating plain, broken by low hills and woods, and extends to the banks of the Vistula, which forms its southern boundary towards Galicia. The Vistula, which is the chief river of Cracow, receives within the confines of the Republic, the waters of the small rivers Cznerna, Przemza, Radewa, Monuszka, Chobka and Wolka, and becomes navigable under the walls of Cracow. There are neither canals nor lakes in the country; at Krzessowice there are warm sulphurous springs. The climate is moderate, though not genial enough to ripen the grape; it is however salubrious and agreeable, and milder than in the other parts of Poland. The soil is rich, but as agriculture has made little progress, it produces scarcely more grain than is sufficient for the consumption of the inhabitants. Yet Cracow is considered the most cultivated portion of Poland. The vegetables and fruits are excellent. Its chief productions are corn, pulse, flax, wood, oxen, sheep, swine, game, fish, wax, and honey; also coals, iron, marble, freestone, clay, &c. but the quantity of wood is inconsiderable, and the iron found is not sufficient to supply even the single works at Krzessowice.

Cracow contains only two or three manufacturing establishments, the chief of which are the ironworks of Krzessowice. The peasantry spin and weave their own cloth, and there is little trade except in the capital. The republic is divided into land and town districts; the first must have a population of more than 2000; the latter of more than 2500; each district has its starost; and three districts form a circle with a justice at its head. The population are chiefly of Polish extraction, there being only from 400 to 500 Germans, and between 10,000 and 11,000 Jews; it amounted in 1803 to 93,100; in 1819 to 95,822; in 1826 to 118,000; and in 1832 to 123,157. It has a militia of 300 men, and a gendarmerie of 40; but no regular troops. Although the established religion is the Roman Catholic, all Christian denominations enjoy liberty of conscience and worship; the number of Protestants is about 1700.

The yearly income and expenditure as fixed by the Chamber of Representatives for the period 1833—1837 is 1,775,766 Polish florins, or about 44,500*l.* sterling. Cracow contains 2 towns, 2 market-towns, 71 villages and hamlets, 16 monasteries, with 87 monks and 69 lay brothers; 10 nunneries with 164 nuns; 100 churches. The bishop of Cracow has a chapter of 16 canons.

In the partition of Poland in 1795, Cracow fell to the share of Austria, and in 1809 was erected, with the whole of western Galicia, into the grand duchy of Warsaw. Its existence as a republic, dates from the Congress of Vienna in 1815, when the three great powers, Austria, Russia, and Prussia, not being able to agree to which of them it should be assigned, determined to form it into an independent republic under their joint protection, guaranteeing to it the perpetual neutrality and inviolability of its territory, except in the case of its affording an asylum to deserters, or offenders against any of the three protecting powers.

By the constitution of the Republic of Cracow, there is no distinction of ranks; all are equal in the eye of the law. The legislative authority is vested in a body of representatives elected by each district, three members of the senate (one of whom is president of the assembly), three canons of the chapter of the cathedral, three doctors of the university of Cracow, and six judges of the tribunals. This body annually holds a session in December, which continues about a month; makes laws, votes the budget, inspects the administration, nominates two-thirds of the senators as well as the judges, &c. The executive power is lodged in a senate of twelve members and a president, who, with eight of the senators, is nominated by the legislative assembly; two are chosen by the chapter and two by the university. Of the senators, eight are chosen for life, and four are elected annually; the president is chosen for three years. The senate draw up laws previously to their being laid before the legislature; and appoint to such civil and ecclesiastical offices as are not dependent on the chamber of deputies.

CRACOW (in Polish, Krakoo), the capital of the republic of the same name, is situated at the foot of Mount Krakus or Wavel (699 feet above the level of the sea), in the delightful and extensive valley of the Vistula, and on the left bank of the river, at its confluence with the Radeva, in 50° 4′ N. lat., 15° 15′ E. long. It is enclosed by three hills; the St. Bronislava, on which a monument, 120 feet high, has been erected, in memory of Kosciusko; the Krakus or Wavel, and the Wanda. It is united to the Austrian town of Podgorze by a bridge of rafts 145 feet long.

Cracow is surrounded with promenades, which have replaced the old ramparts, walls, and towers. It consists of three distinct quarters, Cracow, Stradom, and Kazimierz, which last lies on an island in the Vistula, and is joined to the town by a bridge. It is the residence of the Jews, who have here a synagogue. The suburbs are likewise of some extent.

This antient capital of Poland, where its kings were crowned and buried, received its name from Krakus, duke of the Poles and Bohemians, or White Chrobatia, who is said to have founded Cracow about A.D. 700. It was wrested from the Moravians by Ziemowit, the Bohemian, and was taken from the Bohemians in 999 by Boleslaus the Great, who raised it to the rank of the capital of Poland. Its antient limits were far more extensive, and its population treble the present amount. It had a flourishing commerce, and its numerous lofty towers and buildings still give to it, in the distance, the appearance of a large and handsome city; but this impression is destroyed on entering its dark, narrow, and deserted precincts. The town is however clean, and has a very spacious public square, surrounded with low miserable shops.

The most striking of its antient monuments is the cathedral, a beautiful specimen of Gothic architecture, and the finest in Poland; it was destroyed by fire, and rebuilt by Nanker, bishop of Cracow, in the year 1320. Here the kings of Poland were crowned, and its numerous chapels recall the events of the history of this kingdom, from Boleslaus to Kosciusko. It has 50 altars, above 20 chapels, and contains the tombs of most of the Polish monarchs, of Casimir, John III., Sobieski, St. Stanislaus, whose remains are enclosed in a silver coffin, Prince Poniatowski, Kosciusko, and Dombrowski, &c. The archives and library preserved in this edifice contain many valuable manuscripts. Its bell, the largest in Poland, was cast in 1520.

The castle, called the Königsburg, on Mount Wavel, a very spacious Gothic structure, the first building of which was, as is said, the work of Krakus about the year 700, suffered by two great conflagrations. It was restored to its pristine splendour by Augustus II. of Poland. It was fortified by Dumourier in 1768, and repaired when in possession of the Austrians, who converted it into barracks. Its subterranean vaults, which are excavated in the mountain, were formerly the depository of the royal regalia. Of the 71 churches which Cracow once contained, only 38 are at present devoted to the purposes of divine worship. The finest of these are St. Mary's, which is second only to the cathedral; the Protestant church of St. Martin, and many magnificent convents, of which several were abolished by the Austrian government. The other remarkable edifices are the episcopal palace, a spacious building of modern construction, with an historical museum for Sarmatian remains; the old Town Hall, a quadrangular, tower-like structure, evidently built for defensive purposes, &c. The Roman Catholic University, which was founded in 1364 by Casimir the Great, and in 1780 assumed the title of Schola Regni, is the oldest, and was formerly the only university in Poland. It contains a library, chiefly of old books, and a collection of 5000 MSS., principally on theology; an Observatory, situated in the suburbs of Wessola; a cabinet of natural history, &c. It has four faculties; in 1817 it had 131 students, and since then never more than 250 or 300, although it is open to all Poles under the Austrian, Russian, or Prussian dominion.

There are, besides, in Cracow, a Piarist college and gymnasia, normal, and various elementary schools, 5 hospitals, an orphan asylum, &c. The town contains nearly 2000 houses. Under Sigismund I. Cracow had 80,000 inhabitants; in 1818 they had dwindled down to 24,506, and at the present day their number is about 24,900. There are no manufactures, except a few of cloth and woollens. The trade, which is principally in the hands of the Jews, is not extensive, although Cracow is the chief depôt of Hungarian wines, salt, and wax, and the central point of commerce between Poland and part of Galicia and Hungary.

Near Cracow is Lobzoff, a summer residence of the former kings of Poland; it was built by Casimir the Great, whose mistress, Esther, a Jewess, was buried in the gardens belonging to it.

CRA'CTICUS. [Barita.]

CRADLING, slight timber-framing constructed under floors in order to form arched or coved ceilings to this timber-work the lath and plaster is attached. The same term is applied to the rough framing to which the entablature and cornice of a shop-front may be attached.

CRAIG, JOHN, was educated at St. Andrews, Scotland, and then became a tutor in England to the children of Lord Dacre. Returning to his native country when the two kingdoms were involved in war, he entered the Dominican order, but was shortly afterwards imprisoned on a suspicion of heresy. On regaining his liberty, he went into England again, thence to France, and finally to Rome, where his talents recommended him to the notice of Cardinal Pole, under whose direction he entered the Dominican order at Bologna. Here he became entrusted with the education of the novices, and was also employed in various ecclesiastic missions throughout the continent; and for his important services was rewarded by the appointment of rector to one of the schools of the order. Having afterwards become a convert to the opinions of Calvin, he was seized, and accused of heresy, then sent to Rome, where, after an imprisonment of nine months, he was summoned to stand his trial before the court of Inquisition. Here he made a bold confession of his faith, and, being accordingly convicted, was condemned to be burnt. It happened, however, that on the night previous to the day on which this sentence was to be put in execution, the pope died, and the populace rejoicing to be free from his yoke, rose in a tumultuous manner, and broke open the prisons. Craig came forth from his cell, and fled to Vienna, whence, after remaining there a short time, he was dismissed by the emperor with letters of safe conduct, under the protection of which he passed through Germany into England, and thence to Scotland, where he arrived soon after the establishment of the Reformation. He preached for a short time in Latin to the learned in St. Magdalen's chapel, when, having recovered his native language, he was appointed minister of Holyrood-house, and became a principal coadjutor of Knox, the great Scottish reformer, in the work of reformation. He was afterwards appointed minister of Montrose, and in 1574 minister of Aberdeen, in which capacity he was chosen Moderator of the General Assembly of the church of Scotland, which met in October, 1576. The following year he was removed to Edinburgh; and in 1579 was associated with the learned John Duncanson as minister to the royal household.

Craig drew up the National Covenant in the year 1580; he was also the author of two theological works; the one an answer to an attack on the Confession of Faith, the other a form of examination entitled Craig's Catechism, which was appointed by the General Assembly to be used in schools and families in place of 'The Little Catechism.'

He died at Edinburgh, on the 12th December, 1600, at the advanced age of 89; but for some years before had performed no public duty. (See M'Crie's *Melville;* and Tytler's *Life of Sir Thomas Craig.*)

CRAIG, SIR THOMAS, of Ricearton, was, according to Baillie's biographical notice of him prefixed to the last edition of his celebrated Treatise on the Feudal Law, the son of Mr. Robert Craig, merchant in Edinburgh, a descendant of the Craigs of Craigston, in Buchan; though, as we shall afterwards find, this statement has been disputed. Baillie says that Craig was born about the year 1548; but this is plainly a mistake, for in 1552 he was sent to the university of St. Andrews, and entered as a student of St. Leonard's, a college which had been erected about forty years before 'for training up poor scholars in learning and the arts, to the glory of God, and the spiritual edification of the people.' He remained here only till he proceeded bachelor of arts, when he went to France to prosecute his dies in the university of Paris. On his return to Scotland, about 1561, the Reformation had just been accomplished there; and his distinguished relative, the Rev. Dr. John Craig, was then minister of Holyrood-house. This learned divine had himself arrived in Scotland only a twelvemonth before. Under the care of this eminent person the religious views of young Craig were changed, and, devoting himself entirely to study, he left nearly all his youthful contemporaries in literature far behind him.

He passed advocate in the Court of Session at Edinburgh on the 2nd February, 1563; and in July that year we find him in the judicial situation of justice depute to Archibald, fifth earl of Argyll, hereditary lord justiciar of Scotland (*Abstract Books of Adjournal, MS. Adv. Libr.*), an ardent friend of the Reformation. In May, 1564, he had a grant from the crown of the escheat of Alexander Innes, of Crombie; and in the following January, another grant from the crown of the unlaws or amerciaments of any six persons he might choose among those unlawed in the justice courts, and this *so long as he should enjoy the office of justice depute.*

His first appearance as an author was on occasion of the queen's marriage with her cousin Darnley, for which he composed an epithalamium, or marriage song. The piece, which is not to be found among Craig's poems in the 'Delitiæ Poetarum Scotorum,' was only lately discovered. As described by Tytler, it is in its general tone too full of effort, too ambitious in the display of classical allusions, and too richly and laboriously coloured, but not without some passages of beauty and simplicity. The little offering was tendered to a woman—a queen—a bride, and all these centred in one who was not inattentive to the interests of learning. On the 24th October that year, Craig had a grant from the crown of the unlaws above mentioned *during his life.*

In his office of justice depute Craig appears to have been particularly zealous. A remarkable instance of this occurred the following month. On the 14th November, 156 one John Pigget was indicted before him for the murder of one Agnes Robertson; and what is singular, there was produced in evidence a certificate in Latin by Craig himself of the fact of Pigget committing the murder by assault; and moreover we find Craig protesting for an assize of error, or writ of attaint, in case the jury should acquit the prisoner. (*Abstract Books of Adjournal, MS. Adv. Libr.*) Conduct like this shocks our feelings of judicial propriety; yet we must condemn it with lenity, and would impute it to the times rather than to the man. On the 18th of December he had a grant from the crown of the escheat of Alexander Dunning of Westercrieff; and the week following, a grant of the escheat of James Johnston, in Middlegill, and others. In looking at these grants of escheat, we must bear in mind, that in the times we speak of, the judges were commonly paid out of the issues of their court, and it is probable that Craig had then no other source of remuneration. In 1574 however, when, as we shall find, he was promoted in his profession, he received from the lord treasurer 120*l.*, being his fee as justice depute for three years from Whitsunday, 1571, at the rate of 40*l.* a year, which was an allowance equal to that then paid to the lord advocate. Craig presided in the court of justiciary held in April, 1566, where Thomas Scot, the sheriff depute of Perth under Lord Ruthven, the hereditary sheriff, and Henry Yaire, a priest, servant to the Lord Ruthven, were adjudged to be hanged and quartered, and their heads set upon the turret of the buildings adjoining the royal palace, under the suspicion of having been accomplices in the murder of Rizzio, who was openly assassinated in the queen's presence by the Lord Ruthven, the Lord Chancellor Morton, and others, at the head of whom was Darnlev himself.

On the 19th of June following, the queen was delivered of a son, and Craig again appeared as a court bard, hailing the birth of the young prince in a Genethliacum in Jacobi principis Scotorum. He seems soon afterwards to have married Helen Heriot, daughter of the influential laird of Traborun, in the county of Haddington; and in 1569 his eldest son Lewis was born.

Craig continued in the office of justice depute till the end of the year 1573, when he was appointed sheriff depute of Edinburgh, under the earl of Morton above mentioned, the hereditary sheriff, to which place and that of admiral of Scotland the earl was appointed by the regent Murray, in 1567, not long after he had been reinstated in the chancellorate; and Craig's younger brother Robert was made justice depute in his room. From the beginning of the year 1576 Craig was in the courts as a practising counsel down to the beginning of the year 1581. Morton was that year committed to Dumbarton castle for his supposed concern in the murder of Darnley; and the same year Craig was ordered to enter his person in ward in the same castle of Dumbarton. Craig at last obtained his liberty, but was not replaced in the office of sheriff depute.

In April of the above year, 1576, Craig got a crown charter of the estate of Craigfintray, in the county of Aberdeen, to himself and his heirs male; whom failing, to his brothers John, James, Robert, and Oliver, and their heirs male; whom failing, to the heirs male whatsoever of William Craig, of Craigfintray, bearing his name and arms; the charter proceeding on the resignation and surrender of the said William Craig to the above effect. The precise relationship existing between these persons is not known; but from the destination Mr. Tytler supposes that William Craig was the father of the above brothers. He accordingly disputes Baillie's account of our Craig's lineage, and adds that he was the heir of the property and the representative of the family of Craig of Craigfintray. But there are reasons for not concurring in Mr. Tytler's opinions which seem to us conclusive.

In April, 1588, Craig obtained a crown charter of the lands of St. Lawrence Houses, in the county of Haddington, to himself and Helen Heriot, his wife; and from about that time forward we find him again in practice at the bar. He resumed also his poetic pen, and wrote some commendatory lines to Jacks Onomastichon, published in 1592. The same year the king brought a reduction of some deeds and conveyances executed by his Majesty under influence on his minority; and Craig, who had now been about thirty years at the bar, and enjoyed a very high professional reputation, was taken into the cause to assist Skene and old M'Gill, the crown counsel.

It was probably about this time that Craig contemplated his great work on the feudal law. Such a work was in a manner new to the law literature of Scotland. The learned King, his junior at the bar, had improved upon his predecessor, Kintore, and composed a Treatise on Maritime Law,—probably the first regular work on that branch of jurisprudence in Britain; and Balfour's 'Practicks' were well known. But no Erskine had yet arisen, no Stair, no Mackenzie; and Hope was at this time but a 'servitor' to Nicholson, who, like most of his brethren, regarded Sharp and Craig with the awe due to a superior order of beings. But Craig narrowed his powerful mind, its fancy and genius, and all its accumulated stores of learning and experience, to a temporary object; and to adopt the sentiment if not the language of one who had weighed his merits, instead of seizing the precious opportunity he enjoyed of presenting to his country a just system of her national jurisprudence, he not only passed by the evidences of her common law which lay beside him, but endeavoured to sink them into oblivion in favour of the civil and feudal laws. (Ross's *Lectures*, vol. ii. pp. 9, 10). He had scarcely risen from his learned labours however, when he found that Elizabeth was on the eve of her demise; and that various intrigues were carrying on and cabals formed to secure her crown, with a view to the king's succession to which his treatise on Feuds was composed. On the 1st of January, 1603, therefore, he dedicated to the king a treatise on the Succession to the Throne of England, which he had written in confutation of the jesuit Parson's Conference on the Disputed Succession, wherein the right of the people to choose their king was boldly reasoned, and the crown indirectly claimed for the infanta of Spain. But in less than three months after, the queen repeated on her death-bed her former declaration that her cousin the king of Scots should be her successor James accordingly ascended the throne of England without dispute; and Craig's reply to Doleman was never printed.

On the king's departure for England with his family, Craig wrote a Paræneticon of congratulation: and on the same occasion, a Propempticon, or farewell poem, to the young prince Henry. The same year he composed his 'Stephanaphoria,' in honour of the king's coronation; of which ceremonial Craig seems to have been a witness, having, in all likelihood, accompanied the royal party into England; and previous to his return home he addressed to the king a short poem, in which he took a solemn farewell of his Majesty, and, at the same time, of the Muses.

Soon after his return Craig was appointed one of the commissioners nominated by the parliament to meet with commissioners from England and treat of a union between the two kingdoms; and thereupon in the summer of 1605 he wrote his treatise on the union. About the same time he wrote his treatise on homage, to vindicate Scotland from the charge of feudal dependence on the crown of England, brought against it in the chronicles of Hollinshed. Neither of these works was ever published; and the latter doubtless for obvious reasons. The tilt against the old chronicler by a knight so well accomplished as Craig can be enjoyed in the closet; but it would have been unwise to set the lists before the world, or renew feelings of jealousy between nations now united under one and the same crown.

It is probable that Craig had the offer of a seat on the bench, though he was never raised to it; but his son Lewis was, somewhere between the month of February, 1604, and the month of June, 1605, knighted, and admitted as an ordinary lord, when he had been little more than four years at the bar.

In the year 1606 Craig held the office of advocate for the church of Scotland; and some time before his death, as he would not formally accept the honour of knighthood, the king commanded that he should be everywhere saluted by the style accorded to that honour.

The particulars of his death are not known; it took place on the 26th of February, 1608, when he had been upwards of forty-five years at the bar, and probably therefore when he was not much short of seventy-five years of age.

CRAIG, JOHN. The dates of his birth and death are unknown; but he was alive in the interval 1685-1718. He was a Scotchman by birth, and was rector of Gillingham, in Dorsetshire. He deserves remembrance as one of those who were active in developing the principles of the theory of fluxions after its appearance. His writings are partly in the Philosophical Transactions, and partly published separately. The latter are, 'De Calculo Fluentium,' London, 1718, with two books 'De Opticâ Analyticâ.' 'De Figurarum, &c. Quadraturis,' London, 1693. There had previously, in 1685, appeared a tract on the same subject. 'Theologiæ Christianæ Principia Mathematica,' London, 1699, a very silly attempt to apply numerical reasoning to historical evidence. He concludes from a formula that the evidences of Christianity will be extinct by lapse of time in 1454 years from 1696, or A.D. 3150, at which date he therefore places the commencement of the Millenium. Craig is called by some continental writers the introducer of the theory of Leibnitz into England. [Fluxions.]

CRA'MBE MARI'TIMA, or **SEA KAIL**, is a glaucous spreading plant, with broad-toothed sinuated leaves, and dense corymbs of large white flowers, found occasionally on the sea-coast of England, and now commonly cultivated in gardens for the sake of its delicate tender shoots. Naturally the flavour of the plant is strong, cabbage-like, and highly disagreeable, but in the state in which it is sent to the kitchen, it is merely a colourless mass of delicate fleshy vegetable tissue, with little or no flavour. This arises from the shoots that are to be cooked being grown in darkness, and with a little more speed than usual. For this purpose a garden-pot is inverted over the crown of an old sea-kail stock, in the winter before the leaves sprout. Over the pot is thrown a little litter, or some decaying leaves, or some old tan, so as to increase the temperature of the earth, and to exclude light; after a week or two the pot is examined from time to time, and when sprouts five or six inches long have been produced, they are cut off and fit for table.

Sea kail loves a light sandy soil, well drained in winter and richly manured. It will continue to bear cutting for twenty years together without suffering much; and is one of the most simple and useful of all culinary plants for a small garden. It is generally grown in rows eighteen inches or two feet apart.

CRA'MBUS, a genus of moths (*Lepidoptera Nocturna*) of the family Tineidæ (Stephens).

In crossing dry meadows during the summer time, we observe numerous little moths fly from the grass at every step we take; they soon settle again, and are then not easily detected, owing to their mode of folding their wings, which when shut almost inclose their slender bodies, and partly surround the blade of grass on which they rest; their form is then long and narrow, pointed at the head, and somewhat truncated at the opposite extremity. Their colouring is often brown and white, disposed on the upper wings principally in longitudinal lines. Very frequently, however, we find them adorned with beautiful metallic colours, generally of silvery or golden hues. Such are the insects which constitute the genus *Crambus*, and of which we possess about forty species in this country. The technical generic characters are:—Proboscis distinct; wings convoluted round the body when at rest; superior wings narrow; palpi long, the inferior the longer; head furnished with short closely-applied scales.

When the wings are expanded, these moths commonly measure about an inch in width; they are called in England the *Veneers*, and sometimes *grass-moths*.

CRAMER, GABRIEL, born, 1704, at Geneva; died, 1752, at Bagnols. He was professor of philosophy at Geneva, and author of a large number of works, for a list of which the 'Biogr. Univ.' refers to Sénebier, 'Hist. Litt. de Genève.' We have here only to mention him as the editor of the works of John and James Bernoulli, of the correspondence of the former with Leibnitz, and to notice his 'Analyse des Lignes Courbes Algébriques,' Geneva, 1750. This work is the largest collection of examples which exists, and is of permanent utility to elementary writers. So far as expressions entirely algebraical (as distinguished from transcendental) are concerned, it is a complete treatise on the elementary theory of curves.

CRAMP, a sudden, violent, and rigid contraction of a muscle, with pain, often intense. [Spasm.]

CRAMP, or **CRAMPERN**, is a piece of metal, usually iron, bent at each end and let into the upper surface of two pieces of stone when their perpendicular faces are joined together. Cramps are employed in the masonry of all solid structures. Copper, though more expensive, is better adapted for cramping, on account of its durability, than iron as the iron, through oxidation, causes the stones to split. The antients often used bronze cramps to bind their masonry together, as in the Colosseum. A great many of the cramps of this building have been cut out on account of the value of the metal. When a piece of stone is placed perpendicularly over another, without being connected with any other stone at the side, as in the Gothic pinnacle or in the shaft of a column, an upright piece of iron or copper is used, which is termed a plug. Cramps are cemented to the stone with lead; sometimes plaster, and even sulphur is used. In the fourth volume of Stewart's 'Athens' are some interesting details by Mr. Cockerell of the manner adopted by the Greeks in cramping the stones of the temple of the giants at Agrigentum. The Egyptians sometimes used wooden cramps.

CRANBERRY, the fruit of two species of Oxycoccus. The *English cranberry*, Oxycoccus palustris, is found wild abundantly in the fens of Norfolk, Lincolnshire, and many other parts of England, always by the side of little rills, and not among stagnant water; it has slender trailing thread-like shrubby shoots, clothed with tiny linear leaves, and has a five-parted pink corolla with the segments sharp-pointed and turned back. The fruit is a round austere red berry, which makes excellent tarts and one of the many kinds of marmalade. The Russian cranberries of the shops are borne by this species. They are not gathered till after the disappearance of winter. Near Petersburgh the cranberry plant is so common, that the snow is stained crimson by the berries crushed to pieces by the passage of sledges over them. The *American cranberry*, Oxycoccus macrocarpus, is very like the other, but its leaves, flowers, and fruit, are larger; and the latter has a more medicinal taste. It is imported from the United States, in hogsheads, in considerable quantity, and used for the same purposes as the other; but it is considered of inferior quality.

Oxycoccus palustris has never yet been cultivated to any good purpose; chiefly owing to the difficulty of giving it a supply of running water. The Oxycoccus macrocarpus will grow readily and bear abundantly if planted in peat earth in a moderately damp and slightly shaded bed. It is however seldom so treated, the berries themselves being so cheap in the London market.

We believe that what in Scotland is called cranberry marmalade, is not prepared from the berries of the cranberry, but from those of the Vaccinium Vitis Idæa.

CRANBORNE. [Dorsetshire.]

CRANE. [Gruidæ.]

CRANGON. [Crustacea. Shrimp.]

CRA'NIA. [Branchiopoda.]

CRANIOLOGY. [Phrenology.]

CRANMER, THOMAS, the second son of Thomas Cranmer and Agnes, daughter of Laurence Hatfield, his wife, was born at Aslacton, in Nottinghamshire, on the 2nd of July, 1489. The respectable family from which he descended had been settled in that county for some generations. His first instruction was received at a village school, from which he was removed by his mother, who had become a widow, and who placed him, in 1503, at Jesus College, Cambridge, where he became a fellow in 1510-11. He applied with great diligence to the studies of the University: Greek, Hebrew, and theology were the principal objects of his industry. Before he was twenty-three years old, Cranmer married a woman of humble station but respectable character, a kinswoman of the landlady of the Dolphin; and having in consequence forfeited his fellowship, accepted the appointment of lecturer in Buckingham, now called Magdalene College. The duration of this employment was very short; for in about a year after his marriage, his wife having died in childbed, by a somewhat irregular proceeding he was restored to his fellowship at Jesus. The agents of Wolsey, who had founded this celebrated college at Oxford, were now searching the kingdom for men of talent and learning to fill the vacant chairs in that establishment; and Cranmer was distinguished by them with the flattering offer of high and lucrative employment. After some hesitation, he refused the new dignities. In 1523 he took the degree of D.D. During his residence in the university, he had undertaken, in addition to his other duties, the charge of educating two sons of a Mr. Cressy, who was connected with him by marriage; and when the sweating sickness broke out in Cambridge (1528), retired to that gentleman's house at Waltham Abbey, where he was occupied with the instruction of his pupils and the prosecution of his studies. This change of residence influenced the remainder of his life. By order of Henry VIII., six men of learning had been chosen from each university to discuss the validity of his marriage with his brother's widow, Catharine of Aragon, and Cranmer, among others, was selected; his absence from Cambridge, however, prevented him from giving his assistance to the delegates, who finally elected a substitute in his place. Either accidentally or by design, Gardiner and Fox (afterwards bishops of Winchester and Hereford) being in attendance upon the king, who was on a journey, met Cranmer at Mr. Cressy's table, and inquired anxiously the opinion of so distinguished a man upon the all-absorbing matrimonial question. He replied, that although he had not given much consideration to the question, he thought the course to be followed appeared to be sufficiently simple. The cause should be determined by reference to the Bible—should be settled by divines, the most proper persons to determine it, and by those of the English universities, who were as well fitted to entertain it as those of Rome or any foreign country. The report of this judgment, which was not wholly new, gave great satisfaction to the king, who immediately sent a messenger to require his attendance at the palace. Unwilling to forsake a life of study and retirement, Cranmer endeavoured to excuse himself from attending at court. His excuses, however, did not avail; and the reluctant adviser having been graciously received, was commanded to reduce his opinion to writing, and consigned to the hospitality of Lord Wiltshire, the father of Anne Boleyn. The opinion was soon written. It asserted that the marriage of Henry with his brother's widow was condemned by the authority of the Scriptures, the councils, and the fathers; and that the pope had no power to give a dispensation for that which was contrary to the word of God. Cranmer having professed his willingness to maintain these positions in the presence of the pope, was acquainted with the king's intention immediately to send him to Rome. Pains were taken to make this judgment known. Cranmer himself disputed upon it at Cambridge, and brought several over to his opinion. He then returned to his attendance upon the court; and having been appointed chaplain to the king, and presented to a benefice and the archdeaconry of Taunton, joined the others who were associated with him in the embassy, and travelled to Rome about the close of 1529.

The ambassadors, finding all arguments unavailing to persuade Clement to favour the divorce, quickly returned to England. Cranmer alone remained in Italy. At length even his patience was exhausted by continued refusals to allow him to maintain in public the judgments of the English and foreign universities, which were for the most part favourable to the king's cause. The pope conferred on him, for the sake of conciliation, the empty title of 'Supreme Penitentiary,' and soon afterwards gladly saw him turn his back upon Italy (1530). In prosecution of the same business, Cranmer now went to France, and also to the emperor of Germany—an expedition which, although it produced no decisive public result, led to an event of great private consequence to himself. Regardless of the Romish injunction for clerical celibacy, during this residence abroad he married (1532) a second time; the object of his choice was the niece of his friend Osiander, the pastor of Nuremburg. This imprudent act, which he could not avow, exposed him eventually to many unworthy evasions. It was not long after they were united, before Cranmer received news of Archbishop Warham's death (August, 1532), and of Henry's intention to raise him to the see of Canterbury. He suffered four months to elapse, in the hope that the king might change his mind, and then unwillingly accepted this promotion, which the necessary oaths respecting celibacy and obedience to the pope rendered unacceptable: he was consecrated on the 30th of March, 1533, making a public protestation, at the time when he swore submission to the pope, 'That he did not intend by this oath to restrain himself from anything that he was bound to either by his duty to God, or the king, or the country.' 'By this,' says Burnet (*Hist. Reformation*, vol. i.), 'if he did not wholly save his integrity, yet it was plain he intended no cheat, but to act fairly and above-board.' Afraid of a rupture with England, the pope accepted less than the usual fee.

Cranmer, soon after his appointment, discussed the king's cause in convocation; and having travelled to Dunstable, to which town the commission adjourned in order to be near Queen Catharine's residence at Ampthill, he there (23 May, 1533) declared the marriage null and void. Five days afterwards he publicly married the king to Anne Boleyn, a private marriage having taken place in the January previous. He also officiated at their coronation on the 1st of June, and stood sponsor to the Princess Elizabeth, who was born in the following September. The business of his office and parliamentary duty now occupied his time. With his assistance were passed several statutes, by which the power of the pope in England was materially diminished; the convocation and universities assented to these statutes, pronouncing that 'the bishop of Rome has not any greater jurisdiction conferred on him in this realm of England than any other foreign bishop.'

In 1534, when Sir Thomas More and Fisher, bishop of Rochester, refused the oath of supremacy, Cranmer's best endeavours were used in vain, first to overcome the scruples of the recusants, and afterwards to dissuade the king from executing the sentence that had been pronounced upon them. In this year, with the consent of the convocation, he set on foot a translation of the Bible, by dividing Tindal's version of the New Testament into nine or ten parts, which he required the most learned bishops to revise; the translation was completed and ultimately printed at Paris. In 1535 Cranmer assisted in the correction of a second edition of the King's Primer, a book containing doctrines bordering upon Protestantism, of which it has been asserted that the archbishop was originally the compiler. His continual study of the bible, and the notes that he had collected upon all heads of religion, both from places in scriptures, and ancient fathers and doctors, fitted him most fully for the undertaking. In August he wrote a curious letter (Strype) to the king, respecting the publication of his supremacy by the clergy, and urged him to the suppression of the monasteries, which he considered inconsistent with true and full reformation. Cromwell was now raised by the king to be head of his ecclesiastical affairs, under the title of Vicar-general, and Cranmer consecrated Latimer and Shaxton to the sees of Worcester and Salisbury. In 1536 died Catharine the divorced queen; and Henry being now tired and jealous of Anne Boleyn, soon got rid of her. Cranmer was forbidden the court, lest his presence might impede the proceedings against the queen, from whom he received uniform kindness. In virtue of his office he pronounced her marriage void (1536), and on the day after her execution the king was united to Jane Seymour. In June the archbishop opened the convocation, where Cromwell presided as Vicar-general; the record of the late queen's divorce was sanctioned without the opposition of Cranmer or any other member. After much violent and useless discussion, the synod proceeded to debate upon the sacraments. Cranmer spoke at considerable length, and articles were afterwards framed by him, and others of the 'new learning,' as the doctrines of the reformers were then called, by which considerable innovations were effected. The pope, who was watchful of the proceedings of England, threatened to assemble a synod, for the sake of passing censures upon Henry; in anticipation of which, Cranmer and others signed a declaration that the king need not obey their decisions, in case such an assembly was convened. With the assistance of many eminent divines, Cranmer arranged a compilation called the Bishops' Book, inculcating the doctrines of the Reformers as expressed in the articles of the preceding year. The king, to whom this book was submitted, himself inserted some corrections, from which the archbishop was bold enough to dissent. However ill Henry's temper might have brooked such contradiction from another, he bore it patiently from the archbishop, who had been his most useful friend, and we find that in the October of this year, when the queen gave birth to Prince Edward, the primate and the duke of Norfolk stood sponsors at his baptism.

The destruction of the greater abbeys was now rapidly proceeding; and the funds which arose from them were lavished by Henry upon unworthy favourites, until Cranmer, who had hoped to apply them to the promotion of religion and education, remonstrated against their improper application. A sum of money was obtained for the foundation of some new bishoprics, but the king's prodigality could be checked no further. In the autumn of 1538 the primate came to London to meet an embassy of German Protestant divines, for whom he strove to procure a conference with the English ecclesiastics. To the great disappointment both of the ambassadors and the reformers, the king opposed their wishes, and directed Tonstal, a bishop opposed to the 'New Learning,' to draw up an answer to the dissertation which had been compiled by the German divines.

On the 5th of May, 1538, Cranmer and others were appointed commissioners 'to inquire (Le Bas, vol. i. 204) into the debated doctrines, and to prepare such articles as would pacify the spirit of controversy.' At the end of eleven days, the labours of the commissioners coming to no result, the duke of Norfolk offered six articles (Burnet, vol. i.) for the consideration of the House of Lords. Cranmer's opinion agreed only with one of these articles. Being desired by the king to explain himself in writing, he composed a treatise upon the case, which, with his secretary, to whom it was intrusted, became the subject of a singular adventure. (Burnet, vol. i.) In parliament, he argued for three days with considerable learning and eloquence, until the king, who favoured the articles, angrily desired him not to appear again in that house before they had become law. Cranmer, obedient to Henry in most points, in this respectfully resisted the king's commands: but although he continued present, he was unable either to throw out the duke of Norfolk's measure, or to alter the sanguinary penalties which it contained. As soon as this act was passed, Latimer and Shaxton resigned their bishoprics, an example which, contrary to expectation, the archbishop did not think it his duty to follow. He retained his see, and lived in retirement with his wife, who however was soon compelled to retreat to Germany.

In July, 1540, the primate presided at the convocation which pronounced the unjustifiable sentence of dissolution of the marriage which had been solemnized between Henry and Anne of Cleves. This ridiculous ceremony was quickly followed by the execution of Cromwell.

The misconduct of Catherine Howard, whom Henry had married as soon as he had put away his former queen, coming to the knowledge of the archbishop, he undertook to report her profligacy to the king (1541). After an investigation, the proofs of her crimes were held to be conclusive; she was condemned, and, after a delay of some weeks, during which time Henry, through a message, of which Cranmer was the bearer, promised to spare her life, she was executed.

The maintenance of the ground that the Reformation had gained, and the extension of it where it was possible, now (1542) became the sole occupation of Cranmer, who had transferred to the universities the task of revising a new edition of the Bible published the year before, which it had been proposed to apportion among the bishops, requiring an English version of such part from each, whatever might be his opinions. This was considered a step gained, as it certainly was the preferable method: and notwithstanding the Reformers did not in all things prevail (for a prohibition against Tindal's Bible was secured by their opponents), they had still further success in procuring an order that the scriptures should be read in English by the ministers in the church service. In a minor degree Cranmer's attention was occupied in reproving the excess of luxury in which some ecclesiastical establishments as well as the bishops had indulged.

In May (1543) appeared the King's Book, which was in fact little more than a new edition of the *Institution*, altered in some points by the papal party: it received its name from the preface, which was written in Henry's name. The clergy being hostile to this book, Cranmer, at a visitation of his diocese, in submission to the king's supremacy, forbade them from preaching against any portions of it, however they or he himself might dissent from them. The exertions which he had used for the correction of his diocese, in which religious variance was at a great height, were watched and examined by his political adversaries, who hoped to found on them such accusations as would ensure his ruin. The prebendaries of Canterbury and some magistrates in Kent, encouraged by Gardiner, after holding a succession of meetings, finally drew up articles accusing Cranmer of abusing his power. These charges were submitted by the prebendaries to the council, and by the council to the king. Henry immediately caused the accusation to be sifted by a commission, who declared them to be unfounded, and the authors of the conspiracy afterwards submitted themselves to Cranmer, who refrained from bringing them to punishment.

In 1644 Cranmer successfully exerted himself in parliament to carry a bill to mitigate the severity of the statute of the Six Articles. He also assisted in compiling an improved English Litany, essentially similar to that which is now in use. Difficulties however were increasing around him, and he had the dissatisfaction of seeing the seals, which were now resigned by Lord Audley, his personal and political friend, conferred upon Lord Wriothesley, an adherent of the Roman Catholic party. By this appointment, as well as by the death of the duke of Suffolk, it was expected that the king's favour towards the Reformers might be weakened. Nor indeed was it long after Suffolk was in his grave before Cranmer, who, with three others, had been associated with the queen in the government of England during Henry's temporary absence in France, had reason to feel his loss. The duke of Norfolk and other members of the privy council accused him of spreading heresies through the land, and prayed the king, that, for the safety of his dominions, the archbishop might immediately be committed to the Tower. Henry, on the same night that the accusation was received, caused Sir Anthony Denny to carry a message to Cranmer, who rose from his bed to attend upon the king at Whitehall. The council assembled on the following morning, and summoned before them the primate, who had been insultingly kept for an hour in a servant's waiting-room. At length sentence of imprisonment was passed upon him, but, to their surprise and confusion, he produced the signet of the king, from whose hands he had received it the night before. The council did not venture to proceed any farther in the case.

After a peace had been concluded with France (1546), Anhault, the French admiral, came to England. A resolution was made by him, and sanctioned by the king, that the Reformation should be proceeded with, and that in both countries the mass should be changed into a communion, the form of which Cranmer was ordered forthwith to draw up. This was the last year of Henry's reign.

The king, who of late had grown so corpulent and unwieldy that he was raised up and let down the stairs by a machine, after an illness of some weeks, sank under his disease on the 27th of January, 1547. Cranmer was named one of the executors of his will, and one of the regents of the kingdom.

On the accession of Edward, who had not yet completed his tenth year, and, the better to establish his supremacy, the bishops received anew their bishoprics at his hands. The first public act of the primate was the coronation of the new king (February 20, 1547), and the delivery of a short address which he then substituted for the customary sermon. No one that heard the expressions of the archbishop could hope for the restoration of papal supremacy; all things indeed betokened a still further extension of the Reformation. An inquiry into the state of religion, by means of a visitation of the whole kingdom, was immediately set on foot: twelve homilies, four of which are ascribed to Cranmer, were drawn up, and ordered to be placed in every church, with the translation of Erasmus's paraphrase of the New Testament, for the instruction of the people. It is true that these measures, though they had many supporters, met with frequent opposition. Gardiner continued to argue, both in person and in writing, against the homilies and the paraphrase, which the bishop of London also proclaimed to be heretical. Nevertheless Cranmer's influence prevailed: and when he produced, in convocation, an ordinance that the laity as well as the clergy should receive the sacrament in both kinds, the proposition passed *unanimously*, and soon after obtained the sanction of the legislature. By the same parliament the Act of the Six Articles and other severe statutes were repealed.

During this winter session of parliament it was proposed to confer upon the king such chapels, chantries, and colleges as had escaped his father's grasp. There were few subjects upon which Cranmer's opinion coincided with that of the Roman Catholic party, but in this case he joined their ranks, and voted in opposition to the bill. He now (1548) revived the proposal for substituting a communion office for the mass, and a service was framed in time to be circulated to the clergy for their use at the following Easter.

The more considerable labours which occupied the Protestants at this time still remain to be told. An English translation of a catechism which had been written in German and in Latin by one Justin Jonas, was published by the archbishop, entitled 'Cranmer's Catechism.' In the month of May a commission of twelve divines, with Cranmer at their head, was appointed for the compilation of an English liturgy. Nor were these the only additions to the ordinary duties of the primate; he took charge of a bill, which was passed, permitting marriage among the clergy. By the end of November the Prayer-book was finished, and on the 15th of January, 1549, legal sanction was given to it. Great opposition was made to these changes in different parts of England, in Wiltshire, Somerset, Norfolk, and especially in the west, where at the instigation of their religious teachers the people took such weapons as they could procure, and mustered in considerable force. The legislature, anxious to quell this disturbance, desired Cranmer to draw up an answer to fifteen articles of remonstrance which had been framed by the insurgents. A very masterly reply (Strype's Cranmer, Appendix 40) was written, but not completed, before the leaders of the insurrection were apprehended and executed, and the rebels had dispersed. It would have been more to the honour of the archbishop if the spirit that pervaded his reply had been carried into a commission, at which he presided, for the suppression of certain heresies, for he would then have escaped the stain of having condemned two persons to the stake; but however amiable and forbearing was his general disposition, no excuse can be offered for him or for his friends Ridley and Goodrich, who, with others, were implicated in this affair. Upon the condemnation of Lord Seymour (1549), Cranmer signed the warrant for his execution, notwithstanding the canon law set forth that no churchman should meddle in matters of blood. Whatever may have been the primate's conduct towards Seymour, towards his brother the Protector Somerset it was unexceptionable: from the time that his distresses commenced till his execution was effected by the enemies whom the weakness of his character and elevated station had created, he retained Cranmer's firm and invariable friendship. Bonner, the bishop of London, was now degraded by commissioners, of whom Cranmer was one. When this commission was dissolved, an ordinance was signed by the primate, the chancellor, and four others of the council, for the abolition of Roman Catholic books of devotion: an addition was also made at this time to the ritual that had been substituted for them, in the shape of a formulary for ordination: and other steps were taken by the primate in order to diffuse a better knowledge of the creed of the Protestants. At Lambeth he received the most eminent foreign divines, Martin Bucer, Fagius, Peter Martyr, with several more.

Cranmer was greatly troubled at the discussions of the clergy respecting the removal of altars from the churches and the placing of communion tables in their stead. This had been done (1550) partly at the recommendation of Hooper, a divine who had been driven from England by the act of the Six Articles, and who, during his residence abroad, had adopted very scrupulous opinions. In July, Hooper was made bishop of Gloucester: and soon after Cranmer received from him a refusal to wear the usual episcopal habits. This question, upon which the primate himself seems sometimes to have hesitated, was now brought to an issue. If a dignitary of the church had been suffered to discontinue the vestments of his order, such was the state of the lower clergy that they would immediately have obeyed the signal and relinquished the surplice and the gown. Cranmer, upon consideration, determined to oppose Hooper's intentions, and in case of an obstinate adherence to his scruples, to remove him from his bishopric: a compromise eventually followed, and he adopted some of the usual habits.

The bishop of Chichester would not obey the order respecting the removal of altars, and the primate consequently deprived him of his see. The case of bishop Gardiner, who had now been in prison nearly two years, was also proceeded in. Articles were sent to him touching the king's supremacy—the full obedience owed to him notwithstanding his youth—that he had power to correct what was amiss in the church, &c.; and these, with some exceptions, he signed. Other articles were then framed, treating of the marriage of the clergy, the suppression of masses and images, the new book of service, &c.; to these he refused to put his name, upon which the commission, consisting of the primate, Bishop Ridley, who had succeeded Bonner in London, and six others, eventually deprived him of his bishopric and sent him back to the Tower. The conduct of Cranmer in the cases of Bonner and Gardiner was a great exception to his usual moderation. Gardiner, during his imprisonment, occupied himself in answering a treatise published by Cranmer, entitled the 'Defence of the True Doctrine of the Sacrament.' This controversy was carried on by the archbishop until the end of his life. The subject of it was one which had greatly occupied the mind of his friend, bishop Ridley, as well as his own; he had more than once changed his opinions, which at length became fixed according to the doctrine maintained in his treatise. (Jenkyns's *Remains of Cranmer*.) His arguments with Gardiner and Smythe, his chief opponents, show considerable skill and learning.

At the close of this year a revision of the Service-book of 1548 was commenced by him, with the assistance chiefly of Ridley and Cox, who, with Peter Martyr and Bucer, stated objections and recommendations in writing. The undertaking was checked in 1551, by the lamented death of Bucer, who (Burnet says) was, 'by order of Cranmer and Sir John Cheek, buried with the highest solemnities that could be devised.' The bishops being now (1551) for the most part divines favourable to the Reformation, the compilation of articles for the greater uniformity of faith was undertaken by them at the suggestion of the king. This additional labour so filled the hands of Cranmer, that his time was nearly always occupied by one or other of the great duties that he had imposed upon himself: scarcely could he be spared to attend at the trial of Bishop Tonstal, a man of moderation and learning, against whom accusations were brought forward in December. The bishop was deprived of his see, a sentence which was so contrary to Cranmer's wishes and opinion, that, together with Lord Stourton, a Roman Catholic, he entered his protest against it. It was not till this year (1552) that Cranmer gave up all hope of effecting an agreement in religious doctrines among all the churches that had withdrawn from the Papal supremacy. He was greatly disappointed at the failure of a scheme in which he had always been sanguine of success. The Reformers had now to lament the declining health of the king, but they did not relax their exertions in the cause of religion, for the Service-book was finally completed and the Book of Common Prayer adopted by parliament in the spring of 1552. A project for the reformation of the ecclesiastical courts was revived, and soon completed under the superintendance of the archbishop: only the king's signature was required for its validity. In May, 1553, Edward issued a mandate that the clergy should subscribe to the Forty-two Articles upon which the divines had agreed; but he died soon afterwards without authorizing the new ecclesiastical code, which it scarcely need be said was never afterwards adopted.

No sooner was Edward dead than Lady Jane Grey was proclaimed queen: and a letter was sent to the Princess Mary declaring Queen Jane to be the sovereign. This letter was signed by many of the principal persons in the state, and among others by Cranmer. His zeal for the Protestant cause must have blinded him to the danger of an enterprise directly contrary to the resolution he had formed upon first hearing of the project. On the 9th of July, 1553, the chief officers of state swore allegiance to Jane: on the 20th we find many of those who had been zealous in her cause, 'impatient to send in their submissions to Mary.' On the same day an order was sent by Mary to Northumberland to disarm, which paper, strange to say, was signed by Cranmer. The hopes of the Protestants were now at an end; Queen Mary's unshaken attachment to the Roman Catholic creed was universally known; Gardiner was released and made chancellor, and power of appointing preachers given to him instead of to the primate: a commission was also granted to the bishops of London, Winchester, Chichester, and Durham, to degrade and imprison Protestant prelates and ministers on the charges of treason, heresy, and matrimony.

Cranmer's friends recommended his immediate flight; but in consideration of the high office that he held, he rejected their advice. In the beginning of August he was summoned before the council, and ordered to confine himself to his palace: on the 27th he was again brought before the same tribunal; and in September, together with Latimer and Ridley, was committed to the Tower. During his confinement to the palace, in refutation of some reports that the primate would come over to the Roman Catholics, he wrote a declaration against the mass. This was not published, but by some means, respecting which there is a difference of opinion (Todd, vol. ii.; Burnet, vol. ii.), copies were obtained of it which reached the council, and were openly read in Cheapside. In the Star-chamber Cranmer avowed the writing, and his intention of affixing it to every church-door in London. The council committed him not only for treason against the succession of the queen, but for perseverance in 'disquieting the state.' The queen did not oppose the committal.

In March, 1554, Cranmer was removed, in company with his fellow-prisoners, to the prison of Bocardo at Oxford, where was renewed the controversy respecting the Lord's Supper, which, by the queen's desire, was named the subject for discussion.

On the 13th of April, the persons sent by the convocation to dispute appeared in the university, and Cranmer, who was first called before them, after examining the questions set before him (Burnet, vol. ii.), entered into argument upon them. After him reasoned Latimer and Ridley, amidst much shouting, hissing, confusion, and insult, so that the assembly, says Burnet, 'looked liker a stage than a school of divines.' On the 19th the discussion was revived; and on the 28th they were again brought to St. Mary's, where it was declared, that unless they would turn, they were obstinate heretics, and no longer members of the church. Cranmer then replied, 'From this your judgment and sentence I appeal to the just judgment of the Almighty, trusting to be present with Him in Heaven, for whose presence in the altar I am thus condemned:' and having thus spoken he was removed again to his prison.

He had some days before sent a petition to the council and tho queen, praying pardon for his offences towards her, but the bearer to whom he had intrusted the papers broke them open, and it is not known that they reached their destination. However this may be, the council decreed that the charge of treason should be withdrawn, and the proceedings for heresy followed up, that the pains of fire, and not the axe, might be the manner of his death.

It was now discovered that the tribunal before which Cranmer had been tried was not competent to decide the case, and that the sentence was illegal. The pope therefore issued a fresh commission, and on the 12th September, 1555, the primate was again examined by Brokes, the bishop of Gloucester, and two civilians, Martin and Story. After some discussion, sixteen articles of accusation were produced, touching which eight witnesses were examined, and then the case closed. It is remarkable that, previous to these proceedings, Cranmer was summoned to appear within eighty days before the pope at Rome: this must have been a mere fiction of papal law, not intended for him to obey, as indeed it was impossible for any prisoner to do. Not long after Cranmer was sent back to prison, he heard of the execution of Ridley and Latimer, and after a few more weeks had passed, he received from Cardinal Pole an answer to two letters that he had written to the queen during the interval between the last proceedings at Oxford and the day that these bishops were brought to the stake. It appears from these letters that the primate's adherence to Protestant principles was still unshaken. On the 29th of November the eighty days had elapsed, and on the 4th of December he was excommunicated and deprived of his bishopric. A letter from the pope (Paul IV.), bearing date the 14th of November, affirming him to be contumacious, because 'he took no care to appear' at Rome when cited, and declaring him guilty of heresy and other enormities, finally commanded his execution. On the 14th of February, in obedience to this mandate, Cranmer was degraded. It was within a few days after this that the fortitude of a mind which had hitherto been firm gave way under the pressure of misery and the close prospect of a torturing death. The love of life overcame his firmness: he forsook his principles, and wrote a recantation of his faith. By whose exertions his resolution was shaken we cannot ascertain; but this unworthy sacrifice of opinion served only to render his enemies triumphant: whatever had been their promises, the recantation was of no avail towards the preservation of his life. On the 20th of March, the eve of his execution, he was visited by Dr. Cole, the provost of Eton College, who had been ordered by the queen to attend him. During this interview Cranmer gave answer that he remained firm in the *Catholic* faith as he had recently professed it, an answer that has by some been considered equivocal. After Cole had left him, Garcina entered the prison, and requested him to transcribe a recantation, to be delivered by him at the stake, which the prisoner consented to do. On the following day he was led to St. Mary's church, where, after an exhortation had been read by Dr. Cole and Cranmer had finished his private devotions, he solemnly addressed the people, openly professing his faith, and at length declaring, 'Now I come to the great thing that troubleth my conscience more than any other thing that I ever said or did in my life; and that is the setting abroad of writings contrary to the truth which I thought in my heart, and writ for fear of death, and to save my life, if it might be; and that is all such bills which I have written or signed with mine own hand since my degradation, wherein I have written many things untrue. And forasmuch as my hand offended in writing contrary to my heart, therefore my hand shall first be punished. For if I may come to the fire, it shall be first burned. And as for the pope, I refuse him, as Christ's enemy, and antichrist, with all his false doctrine.' The whole assembly was astonished at this speech: they had supposed that he would have confirmed and not retracted his recantation. He was then hurried away to the stake, where he stood motionless, holding up his right hand, and exclaiming, until his utterance was stifled, 'This unworthy hand! Lord Jesus receive my spirit!'

Cranmer's diligence and application were unusual: he was deeply read in theology and canon law, and was familiar with Hebrew, Greek, and Latin, as well as French, German, and Italian, which he acquired during his travels. the copiousness of his common-place books gave weight to his opinion, and readiness to his power of argument. His reservation respecting the oaths which he swore when appointed archbishop, his subserviency to Henry VIII. in annulling his marriages, his share in the condemnation of some heretics, his conduct at the disgracing of Bonner and Gardiner, and the want of courage which made him recant after his condemnation, are great blots on his character. But though his conduct on these occasions was marked by dishonesty, intemperance, and want of firmness, these were rather impulses than habitual and characteristic vices, for it cannot be denied that Cranmer was sincere, mild, and moderate, and for the most part a firm man: nor is it to be forgotten that persecution was the policy of all religious parties at this period. He had moreover the virtue of constancy to his friends, a very rare quality in the times in which he lived; and never relaxed his friendship towards Anne Boleyn, Cromwell, or Somerset in their adversity. The affability of his manners, and the gentleness of his temper, made him beloved by many friends and men of learning, to whom he also extended a liberal hospitality; so that his protracted imprisonment and cruel death was one of the most unpopular measures of Mary's government. A complete collection of the extant works of Cranmer has been published at Oxford by Dr. Jenkyns.

(Strype's *Memorials of Cranmer;* Fox's *Acts and Mon.;* Burnet's *Hist. Reform.;* Gilpin's, Todd's, and Le Bas's *Lives of Cranmer;* and the general histories of the period.)

CRAPE is a light transparent fabric composed of silk, from which, by the mode of its preparation, all the gloss has been taken, and which, when dyed, as it usually is, of a black colour, is worn as the sign of mourning for the dead.

The weaving of crape is conducted according to the simplest method of the weaver's art, all its peculiarity being given to it in the dressing, which it receives after it is taken from the loom. The silk is used without its having been washed or dyed, and consequently with all the natural viscid gum which forms a part of its composition as spun by the worm. For thin crape, the only preparation which the filaments undergo previous to the weaving is the simple twisting, which forms the first process of the throwing mill, and in which state the thread is technically called *singles*. When it is intended to make a more substantial fabric, the warp is made of two and sometimes three filaments twisted together, which in that state are called *tram:* the weft is still composed of singles. After the web is taken from the loom, it is dressed with a viscid solution of gum, which in drying causes the individual threads to resume, as far as the interlacing will admit, the form they originally held previous to their being twisted in the throwing mill, and thus is produced the peculiar wrinkled appearance by which crape is distinguished. This fact will be shown if a piece of crape is washed in water hot enough to discharge the gum, when the web will resemble thin gauze.

CRASHAW, RICHARD, an English poet, the son of the Rev. William Crashaw, a divine of some note in his day, was born at London, but in what year is uncertain. In early life he was placed, through the kindness of Sir Henry Yelverton and Sir Randolph Crew, upon the foundation at the Charterhouse, whence, in March, 1632, he went to Pembroke Hall in Cambridge, and took the degree of B.A. in 1634. He afterwards went to Peterhouse, of which he was a fellow in 1637, and became M.A. in 1638.

In 1634 he published a volume of Latin poems, mostly devotional, in which the celebrated line is found upon the miracle at Cana in Galilee, which has been ascribed to other and greater poets than Crashaw:

> 'Nympha pudica Deum vidit, et erubuit.'
>
> 'The modest water saw its God, and blushed.'

A second edition of his 'Poemata and Epigrammata' was published at Cambridge, 8vo., 1670.

At what time Crashaw was admitted into holy orders is uncertain. Wood says he took degrees at Oxford in 1641; about which time he seems to have become a popular preacher, full of energy and enthusiasm. His degrees, however, do not appear in the public register. In 1644, when the parliamentary army expelled those members of that university who refused to take the covenant, Crashaw was among the number; and being unable to contemplate with resignation or indifference the ruins of the church establishment, he went over to France, where his sufferings and their peculiar influence on his mind prepared him to embrace the Roman Catholic religion. In 1646 the poet Cowley found Crashaw in France in great distress, and introduced him to the patronage of Charles the First's queen, who gave him letters of recommendation to Italy: there he became secretary to one of the cardinals at Rome, and was made a canon in the church of Loretto, where he died of a fever, soon after his promotion, about the year 1650. His 'Steps to the Temple, Sacred Poems, with other Delights of the Muses,' was published in 12mo., 1646; a second edition, 1648; and a third, also called second in the title, 8vo., 1670. Pope occasionally borrowed thoughts from Crashaw, but improved them. Crashaw resembled Herbert in his turn of mind, but possessed more fancy and genius. (See the new edit. of the *Biogr. Britannica*; Chalmers's *Biogr. Dictionary*, vol. x., p. 482-485; Wood, *Fasti Oxon.*, Bliss's edit., vol. iv., p. 4; Ellis's *Specimens of the early English Poets*, vol. iii., p. 224.) In 1652 a posthumous volume of his Poems was published at Paris, accompanied with vignettes by Messager, entitled 'Carmen Deo nostro, te decet Hymnus—Sacred Poems, collected, corrected, augmented, most humbly presented to my Lady the Countesse of Denbigh, by her most devoted servant R.C., in hearty acknowledgement of his immortall obligation to her goodness and charity,' 8vo. An edition of his English Poems, selected from the two volumes, was published by Peregrine Phillips, 12mo., London, 1785.

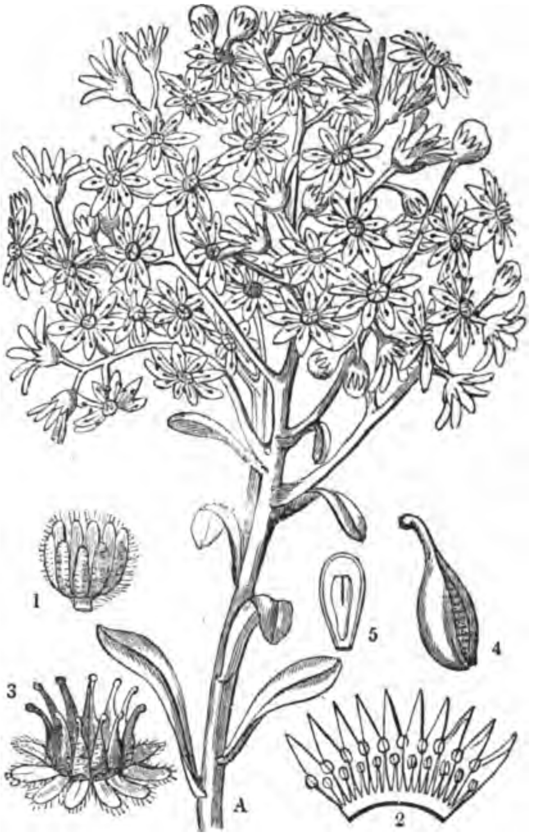
CRASSATELLA. [CONCHACEA.]

CRA'SSINA. [VENERIDÆ.]

CRASSULA'CEÆ, a natural order of Polypetalous Exogens, forming by itself the Crassal alliance of the Apocarpous group. It consists of succulent plants, with herbaceous or shrubby, and annual or perennial roots, growing in hot dry exposed places in the more temperate parts of the old world chiefly. On the sun-scorched cliffs and volcanic soil of the Canaries, and on the dry sterile plains of the Cape of Good Hope, they are most abundant. Their flowers are arranged in panicles, spikes, cymes, and corymbs; each has a calyx of several divisions, alternating with which is the like number of petals, alternating with which is the like number of stamens, or twice as many, alternating with which are as many distinct carpels as there are segments of the calyx. The stamens arise from the tube of the calyx; there is usually an hypogynous gland at the base of each carpel; the carpels are often of the same colour as the petals; and sometimes in monstrous cases the anthers bear ovules as well as the ovaries. The fruit consists of a number of distinct follicles, each containing numerous minute seeds; the embryo lies in the axis of fleshy albumen.

Many species of Crassula, Kochea, Sempervivum, Sedum, &c., are cultivated for the beauty of their flowers; the various annual Tillæas, &c., are obscure weeds; houseleeks (different sorts of Sempervivum) are grown for their refrigerant qualities; and the leaves of Sempervivum arboreum possess powerful tanning qualities.

All the hardy species may be grown on old walls, roofs, ock-work, or other places thoroughly drained of moisture: the greenhouse kinds require what is called a dry stove treatment, that is, they must be potted in a mixture of lime rubbish, broken pots and earth; in summer they are freely exposed to the weather in sunny situations without protection, and in winter they are kept moderately cool, and nearly without water.



[Crassulaceæ.]

A, a portion of a branch of Sempervivum villosum; 1, a calyx of S montanum; 2, a part of the petals and stamens laid open and adhering by the tube of the calyx; 3, a calyx with the ovaries projecting—the hypogynous scales are seen at the base of some of these; 4, a ripe follicle; 5, a section of a seed showing the embryo in the albumen.

CRASSUS, the surname of several Roman families, and especially of the triumvir Marcus Licinius. When he is first mentioned in history, he is spoken of as exceedingly rich; and it was partly owing to this circumstance that he was appointed to take the command against the revolted gladiators of Capua. In a few days he raised an army of six legions, and marched in quest of the enemy. A battle was fought in the south of Italy, near Rhegium, in which Crassus was completely victorious, and Spartacus fell with 40,000 of his men. Crassus was rewarded with an ovation on his return; but instead of the usual myrtle-wreath, he had a laurel crown. (Aul. Gellius, v. 6.) At the time of his expedition against Spartacus, he held the office of prætor; and the following year (A.U.C. 683, 71 B.C.), he was chosen consul with Pompey. The influence which Pompey gained by his popular and engaging manners Crassus succeeded in acquiring by the hospitality and munificence which his immense wealth easily supported. On one occasion he gave a general entertainment to the whole people, and distributed corn enough for three months' provision. No acts of importance, however, are recorded by historians during this administration. After some years, Crassus and Pompey dropped that determined violence towards each other, which, though frequently concealed, had never been wholly removed, and joined Cæsar in what is called the first triumvirate. While the actual power was almost entirely engrossed by Cæsar, he endeavoured to blind Crassus and Pompey to the real state of things by certain concessions which he made. With this view he included them both in a commission for dividing the lands of Campania, and for settling a colony at Capua, and thus enabled them to provide for some needy adherents to their interests. After a time the alliance was discontinued, but it was renewed again; and in B.C. 56 Pompey and Crassus offered themselves as candidates for the consulship, in order to keep out Domitius Ahenobarbus, who was violently opposed to Cæsar, and would be likely to thwart his designs. Cæsar had been appointed over the province of Gaul for five years; and Crassus and Pompey, though for some time they concealed their intentions, at last succeeded in gaining the provinces of Syria and Spain for the same period and on the same terms. Pompey did not leave immediately for Spain; but Crassus set out for Syria without delay, even before the year of his consulate was expired, B.C. 55. From the great preparations which he made, both in raising forces and in other ways, and from his known avarice, it was clear that a war with the Parthians was the real object at which he aimed; and the joy which he displayed at the prospect of so vast an increase of his wealth Appian (*on the Parthian Wars*, § 135) describes as perfectly childish and ridiculous. The tribune Ateius endeavoured to prevent Crassus from going on this expedition, but in vain; and as Crassus was passing through the gates of Rome, the tribune pronounced certain terrible imprecations upon him over a small fire, which had been lighted according to the usual practice in such cases. A person thus devoted, it was believed, could not possibly escape, and the person who so devoted another could not prosper himself, and therefore it was a course not pursued hastily or on light grounds. (Appian, § 137; Cicero *de Divinatione*, i. 16.) This consideration increased the alarm which the curse produced in the people, and even among the army of Crassus himself. Nevertheless he proceeded, by way of Macedonia and the Hellespont, to Asia. He crossed the Euphrates and ravaged Mesopotamia without resistance. Orodes, the king of Parthia, being at the time engaged in an invasion of Armenia, his general Surena commanded the Parthian forces against the Romans. A battle was fought near Carrhæ between Crassus and Surena, in which Crassus was defeated. The clamours of his soldiers obliged him to accept proposals of peace from Surena, to whom the messengers of the Parthian general promised to lead him. His resistance to their insulting treatment provoked their fury, and they put him to death without delay, B.C. 53. Surena had his head and right hand cut off and sent to Orodes.

We have no proof that Crassus possessed very great talent of any kind, and, but for his wealth, he would probably have been scarcely known. From his father he inherited a large fortune; but the rest of his wealth was not acquired by the most honourable means. He is said to have enriched himself by purchasing at a very low price the estates of those who were proscribed by Sylla; also by letting for hire slaves, whom he had instructed in various arts and trades; and so high was his own standard of opulence, that he said no one could be rich who was not able to maintain an army at his own expense. With all his avarice he was generally ready to lend money to his friends, and was hospitable without extravagance. Cicero (*Brut.*, § 66) represents him as a man of moderate acquirements and slender abilities, but of great industry and perseverance. In another of his works (*Tusc. Quæst.*, v. 40) he says, 'Crassus was somewhat deaf, but a greater misfortune than this was the bad character which people gave him, though in my opinion unjustly.' (Cicero, *Epist. ad Atticum*, i., 14, 17; iv., 13; Appian, *on the Parthian Wars*, § 134-155; Dion Cassius, xxxvi. & xxxvii.; Plutarch, *Life of Crassus*.)

'Coin of Crassus.]

British Museum. Actual Size. Silver. 61¼ grains

CRASSUS, LUCIUS LICINIUS, was considered the greatest orator of his time. He appears to have superintended the course of Cicero's early education. (*De Oratore*, ii., 1.) Cicero, in one place (*Brut.*, § 38), pronounces him perfect, and in the treatise before referred to (*De Oratore*) he delivers his own sentiments on eloquence in the person of Crassus. In the beginning of the third book he takes occasion to lament the death of the interlocutors in the dialogue, Crassus and Antonius.

CRATÆ'GUS, an extensive genus of hardy trees and bushes, the different species of which are cultivated for the sake of their ornamental appearance, especially when loaded with brightly-coloured fruit. It belongs to the pomeous division of the rosaceous order, and is very nearly allied to the apple, from which it differs in the fruit containing a variable number of stones, as the medlar does; from the medlar it is known by its fruit being closed, not spread open, at the apex.

The species inhabit woods and hedges throughout the northern hemisphere, from Barbary and Palestine to about 60° N. lat. in the east, and from Mexico to a similar latitude in the west. South of these limits they do not occur in a wild state. The flowers appear in the greatest profusion, usually in terminal cymes, in the early months of the year, and are succeeded by small round fruits, coloured yellow, red, purple, or black. Most of them are merely haws, and fit only for the food of birds; a few are larger and more fleshy, but none of them have been found worth cultivating for the fruit, except the azarole (*Cratægus Azarolus*), which is eaten in Italy, and the aronia, which is sold in the markets of Montpellier under the name of *Pommettes à deux closes*.

Between sixty and seventy well-marked species and varieties are known in the gardens of this country. Into extensive collections they are all worth introduction except *Cr. parvifolia* and those immediately allied to it; and for the ornament of park scenery there is probably no genus of flowering trees at all to be compared with Cratægus for variety, fragrance, and beauty. Our limits prevent our noticing all these at length; we therefore confine ourselves to a brief indication of those which are most valuable for ornamental purposes.

Under the name of *Hawthorns* we would comprehend all the numerous sorts which are either varieties of *Cratægus oxyacantha*, or nearly related to it. They have all deeply-lobed rather shining leaves so little hairy that their bright green colour is not deadened, small fragrant flowers, and small shining haws. They are distinguished for the graceful manner in which they generally grow in rich soil and unharmed by the pruning-knife. Thirty feet is not an unusual height for very fine specimens, and when of that size their appearance is exceedingly graceful and picturesque. *Cr. oxyacantha* itself produces varieties with double flowers, bright crimson flowers, yellow fruit, black fruit, and fruit downy when young; the latter is called *Cr. oxyacantha eriocarpa*, and is one of the most beautiful of the genus. Besides these we would recommend most particularly to planters the *Cr. heterophylla*, or Constantinople thorn, which is more erect and rigid in its manner of growth than any of the varieties of *Cr. oxyacantha*, and grows remarkably fast.

Very nearly allied to these are the *Oriental Thorns*, species which have their deeply-cut leaves covered so closely with hairs as to have a dull grey or hoary aspect, large fragrant flowers, and large succulent rather angular fruit. These are less graceful in their manner of growth than the true hawthorns, some of them, especially *Cr. tanacetifolia* and *odoratissima* having a round formal head; but their flowers are even more fragrant than the May-bush, and their fruit renders them striking objects in the autumn. The azarole is one of them; but it does not fruit or flower readily, and is the least worth having of the group. What we should recommend are *Cr. odoratissima*, with its red, *Cr. tanacetifolia*, with its yellow, *Cr. orientalis*, with its purple, and *Cr. Aronia*, with its light orange-coloured fruit.

The *American Thorns* are species with leaves but little lobed, usually broad, shining, and toothed unequally, often having exceedingly long spines, and having fruit generally of an intermediate size. They are not quite so handsome as the species of the two former groups; but the following, nevertheless, have sufficiently ornamental features, viz., *Cr. crusgalli*, or the Cockspur thorn, with very long strong spines and shining deep-green leaves; of this we have a broad-leaved variety called *splendens*, and a narrow-leaved variety called *salicifolia*; *Cr. prunifolia*, *ovalifolia*, and *Douglasii*, with dark handsome leaves; *Cr. punctata*, with large yellow or red haws; *Cr. cordata*, with brilliant scarlet fruit, and *Cr. microcarpa*, with very small beautiful vermilion fruit and graceful pendulous shoots.

The *Small-leaved Thorns* are all North American they form small straggling bushes, and are not worth cultivation.

Finally, the *Evergreen Thorns* consist of *Cr. mexicana* and *pyracantha*. The former is a small tree, with lance-shaped bright green leaves and large round yellow fruit; it is probably too tender for hardy cultivation north of London. The latter, an inhabitant of rocks and wild places in the south of Europe and the Caucasus, has so long been cultivated for the sake of its flame-coloured berries and evergreen leaves as to require no description here.

All these plants may be budded or grafted upon the common hawthorn, so that persons whose means do not allow them to purchase the plants may nevertheless ornament their gardens with them by providing hawthorn stocks, upon which they may work them themselves; or a very small garden might exhibit a good many sorts, if each of the groups here pointed out were intermixed upon the same plant; this might be easily effected by a skilful budder. It would not, however, do to intermix the different groups upon the same plant, because the species would not harmonize, and consequently a bad appearance would be the result.

(See Loudon's *Arboretum* and *Fruticetum Britannicum*, part iii., and the *Botanical Register*, vols. 21 and 22, for more detailed information concerning these plants.)

CRATERUS. [ALEXANDER III.]

CRATES, the name of several Greek writers. I. A comedian of Athens, one of the most eminent of the predecessors of Aristophanes, who speaks very favourably of him. (*Eqq.* 537.) He is said to have been originally one of Cratinus' actors (Schol. on Aristoph. *Eqq.*), but he could not have been so very long, since he was well known as a comic writer in 450 B.C. (Euseb. *ad Olymp.*, 82, 2.) Aristotle tells us that he was the first who introduced regular plots into his comedies. (*Poet.* c. v.) II. A Cynic philosopher, the son of Ascondas of Thebes, who flourished about the year 328 B.C. He was living in 307 B.C., when Demetrius Phalereus retired to Thebes. (Diogen. Laërt. vi. 85; Plutarch, *Mor.*, p. 69, c.) He was a disciple of Diogenes and Bryson, and was surnamed the 'door-opener' (*θυρεπανοίκτης*), from his habit of entering any house he pleased whether invited or not. (Suidas.) III. A philosopher of the old academy, son of Antigenes, and born in the deme of Thria in Attica. He was a disciple of Polemo, to whom he was much attached, and the instructor of Arcesilaus and Bion the Borysthenite. (Diog. Laërt. iv. 4.) He flourished about the year 287 B.C. (See Clinton's *Fasti Hellenici*, ii., p. 183.) Cicero says, that his philosophical doctrines did not at all differ from those of Plato. (*Academ.* i. 9.) IV. A celebrated grammarian and stoic, son of Timocrates, and born at Mallos in Cilicia. He was sent as ambassador to Rome by Attalus, king of Pergamus, about the year 159 B.C. (See Clinton, *Fasti Hellenici*, iii., p. 89.) His works were very numerous. (See a list of them in Clinton, iii., p. 528, note e.)

CRATI'NUS, the son of Callimedes, a writer of the old comedy, was born at Athens 519 B.C. It is not known when he began to write comedies; it is inferred, however, from the words of Aristophanes (*Eqq.* 524-530), that he did not appear as a dramatist till somewhat advanced in life. (See Clinton's *Fasti Hellenici*, vol. ii., p. 49.) He was the most formidable adversary of Aristophanes: two occasions are recorded on which the judges pronounced him only second to that great poet; and in 423 B.C., the first prize was awarded to his comedy called the 'Wine-Flask,' the 'Connus' of Ameipsias being placed second, and the 'Clouds' of Aristophanes third. He died the year after. Cratinus was highly esteemed by his countrymen, and at one time, according to his rival Aristophanes, was so much in fashion, that no songs were listened to at banquets except choruses from his comedies. In his old age he was much addicted to drinking; and in his last play he shows how his faithful wife *Comedy* strove to get divorced from him in consequence of his exceeding love for his fascinating mistress the *Wine-Flask*. (See the Scholiast on Aristoph. *Eqq.* 401.) Aristophanes frequently alludes to this failing of his contemporary. (See, for instance, the *Peace*, 701.) The names of forty of his comedies have come down to us. (Fabricius, *Bibl. Græca*, ii., p. 431.)

CRATIPPUS, a Peripatetic philosopher, born at Mitylene. He was a contemporary and friend of Cicero, who thought him the first philosopher of the age (*De Officiis*, 'a Cratippo nostro, principe hujus memoriæ philosophorum'), and intrusted his son Marcus to his care at Athens. (*De Officiis*, i. 1.) He taught first in his native place, where he was still residing when Pompey came thither after the battle of Pharsalia; he had an interview with the defeated general, with whom he conversed on providence. (Plutarch, *Pomp.*, c. lxxv.) Afterwards he went to Athens, and Cicero not only got him made a Roman citizen by Julius Cæsar, but even prevailed upon the Areopagus to vote that he should be requested to continue at Athens as an instructor of youth, since he was an ornament to the city. (Plutarch, *Cicero*, c. xxiv.) Brutus went to Athens to hear Cratippus while engaged in preparations to meet the army of the Triumvirate. (Plutarch, *Brutus*, c. xxiv.) Cratippus wrote a treatise on divination, in which he allowed that kind which was derived from dreams and the ravings of idiots, but denied all other sorts of divination. (Cicero *de Divinat.* i. 3 and 32.) In addition to his merits as a philosopher, we are told that he was an amusing companion, and gifted with great powers of conversation. (Cicero *ad Familiares*, xvi. 21.)

CRAWFISH. [ASTACUS. CRUSTACEA.]

CRAYONS (from the French *crayon*, derived from *craie*, chalk) are a species of material for drawing, and may be considered as of two kinds, native and artificial. The principal native crayons are black, white, and red. The best black is procured from Italy. It is a species of earth, which is soft in the ground, but hardens on exposure to the air. It is of a bright even tint, and of a smooth and moderately hard texture. Admirably adapted to outlining and shading drawings of any size, it is the artist's best tool for study. It will form a large, bold, and strong line, and is at the same time capable of extreme fineness. The best white is a pure chalk, and is procured in France. It is of a brilliant colour, but very brittle; so that it is difficult to avoid breaking it frequently. There are various modes of correcting its brittleness, such as soaking it in milk, baking it on hot iron, or in the fire; but they all, more or less, injure the brilliancy of its tint. Pipe-clay is sometimes employed as a substitute, as being smoother and less brittle; but it is of a very inferior tint. White chalk is used on tinted paper to touch on or hatch the high lights. It is also much used by the painter to determine or correct his outline. Red chalk is employed in the place of black chalk on white or tinted paper, because it is freer than the best black chalk, and firmer and smoother than the inferior kinds. It is also of a warmer and more agreeable tone of colour; but it is by no means capable of the same degree of fineness in small or highly-finished drawings: it is a clayey ochreous substance. All these three kinds of native crayons are frequently combined in the same drawing, on tinted papers, which are generally of a neutral grey, of a blueish, greenish, or brownish quality.

Artificial crayons are composed of different coloured earths, and other pigments, rolled into solid sticks with some tenacious stuff such as milk, common gin, or beer-wort. The best are procured from Switzerland. They are employed in crayon painting upon a ground composed of paper or vellum, stretched upon a canvas, which has been previously extended on a deal frame. It is requisite to paint with cooler tints in crayons than in oils, which is the reason why crayon painters generally fall into such a cold style of colouring when they work in the other material. Great softness and delicacy and great vivacity of tint may be obtained in finished crayon paintings; but depth, richness, and truth of colour, are not attainable, nor solidity in the forms. Moreover, the delicacy proper to the substance is tolerably certain to betray the artist who devotes himself solely to its use into a petty and weak style of drawing. For sketches of portraits, in which the form and expression, and a general idea of the complexion, are all that is required, crayons are a very pleasing and useful material; but they should be employed only occasionally, and as a variety to other modes of study.

The native crayons are the legitimate materials for the artist in the study of drawing, and in tracing the first thoughts of design. Some of the sketches of Raphael, Michael Angelo, the Caracci, and others of the great painters, remain to attest the utility of crayons in forming the style of a painter or sculptor, and their capability of expressing the highest qualities of design.

An instrument called a portcrayon is employed to hold the crayon by. It is a metal tube, split at each end, so as to gape a little to admit the crayon: a sliding ring embraces the tube, and may be made to close the disparted sides firmly upon the crayon.

A stump, made of leather, cork, or paper, closely rolled, or cut into a short round stick, more or less sharply pointed at each end, is used to soften and spread the chalk or crayon in the shaded parts of the drawing.

CREAM. [BUTTER.]

CREAM FRUIT, a kind of eatable fruit found at Sierra Leone, and said to be produced by some apocynaceous plant.

CREASOTE or **KREASOTE** (from *κρέας*, 'flesh,' and *σώζω*, 'to save,') is a fluid compound of oxygen, hydrogen, and carbon, obtained by Reichenbach. This substance exists in crude pyroligneous acid, but it is best prepared from that portion of the oil distilled from wood-tar which is heavier than water. The operation is too complicated to admit of its being stated at length. The properties of creasote are the following:—It is a colourless transparent fluid, and has a strong odour which greatly resembles that of smoked meat, with a caustic and burning taste. Its specific gravity is 1·037; it boils at 397°, and remains fluid at 17° below zero. It requires 80 parts of water for solution, and is soluble in alcohol, æther, and sulphuret of carbon, in all proportions. It burns with a sooty flame, refracts light powerfully, and is a non-conductor of electricity; it has neither acid nor alkaline properties. It is highly antiseptic, and hence the name given to it. It combines both with acids and with alkalis; but it is decomposed by strong nitric and sulphuric acid. It unites with chlorine, iodine, bromine, sulphur, and phosphorus.

Creasote coagulates albumen, even when much diluted, and it also coagulates serum. Meat and fish are preserved after having been brushed over with creasote and dried in the sun; the antiseptic power of pyroligneous acid and wood-smoke is supposed to be derived from its presence. A few drops added to ink are said effectually to prevent its becoming mouldy. It is stated to be composed of—

Carbon . . .	77·42
Oxygen . . .	14·46
Hydrogen . .	8·12
	100

Medical Properties.—The chemical analysis, as given above, shows this compound to contain a very large proportion of carbon; which circumstance, along with other peculiarities, renders it in certain cases a valuable medicine, and in other instances a formidable poison. The introduction, by its means, of a large quantity of carbon into the body, produces all the bad effects which an excess of that principle in the animal system is known to occasion; while in certain morbid states of the system, this increased quantity of carbon produces the remarkably sedative effect which has followed its use. There can also scarcely be a doubt but that the highly carbonized nature of this compound, along with its power of coagulating albumen, is the source of the powerful antiseptic properties which many of its combinations and solutions have been known for ages to possess. Independently of its general action on the system when taken internally, it produces, when concentrated, a local effect on the part to which it has been applied very necessary to be borne in mind, and which probably is owing to the power which creasote seems to possess of coagulating the albumen, even of living as well as of dead tissues, and which it is enabled to reach by destroying the epidermis of the part which it has been allowed to touch. Dropped upon the tongue it causes violent pain; unless largely diluted it cannot be swallowed, as, independent of the pain, it coagulates the albumen of all the fluids with which it comes in contact. Fibrine, carefully separated from other principles, is not affected by creasote.

A few drops of a very dilute solution of creasote taken into the stomach causes a sensation of warmth, and if repeated at short intervals, or the dose gradually increased, giddiness and other signs similar to those of intoxication are experienced. The urine is frequently observed to acquire a black hue, 'as if a small quantity of Indian ink had been added to it, perfectly transparent, and without sediment.' (*Medical Gazette*, vol. xvi. p. 599.) In larger doses it has all the effects of a narcotico-acrid poison, the venous state of the blood producing on the brain a markedly sedative effect, and the respiration becoming slow and laborious, or convulsive. Animals, fishes, and insects, plunged into creasote water speedily die with strong convulsions. Even plants watered with it perish, except perhaps those of the tribe Ericaceæ, which constitute the chief vegetation of bogs or mosses.

Creasote has been recommended as a remedy in very many diseases, in few of which will it ultimately be found useful. Vomiting, including sea-sickness, some forms of bronchitis, cutaneous diseases, and hæmorrhage either spontaneous or from wounds, are the only cases in which it has a claim to confidence. Vomiting, such as frequently occurs in hysterical and other persons from irritation of the origin of the eighth pair of nerves, will almost invariably be alleviated or checked; also that in sea-sickness, which proceeds from a similar cause, may be lessened, but scarcely any other kind of vomiting can be relieved by it. That form of vomiting which occurs towards the end of phthisis pulmonalis, and is connected with subacute inflammation of the stomach, is sure to be aggravated by it; as will any other, either caused by scirrhus, ulceration, or any crude indigested matter in the stomach. The utility of breathing the vapour of tar-water in some forms of bronchitis often mistaken for consumption, has been long known; but creasote can be of no service in true tubercular consumption, when cavities exist in the lungs. Creasote possesses great influence over external ulcers when it can be applied sufficiently strong to coagulate the albumen, and so form an artificial skin, under which the healing process goes on kindly. Thus in porrigo, especially ringworm of the scalp, and psoriasis, it is unrivalled. But poisoning has resulted even from its external application. Its power of coagulating the albumen of the blood renders it a most valuable styptic, and it may be employed to stop the bleeding mouths of even the largest arteries, such as the carotid, during surgical operations, or the flow of blood from leech-bites. In case of poisoning by creasote, moderate venesection and artificial respiration may be employed; the latter should be continued 'till by the operation of the lungs, the liver, and the kidneys, the system can free itself from the hurtful excess of carbon. The solution of creasote should always be prepared of a definite strength, to prevent unfortunate occurrences from an over-dose. Creasote is now extensively employed to preserve anatomical preparations for museums. It is likewise fraudulently added to whiskey to give the *peat-reek* flavour which many like.

CREBILLON, PROSPER JOLYOT DE, was born at Dijon in 1674, of an antient and noble family. He was sent by his father to Paris, to study the law, under a person named Prieur. The master and pupil were both attached to the theatre; and the former observing in Crebillon strong marks of a poetic genius, urged him to try his powers on a tragedy. Crebillon accordingly took the subject of the children of Brutus, which he carried to the actors, who however rejected it in a manner so little flattering to the feelings of an author, that he threw his manuscript into the fire, and gave up all thoughts of writing for the stage. Prieur would not suffer him to remain in this despondency, and the tragedy of 'Idomenée,' produced in 1707, was the fruit of his persuasions. The fifth act did not at first please the audience, but an alteration was made, and the piece was perfectly successful. In 1707 appeared his second piece, called 'Atrée,' which is founded on the horrible incident of Atreus bringing to Thyestes a cup filled with the blood of his own son. Prieur being in a declining state of health when this tragedy came out, was carried into a box: at the end of the representation he embraced Crebillon, and said: 'I die contented, I have made you a poet, and I leave a man to the nation.' The success of 'Atrée' was indeed very fair, but it was not until the production of 'Rhadamiste,' in 1711, that Crebillon's fame rose to its height, and it is on this piece that it chiefly rests. Boileau is said to have entertained a very mean opinion of 'Rhadamiste,' but this has been explained by the fact, that he had only heard the first two scenes, which are unquestionably inferior to the others. After the production of this piece, Crebillon did not much increase his reputation; his 'Xerxes' (1714), and 'Semiramis' (1717) were not very successful; and though 'Pyrrhus' (1726) was very well received, the author himself said he was surprised, as it was 'the shadow of a tragedy, rather than a tragedy itself.'

He did not bring out any other piece for twenty-two years. The death of his wife, and certain pecuniary difficulties, weighed down his spirits to that extent, that he was incapable of writing. However, at the end of that period he was allowed by the king a pension of 1000 francs, for which he was indebted to the persuasions of Mad. Pompadour, who was instigated, it is said, by her hatred to Voltaire to benefit Crebillon, as these two authors were always looked on as rivals in the drama. His tragedy of 'Catilina' was now advertised, and great were the expectations of the public; the court were determined to patronize him, and the king himself furnished the requisite dresses. It was produced in 1749, and the applause was tumultuous. The public however on reading it began to retract their hasty praise, and it was objected that the tragedy was a very unfaithful picture of the manners of antient Rome, a censure which should not be passed on Crebillon as *peculiarly* distinguishing him from other authors of his school. 'Le Triumvirat' was produced when the author was eighty-one years of age, and had but indifferent success; he also began another tragedy, called 'Cromwell,' about this time, which was never completed.

Crebillon died in the year 1762, and a monument was erected to his memory in the church of St. Gervois, by the order of Louis XV. The French actors also caused a magnificent service to be celebrated in the church of St. Jean de Latran in honour of the veteran dramatist, at which all the literati and most of the nobility of France attended.

It is on the tragedy of 'Rhadamiste' (Tacitus, *Annal.* xii. 44, &c.), that the fame of this author rests; and in spite of the various solecisms which profound critics of the French language discover in this work, the English reader will find it more to his taste than many tragedies, the names of which are more familiar to him. The plot is highly interesting, and there is a fire in the character of 'Rhadamiste,' and a matronly dignity in that of 'Zenobie,' which arrests the attention of the reader, and prevents the tedium which many English readers feel in perusing a French tragedy.

Those who wish to know more of Crebillon may read a chapter on this author in La Harpe's 'Cours de la Littérature.' The chapter is a long one, and the extracts are so copious, and the reader's attention is directed so pointedly to the remarkable passages, that he may really learn more of Crebillon by reading that critique than by perusing the author's own works.

CREBILLON, CLAUDE PROSPER JOLYOT DE, son of the preceding, was born at Paris in 1707. He wrote a number of romances, which acquired a great popularity, owing, as some say, more to their extreme licentiousness than to any intrinsic merit. His strict moral character is always brought forward as a remarkable contrast to the great laxity of his writings. He was well known as a member of two convivial societies, called the *Dominicaux* and the *Caveau*, the latter of which enrolled among its names those of Piron, Collé, and Gallet. Crebillon the younger died in 1777.

The remark that his fame is only owing to his obscenity does not to us seem wholly true. Indeed the very author of this remark (*Biog. Univ.*) makes another which tends to weaken it. He says that Crebillon is too cold a writer, and wants that warmth of colouring which is requisite to render works of a licentious nature endurable. The fact is, that his novels, in spite of their outrageous indecency, contain a most accurate picture of the motives that actuate persons in a corrupt state of society. They are rather the works of a cynic, who tears the mask off vice, than of a voluptuary, who is absorbed in its contemplation; and if we regard them in this light, their grossness may be reconciled with his strict moral character. Still however the philosophy which they inculcate is of a morbid nature (being much like that of Rochefoucault), and only those whose minds are unassailable by impurity can peruse with any profit the novels of Crebillon.

CRE'CY, or (as it is frequently written in English works) **CRESSY,** a small town (bourg) in the department of Somme, in France, on the little river Maie, which falls into the æstuary of the Somme. It is in the midst of a territory fertile in wheat and other grain, and in grass: cattle, wool, and hemp are among the articles of trade. There are several tan-yards, and oil and corn-mills. There is a considerable forest in the neighbourhood. The population of the commune as given in Prudhomme's *Dictionnaire Universel de la France*, 1804, was 1207.

Crécy is chiefly known by the great battle fought near it, August 26, 1346, between the English and French armies under their respective kings, Edward III. and Philippe VI. (de Valois). The English, who had been plundering Normandie, and had carried their ravages to the neighbourhood of Paris, were retreating when they were overtaken by the French. The force of the contending armies is usually estimated at about 30,000 English and 100,000 French: but Mr. Turner (*Hist. of England during the Middle Ages*, 2nd edit., Lond. 1825, vol. ii. p. 199) states the English army to have been as follows:—1st division, under the Prince of Wales (Edward the Black Prince), 800 men-at-arms, 2000 archers, and 1000 Welshmen; 2nd division, under the earl of Northampton and others, 800 men-at-arms, 1200 archers; 3rd division, or reserve, under the king in person, 700 men-at-arms, and 2000 archers. Allowing these numbers to have been doubled by the addition of the retainers of the men-at-arms, it will still give only 17,000 men. The English reserve was not engaged, and the king remained during the whole action at a windmill, surveying the fight and refusing to send aid, though his son, then a boy of sixteen, was hard pressed by the enemy, adding to the messenger who had entreated aid, 'Return, Sir Thomas, and tell those who sent you not to expect me while my son is alive. Tell them that I command that they let my boy win his spurs: for I wish, if God has so ordained, that the day be his own, and that the honour rest with him and those in whose care I have placed him.' The French were defeated very much through their own impetuosity and want of discipline. The butchery was dreadful, for the English, being so much inferior in number, showed no mercy. The king of Bohemia, the duke of Lorraine, the count of Alençon, brother of the king of France, the count of Flanders, eight other counts, two archbishops, and several lords and German barons, fell; and (according to the English account) 1200 knights and about 30,000 other persons. Philippe of Valois received two wounds, and was one of the last who fled. An equal or even greater number of French fell the next day in various rencontres, according to Froissart. The result of this fearful slaughter was the siege of Calais, which surrendered after a year's siege.

CREDENTIALS are the instruments which an ambassador or other diplomatic minister receives from his own government, authorizing him to appear in his diplomatic character, defining the extent of his powers, and showing to what rank of ministers he is intended to belong. The credentials are usually in the form of a closed letter, addressed to the power to which the minister is sent; but ministers are sometimes accredited by letters patent, which is the form commonly adopted when they are to be sent to a congress.

A minister cannot be received in any other character than that which is given him by his credentials; and for this reason he usually communicates their contents before he is admitted to his first audience. If he is accredited by letters patent, this is done by showing the instrument itself; but if his credentials are sealed, then by presenting a copy of them.

The powers granted by the credentials may either be confined to certain specified transactions, or extend generally to all negotiations whatever; and may, in either case, be either limited or unlimited; in which latter case the minister is styled a minister with full powers, or minister plenipotentiary. (Vattel, *Droit des Gens*, liv. iv., § 76; Klüber, *Droit des Gens moderne*, § 193, 194.

CREDIT, in Political Economy. [Bill of Exchange. Currency.]

CREDITON. [Devonshire.]

CREECH, THOMAS, is the translator of Lucretius, Horace, Theocritus, and detached portions of several other Greek and Latin authors, of which a list is given in Kippis's Biographia Britannica. He was born at Blandford, in Dorsetshire, in 1659, admitted of Wadham College, Oxford (of which he appears, from the title-page of his Lucretius, to have become a fellow), in 1675, and elected probationer-fellow of All Souls' in November, 1683. He published in 1682 his translation of Lucretius, which appears, on the testimony of a violent and foolish invective against the work, to have gained much credit at Oxford, and is his best work. Dryden, who himself translated parts of Lucretius, has bestowed high praise on his predecessor. (*Preface to first part of Miscellanies.*) Creech published a Latin edition of the same author in 1695, and a translation of Horace in 1684, the latter with very indifferent success. He was appointed to the college living of Woburn, Herts, in 1699; and two years afterwards, in June, 1701, hung himself in his chamber at Oxford. His temper was very morose, which leaves room to ascribe this act to some constitutional infirmity.

CREED, from the Latin credo (I believe), the English name for those short summaries of Christian doctrine which in the continental churches are commonly called symbols, though sometimes also credos. The English church adopts, as 'thoroughly to be received and believed,' the three antient creeds, called the Apostles' creed, the Athanasian creed, and the Nicene creed; but it does not assert any of them to be inspired, nor does it even affirm the first-mentioned to have been actually drawn up by the apostles; it only says of them generally that 'they may be proved by most certain warrants of holy Scripture.' (Art. viii.) The Catholic church adopts along with these what is called the creed of the council of Constantinople, which contains some addition to what is said in the Nicene creed on the subject of the divinity of the Holy Ghost. Many other similar formulæ have been received at different times in particular churches.

CREEK is a small inlet on a low sandy coast. Such inlets occur also frequently in harbours inclosed by a low shore and along the banks of rivers. Sometimes, especially in harbours, creeks are formed by the mouths of small brooks and rivulets. In large rivers creeks are resorted to by small craft as harbours or landing places, and they are often visited by fish in spawning time. In the United States the name creek is very generally applied to small *inland* streams, which in England would be called brooks or rivers.

CREEK INDIANS were, at the beginning of the present century, one of the most powerful native tribes within the limits of the United States of America. They occupied nearly all the countries lying north of 31° N. lat. between the Flint river, the eastern branch of the Chatahoochee, and the Tombigbee or western branch of the Mobile river, and did not permit Europeans to settle west of the Flint. They then occupied a large part of the state of Georgia, and more than half of that of Alabama. In 1802 and 1805 they ceded the north-western portion of their territories to the United States; but in 1813 they joined their arms with those of the Spaniards in Florida against them, and were only defeated and subjected by a very destructive war in 1814. Though their number was much reduced by this war, it was still estimated at 20,000, of which number about one-fourth were warriors. At this period they were obliged to give up all the countries west of the river Coosa, a branch of the Alabama. In 1826 those of them who inhabited that portion of Georgia which lies between the Flint river and the Chatahoochee sold their lands and retired to the banks of the Arkansas, where a tract of land was assigned to them by the general government. Many of them are said to have emigrated to the Mexican state of Texas. Of their former territories the Creeks occupy at present only the north-eastern corner of Alabama, together with a small number of Cherokees. They have made considerable progress in civilization, having entirely abandoned a wandering life, and inhabiting fixed places. They have large flocks of cattle, and cultivate grain, maize, potatoes, and some roots and vegetables: they also have different kinds of domestic manufactures. They have schools established among them. Their language is a dialect of the so-called Floridian language, which is spoken by all the tribes south of the Tenessee river, and as far west as the Mississippi. The Seminole Indians in Florida are called Lower Creeks. The name Creeks was given to them by the first settlers. They call themselves Muskogees.

CREEPER (Zoology). Creeper-family, *Certhiadæ*. A family of birds placed by Mr. Vigors under his order *Scansores* or *climbing birds*. 'The genus *Certhia*,' writes that author (*Linn. Trans.*, vol. xiv., p. 461), 'as originally instituted by Linnæus, contained, besides the true *Certhia* and its congeners which form the extreme family of the preceding tribe (*Picidæ*), all those birds whose slender and gradually curved bills and delicate formation of body, added to their practice of employing their tongues in taking their food, indicated a strong affinity to each other, and which have since been particularized by authors under the various names of *Nectarinia*, *Cinnyris*, *Drepanis*, &c. To the group thus known and described by the Swedish naturalist, later ornithologists, who have strictly followed his steps, have added another, discovered since his time in Australasia, similar in habits and manners, and now distinguished by the generic title of *Meliphaga*. The whole of the birds, however, thus united by close affinities, and as such generally brought together by systematic writers into one conterminous series, are decidedly divisible into two distinct groups, naturally arranging themselves under different subdivisions of the order. The family of *Certhiadæ*, as we have seen above, live upon animal food; while the remaining genera of the Linnæan *Certhia* subsist chiefly upon vegetable juices. The tongues of each, though similar in being more or less extensible, and in being the medium through which they are supplied with food, are equally distinct as the nature of the food itself. Those of the former are sharp, and of a spear-like form, as if to transfix the insects which are their prey; while those of the latter are divided into tubular filaments, which appear exclusively adapted to the purposes of suction. In other particulars they exhibit an equal difference. The *Certhiadæ* climb, and their feet are of a conformable structure; but the feet of the *suctorial birds* are not only in general unsuited to that purpose, but they become gradually weaker, and of less use as they come nearer the type of the tribe, where they are so short and slightly formed, as to be serviceable only in perching, when the bird is at rest..... The two groups of the Linnæan *Certhia* are disposed in the separate departments to which the distinct nature of their food and habits more immediately unites them; while at the same time, by their forming the extremes of their respective tribes, and touching each other at the corresponding points of the circles in which they are arranged, their obvious affinities are preserved inviolate.'

Having thus shown that, according to Mr. Vigors, the *Certhiadæ* on one side lead the way to the Tenuirostral group, we must go back a little to make the reader acquainted with its true place, in the opinion of Mr. Vigors, among the Scansorial birds. The strong affinity, he observes, between the *Picidæ* (wood-peckers) and the *Certhiadæ*, in their general habits of climbing and of feeding by their extensile tongue, needs no illustration. The difference in the form of the typical bill of *Picus*, and that of the true *Certhiæ*, the former straight and powerful, the latter curved and slender, is softened down by the intervention of the genus *Dendrocolaptes*, Herm., which, as it stands at present, includes some groups (*Dendrocolaptes Picus*) where the bill is as strong and as straight as in *Picus*; others (*D. scandens*), where the bill, still retaining its strength, becomes gradually curved; and others (*D. procurvus*), where the bill still further deviating from the type of the genus to which it belongs, assumes the full curve and slenderness of the bill of the typical *Certhiæ*. The Linnæan *Pici*, he remarks, include some species where the bill loses the straight and angulated form, and becomes curved and compressed; and these, of which *Picus auratus*, Linn., is the representative (*Colaptes*, Swainson), show in this particular a clear approximation to the true *Creepers*; while the latter exhibit an equal contiguity to the former, in some of the aberrant groups of the family, which retain the stiff shafts of the tail-feathers so remarkable in the true *Pici*. The conformation of the foot of the *Certhiadæ*, shows a deviation from the perfect structure of the more typical *Scansores*, distinguishes them as an aberrant group of the tribe, and calls for a separation. In the *Certhiadæ* the foot is not strictly scansorial; but though they have not two posterior toes like the *Picidæ*, the single hind toe of the *Certhiadæ* is considerably longer and stronger than it is in the generality of *Perchers*.

'In addition,' continues Mr. Vigors, 'to *Dendrocolaptes*, already mentioned, and the true *Certhia* of the present day, the family before us consists of a variety of genera strongly united by their corresponding habits. Among these, *Climacteris*, Temm., and *Orthonyx*, Temm., preserve the strong shafts of the tail-feathers, which are carried on to them from the true *Pici*. This construction gradually disappears in the remaining groups of the family; but the strong hind toe, and the tongue more or less extensile, and serving to spear their prey, is still conspicuous. Among such groups we may particularize the *Tichodroma*, Ill., and *Upupa*, Linn., together with the Linnæan *Sitta*, and the conterminous form of *Xenops*, Ill. Here also may be associated the *Opetiorhynchus* and *Anabates* of M. Temminck, as also the *Oxyrhynchus* of the same author. This genus may be observed to be connected with those groups of the present family which are united with the genus *Yunx* of the preceding; it is a perfect *Wryneck*, as justly asserted by M. Temminck, with a *Creeper's* foot. I wish not, how ever, to enter into the affinities of these groups. We know but little of them as yet: and every day is bringing in fresh subjects, and fresh information on a department of the class which has hitherto, I know not why, attracted but little attention.'

Mr. Swainson (*Fauna Boreali Americana*, vol. ii.) places the genus *Troglodytes* (wrens) among the *Certhiadæ*, which family he also places under the *Scansores*.

Cuvier, the Prince of Musignano, and Lesson, arrange the *Certhiadæ* under the *Tenuirostres*, and the following are the genera which M. Lesson enumerates.

Family character.—*Bill* sometimes very much curved, sometimes but little, sometimes nearly straight, rounded, slightly compressed, pointed; *tongue* simple, cartilaginous at the extremity; *tail-feathers* generally worn at the end. (Lesson.)

Genera. Certhia.

Bill moderately long, more or less curved, triangular, compressed, slender, pointed; *nostrils* basal, partially closed by a membrane; *wings* short, fourth quill longest; *tail-feathers* stiff, a little curved, pointed at the end. Example, *Certhia familiaris*, Linn.

[Certhia familiaris.]

Description.—Bill about half an inch long, slender and curved; head and neck above, streaked with black and yellow-brown; a white line above each eye; irides hazel; back, rump, and scapulars approaching to tawny; quills dusky, tipped and edged with white or light brown; coverts dusky brown and yellowish-white, producing a variegated appearance; a yellowish-white bar across the wing; breast and belly silvery white; tail-feathers twelve, tawny brown; length rather more than five inches; weight about two drams (Montagu), Pennant says five drams.

The *Creeper*, *Common Creeper*, *Tree-creeper* and *Tree-climber*, *Certhia familiaris*, Linn., is, according to Belon and others, the Κέρθιος (*Certhius*) of Aristotle (book ix., c. 17); it is *Le Grimpereau* of the French; *Picchio piccolo*, *Picchietto*, *Rampichino* and *Piccio rampichino* of the modern Italians; *Baumlaufer*, *Kleinere Grau-Specht*, or *Kleinste Baum-Häcker* of the Germans; *Krypare* of the 'Fauna Suecica;' and *y Grepianog* of the antient British.

Habits.—The creeper is a most restless and active little bird, ever on the alert, and climbing up and about the trunks and branches of trees intent on picking up its insect food. Though comparatively common, and a constant resident in Britain, it is not easily seen; for its activity in shifting its position makes it very difficult to follow it with the eye. At one instant it is before the spectator, and the next is hidden from his view by the intervening trunk or branch to the opposite side of which it has passed in a moment. The form of the tail and organization of the feet are beautiful adaptations for this sort of rapid locomotion. Its note is monotonous, and often repeated.

Nest in the hole or behind the bark of decayed trees, formed of dry grass, and the inner part of the bark, lined with small feathers, in which six or eight eggs are deposited: while the female sits on these she is regularly fed by the male bird.

Geographical Distribution.—Britain and the Continent of Europe. Pennant says, that it migrates to Italy in September and October. Latham states, that it is found in various parts of Germany and elsewhere on the Continent, and is also said to inhabit North America. This is confirmed by the Prince of Musignano, who, in his *Specchio Comparativo*, notes it as common and permanent near Rome, and rare near Philadelphia.

Temminck is of opinion that the *Certhia brachydactyla* of Brehm is identical with *Certhia familiaris*.

Tichodroma (Petrodroma, Vieill.).

Bill longer than the head, triangular at the base, slightly bent, rounded, entire, and depressed at the point; *nostrils* horizontal; *tail-feathers* nearly equal, with ordinary shafts; *wings* long, fourth, fifth, and sixth quill the longest. Example, *Tichodroma muraria*, C. Bonap.; *Tichodroma phœnicoptera*, Temm.; *Certhia muraria*, Linn.

Description.—Summit of the head of a deep ash colour; nape, back, and scapulars bright ash; throat and front of the neck deep black; lower parts blackish ash; coverts of the wings and upper part of the exterior barbs of the quills bright red; extremity of the alar quills black: these quills have two large white spots disposed upon the interior barbs; tail black, terminated with white and ash; bill, iris, and feet black; length six inches six lines. Such is Temminck's description of the male in its nuptial or spring dress.

The female, according to the same author, has the summit of the head of the same bright ash as the back; the throat and front of the neck white, slightly tinged with ash; and the rest of the plumage like that of the male.

This bird is the *Grimpereau de muraille*, *Pic de muraille*, *Ternier*, *Eschelette* and *Echelette* of the French; *Picchio muraiolo* and *Picchio di muro* of the Italians; *Mauer Baum laufer* of the Germans, and *Wall-creeper* of Latham.

[Tichodroma muraria.]

Geographical Distribution.—South of Europe. Tolerably abundant in Spain and Italy, always on the most elevated rocks, and very rare in the mountains of moderate height. Never found in the north, according to Temminck. The bird is common in Provence; and the Prince of Musignano notes it as permanent and rather rare near Rome, where it may, however, be seen creeping on the outward walls of St. Peter's. It is not a British bird, at least it has never been recorded as such.

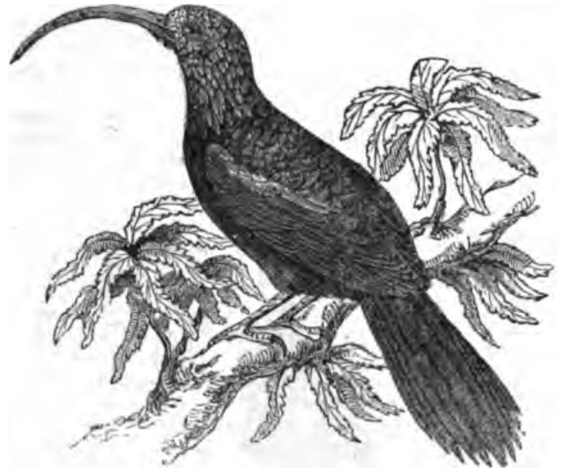
Habits, Food, Nest, &c.—Temminck says that what the *Creeper* does upon trees the *Wall-creeper* does against the vertical faces of rocks, on which it sticks firmly (se cram ponnent fortement), without, however, mounting and descending by creeping. Clefts and crevices of rocks and the walls of old edifices are its favourite haunts, and sometimes, but very rarely, the trunks of trees. It *feeds* on insects, their larvæ and pupæ, and is particularly fond of spiders and their eggs. Belon has figured his example clinging to a pillar with a spider in its bill. The nest is made in clefts of the most inaccessible rocks and in the crevices of ruins at a great height.

The bird moults twice a year. It is in the spring only that the male has the black on the throat, and this ornament disappears before the other feathers fall. The females moult also twice, but without changing colour, which makes it impossible to distinguish the sexes after pairing and breeding time. The young may be distinguished from their parents before their first moult, but in winter no difference is observable. (Temminck.)

Dendrocolaptes (Dendrocopus, Vieill.)

Bill long or moderate, compressed laterally, rather strong, convex, straight or curved, or only curved towards the extremity, pointed; *Nostrils* lateral, round, open; *Tongue* short and cartilaginous. Third, fourth and fifth *quills* the longest. *Tail-feathers* stiff, pointed. Hind *toe* shortest; claws very much curved, channelled. Example, *Dendrocolaptes procurvus*, Temm. *D. trochilorostris*, Wied. Locality, Brazil.

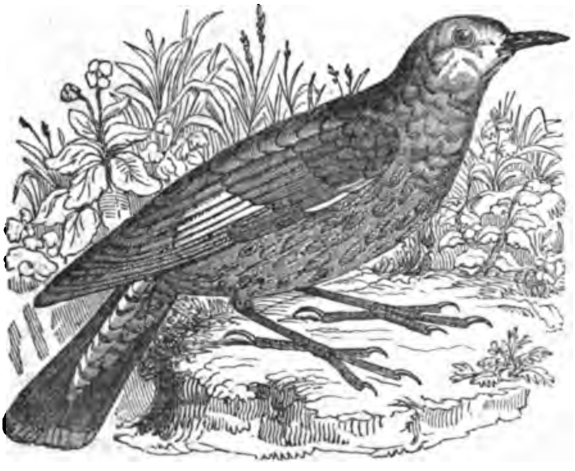
Description.—Size of the blackbird. Bill strongly curved and nearly twenty lines long. Tail graduated and each feather terminated by a stiff point. General colour cinnamon, passing into dirty ruddy grey on the head and belly. There are numerous white spots on the head and neck.



[Dendrocolaptes procurvus.]

Climacteris.

Bill short, weak, very much compressed throughout its length, but little curved, oval-shaped; mandibles equal, pointed; *Nostrils* basal, lateral, covered by a naked membrane. *Feet* robust; tarsi of the length of the middle toe, which, as well as the hallux, are extraordinarily long; claws large and curved, channelled on the sides, subulate, very much hooked; external toe united up to the second articulation, the internal toe as far as the first; lateral toes very unequal. *Wings* moderate; first quill short, second shorter than the third, which last and the fourth are the longest. (Temminck.) Example, *Climacteris Picumnus*.



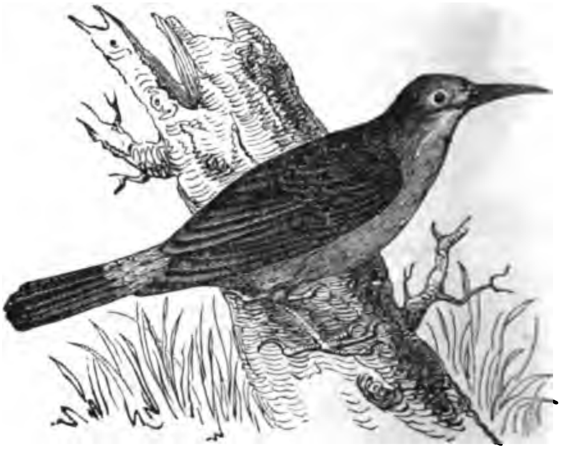
[Climacteris Picumnus.]

Description.—Summit of the head deep-grey; nape and neck bright grey. Wings and two middle feathers of the tail brown; a large nankeen-coloured band passes nearly through the middle of the quills. Tail-feathers black, except at their origin and extremity. Throat and cheeks dirty white. Breast grey. Feathers of the lower parts white in the middle, bordered with brown. Lower coverts of the tail Isabella-colour, marked with transverse brown spots. Length six inches six lines. (Temm.) Locality, Timor, Celebes, and the North coast of Australia.

This genus bears a strong relation to the *Soui-mangas*.

Furnarius (Opetiorhynchos), Temm. Figulus, Spix.

Bill shorter than the head, as wide as it is high, compressed laterally, but little curved, entire, pointed; *Tongue* moderate, straight, worn at the point. *Wings* feeble. (Vieillot.) Type, *Merops rufus*, Gmel. Example, *Furnarius fuliginosus*, Lesson. *Certhia antarctica*, Garnot.



[Furnarius rufus.]

'The genus *Furnarius*, writes M. Lesson, 'was established by M. Vieillot for the reception of some small birds of Paraguay, the most celebrated among which have been placed among the Thrushes, the Creepers, the Bee-eaters and the Promeropidæ. The most antiently known, the *Fournier* of Buenos Ayres (*Merops rufus*, Gm. *Figulus albogularis*, Spix), is often noticed on account of the manner in which it constructs its nest, viz.: in the form of an oven (*four*), whence comes its name. On this point we know nothing of the habits of the *Fournier brun*, which lives in South America, and which approaches much in other respects to *Merops rufus*, figured by Commerson under the name of *Hornero Bonariensium* and of *Turdus furnifaber*, and which is said to be an object of veneration at La Plata. As it ought to be, the genus *Furnarius* should only contain the three species indicated by D'Azara, and that which we add under the name of *Furnarius fuliginosus*.

'This bird is five inches and a half in length; the bill is eight lines long, the tarsi an inch, and the tail two inches eight lines. The bill is slightly compressed, convex above, with the upper mandible slightly curved, entire, and exceeding the lower one. The tail is nearly rectilinear, composed of twelve feathers. The legs are feathered down to the tarsi, which are slender, elongated, with large but little apparent scutella. The middle toe is longest; the two outside ones nearly equal in length, and the external toe is united with the middle toe at its base. The claw of the posterior toe is double the length of the anterior toes, which are very much compressed at the sides, curved, and pointed. The entire plumage of the bird is a clear fuliginous brown spread equally over all the parts of the body, the neck alone exhibits yellow and brown ill-defined striæ. The under side of the tail is of a bright grey-brown. A yellow band of deeper tint occupies the middle of the great quills, and forms a kind of scarf when the bird is in flight; the extremity of the quills is a little deeper than the rest of the plumage, and their external border is a shade brighter.' (Lesson.)

Locality.—*Furnarius fuliginosus* inhabits the Malouine islands. It lives upon the beach, where its familiarity and fearless disposition permits approach till it may be almost touched with the hand. Its sombre plumage has caused it to be mentioned under the name of *Merle* in the narratives of some voyages. Pernetty, who sojourned at the Malouines, thus describes it· 'This bird is so tame that it will almost fly upon the finger; in less than half an hour I killed ten with a small switch, and almost without changing my position. It scratches in the goëmons (*fucus*) which the sea throws upon the beach, and there eats worms and small shrimps, which they call sea-fleas (*puces de mer*).' 'Its flight is short. When disturbed it contents itself with flying two or three paces farther off. Its habits are solitary.' (Lesson.)

Cœreba.

(See Nectarinidæ.)

Dicæum.

Bill pointed, bent, of the length of the head, depressed and widened at the base.

The species forming this genus, instituted by Cuvier, are small, oriental, have more or less of scarlet in their plumage, and differ from the true *Certhiæ*, inasmuch as their tails are not worn, nor do they creep. It is questionable whether they do not belong to the *Nectarinidæ;* but their position will principally depend upon their habits and the form of their tongue. Cuvier places the genus next to *Le Fournier* (*Merops rufus*) and under *Nectarinia.*

[Dicæum erythronotus.]

CREES and **Chippeways.** These constitute at present one of the most numerous and most widely extended of the aboriginal nations which inhabit the interior of North America. The Crees, formerly called by the French Knistineaux, inhabit the shores of Hudson's Bay from Moose River, which falls into the south-western corner of James Bay, to the mouth of Churchill River (about 59° N. lat.), and hence they extend westward to the Athabasca Lake, and to the plains which lie betwixt the forks of the Saskatchewan, near Carlton House. They do not extend to the Rocky Mountains, the plains lying along the base of this range being in possession of a branch of the Assinneboin Indians, who are of the Sioux stock, and speak the language of the Iroquois or Hurons. The Chippeways inhabit the country about Lakes Michigan, Huron, and Superior. But it seems that many other tribes belong to the same stock as the Crees; for all the nations which are within the limits of the United States north of the Ohio and east of the Mississippi speak languages which may be considered only as dialects of that spoken by the Crees and Chippeways. [Algonquins.]

The Lennapi, one of these tribes, have a tradition amongst them, that 'their ancestors, coming from the westward, took possession of the whole country from the Missouri to the Atlantic, after driving away or destroying the original inhabitants of the land, whom they termed Alligewi. In this migration and contest, which endured for a series of years, the Mengwe or Iroquois kept pace with them, moving in a parallel but more northern line, and finally settling on the banks of the St. Lawrence and the great lakes from whence it flows.' (Richardson *in Franklin's First Journey.*)

M'Keevor gives the following description of this race — 'They are, for the most part, tall, large-boned, and long-visaged, with very prominent features; the eye is penetrating, and of a deep black colour; the nose prominent, of an aquiline shape, not at all flattened; the forehead is short and straight; mouth large, but lips not at all everted; hair uniformly of a shining black, straight and coarse, having no disposition whatever to curl. When viewed in profile, the parts appear more deeply and distinctly marked than in the Esquimeaux. The ear is not placed so far back on the head, nor is the space between the eyes at all so great as in the last-mentioned nation. The general expression of the countenance is gloomy and severe. They have little hair on their chin or upper lip, owing to its being eradicated immediately on its first appearance. The females differ considerably both in person and features from the men, being short, small-boned, with the face approaching more to the rounded form. They have, for the most part, an expression of mildness and sweetness in their looks.'

The Crees, like the other tribes of North America, live upon the produce of the chace and the fisheries in the numerous lakes and rivers by which their country is watered. No kind of agriculture has been introduced among them, as among those tribes that inhabit the southern portions of the United States. This is chiefly to be ascribed to the general sterility of the countries which they inhabit, and partly to the rigour of the climate. Even in the European settlements no attempt to sow and plant has been made north of Carlton House, on the Saskatchewan, and at the latter place only on a small scale. The hardships to which their manner of life frequently exposes them, and the want of food for some weeks together, sometimes compel them to commit cannibalism. Instances of this kind are on record, even of parents having fed on their own children; but these extreme cases are of rare occurrence. They commonly evince a strong affection for their offspring, and bewail for a length of time the loss of their relations.

Europeans are very little acquainted with the language of the Crees. M'Keevor has added a short vocabulary to his voyage. Dr. Richardson collected a copious and valuable vocabulary, which is still unpublished. Mr. J. Howse of Cirencester, who was in the service of the Hudson's Bay Company for twenty years, is now preparing, under the sanction of the London Geographical Society, a grammar of the Cree language, which will, we feel confident, throw a new light on the structure of the Cree and all the cognate languages of the North American continent. (Hearne, Richardson, M'Keevor, *Voyage to Hudson's Bay.*)

CREFELD, a minor circle in the Prussian province of Düsseldorf, lying on the left bank of the Rhine, and bounded on the north and west by the province of Cleves. Its area is about 88 square miles; the surface is completely level, and the soil, though in parts light and sandy, is productive, and very favourable for the cultivation of rye, oats, and buckwheat, flax and fruit. The Rhine skirts it in the east, and the Nierse in the west. The arable land consists of about 45,000 acres, which form above three-fourths of the whole surface. Agriculture is the chief employment of the inhabitants; and next to this the rearing of cattle, and manufacturing, which last is principally carried on in and about the town of Crefeld. The circle contains three towns (Crefeld, 19,000 inhabitants; Uerdingen, 2200; and Linn, 980), twenty-two villages, and twenty-one hamlets. The population was in 1816, 32,069; in 1826, 35,446; and in 1831, 37,611.

CREFELD, the chief town of the circle, lies in a low marshy situation, and was surrounded with walls and ditches as early as the year 1373; 51° 20′ N. lat., and 6° 32′ E. long. It is well and regularly built, and being encircled by gardens and country seats, is one of the prettiest spots in this part of Germany. The houses are about 1600 in number, and the inhabitants about 19,000: in 1784 they were 5800, in 1816, 9839; and in 1831, 18,738. The town contains a Roman Catholic church, two Protestant churches, a synagogue, and a place of worship for the Mennonites, of whom there are about 800; an orphan asylum, hospitals, a house of correction, and a school in which girls are taught all kinds of female labours. The manufactures to which Crefeld is indebted for its prosperity were set on foot by the Protestants, who sought refuge here from religious persecution at the end of the seventeenth and beginning of the eighteenth centuries. The chief branches of these manufactures are silks and velvets; they are carried on both in the town and its immediate neighbourhood, and afford employment to upwards of 6000 hands; their produce is estimated at more than 500,000*l.* a year. The other branches of manufacture are cotton-yarn, woollen cloths, and kerseymeres, flannel, stockings, linens, hats, gloves, thread, refined sugar, tobacco, soap and starch, looking-glasses, sheet-iron, iron and copper wares, and felt for hats. The trade of Crefeld is brisk and extensive, particularly in its own products, and it has three good fairs in the course of the year.

CREMA, the town of. [Lodi.]

CREMNITZ (Hungar. Kërmöcz-Bánya), a mining-town in the northern part of the county of Bars, in Hungary, situated in a narrow gloomy valley, closed in by seven high hills. It is a royal free town, and the place where the earliest mines in the kingdom were opened; 48° 42′ N. lat. 18° 53′ E. long. The inner town, even with the castle, contains only 39 houses, but its suburbs are extensive and add 582 more to the number. The population is about 5500, mostly Germans or Sclavonians, who derive their subsistence from the adjacent mines. Among the buildings of note are the archiepiscopal residence, the principal church, with two lofty richly-gilt steeples and a coppered roof, built by the townsmen in 1461, four other churches, the chancery, mint, town-hall, royal gymnásium, Roman Catholic high school, royal hospital for the miners, an hospital for the townspeople, and a convent. It is the seat of a subordinate board of mines, and coins the celebrated Cremnitz ducats. The royal mines in the neighbourhood produce gold, esteemed the finest obtained in Europe, and silver, and employ between 800 and 1000 workmen. The waters of these mines contain a large quantity of sulphate of iron. The smelting-houses on this spot smelt not only all the ores found here, but what the Schemnitz and Kieschlich mines yield. The produce of the Cremnitz mines has greatly fallen off of late years. The town contains a Normal school, a Lutheran school; two paper-mills, and a manufactory of earthenware and of red lead. It is the most antient free town in Hungary.

CREMO'NA, the province of, in the Lombardo-Venetian kingdom, is bounded to the north by the province of Brescia, east by that of Mantua, south by the Po, which divides it from the Duchy of Parma, and west by the province of Lodi. Its length is about 40 miles from north-west to south-east, and its breadth is about 15. The Po, the Oglio, and the Adda are the principal rivers of the province. It is entirely a country of plains, forming part of the great level of Lombardy.

It is divided into nine districts, which are subdivided into 187 communes, with a population, in 1835, of 184,987 inhabitants, being an increase of 835 upon that of the year 1834. (*Bollettino Statistico di Milano.*) The districts are: Cremona, Soncino, Soresina, Pizzighettone, Robecco, Pieve d'Olmi, Casal Maggiore, Piadena, Pescarolo. The country is very productive in corn, flax, wine, oil; it also produces silk, cheese, honey, and wax. There are in the province 148 elementary schools for boys, attended by 7353 pupils; and 39 female schools, attended by 2339 girls. (*Report of* 1833.) At Cremona and Soresina are two female colleges for secondary instruction. At Casal Maggiore is a private establishment for secondary education for boys, and at Cremona a gymnasium and a royal lyceum. The Po and the Oglio being subject to overflowings, considerable sums are spent yearly by the treasury in repairing the embankments. The communal or cross roads constructed or repaired in the province cost, in 1831, the sum of 113,142 livres; in 1832, 191,838 livres; and in 1833, a sum of 129,219 livres. The two principal towns of the province, besides the capital, are Casal Maggiore, with about 4000 inhabitants, and Pizzighettone, a fortress of considerable strength on the east bank of the Adda.

CREMO'NA, the capital of the province, and a bishop's see, 45 miles south-east of Milan, is situated on the north bank of the Po, and surrounded by walls flanked with towers and wet ditches. A navigable canal, which communicates between the Oglio and the Po, passes through the town. The Po is navigable for large boats from Cremona to the sea. The town is five miles in circumference, but its population is not more than 26,000, and consequently many of its streets, which are mostly regular and tolerably wide, appear desolate. Cremona has many good buildings, such as palaces and churches. The façade of the cathedral, which is a Gothic building, is ornamented with curious sculptures representing the signs of the zodiac and the rural labours of the various seasons. The interior is rich in paintings of native masters, Moretti, Malosso, Boccacino (who is styled the Raphael of Cremona), Sojaro, &c.; and also in sculptures, especially by Sacchi, a Cremonese artist of the thirteenth century. The other remarkable churches are S. Nazario, which contains some master-pieces of the brothers Campi, distinguished painters of Cremona; S. Pietro al Po, S. Abbondio, S. Lorenzo, Sa. Pelagia, also possess paintings of the Cremonese school. At Sa. Pelagia are two inscriptions in honour of Girolamo Vida, a distinguished prelate of the age of Leo X., who was a native of Cremona. Vida, who has been praised by Ariosto and by Pope, is the author of a Latin poem on the life of Jesus Christ, from which Tasso has not disdained to borrow some fine passages of his Jerusalem, and also of an 'Ars Poetica,' a didactic poem, which is much esteemed. The town-house on the great square, the new market, the theatre, and some of the gates of the town, are worthy of notice. But the famous tower or belfry ending in a spire, which is one of the loftiest in Italy, is the wonder of Cremona: there are about 500 steps to ascend up to the bells. The spire is a conspicuous object for many miles around in the plains of Lombardy. About one mile outside of the town is the church, formerly an abbey, of S. Sigismondo, founded by Francisco Sforza I., duke of Milan, who married here Bianca Visconti: it is full of paintings. (Panni, *Rapporto delle Pitture che trovansi nelle Chiese della Città e Sobborghi di Cremona.*) There are also in Cremona some private galleries of paintings, of which that of Count Ponzoni is the principal. Cremona is the residence of the delegate or governor of the province. It has civil, criminal, and commercial courts, a lyceum, and a gymnasium, and a school of the fine arts. It is also the first city in Italy where infant schools were established in 1829, through the exertions of a philanthropic clergyman, Abate Aporti. Being encouraged by the local authorities as well as by the Austrian government of Lombardy, these schools are spreading to Brescia and other provinces. In the town of Cremona there are several infant schools: one is mentioned in which the pupils pay from two to three livres a month, and which is attended by 80 or 90 children; two others are gratuitous or charity schools, in which about 340 children of both sexes and of poor parents are instructed, and have their dinner given to them. (*Bollettino Statistico*, 1834.) Children remain at school from morning till night; they are admitted from two to six years of age, after which they go to the public elementary schools. Their physical as well as intellectual, moral, and religious education is attended to. Aporti has published an interesting account of these institutions, with the method of instruction pursued in them, a catechism, &c.: *Manuale d'Educazione ed Ammaestramento per le Scuole Infantili*, Cremona, 1833. A notice of Aporti's labours appeared in No. XIX. of the *Journal of Education*, 1835. There are also holiday schools at Cremona and in various parts of the province, in which boys above twelve years of age who have left the elementary schools receive instruction, especially in the branches of knowledge connected with the mechanical arts, such as drawing, &c. These schools are open at certain hours on Sundays and other holidays which are kept in Catholic countries.

Cremona carries on a considerable trade in agricultural produce by means of the Po and the various canals communicating with that river. It has manufactures of silks and cottons. It was once celebrated for its violins and musical strings, but that branch of industry appears to have greatly declined. The high road from Milan to Mantua and Venice passes through Cremona.

Cremona was in the territory of the Galli Cenomani. It was colonized by the Romans under the consuls T. Sempronius and P. Cornelius, at the time when Hannibal was marching against Italy (Tacitus, *Histor.*, iii. 34) as a place of defence against the Gauls and other enemies from the north. It became a populous and flourishing town. In the civil wars of the triumvirate it was plundered by the soldiers of Octavianus, and its fertile fields were divided among fresh colonists, the former owners being driven away, a calamity pathetically alluded to by Virgil in his Bucolics and Georgics. Virgil was born at Andes, between Cremona and Mantua. In the war between Vitellius and Vespasian the citizens sided with the former, upon which the victorious army of Vespasian having entered the town, plundered and burnt it. Tacitus (*Hist.*, iii.) has given a fearful account of that catastrophe. Cremona was restored by Vespasian. After the fall of the empire, it underwent the same vicissitudes as the other cities of Lombardy: it suffered severely at the hands of Frederic Barbarossa, was afterwards distracted by the Guelf and Guibeline factions, had its petty tyrants, and at last fell under the dominion of the Visconti of Milan, since which time it has continued to form a part of the Milanese state. (F. A. Zacharia, *Cremonensium Episcoporum Series cum Dissertatione de Cremonæ Origine, Amplitudine, &c.*, 4to, 1749.) The literary history of Cremona has been written by Arisio, *Cremona Literata*, 2 vols. fol., 1702-6.

CREMO'NA, a general name given to violins made at Cremona in the seventeenth century by the Amati family, and by Stradiuarius at the commencement of the eighteenth. These instruments excel all others, and the choicest of them bear very high prices. [VIOLIN.] Cremona is a name erroneously given to a stop in the organ; it ought to be Krumhorn, a sort of cornet, of which it is intended to be an imitation.

CRENATULA. [MALLEACEA.]

CRENILA'BRUS (Cuvier), a genus of fishes of the section Acanthopterygii and family Labridæ. The species of this genus have all the general characters of the true *Labri*, or *Wrasses*, but are distinguished by their having the margin of the preoperculum denticulated: the cheeks and operculum are scaly.

Four species of this genus have been found off the British coast, of which the common one, *Crenilabrus tinca* (*Labrus tinca* Linnæus), is called the Gilt-head, Connor, Golden Maid, &c. This fish is found on various parts of the coast; it is about six inches in length, and the depth is nearly one-third of the length. The general colour of the body is obscure red and green; these colours are arranged in longitudinal stripes on the upper parts, and beneath the lateral line the red is disposed in spots. The Gilt-head mostly frequents deep water, where the bottom is rocky; its food is chiefly Crustacea.

Crenilabrus cornubicus (the Goldfinny or Goldsinny) somewhat resembles the last, but may always be distinguished by a black spot on each side near the base of the tail, and situated on the lateral line; its general colour is yellowish green, darkest on the back; the sides are usually adorned with longitudinal lines of a deeper hue. Length about three or four inches.

Crenilabrus gibbus (the Gibbous Wrasse) may be readily distinguished from either of the known British species of this genus by its comparatively shorter and more elevated form. The depth of the body is considerably more than one-third of the length: the colours are chiefly orange and blue; the gill-covers and sides of the body are spotted, and the back is striped. The ventral fins are green, the pectorals are yellow, with transverse red stripes at their base.

Pennant obtained a specimen of this fish off the coast of Anglesey; and this is we believe the only instance on record of its capture off the British coast.

Crenilabrus luscus (the Scale-rayed Wrasse) has been once caught off the coast of Cornwall: the specimen was twenty-two inches in length. The tail is round, and consists of fifteen rays; 'between each ray of the dorsal, anal, and caudal fins, is a process formed of firm, elongated, imbricated scales. Colour, an uniform light brown, lighter on the belly; upper eye-lid black; at the upper edge of the base of the caudal fin is a dark brown spot Pectorals yellow; all the other fins bordered with yellow.'

CREOLES, a word originally Spanish, and used to designate the children and descendants of European parents, who were born in the South American or West Indian Colonies, as distinct from the resident inhabitants born in Europe, as well as from the offspring of mixed blood, such as the Mulattos and Mestizoes, born of negro or Indian mothers. The Creoles of Spanish America were for a long time inadmissible to civil and political offices as well as to the higher ranks in the army; and even after Charles III. removed their disqualifications, they were still considered as inferior to the native Spaniards. This state of humiliation contributed perhaps as much as the climate to render them lazy and indolent. The insurrection of the Spanish colonies made the Creoles masters of the country, from which the native Spaniards were mostly driven away. In the West India Islands the Creoles are upon an equal footing with European natives. The Creole women are characterized by the symmetry of their persons, the brilliancy of their eyes, and the sallowness of their complexions.

CRÉPI'DULA. [CALYPTRÆIDÆ.]

CREPUSCULA'RIA (Latreille), a section of Lepidopterous insects, corresponding with the genus Sphinx of Linnæus. These insects occupy an intermediate station between the *Lepidoptera Diurna*, or butterflies, and the *Lepidoptera Nocturna*, commonly called moths.

Distinguishing characters:—Antennæ growing gradually thicker towards the apex, at which part they are furnished with an elongated club, either fusiform or prismatic. Inferior wings furnished with a rigid bristle-like process at their base, which passes into a hook on the under surface of the superior wings, and serves to retain them. The larvæ are furnished with sixteen legs, and many of them have a long horny process on the last segment of the body. The chrysalides are smooth, or sometimes furnished with small spines (but destitute of the points and angles usually observed in those of butterflies); they are either inclosed in a cocoon or buried in the earth: the larvæ sometimes feed upon wood, in which case they assume the pupa state within the tree or branch.

The families contained in this section are the Sphingidæ, Sesiidæ, Ægeriidæ, and the Zygænidæ.

CREPU'SCULUM. [TWILIGHT.]

CRESS, the name given to various plants with acrid or pungent leaves. Common cress is *Lepidium sativum;* water-cress, *Nasturtium officinale;* Belleisle or Normandy cress, *Barbarea præcox;* Indian cress, *Tropæolum majus.*

CRESSY. [CRECY.]

CREST, from the Latin *crista*, the ornament of the helmet: a term in heraldry sometimes used for the helmet itself. Hence, *to crest*, to adorn as with a plume or crest, in Milton, *Par. Lost*, ix. 500,

'his head
crested aloft.'

In speaking of the cimier or crest, says Dallaway (*Inquiries into the Origin and Progress of Heraldry in England*, 4to., Glouc. 1793, p. 386), it will be necessary to describe the armour worn for the defence of the head, and the progressive embellishments which were added to its rude form, with the æra of their invention. Montfaucon, that most critical antiquary, has preserved many delineations of the antient Norman casque, which, when the whole body was invested in mail, was composed of iron framework, covered with leather, and quite flat at the top, to which shape succeeded the conical head. By the number of bars of which the beauvoir or visor consisted, when presented in front view, the rank of the wearer was ascertained; that of the esquire was always in profile and closed, to denote his vigilance and activity in battle. To Edmund Crouchback, earl of Lancaster, the origin of several heraldic novelties in this kingdom is readily referred, and his seal will be found to exhibit the crest, accompanied by the lambrequin and wreath, as the first instance, prior to the year 1286. The crest is said to have been carved in light wood, or made of leather, in the shape of some animal, real or fictitious, and fastened by a fillet of silk round the helmet, over which was a large piece of fringed samit or taffeta, pointed, with a tassel at the end. Before figures were introduced, plumes only were used, as well upon the head of the horse as on that of the warrior, which we gather from the seal of Baron de Spencer in 1296. The principal application of crests was in jousts or hastiludes, when the shield was not borne, but where they afforded an equal distinction; or by the chief commanders of horsemen in the field of battle. Originally of the highest importance, conceded by royal grant, and confined to very few persons; in process of time the assumption of them has become universal. They are not held to be absolutely hereditable, but may be assumed; and as females could not avail themselves of their primary use, accordingly no woman is allowed to bear a crest. As an appendage to sepulchral monuments, crests are placed beneath the head of the armed effigy, attached to the helmet by the wreath and lambrequin; and at the feet a lion or dog is invariably added. Upon many of the large altar tombs, so frequent in the sixteenth and seventeenth centuries, those both of the man and of his wife's family are carved at the feet of the recumbent figures.

Instances of crests formed of feathers may be seen in that of Sir Henry Percy, in Edward I.'s time, engraved at the bottom of plate xxiv. of Meyrick's 'Critical Inquiry into

Antient Armour,' and in that of Sir John Harsick, *t.* Richard II., 1376, in plate xxxvi. of the same work: and many such occur in the illuminations to the contemporary manuscripts of Froissart's Chronicle. The custom of conferring crests as distinguishing marks seems to have originated with Edward III., who in 1333 (*Rot. Pat.* 9 Edward III.) granted one to William Montacute, earl of Salisbury, his 'tymbre,' as it is called, of the Eagle. By a further grant in the 13th of the same king (*Rot. Vasc.* 13 Edw. III. m. 4.), the grant of this crest was made hereditary, and the manor of Wodeton given in addition to support its dignity.

CREST. [DROME, Department.]

CRESTED DOGSTAIL GRASS. [CYNOSURUS.]

CRETACEOUS GROUP, in Geology, consists of the upper strata of the secondary[*] series immediately below the tertiary[*] series and superincumbent on the Wealden, or where that is wanting, on the oolitic system. This group is common to Europe, and also to at least a part of Asia. It consists of chalk resting upon either an arenaceous or argillaceous deposit. The chalk bears a remarkably uniform mineralogical character over a surface extending from the British islands through northern France, northern Germany, Denmark, and Sweden, into both European and Asiatic Russia. (De La Beche, *Res. in Theor. Geol.*) The cretaceous system is subdivided into the following strata:—

Chalk . .	Upper	In which numerous species of marine fossils are found, amounting to about 260 genera and 768 species.
	Lower	
	Marly	
Green-sand	Upper Green Sand	
	Gault	
	Lower Green Sand	

The area over which this system prevails in England, and the various strata which it contains, have been well defined by geologists. The following article is chiefly abstracted from a valuable paper on the subject inserted by Dr. Fitton in the *Geological Transactions*, 2nd series, vol. iv. p. 2. pp. 103—388.

The Cretaceous Group occupies nearly the whole of the south-eastern part of England: a line drawn from Crewkerne on the S.W. to Hunstanton on the N.E. forms its western boundary, and it extends from this line to the east coast, with the exception of a small part on the S.E. The same formation appears to prevail in the north of France, extending to the cretaceous district of Aix-la-Chapelle. The chalk, or upper portion of the system, is, in some parts, covered with the strata of the tertiary series; in other parts it is denuded. The green-sand crops out round its edge, which is broken and interrupted in many places where the lower strata appear.

On the N.E. the chalk appears in a narrower belt along the cliff from near Cromer to Hunstanton. From Cromer along the coast to the mouth of the Thames, and along the north bank of that river, it is concealed by the upper strata, which extend a considerable distance inland.

Beginning with Norfolk and proceeding southwards, the boundary line between the chalk and the superior strata, is about four miles east of Snettisham, two miles west of Diss, eight miles east of Mildenhall, between four and five west of Bury St. Edmunds, continuing to the north-east of Hertfordshire by Hertford and near St. Albans to three miles south-east of Wendover.

In the northern part of this district the chalk has in a few places been partially denuded. On the north-east there is a small piece of chalk along the banks of the Bure. The town of Norwich also stands upon chalk, which, in its vicinity, extends along the banks of the Yare and Wensum. There is a piece of chalk likewise at each side of small parts of the Stour and of the Orwell. The strata superincumbent on the chalk series extend a little beyond Uxbridge on the west, and then run in a narrow tongue to the north-west, three miles south of Wendover, which intervening space at that point is the whole width of the denuded chalk, Wendover being there its western limit. The chalk becomes wider towards the south-east, taking in Maidenhead; it is again partially covered a little to the west of that place, and continues in a very uneven line to Reading, Newbury, and a little to the east of Marlborough. The tertiary strata then run from west to east by Kingsclere, Basingstoke, Guildford, to three miles north of Dorking, round by the Darent, and appears near Woolwich and Greenwich. Another detached portion appears in the north-west of Kent, taking in the Isle of Sheppey, and continues from the æstuary of the Medway along the coast to the Isle of Thanet. The chalk is covered on the west and north of Canterbury and at Sandwich; the beds which cover it terminate on the coast at Deal. On the south coast, from Worthing westward, the chalk is again concealed by the superincumbent series, extending nearly in a straight line through Chichester as far as a little to the east of Salisbury; it then continues in a south-west direction nearly as far as Dorchester. The chalk passes entirely across the Isle of Wight nearly from east to west, in a narrow ridge consisting of vertical strata, from Culver Cliff to Compton Bay; there is also a small piece on the south of the island. The limits of the chalk on the other side, where it is bounded by the outcropping of the lower strata of the system, remain to be noticed. The cliffs of the whole of the Isle of Thanet are composed of chalk. The chalk cliffs again commence near Deal, and are continued past Dover to East Weare Bay, a distance of about thirteen miles. As the chalk rises from Dover towards Folkstone the upper beds disappear, and the cliffs consist entirely of the lower members of that stratum. The rise of the marly chalk occurs about a mile and a half to the east of the escarpment of Folkstone hill, which is 566 feet high. Just at the rise of this bed there is a very copious and perennial spring called Lydden Spout. About two thousand paces west of this spring the cliff recedes from the sea, and the intermediate shore thence to Copt Point is occupied by a mass of ruins which has fallen from above. The sudden transition from the chalk cliffs is very remarkable. Turning inland the chalk range is bounded on the south by the outcrop of the green-sand strata, which extend four miles north of Ashford, three miles north of Maidstone, and is cut by the Medway, whence it forms a line curving outward to the south as far as the Darent, where it is five miles north of Sevenoaks. Merstham is on the boundary, which then continues in nearly a west direction, immediately north of Reigate, to Box Hill, near Dorking, and thence to Guildford, leaving a very narrow ridge of chalk. From Guildford to a point about two miles from Farnham there is a remarkable ridge called the 'Hog's-back,' produced by an upthrow of the chalk and the breaking off of the southern portion of the curve. The coast between Copt Point and Beachy Head, near these respective points, is occupied on each side by the green-sand, and the intermediate space by the Wealden clay and Hastings sand: the two latter do not belong to this series, being lower denuded strata. The Sussex chalk range, or South Downs, commences at Eastbourne, near Beachy Head, and continues thence along the coast beyond Shoreham and onwards in a west-by-north direction. The green-sand bounds it on the north, and leaves a range of chalk varying from eight to three miles in breadth. About three miles south-west of Petersfield the green-sand again sinks below the chalk, which is connected with the north range by the Alton chalk-hills, running from near Farnham to near Butser Hill (917 feet).

It now remains to define the boundary of the chalk from Dorsetshire on the south-west to Norfolk on the north-east. Part of it is thus described by Dr. Fitton:—'The great range of the chalk escarpment in the interior of England, which stretches like the shore of a sea or lake from Crewkerne in Dorsetshire to the north-east of Dunstable in Bedfordshire, is perfectly analogous in structure and appearance to the Downs of Surrey and Sussex. It is interrupted by three or four indentations or gulfs; one of great width, opening towards the west between Crewkerne and the heights about Stourhead, in South Wiltshire; another expanding to the north-west, and terminating in the defile where the Thames cuts through the chalk in its way to the south-east from Buckinghamshire and Oxfordshire. The vales of Pewsey and of Warminster are intermediate bays of the same general structure, but of smaller dimensions; and all these valleys are apparently the result of denudation, aided by previous disturbance of the strata, which has carried away the chalk and laid bare to various depths the strata beneath it.' (*Geol. Tran.*, 2nd series, vol. iv. part 2nd., p. 243.) From the heights near Dunstable, the upper chalk range passes through the north-west of Hertfordshire, by Hitchin and Baldock, to Barkway and Royston Downs, and thence by Balsham and Newmarket into Suffolk by Mildenhall, two miles west of Brandon, four west of Downham, by Nar borough, and on to Snettisham. The chalk hills decline rapidly in height in the north-east of Bedfordshire. Kensworth-hill is 904 feet above the level of the sea; the hills east of that town are 850 feet high. Lilleyhoe is 664; Barkway Windmill, 513; the station near Royston, 484; Balsham, on the east of Cambridge, 380; Newmarket station, 267; Brandon, in Suffolk, 190 feet. The chalk hills stretching from Cambridgeshire to the north-west coast of Norfolk rise nowhere probably above 600 feet in height, bounding 'the fen country like the low shore of a sea.'

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[*] These terms are now considered objectionable by geologists, as not truly designating the different series; but since they are still commonly thus distinguished, it has been thought advisable to adopt the same classification here.

The chalk inland range is highest towards the central part between Wiltshire and Hertfordshire. In departing from that central tract, the rise is comparatively small both towards Devonshire on the south, as well as in the counties northwards. The chalk nearly disappears in Devonshire, a few insulated portions only appearing there; principally upon the coast between Sidmouth and Lyme and along a line from Beaminster through Chard and White Stanton. The transition from the chalk to the green-sand is here distinctly seen, especially on the south-west of Axmouth, where sections of the subjacent beds are exposed in the cliffs. In many parts of the chalk range, the upper and lower strata are well defined even by the outward features; a marked difference appearing in the vegetation and general aspect. The upper chalk has usually layers of flint nodules occurring at regular intervals, and is softer than the lower chalk. At Sandown Bay in the Isle of Wight the latter stratum is defined by a layer of distant and insulated flints which separates it from the flinty chalk above; it is sometimes of a greyish colour, as is also the bed of marly chalk immediately beneath it. This marly chalk is of a tenacious nature, and sustains the water which descends through the chalk; in consequence a line of ponds has been produced along the bottom of the escarpment of the South Downs. The *Malm-land*, remarkable for its fertility, is the soil over the lowest beds of marly chalk. The *Malm-rock*, immediately below the marly chalk, consists of stony beds belonging to the upper green-sand formation. Salisbury Plain, which is more than twenty-five miles in extent from west to east, and twelve miles from north to south, is occupied by the upper chalk. Though it has many inequalities of surface, it would be almost destitute of water, but for the Avon and its branches, which traverse it. But in the tracts occupied by the lower chalk, and still more in the chalk marl, there are few valleys without streams; hence, as well as owing to the difference of soil, the vegetation differs also, and the luxuriance of the lower regions, affords a strong contrast to the barrenness of the higher downs. Dr. Fitton observes, 'were it not that the colour is so nearly alike, these two groups would no doubt have been distinguished in geological maps by different hues; and they ought to be so, wherever the scale is sufficient to express the distinctive features above stated.' The village of Dunstable stands on the lower chalk, which may be distinctly traced from Totternhoe through Houghton Regis, Upper Sundon, and Streatley.

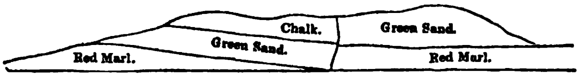
Accurate measures of the entire thickness of the chalk, have rarely been made in England; the following are however approximate numbers taken from the best authorities. Mr. De La Beche's estimate of the average thickness of this stratum is 700 feet. Dr. Conybeare considers it to range from 600 to 1000 feet. The height of the cliff at Beachy Head, which at the summit includes part of the flinty chalk, and goes down very nearly to the upper green-sand, is only 535 feet; 350 feet is the thickness of the flinty chalk at Dover. If then 250 feet are added for the remainder of that division at Beachy Head, the aggregate thickness of the chalk on the Sussex coast may be estimated at about 800 feet. At Wendover Hill, the total thickness of chalk is considered something more than 500 feet. At Diss, in Norfolk, it was found by boring to be 510 feet. The great variation in thickness is ascribed in part to the unequal removal and abrasion of the upper strata, and in part to the original inequality in the thickness of the chalk itself.

The organic remains in the chalk are usually very abundant, and are mostly marine. They consist of marine plants, lamelliferous and celluliferous corals and sponges, Asteriadæ, Crinoidea, and Echinida, mesomyonous and brachiopodous Conchifera, phytiphagous and cephalopodous Mollusca, Crustacea, Fishes, Mosasaurus, Chelonia. Mr. De La Beche observes, 'organic remains are in general beautifully preserved in the chalk; substances of no greater solidity than common sponges retain their forms, delicate shells remain unbroken, fish even are frequently not flattened, and altogether we have appearances which justify us in concluding, that since these organic exuviæ were entombed, they have been protected from the effects of pressure by the consolidation of the rock around them, and that they have been very tranquilly enveloped in exceedingly fine matter, such as we should consider would result from a chemical precipitate.' p. 349. *Researches in Theoretical Geology.*

Green-Sand. The general position of this stratum has been sufficiently indicated in describing the boundary of the chalk, the former outcropping round the latter in an uneven line, in some places much wider than in others.

The Upper Green-Sand commences immediately on the north of Copt Point beyond Folkstone, where the succession of the various beds of the system is best seen. Here the upper green-sand is of comparatively small thickness, and occupies a very narrow belt round the chalk, running in a west-north-west and then in a westerly direction, as already defined in describing the chalk boundary. It assumes a new character near Godstone, and is there more distinctly marked. The firestone obtained in that part of the country is in the upper green-sand, occupying four beds separated by seams of stratification; the thickness of the two first beds is respectively one foot nine inches, and one foot four inches; the two others are only ten inches each; this stone is extensively quarried between Godstone and Reigate. Continuing still in a narrow belt to Guildford, the upper green-sand forms a slight projection along the foot of the Hog's Back; from Farnham by Selborne and Petersfield to the south of Petworth, this stratum runs out beyond the foot of the chalk escarpment like a step or terrace. Near Petersfield it is remarkable for its width, which is there two miles, a much greater extent than at any other part. A little east of Petersfield, for a short space, this stratum entirely disappears; it then continues in a narrow belt along the north escarpment of the South Downs. This formation is but partially disclosed along the base of the central ridge of chalk in the Isle of Wight, but it is distinctly seen along the escarpments of the Under-Cliff; its step-like projection beyond the chalk, as seen in Western Sussex, is likewise observable here in several places.

In the Isle of Purbeck the green-sand runs in a narrow band on the south escarpment of the chalk, but there the separation of the upper and lower green-sands has, in a great measure, disappeared, and the latter is greatly reduced in thickness or wholly united with the upper sand. The Black Down Hills, in Devonshire, are composed of green-sand; the two beds thus united wanting the intermediate gault. These hills are distinguished by the uniform level of their summits, and, when cursorily viewed, appear to be composed of horizontal or nearly horizontal beds of green-sand, with here and there an occasional patch of chalk. It is found however that the rocks composing these hills have been fractured subsequently to their deposition, and that the valleys mostly are lines of faults, having a general northerly direction. At some parts there are faults which do not form valleys. In a section across a southern part of the hills the chalk and green-sand seem to form a continuance; green-sand being on one side of a vertical section, and chalk on the other. In the yellowish sand, near the surface, at the Barnscombe side of the Beacon Hill, brown iron ore is found in polished fragments of very high lustre. Whet-stones are obtained from the Black Down Hills, the manufacture of which occupies a great number of the neighbouring inhabitants. The quarries are driven in direct lines into the hill, almost horizontally, about eighty feet below the top of the hill. The stones from which the whet-stones are cut are irregular concrete masses, imbedded in a looser sand, and more properly belong to the lower green-sand stratum; but the different strata of the green-sand of these hills are not distinguished by Dr Fitton, as the gault between the upper and lower green-sand is entirely wanting. The upper green-sand is not distinctly marked in the great south-western escarpment of the chalk till beyond the Stour, from the north bank of which it extends northwards for about ten miles to Shaftesbury, and continues thence round the vale of Wardour. Or



the south side of the vale of Wardour the upper beds of this stratum are concealed at the foot of the chalk hills, but the lower beds shoot out into plateaus, which form the tops of the hills all the way from Shaftesbury along the south side of the vale of Wardour. On the north side of the vale the whole series of the upper green-sand rises abruptly, and forms a narrow ridge of unequal height. At the north of the valley this stratum appears to consist of two portions; that which immediately succeeds the chalk is the same as the firestone of Surrey; the other is equivalent to the malm-rock of Sussex, and abounds in chert. In a well sunk at Ridge the upper green-and is distinguished into four different strata, their aggregate thickness being 100 feet. The upper green-sand is not nearly so conspicuous inland as near the coast; from the vale of Wardour it does not occur again till the vale of Pewsey. The town of Devizes stands upon a platform of the upper green-sand, which is there about 430 feet above the sea. It occurs again at Swindon, and then at Tetsworth, whence it continues in a narrow belt and in a north-east direction beyond Cambridge.

The upper green-sand consists in some places of a soft marly sand, traversed in every direction by stem-like cylinders, having within them cores of darker green matter; it also contains some irregular masses of a bright brown or orange hue, but the greater part is composed of grey calcareous marl, resembling the lowest chalk, but so thickly interspersed with green particles as to entirely assume their colour. The green particles, according to analysis, are found to consist of—

Silica	48·5
Black Oxide of Iron	22·0
Alumina	17·
Magnesia	3·8
Water	7·
Potash	traces
	98·3

The thickness of this series near Folkstone is from 25 to 30 feet: at Godstone it increases considerably, and the depth of the wells sunk through it in the malm-rock strata of Hampshire varies from 60 to 100 feet. In Western Sussex the thickness is between 70 and 80 feet. It is about 70 feet in the Isle of Wight. The thickness of the green-sand at Black Down is about 100 feet, probably from 60 to 80 in the vale of Wardour, and from 30 to 50 near Swindon. At Cambridge it is not more than 18 inches; thence through West Norfolk the stratum is no where distinctly seen. At Hunstanton the beds which are supposed to represent it are not more than two feet thick.

Gault.—The stratum which is usually found between the upper and lower green-sand is obscured at East Weare Bay by the ruins of the superior beds, but is visible in detached points. Farther on, towards Folkstone, it becomes more marked, and forms the greater part of the cliff at Copt Point, as well as the grassy cliff between the base of the Martello tower situated in the vicinity and the sea. Thence it forms a narrow band between the upper and lower green-sand. Near Godstone it occupies a tract distinguished as 'the Black Land,' and forms a slight depression below the stratum which affords the firestone. Between Farnham and Alton this narrow belt of gault swells out to three or four times its former width, and then again narrowing continues to form a narrow band between the two strata of green-sand as far as Beachy Head. In the Isle of Wight this stratum likewise forms a narrow band between the upper and lower sand. The gault again appears in the vale of Wardour: on the south it forms a rapid slope; on the north a depression immediately below the sand: it is here identified with that in the eastern counties by the characteristic fossils. At Ridge, near Fonthill Park, the clay of this stratum has been long used for tile-making, and it is there 75 feet in thickness. From the vale of Wardour and thence north-eastward to the sea at Hunstanton the gault everywhere appears, though it is much reduced in quantity in Norfolk. This stratum occupies a large part even of the higher grounds between Whitchurch and Wing. Immediately to the west of Hitchin and Baldock it is still wider; the towns of Shefford and Biggleswade stand on it. From Cambridge, for a few miles towards the north, it likewise occupies as great a width. In consequence of the numerous borings for water made in Cambridgeshire about this part, its relations and thickness have been well ascertained, especially from Basingbourne through Meldrith, and thence towards Cambridge. This stratum is very distinct at Mildenhall: the blue gault has been traced as far as West Newton, about three miles south of Ingoldsthorpe. The valley between the chalk and lower green sand is there interrupted by an advance of the chalk; and beyond that point the blue gault is no longer observable: its place is thence occupied by the red marly stratum of Hunstanton Cliff, which is a calcareous argillaceous matter, four feet thick, and it is questioned by geologists whether the term gault should be applied to it The gault, as far as regards its composition, may be divided into two portions; the upper part, immediately succeeding the upper green-sand, contains green particles, and thence for some feet downwards it is harsh and sandy. The lower portion consists of a smooth, uniform, very plastic clay, of a light-blueish colour, which is used for tiles and common pottery. Throughout the gault, but chiefly in the lower part, concretions of iron pyrites are found, and other nodules and irregular masses. The thickness of this stratum at Copt Point is about 130 feet. At Merstham it is 150 feet thick, which is likewise the average thickness in Cambridgeshire. In the Isle of Wight it is about 70 feet; at Ridge about 75; near Thame 90 feet: at Mildenhall the blue clay is only 9 feet. Mr. Rose considers it not more than 15 feet in West Norfolk.

The Lower Green-Sand.—This stratum appears of a uniform surface, shooting out beyond the chalk in the south-east counties, and occupies a much larger area than either of the upper strata of the green-sand series. The resemblance in the aspect of the surface of the country, here occupied by the lower green-sand, to that of the Black Down Hills, in Devonshire, is extremely striking; and perhaps indicates that the description of the latter more properly belongs to this section than to that which treats of the upper green-sand stratum. The lower green-sand has three distinct subdivisions, clearly defined in most parts where it occurs. This series of strata rises gradually from Copt Point, and occupies the whole cliff west of the village: thence it is continued without interruption through Sandgate, and in the heights above Hythe. Its outcrop turns from the coast to the interior at Adlington Corner: here the subdivisions are all distinctly marked, and their respective limits defined. The lower beds, which contain much calcareous matter, are extensively worked in quarries, both for building and lime-burning, at Pluckley, on the north-west, and at Great Chart, on the south-west of Ashford, and generally along the outcrop west of Adlington Corner, where it forms a prominent ridge adjoining the valley of the Weald: here are the principal beds of stone known under the name of 'Kentish Rag.'

Extensive quarries are worked at Boughton, to the south of Maidstone. The stone for the construction of Westminster Abbey is said to have been procured here. The stone is a variety of the Kentish rag. From Adlington Corner the lower green-sand continues towards the west in a broad band varying in width; on the coast the distance from the chalk at Folkstone-hill to the outcrop of this series is about ten miles, but from Lenham to the outcrop it is not more than two. Maidstone, Sevenoaks, Godstone, Reigate, Dorking, and Godalming, stand on the lower green-sand series. Near Godstone the surface is comparatively lower, and ponds are frequent where the middle stratum occurs: the stony beds of the lowest group then rise to form the escarpment of Tilburstow Hill, which is nearly on a level with the chalk downs. At the top of the hill, the beds, which to the north of Tilburstow Hill, rise uniformly at an angle of not more than 10°, are suddenly thrown up to about 45°, giving decisive evidence of an elevation from the chalk, or of a sinking towards it. Fullers earth has been dug in this part of Surrey for a very long period; at present the neighbourhood of Nutfield is the only place in which it is got. The beds occur near the top of the lowest stratum of green-sand; in one pit near Nutfield the principal bed of fullers earth is 16 feet thick. On the south of the Hog's-Back the lower green-sand rises, like the chalk, at a very high angle, and then, being bent suddenly in an opposite direction, is continued several miles to the south. Hindhead is the most prominent point in this part of the country, where the whole of the tract occupied by the lower green-sand is wild and barren, producing only fern, heath, and furze. Dr. Fitton remarks—'In crossing this desolate region by the main road from London to Portsmouth, it is difficult to believe that we are only forty miles distant from the capital, and midway to one of the chief naval establishments of the empire; but the nature of the soil effectually prevents improvement, and it is not improbable that this tract may remain for centuries unchanged, and still exemplify the power of geological causes in modifying the civil condition of countries, as well as their external features.’ (*Geol. Tran.*, series 2nd., vol. iv. p. 147.)

As this formation turns towards the east and continues along Sussex to the coast, it is not nearly so wide as on the north of the Weald. At Beachy Head it is three miles wide, but it is only one mile wide a little to the west of the spot where the Adur runs through it. The lower green-sand occupies a great part of the surface on the south of the Isle of Wight, and is everywhere conformable to the chalk; a ridge of highly inclined strata of green-sand crossing the island from the shore on the south of Bembridge down to the foot of Afton Down. The sands likewise form the lower ground of the interior from Mottestone through Newchurch to the coast.

A narrow belt of green-sand runs along the west and north-west of Dorsetshire. In the vale of Wardour the lower green-sand is no where prominent; but it occupies the whole of the entrance of the Vale of Pewsey, and continues, with its subdivisions well defined, through the northern counties in a north-east direction as far as the coast of Norfolk. The greatest width of the formation in this part occurs between Leighton and Ampthill in Bedfordshire, where it rises in Bow-Brickhill to the height of 683 feet above the sea. Near Woburn there is a fuller's-earth pit, the beds of which occur, like those in Surrey, near the top of the lowest division; that of the best quality is in a bed from seven to nine feet thick. The pits in this part of the country have continued to supply fuller's earth for more than a hundred years.

The three groups into which this stratum is divided, are, in most places in the south-east counties where sections have been made, well defined; and in general, in different situations where this formation occurs, the respective characteristics are found to be alike.

The first of these subdivisions consists principally of sand, white, yellowish, or ferruginous, with concretions of limestone and chert. It commonly forms a flat, but sometimes an irregularly hilly surface rising from the valley of the gault; it bears a dry barren soil. The second group contains an abundance of green matter and comparatively little stone; it is retentive of moisture, and occupies a flat and marshy tract. The third and lowest group contains more calcareous matter than the upper divisions. Where the sand of the first division emerges from beneath the gault it is often loose and of a white or buff colour; but sometimes there occurs a course from half a foot to one foot in thickness of concretions of pyrites. The middle group is characterized by a great diversity of colour and consistency which it assumes under different circumstances. When dry, the hue is frequently of a rusty yellow; but in other states it is of a dark greenish colour, and passes rapidly from the consistency of loose dry sand to a tough cohesive mass. At the very lowest part it is sometimes very marly. The fuller's earth belongs to this portion of the series, or to the upper part of the lowest division: the lower part of the latter is usually a group of stone beds, separated by yellowish calcareous sand and clay, commonly called ‘Hassock.’ The whole thickness of the lower green-sand on the shore between Copt Point and Hythe is about 250 feet, thus distributed—

First sub-division about 70 feet; second, from 70 to 100; and the third, from 60 to 80 feet. In western Sussex, Mr. Murchison states that nearly 400 feet of sand were bored through at Petworth; and Mr. Martin considers that the two lower members may be together about 150 feet thick. In the Isle of Wight the thickness seems to be as great as, if not greater than, that near Folkstone. At Brill, in Buckinghamshire, this formation is found to be about 26 feet; in West Norfolk, Mr. Rose estimates it at about 80 feet.

The organic remains are mostly marine throughout the whole of the green-sand series. There are marine plants, celluliferous corals, sponges, Asteridæ, Echinida, Conchifera, phytiphagous, a few zoophagous, and many cephalopodous Mollusca, Crustacea, &c.; often silicified. Numerous fossils have been found in the Blackdown Hills, usually in a state of fine preservation, principally from the loose sandy character of the matrix in which they are imbedded. The composition of the fossils is also another cause of their good preservation; with but few exceptions, the shells are converted into chalcedony, and the whole of their calcareous matter has disappeared. A very extensive collection of fossils from these hills, formed by the late Mr Miller, is now in the museum of the Bristol Institution.

The reader may consult Greenough's and Walker's Geological Maps of England for the general distribution of the beds here described.

For the description of the chalk in Yorkshire and Lancashire, see their respective counties.

CRETE. [Candia.]

CRETINS, the name given in the Valais and other Alpine valleys to certain individuals who are more or less idiots, and most of whom have large swellings on their necks, called goîtres. The goître or wen is not however always a necessary sign of crétinism. Many have goîtres without being crétins or idiots; and some crétins, it is said, have no goîtres, but the latter fact seems doubtful, or at least rare. The goîtres are of all sizes, from that of a walnut to the size of a quartern loaf. There are also various gradations of crétins; those in the lowest state of idiotcy cannot articulate distinct sounds, but make a sort of cry, or burst out into an idiotic laugh; they are as helpless as infants, and their intelligence seems below that of many brutes. Others are able to go about, and attend to some easy labour, and make themselves understood. They are numerous about the villages and hamlets of the Lower Valais and of the Val d'Aosta; they are not so common in the German part of Switzerland, where, in many of the valleys, they are unknown: it is said that they are not found among the natives of the higher valleys or mountains; even in the Upper Valais, east of Sion, they are rare. There has been much discussion about the causes of this infirmity: some have attributed it to the nature of the water; others, and Saussure in particular, to the stagnation of the atmosphere; for it appears to be most frequent in the low marshy spots at the bottom of valleys surrounded by high mountains, where the fresh air does not circulate freely, and where the reflected rays of the sun are very powerful in summer. The germ of the disease seems to be hereditary, though all the children of the same family are not affected by it; but there is no doubt that localities, poor diet, filth, laziness, and ignorance, materially assist its development. Since the beginning of the present century it has been observed that the number of crétins in the Valais has decreased, which is attributed to better social and domestic habits of life, to the drying up of marshes, the use of purer water for drink, and to the custom of sending children, during summer, to the upper valleys and châlets, among the Alps. The general use of coffee is also said to have contributed to it. (Walsh, *Voyage en Suisse*, vol. ii.; *Canton du Valais*). The Cagots, in some valleys of the Pyrenees, appear to be a sort of crétins.

CREUSE, an inland department of France, deriving its name from one of the rivers by which it is watered. The department is of a compact form, approaching to oval, having its greatest length N.W. and S.E. 68 miles, and its greatest breadth at right angles to the length 50 miles. It is bounded on the N. by the departments of Indre and Cher, on the N.E. by that of Allier, on the E. by that of Puy de Dôme, on the S. by that of Corrèze, and on the W. by that of Haute Vienne. Its area is about 2057 square miles: it contains 284 communes, or parishes; and the population in 1832 was 265,384, or about 129 to a square mile, being considerably below the average population of France relative to the surface. Guéret, the capital of the department, is in 46° 10′ N. lat., and 1° 51′ E. long. 186 miles in a straight line S. by W. of Paris, or 255 by the road through Briare, Nevers, Moulines, and Montluçon.

The department is hilly: the hills that pervade it are branches from the central mass of the Auvergnat mountains. The two principal chains of hills run nearly N.N.W. and S.S.E., and enclose between them the valley of the Creuse. This river rises in the S.E. part of the department, near the boundary which separates it from the department of Corrèze, and flows northward past the town of Filletin to Aubusson, receiving the waters of the Roseille on the right, a little above Aubusson. From Aubusson it flows N.N.W. through the valley above described, which runs nearly the whole length of the department. Just before it enters the adjoining department of Indre, the Creuse receives on the right the Petite Creuse, or Little Creuse, which rising just beyond the north-eastern boundary of the department, in the neighbourhood of Boussac, and swelled by the waters of the Veron, flows westward into the Creuse, and on the left the Sedelle (which is augmented by the waters of the Gazine and Brisentine): but neither of these streams is navigable, nor does the Creuse itself become so during the whole of its long course of from 130 to 140 miles, nearly 60 of which are within this department. It falls into the Vienne, a feeder of the Loire. The Cher, one of the principal feeders of the Loire, rises in the eastern part of the department, also the Tardes, a tributary of the Cher. On the western side of the department we have the Gartempe, the principal feeder of the Creuse (but which does not join that river until long after it has quitted the department), and the Ardour, an affluent of the Gartempe. On the south-western side there are the Maude and the Thorion, tributaries of the Vienne; and the Villeneuve, the Leyrenne, and the Visge, feeders of the Thorion. Most of the rivers which water the department on the W. and S.W. rise on the W.S.W. slope of the chain of hills which bounds the valley of the Creuse. There are small lakes at the head of the Gazine and of the Ardour.

Beside being destitute of all means of water-carriage, the department possesses very little facility for communication by land. No road of the first class touches the department at all, nor is there any of the second class, except on the west side, where about four miles of the road from Paris to Limoges are within the boundary. Of roads of the third class there are several which unite at Guéret, one from La Châtre (department of Indre); one from Dorat, and one from Limoges, (both in the department of Haute Vienne); the latter unites at Bourganeuf with one from Uzerche (department of Corrèze); one from Clermont Ferraud (department of Puy de Dôme); and one from Montluçon (department of Allier): a road of the same class leads from Aubusson to Bourganeuf, and another from Aubusson to Auzance.

The soil of the department of Creuse is very inferior, and combines with the want of the means of communication to reduce the value of the land very far below the average of France. The produce in corn (wheat, rye, barley, and oats) is small; and there is no wine made: the country is not well wooded, but there is good pasturage, in which a quantity of horned cattle and sheep (especially the latter) are fed. The mineral productions of the department have not been sufficiently attended to: there are four places in which antimony is found, but in only two have any mining operations been carried on: the coal-pits in the valley of the Creuse have been very inadequately worked; the iron ore has been neglected, and there is sandstone which would make grindstones, and granite and porphyry for building, or for ornamental works. The inhabitants are industrious, but the low rate of wages and the want of employment at home induces many to seek work in other parts. The love of their native soil however leads most of these emigrants to return home with the fruit of their labours, and purchase a patch of land, in the cultivation of which and in the bosom of their families they spend their days. These emigrants amount to about 23,000 or 24,000 yearly, about 1 in 11 of the whole population: they are mostly mechanics. Of the emigrants in the year 1825, 13,427 were bricklayers and masons, 1982 stone-cutters, 1942 carpenters, 1847 sawyers, 944 tilers and slaters, 803 flax and hemp dressers, 802 tile-makers, 545 paviers, 90 farriers, 63 plasterers, and 45 miners. The chief manufactures carried on in the department are of carpets, which are in high repute; paper, which is also in high estimation, and cotton and woollen yarn. Aubusson is the chief seat of the carpet manufacture.

The department is divided into four arrondissements, that of Guéret on the N.W., population in 1832, 89,513; that of Boussac on the N.E., population 36,738; that of Bourganeuf on the S.W., population 37,965; and that of Aubusson on the S.E., population 101,168. The chief towns are Guéret, the capital, on the hills which skirt the valley of the Creuse on the W.S.W. side, population 3100 for the town, or 3921 for the whole commune; and Aubusson, on the Creuse, population 4354 for the town, or 4847 for the whole commune. For these towns, as well as for Bourganeuf and Boussac, the other capitals of arrondissements, we refer to their respective articles. Of the other towns we subjoin a brief notice.

Felletin is on the Creuse, near its source, and not far from Aubusson. It had, in 1832, 2816 inhabitants for the town, or 3228 for the whole commune. About 300 people are employed in the carpet manufacture, in which this town almost rivals Aubusson. Coarse woollen cloths and paper are also made.

La Souterraine is near the source of the Sedelle, on the road from Dorat (Haute Vienne) to Guéret. The population in 1832 was 1647 for the town, or 2921 for the whole commune. The inhabitants are engaged in the manufacture of coarse hempen cloth.

Ahun, or Le Moutier (*i. e.* Monastère) d'Ahun, is on the banks of the Creuse, between Aubusson and Guéret: it has about 2000 inhabitants, who manufacture woollen cloth. Ahun and Le Moutier d'Ahun were originally distinct, the former being on the summit of a hill near the river, the latter at the foot of the hill and on the bank of the river. Ahun was known to the Romans by the name of Acitodunum, which name appears in the 'Theodosian Table:' in the middle ages (A. D. 997) the name appears, by the title deeds of the foundation of the abbey of Le Moutier d'Ahun, to have been shortened into Agêdunum, from whence, by corruption, the modern name Ahun. Le Moutier d'Ahun derives its name from an abbey of the Benedictine order, and of the congregation of Cluny, the importance of which is indicated by the buildings and gardens which yet remain: the Conventual Church is still the resort of numerous pilgrims on the festival of St. Roch, August 16.

The other towns are, in the arrondissement of Griéret, St. Vaulry, on the road from Dorat to Guérat, with the bourgs of Bonat on the Petite Creuse, Dun-le-Palleteau, near the Bresentine, and Salagnac and La Chapelle, on the Gartempe: in the arrondissement of Bourganeuf, Benévent, near the Ardour: in the arrondissement of Boussac, Gouzon, on the road from Guéret to Montluçon, Chambon on the Tardes, and Jarnaye, with the bourg of Châtelus: in the arrondissement of Aubusson, Auzance near the Cher, Evaux near the Chacrot, and Chenerailles, on the Voulse, a feeder of the Pontchauseau, with the bourgs of Mainsac, Crocq (on the Tardes), Bellegarde and La Courtine. None of these have a population of 1500 for the town or 3000 for the whole commune.

The department of Creuse is in the diocese of Limoges, which includes also the department of Haute Vienne: the bishop is a suffragan of the archbishop of Bourges. It is in the jurisdiction of the Cour Royale, or high court of justice of Limoges, and in the fifteenth military division, of which the head-quarters are at Bourges. It sends three members to the Chamber of Deputies.

CREU'SIA. [CIRRIPEDA.]

CREUTZ (Croat. Körös-Varmegye), a county in Croatia, adjoining south and east to the Hungarian counties of Agram and Warasdin. It has an area of about 640 square miles, and the soil under cultivation consists of about 320,500 acres, of which about 143,500 are arable land, and 31,800 vineyards. The population amounts to about 77,500. It contains 2 towns, 1 market town, 266 villages, and 4 prædia or privileged settlements. The county is mountainous and full of woods. It is watererd by the Drave, Glogovnicza, Bednya, and Lesná; the lowlands are fertile, producing corn, maize, tobacco, fruit, &c., and affording good pasture for cattle. Creutz, the chief town, in 46° 1′ N. lat. and 16° 32′ E. long., lies in a plain, on the Glogovnicza, and is surrounded by old ramparts. It contains 637 houses and about 3100 inhabitants, and has two churches and a high school, as well as a Græco-Catholic ecclesiastical seminary. It is the seat of a Græco-Catholic bishopric and chapter The other town in this county is Kaproneza, in a plain on the river of that name, in 46° 10′ N. lat. and 16° 49′ E. long It is defended by strong walls, and a castle, also of some strength. The number of houses is 749, and of inhabitants about 2600. It has two churches.

CREUZNACH, a minor circle in the Prussian province of Coblenz, bounded by the Rhine and Nassau on the north-east, the grand-duchy of Hesse-Darmstadt on the east, and the Rhenish possessions of Bavaria on the south. Its area is about 200 square miles; it is very hilly in the north-west, where it is traversed by the Hundsrück, but the remainder of the country abounds in pleasant and well-watered valleys. In the south and east it is watered by the Nahe and Simmerbach. The soil is in general fertile, and produces grain, wine, very fine flax, hemp, rape, and clover seed, potatoes, and fruit. Of the land under cultivation nearly 90,000 acres are arable, and the vineyards occupy about 5500. The population, which was 30,685 in 1816, and 45,754 in 1825, amounted to 47,689 in 1831 Creuznach has four towns (Creuznach about 7900; Sobernheim, 2300; Kirn, 1750; and Stromberg, 940), and seventy nine villages and hamlets. Great numbers of cattle are reared; the mineral productions are freestone, marble, salt, and iron.

CREUZNACH, the chief town, is situated on both banks of the Nahe, which is here traversed by a stone bridge, in the bosom of a rich and delightful country, 49° 51′ N. lat., and 7° 53′ E. long. It is supposed to have been the site of a Roman castrum. It is built in the old style, without any regular plan, and the streets are narrow and crooked; it has two Roman Catholic and two Protestant churches, a synagogue, gymnasium, and hospital. The number of inhabitants was 6506 in 1816, and is at present about 7900. They depend on the traffic in grain, wine, cattle, salt, flax, &c., and on their manufactures, which are chiefly leather, brandy, tobacco, and soap. There are three salt works close to the town; the 'Theodore's,' and 'Carl's halle,' belonging to the grand-duke of Hesse, and the 'Münster-halle,' to a society at Frankfort; all of them lie on the banks of the Nahe. The Theodorshalle employs about eighty individuals, and produces annually about 1500 tons of fine salt; the other two works yield about 500 more. About two miles from Creuznach is the celebrated burgh of the Rhinegraves of Stein, hence called the 'Rheingrafenstein;' the few remains of this stronghold are situated on a rock of porphyry, which rises 600 feet perpendicularly above the surface of the Nahe, and commands a splendid view In the vicinity of Creuznach also are the ruins of the 'Ebernburg,' on the left bank of the Alsenz, in which Bucer, Œcolampadius, and Ulrich von Hütten, with other reformers, were afforded an asylum against their persecutors by Francis of Sickingen.

CRE'VIER, JEAN BAPTISTE, born at Paris in 1693, was the son of a journeyman printer. He studied under Rollin, and afterwards became professor of rhetoric in the college of Beauvais. After Rollin's death he undertook to continue his 'Roman History,' of which he wrote eight volumes. He is less diffuse and digressive than his master, though not so pleasing in his style of composition. He also published an edition of Livy, in 6 vols., 4to., 1748, with notes. The work by which he is best known is 'Histoire des Empereurs Romains jusqu'à Constantin', 6 vols., 4to., Paris, 1756. The author has scrupulously adhered to the antient authorities in the statement of facts, but his narrative is rather deficient in interest and force. Though not a critical work, nor entitled to a high rank, it is still a useful compilation. Crévier wrote also 'Histoire de l'Université de Paris,' 7 vols., 12mo., 1761, which is in great measure an abridgment of the larger work of Egasse du Boulay; and 'Rhétorique Française,' 1765, a good work, which has been frequently reprinted. Crévier died at Paris in December, 1765 He bore an excellent private character.

CREWKERNE. [SOMERSETSHIRE.]

CRICE'TUS. [MURIDÆ.]

CRICHTON, JAMES, commonly called 'The Admirable,' son of Robert Crichton of Eliock, who was Lord Advocate to King James VI., was born in Scotland in the year 1561. The precise place of his birth is not mentioned, but he received the best part of his education at St. Andrew's, at that time the most celebrated seminary in Scotland, where the illustrious Buchanan was one of his masters. At the early age of fourteen he took his degree of Master of Arts, and was considered a prodigy not only in abilities but in actual attainments. It was the custom of the times for Scotchmen of birth to finish their education abroad, and serve in some foreign army previously to entering that of their own country When he was only sixteen or seventeen years old (the date cannot be fixed), Crichton's father sent him to the Continent. He had scarcely arrived in Paris, which, whatever may have been its learning, was then a gay and splendid city, famous for jousting, fencing, and dancing, when he publicly challenged all scholars and philosophers to a disputation at the College of Navarre, to be carried on in any one of twelve specified languages, 'in any science, liberal art, discipline, or faculty, whether practical or theoretic,' and, as if to show in how little need he stood of preparation, or how lightly he held his adversaries, he spent the six weeks that elapsed between the challenge and the contest in a continual round of tilting, hunting, and dancing. On the appointed day, however, he is said to have encountered all 'the gravest philosophers and divines,' to have acquitted himself to the astonishment of all who heard him, and to have received the public praises of the president, and four of the most eminent professors. The very next day he appeared at a tilting-match in the Louvre, and carried off the ring from all his accomplished and experienced competitors. Enthusiasm was now at its height, particularly among the ladies of the court, and from the versatility of his talents, his youth, the gracefulness of his manners, and the beauty of his person, he was named *L'Admirable*. After serving two years in the army of Henry III., who was engaged in a civil war with his Huguenot or Protestant subjects, Crichton repaired to Italy, and repeated at Rome, in the presence of the pope and cardinals, the literary challenge and triumph that had gained him so much honour in Paris. From Rome he went to Venice, at which gay city he arrived in a depressed state of spirits. None of his Scottish biographers are very willing to acknowledge the fact, but it appears quite certain that, spite of his noble birth and connexions, he was miserably poor, and became for some time dependent on the bounty and patronage of a Venetian printer—the celebrated Aldus Manutius. After a residence of four months at Venice, where his learning, engaging manners, and various accomplishments excited universal wonder, as is made evident by several Italian writers who were living at the time, and whose lives of him were published, Crichton went to the neighbouring city of Padua, in the learned university of which he reaped fresh honours by Latin poetry, scholastic disputation, an exposition of the errors of Aristotle and his commentators, and (as a playful wind-up of the day's labour) a declamation upon the happiness of ignorance. Another day was fixed for a public disputation in the palace of the bishop of Padua, but this being prevented from taking place, gave some incredulous or envious men the opportunity of asserting that Crichton was a literary impostor, whose acquirements were totally superficial. His reply was a public challenge—the contest, which included the Aristotelian and Platonic philosophies, and the mathematics of the time, was prolonged during three days, before an innumerable concourse of people. His friend Aldus Manutius, who was present at what he calls 'this miraculous encounter,' says he proved completely victorious, and that he was honoured by such a rapture of applause as was never before heard.

Crichton's journeying from university to university to stick up challenges on church-doors and college-pillars, though it is said to have been in accordance with customs not then obsolete, certainly attracted some ridicule among the Italians, for Boccalini, after quoting one of his placards, in which he announces his arrival and his readiness to dispute extemporaneously on all subjects, says that a wit wrote under it, 'and whosoever wishes to see him, let him go to the Falcon inn, where he will be shown,' which is the formula used by showmen for the exhibition of a wild beast, or any other monster. (*Ragguagli di Parnasso.*)

We next hear of Crichton at Mantua, and as the hero of a combat more tragical than those carried on by the tongue or pen. A certain Italian gentleman 'of a mighty, able, nimble, and vigorous body, but by nature fierce, cruel, warlike, and audacious, and superlatively expert and dexterous in the use of his weapon,' was in the habit of going from one city to another to challenge men to fight with cold steel, just as Crichton did to challenge them to scholastic combats. This itinerant gladiator, who had marked his way through Italy with blood, had just arrived in Mantua, and killed three young men, the best swordsmen of that city By universal consent the Italians were the ablest masters of fence in Europe; a reputation to which they seem still entitled. To encounter a victor among such masters was a stretch of courage, but Crichton, who had studied the sword from his youth, and who had probably improved himself in the use of the rapier in Italy, did not hesitate to challenge the redoubtable bravo. They fought: the young Scotchman was victorious, and the Italian left dead on the spot.

Soon after this the sovereign duke of Mantua engaged Crichton as companion or preceptor to his son Vincenzo Gonzaga, a young man who, according to Muratori, had shown a strong inclination for literature, but who was otherwise of a passionate temper and dissolute manners. (*Annali d' Italia.*) At the court of Mantua Crichton added to his reputation by writing Italian comedies, and playing the principal parts in them himself. His popularity was immense, but of brief duration. He was cut off in his twenty-third year, without leaving any proofs of his genius except a few Latin verses, printed by Aldus Manutius, and the testimonials of undoubted and extreme admiration of several distinguished Italian authors, who were his contemporaries and associates. As he was returning one night from the house of his mistress, and playing and singing as he walked (for he was an accomplished musician), he was attacked by several armed men in masks. One of these he disarmed and seized: the rest took to flight. Upon unmasking his captive he discovered the features of the prince of Mantua. He instantly dropped upon one knee, and presented his sword to his master, who, inflamed by revenge, and, it is supposed, by jealousy, took the weapon and ran him through the body. Some contemporary accounts attribute his death to an accidental midnight brawl, others to a premeditated plan of assassination, but all seem to agree that he fell by the hand of the prince; and a belief, or a popular superstition, prevailed in Italy, that the calamities which befel the house of Gonzaga shortly after were judgments of the Almighty for that foul murder.

Such appear to be the well authenticated points of a wonderful story, that has often been doubted, not only in parts, but almost altogether. It has however been cleared up of late years by the industry and research of Mr. Patrick Fraser Tytler, who produces a mass of contemporary or nearly contemporary evidence. (*Life of James Crichton of Cluny, commonly called the Admirable Crichton; with an Appendix of Original Papers*, 1 vol. 8vo. Edinb. 1819.)

CRICKET, an English game of strength and activity. Formerly it was almost confined to the southern counties: Kent, Sussex, and Surrey more especially, have always been famous for skill in it. Of late years it has spread a good deal in the northern quarter of the island, notwithstanding the obstacles opposed by a wet cold climate, and the general unevenness of the ground. The rules are at once too well known and too complicated to be here explained; they are subject to variations at the pleasure of the Marylebone Club, which meets at Lord's Cricket Ground, St. John's Wood. The laws and decisions of that society are recognised by cricket-players in general, in the same way that the authority of the Jockey Club is held definitive in questions relating to horse-racing. This, which might be called our national game, has long been, and still is, cultivated with much zeal and pride: it is, we believe, of English origin, and played, almost exclusively, by the British, who have carried it into many parts of the world where the climate seems little suited to the exertion which it requires; as for example, Bengal.

CRICKHOWELL. [Brecknockshire.]

CRICKLADE, a market and borough town in the northern extremity of the county of Wilts, in the hundred of Cricklade. The population, in 1831, was 1506. It is situated in a level tract of country, on the south bank of the Isis, 84 miles W.N.W. from London, and 44 N.N.W. from Salisbury. The Thames and Severn canal passes near the town, and a branch canal, which forms a junction between the Wilts and Berkshire canal at Swindon, passes through it. The antiquity of Cricklade appears to be considerable. The name is derived by some writers from the British Cerigwlad, signifying abounding in stones. Others derive it from the Saxon cræcca, brook, and lædian, to empty, the position being near the junction with the Thames of two small streams, the Churn and the Key. An improbable story is related by several antiquarians respecting the existence of a famous school of antient learning at Cricklade, which on that account was originally called *Greek*lade; and it is added that the University of Oxford was formed by an emigration of professors and students from this town. Dr. Stukeley, in his 'Itinerary,' considers it to have been a Roman station; but this perhaps is questionable. In subsequent periods, little of historical interest is recorded, except that in 1016 the town was plundered by Canute. In the parish of St. John are the remains of a priory founded in the reign of Henry III. (Tanner's *Not. Monast.*) It is now used in tenements for the poor. There was formerly an endowed free school, but the endowment is now lost. Two national schools for girls exist, and a charity, yielding 125*l.* a year from 100 acres of land, is appropriated to the apprenticing of poor children. The town consists of two parishes, St. Mary and St. Sampson. St. Mary's church is an antient structure, with vestiges of Norman architecture; in the churchyard is a Gothic cross with canopied niches. The church of St. Sampson is a spacious cruciform edifice, and presents a fine specimen of Gothic architecture. The tower is lofty, surmounted with parapets and pinnacles, and highly ornamented with niches and pedestals. There are two dissenting chapels, and Sunday schools supported by subscription. Cricklade has returned representatives to parliament since the reign of Edward I. In consequence of some notorious instances of bribery, the elective franchise was extended by 22 Geo. 3, c. 31, to the freeholders of several adjoining hundreds. (*Report of the Cricklade Case*, 8vo. 1785 At present the borough is represented by two members the number of electors is 2268; the bailiff is the returning officer. Petty sessions are held by the magistrates once a month, and a court of requests every third Saturday. The market-day is on Saturday, and a fair is held on the 21st of September. One in April, for cattle, has been discontinued.

CRICOPORA. [Milleporidæ.]

CRIME AND PUNISHMENT. [Beccaria.]

CRIMEA lies between 44° 20′ and 46° 10′ N. lat., and between 32° 40′ and 36° 30′ E. long., and forms a part o the Russian government Taurida. Its figure is a quadrilateral, whose sides are respectively directed to the north-east, north-west, south-west, and south-east, and the angles to the cardinal points. From the eastern point however a peninsula stretches out between the Sea of Azof and the Black Sea, terminating on the shores of the Straits of Yenikale. On three sides the peninsula is enclosed by the Black Sea; on the north-east it is washed by the Sea of Azof. Its area may be about 8600 square miles, which is greater than that of Wales by somewhat more than a 1000 square miles. The neck of land by which this peninsula is connected with the continent is about 20 miles long. Towards its northern extremity, at Perecop (called Or Kapi by the Tartars), it is about 5 miles across. Strabo, who is very accurate in describing this region, estimates it at 40 stadia. At this place there still remains a strong rampart, erected by the Turks, which extends from the Black Sea to the Sivash or Putrid Sea, an arm of the Sea of Azof. It consists of a deep trench, about 12 fathoms wide and 25 feet deep, which is still in good condition, and of a double wall, built of freestone, which however has been somewhat reduced by the effects of time. Five batteries are erected along this line.

Few countries, of equal extent, present a greater variety than the Crimea. The isthmus of Perecop and three-fourths of the peninsula (being the northern part) form an arid plain or steppe, which is occasionally diversified with deeper spots of ground or hollows. The soil varies in quality, but for the most part consists either of sand alone or sand combined with clay. Towards both seas there are numerous salt-lakes, some of which are from 15 to 20 miles in circuit. They are generally divided from the beach by narrow and low strips of land, and in their neighbourhood the country is of a dry, clayey, and saline nature, resembling the steppes on the Caspian Sea. The plain declines imperceptibly towards the lakes, and is destitute of water and wood; but in some parts covered with a grass sward. It is nearly uninhabited.

Along the south-eastern shores a mountainous tract extends from Cape Khersonese to Kaffa; hence to the Straits of Yenikale it is hilly. The greatest width of this tract is about the middle, where it spreads to the southern banks of the river Salgyr, about 40 miles from the coast; but its mean width does not exceed 20 miles. The whole probably does not cover 2000 square miles. That portion of this region which is to the west of the harbours of Sevastopol and Balaklava forms a peninsula called by the Greeks the Heracleotic Chersonesus, from having been colonized by settlers from Heracleia, in Asia Minor. From Cape Khersonese the country gradually rises in a sloping plain, occasionally diversified with hills; the soil is clayey, and in many parts mixed with gravel, and the surface is more or less covered with a dry turf; the higher parts are naked rocks. To the east of Balaklava the heights attain the elevation of mountains, which run like an immense wall from that town to Alushta. The coast here consists of cliffs, generally several hundred feet in height, and forming numerous headlands and dreadful precipices. At a distance of from one to two miles from the coast the mountains attain a height of 2000 feet and upwards. From this rapid slope a few torrents descend, the beds of which are filled by heavy rains or the melting of the snow. The summit of the mountains consists of extensive flats, which may be compared with the *páramos* of the Andes, and sometimes extend several miles, with occasional eminences on them. These mountain-*tablelands*, called by the Tartars *Yailas*, are only visited by them during hot summers, on account of the rich pastures which they supply for cattle; some of them are covered with snow till the latter end of May. North of the Yailas the mountains gradually descend, forming numerous but narrow lateral ridges, which enclose delicious and sometimes wide valleys, among which that of Baidari has obtained celebrity from the pen of Lady Craven. The ridges by degrees sink down into hills, which terminate in the northern plain.

West of Alushta is the Babugan Yaila, which is nearly as high as the Chatyr-Dag, or Tent Mountain, which stands to the north-east of it, and is separated from it by a considerable depression. A like depression occurs on the east, and divides the Chatyr-Dag from Temirdshi Yaila, which is much less elevated. Thus the Chatyr-Dag with its flat summit appears like an immense table, and on that account is probably called by Strabo *Trapezus*. (vii., 309, Casaub.) On its flat summit rise several eminences, like a tent, from which the name is derived, which is given to the mountain by the Tartars. These summits, which rise 5040 feet above the level of the sea, are the highest mountains in the Crimea. The Chatyr-Dag and the eastern chain, which extends to Kaffa from the Temirdshi Yaila, are more distant from the coast than the western chain, and a number of small streamlets descend from the heights and drain some fine valleys along the sea-coast. Towards Kaffa, the mountains decrease in elevation, and terminate about a mile from the western shores of the open bay on which that town is built.

The country between the bay of Kaffa and the Sivash or Putrid Sea, is a plain very slightly undulating, but it becomes more so in proportion as it proceeds to the east. Near the banks of the strait of Yenikale at Kertsh, the country is traversed by several ridges running nearly south and north, on which numerous craggy points rise to 300 or 400 feet above the sea. Near that town and between it and Yenikale, the peninsula terminates with a rocky though not an elevated shore. This peninsula between the Black Sea and the Sea of Azof is remarkable for its mud volcanoes; of which Pallas particularizes the hill called D'shtube, situate nearly in the centre of the peninsula. In some parts naphtha or petroleum is found.

From this peninsula extends in a north north-west direction a narrow strip of land, which divides the Sivash or Putrid Sea from the Sea of Azof. It is on an average hardly 300 yards wide, upwards of 70 miles long, and very low; it consists towards the south of shelly sand, in which some scattered plants thrive with luxuriance, but farther on the soil exhibits only common sand, more or less consolidated, and of a saline nature. It contains several small salt-lakes, and along its low beach heaps of salt are thrown out by the sea. This narrow tongue, called the isthmus of Arabat, is divided from the Nogay-steppe by a narrow strait, called the strait of Ienitshe or Tonke, and is inhabited only by a few innkeepers; the peasants of eastern Russia bring provisions along this tract to Kaffa, and take back fish.

Numerous rivulets descend from the northern declivity of the mountains, and form several rivers, as the Katshka, Alma and Salghyr, all of which have very broad beds, though in summer they contain very little water and run slowly. But when the snow melts on the Yailas, they become rapid, broad and deep rivers.

The winters are cold and the summers hot. In very severe winters the mercury sometimes sinks 9° below ero, and not only the whole Sea of Azof, together with the raits of Yenikale, but also a great part of the bay of Kaffa covered with ice strong enough to support men on foot on horseback. The climate is so unsettled, that it often ies six or eight times in twenty-four hours. The winds very variable, and bring rain from the west and southst, mild air and frequent mists from the south, serene weather from the east, and cold from the north. In ng the weather is settled, the heat moderate and rehing, and the nights cold and serene; there is seldom rain, especially during the prevalence of violent east ds; and unless a considerable fall of rain happens in ril and May, an unproductive harvest frequently follows. summer the thermometer frequently rises to 98°, 100° and n 102°. On the same day, however, it falls sometimes 20° ven 30°. Droughts frequently prevail for several succes years, and dry up the wells and brooks. Few summers s in which the verdure on the hills is not parched up. under-storms rarely occur, but they are tremendous, sometimes accompanied by hail-stones and destructive water-spouts. In summer and spring rainy weather seldom continues for twelve or twenty-four hours. In autumn bilious fevers prevail. Cold days occur in the middle of October, and are generally accompanied with night frosts, but afterwards the weather again becomes pleasant, and frequently continues mild till December and January.

The crops cultivated in open fields are wheat, rye, barley; oats, maize, spelt, millet, chick-peas, flax, and tobacco. In the gardens are raised melons, water-melons, cucumbers, gourds, artichokes, cabbages, onions, garlic, leeks, brocoli, celery, parsley, carrots, and red beets. The numerous and extensive orchards in the valleys produce pears, apples, quinces, plums, cherries, peaches, apricots, almonds, medlars, pomegranates, mulberries, and nuts. Some of these trees grow also wild on the declivities of the mountains. The forest trees, which cover a great portion of the declivities of the mountains, especially on the northern side, are oak, beech, elms, poplars, lime-trees, maples, ash, and pines (pinus maritima). Of late, great attention has been paid to the cultivation of the vine, of which Pallas enumerates twenty-four kinds. But though many these grapes are good, the wine is still much inferior to that which is produced in Hungary and France. The camel with two bunches is more numerous than is commonly supposed: there are several thousands of them. Great attention is paid by the Tartarian noblemen to the breeding of horses, and they are of a good kind. Those of the mountainous districts are small, but uncommonly hardy and sure-footed. The horned cattle are of a middling size in the plains, and small in the mountains. There are three varieties of sheep, all of which have a long tail, which for half its length is overgrown with fat and covered with coarse wool. One variety, which pastures on the plain lying along the Black Sea between Koslof and Perecop, produces the celebrated Crimean lamb-skins, of which more than 30,000 are sometimes annually exported to Poland and Germany. Of black lamb-skins more than 50,000 or 60,000 are annually exported. The mountain sheep are smaller, but celebrated for their soft fine wool.

Sturgeons are taken on the shores of the Sea of Azof, in the straits of Yenikale, and in the bay of Kaffa. Caviar is made, and also a little isinglass. Salt, which is the only mineral that is abundant, is found at the bottom of the salt lakes during the summer heat. Besides the salt lakes on the plain, there are some others on the eastern peninsula. Salt in great quantities is exported to Southern Russia, and much is also shipped to Anatolia and Turkey from the ports of Kertsh, Kaffa, and Kolof.

The population of the Crimea falls somewhat short of 300,000. More than two-thirds of its inhabitants are a mixture of Mongols and Turks, and are called Tartars Those who live on the plain show in their features their Tartar origin; but those in the northern valleys display a strong mixture of Turkish blood, especially the noblemen (*murses*), in whom the Tartar features are entirely obliterated. Besides the Tartars, different other nations are found, Russians and Germans, who have been transplanted in modern times as colonists, and Greeks, who always seem to have formed a portion of the population, but have considerably increased in latter times.

In the interior, at the nortnern extremity of the hilly country, is the town of Simferopol, or Akmeshed, the capital, not far from the sources of the river Salghyr, with 3000 inhabitants, and that of Karasubazar, with 3700 inhabitants, and some manufactures of morocco and leather. In the mountains is the town of Baktchissarai, the antient residence of the khan. [Baktchissarai.]

The most frequented harbours are on the south-western coast. Koslow or Eupatoria, with 4000 inhabitants, mostly Tartars and Jews, and a fine mosque; exports salt to Anatolia and Turkey. Sevastopol, formerly Akthiar, with 3000 inhabitants, is a station of ships of war. On the south-eastern coast is Balaklava, with a fine harbour, between high mountains, which however is not much used, and Kaffa. [Kaffa.] On the straits of Yenikale is Kertsh or Kiertsh, a thriving place, with more than 4000 inhabitants. It exports salt, salted fish, and caviar. In its neighbourhood are the extensive ruins of the antient town of Panticapaeum, once the residence of Mithridates. Yenikale, at the entrance of the strait, is a small fortress, with 600 inhabitants. The fortress of Perecop, on the isthmus, has 800 inhabitants.

Manufacturing industry is confined to the preparation of leather and morocco in Baktshissarai, Karasubazar, and Koslof, and to cutlery and sadlers' and shoemakers' work at Baktshissarai. In some places coarse earthenware is made. The Greeks in the neighbourhood of Kaffa extract soda from some saline plants.

The chief exports of the Crimea by sea are salt, wheat, soda, butter, and hides: the imports, raw and manufactured cotton of different kinds; silk stuffs of various patterns and in the eastern fashion; wines of the Archipelago, and the straits of Constantinople; brandy, Turkish leaf-tobacco, and a variety of fresh and dried fruits. To Russia are sent, chiefly by the way of Perecop, salt, grey and black lamb-skins, sheep's and bullocks' hides, wool, camels' hair, leather, hare-skins, wines, walnuts, fruits, together with the dry fruits imported from other parts, and fish. The imports are grain, provisions, iron, and different manufactured goods of Russia.

The Greeks became early acquainted with this peninsula, probably soon after the Ionian Greeks and especially the inhabitants of Miletus had begun to form settlements on the northern shores of Asia Minor, about six centuries before the Christian æra. Panticapaeum is called by Strabo a colony of the Milesians. Besides this place they built Theodosia, now Feodosia or Kaffa, and some other places on the peninsula forming the west side of the strait of Yenikale. They preferred this part of the peninsula, from its containing a large tract fit for agriculture, and producing very rich crops—Strabo says thirty times the seed. It was at one time considered the granary of Greece, especially of Athens, whose territory being of small extent and of indifferent fertility, was unable to maintain its great population by its own produce. At one time Athens annually imported from the Crimea between 300,000 and 400,000 medimni of grain, as Demosthenes informs us, in his Oration against Leptines (c. 9). Strabo says, that in one year the Athenians received 2,100,000 medimni from Theodosia, but the text is evidently corrupt. [BOSPORUS.]

(Strabo, vii.; Pallas; Lyall's *Travels in Russia;* Captain Jones's *Travels in Norway, Sweden, Finland, Russia, and Turkey.*)

CRINOI'DEA. [ENCRINITE.]

CRIOCE'RIDÆ (Leach), a family of Coleopterous insects, of the sub-section Eupoda and section Tetramera, distinguished by the following characters:—mandibles truncated at the apex, or presenting two or three notches: labium generally entire, or but slightly emarginated: antennæ of moderate length, filiform, somewhat thickened towards the apex; the joints mostly of an obconic form; tarsi with the penultimate joint bilobed; femora often thick, especially towards the apex.

The principal genera contained in this family are—*Donacia, Hæmonia, Ptauristes, Crioceris, Zeugophora, Auchenia*, and *Megacelis.*

The species of the genus *Crioceris* have the posterior femora of the same thickness as the others: the antennæ gradually enlarged towards the apex, the joints of which are scarcely longer than broad; the eyes are emarginated on the inner side: the thorax is narrower than the elytra, short, and usually of a somewhat cylindrical form: the elytra are elongate.

About eight species of this genus have been found in England, of which the most common is the *Crioceris Asparagi*, sometimes called the Asparagus Beetle, which is nearly a quarter of an inch in length, and of a blue-black colour; the thorax is red with two black spots; the elytra are yellow, with the suture, two transverse bands, and a spot at the base, black.

This pretty little beetle is found in abundance in the south of England, on asparagus plants: the larvæ are of a greenish hue, resemble little masses of jelly, and inhabit the same situations as the perfect insect; they subsist upon the leaves and soft part of the stalk of the asparagus plant.

CRI'SIA. [CELLARIÆA, vol. vi., p. 404.]

CRISTA'CEA. [CEPHALOPODA, vol. vi., p. 426.]

CRISTELLA'RIA. [CEPHALOPODA, vol. vi., p. 426.]

CRITICISM. Literary and scientific controversies, like the vexatious disputes of common life, arise more frequently from verbal than real causes. These quarrels generally originate in words which, notwithstanding the sameness of their sounds, have different significations and different values; or perhaps, to speak more correctly, are conceived in different senses by the disputants. This arises from the fact of few words being universally understood in the same sense. Almost every person affixes his own particular meaning to the words 'virtue,' 'right,' 'religion,' 'idea.' The word 'criticism' is not exempt from a similar difficulty. Criticism with some is synonymous with censure: others have a different notion of the word. Criticism properly means an impartial judgment of a subject, the element of the word signifying, in its original language, the Greek, *to separate, to distinguish, to judge.* As many objects as there are in the world, so many kinds of criticism must there necessarily be. Besides philological criticism, the object of which is to discover erroneous readings in texts, to remove interpolations from them, to restore to its pristine purity the original text of authors, and to investigate the style, there is, 1st. General criticism, such as occurs in impartial accounts of works in reviews, magazines, and other literary productions; 2nd. Æsthetical criticism; 3rd. Historical criticism; 4th. Philosophical criticism.

With respect to criticism and to the art of disputation, as well as the ordinary disputes and differences of life, the following remark may be worth consideration as tending to unite criticism, as a species of wisdom, with one of the greatest virtues, toleration. Every subject or object ought to be considered in two different ways: first, abstractedly or as regards itself; secondly, in connexion with other subjects or objects: the former is the absolute, the latter the relative point of view. A Hottentot beauty, regarded only in the first mode, might safely be pronounced ugly; but were the human race entirely composed of Hottentots, such a beauty would be considered a master-piece of creation, notwithstanding the resemblance of her physiognomy to that of a monkey. The writings of the antient philosophers are of comparatively little value in themselves, but considered relatively, they are admirable and everlasting monuments of the human intellect of those remote ages. An intelligent critic therefore never forgets both modes of viewing the subject under investigation; and thus *criticism* is opposed to *controversy.* First principles, in which both author and critic coincide, being agreed on, the matter only has to be examined: thus in a criticism of Oken's Natural Philosophy, the premiss to be granted would be that in the beginning nothing existed but æther, out of which by degrees everything arose. In poetry it is requisite to ascertain the object of the author, whether the poet meant, as with Crabbe, Goethe, &c., to portray human life under this or that aspect; or, as with Schiller, &c., to delineate the ideal. Criticism thus understood will not degenerate into a mere captious habit of finding fault, nor will disputation assume the appearance of a quarrel.

In philosophy the word 'critical' signifies that method of reasoning which is opposed to 'dogmatism.' A dogmatist maintains an assertion without proof; the critical inquirer not only endeavours to prove every assertion which he makes, considering fully both sides of the subject, but also commences his investigation by an analysis of the powers of the human mind, in order to ascertain what can be known and what cannot. Upon this principle Kant's celebrated work, 'Kritik der Reinen Vernunft,' or 'Criticism of pure Reason,' was written.

Criticism must not be confounded with scepticism, the object of which is to show that truth is not attainable by philosophical inquiry.

CROATIA, called by the natives '**HORV'ATH ORSZAG**,' comprising several countries and districts in the southern part of Austria, has the title of kingdom, though the greater part is now incorporated with that of Hungary, of which it forms the south-western division. It lies between 44° 5′ and 46° 25′ N. lat., and 14° 20′ and 17° 25′ E. long., and extends in a north-easterly direction from the shores of the Adriatic to the banks of the Drave (Drau) and Save. It is bounded on the north by Lower Styria and Hungary; on the east by Sclavonia; on the south by Turkish Croatia and Dalmatia; and on the west by the kingdom of Illyria. Croatia has the following subdivisions:

		Square miles.	Inhabitants.	Capital.
N.W.	The county of Agram......	873	385,000	Agram (capital of Croatia.)
N.	The county of Warasdin ...	718	126,000	Warasdin
N.E.	The county of Creutz	634	77,600	Creutz
W.	The litorale of Hungary ...	130	27,600	Fiume
S.	The military frontiers	5754	459,700	Zeugg
E.	The generalate of Warasdin	1415	111,000	Bellovar
		9524	1,186,900	

Croatia contains 7 towns, 16 market-towns, 1680 villages, and 7 prædia.

The surface of Croatia is extremely irregular. It is traversed by chains of mountains, chiefly continuations of the Julian Alps, is intersected with deep valleys, and also contains extensive plains. The loftiest ridge, that of the Velebich, is in the southern part of the country, and extends for about 70 miles from Zermanya to Zeugg. Its general altitude is from 3000 to 4000 feet: its highest summits are the Badany, which is 4164 feet, and the Velika Viszochicza, 4338 feet above the level of the sea. The second chain, called the Capella, likewise commences in the south-western extremity of Croatia, and runs towards the north-east to the banks of the Unna: it exceeds the Velebich both in breadth and length, being above 80 miles long; and the elevation of its highest summit, the Plessioicza, on which the snow scarcely melts throughout the year, is more than 5550 feet above the sea. The mountains which compose the chain from the banks of the Kulpa to those of the Unna are much lower and less rugged. Towards the Save they gradually decline, and at its confluence with the Kulpa terminate in a plain.

The greater part of these mountains consist of limestone, with various kinds of beautiful marble, porphyry, serpentine, &c. which furnish excellent materials for building; all the bridges and parapets of the great 'Josephine Road,' and most of the houses at Fiume, Zeugg, and Porto Ré, are constructed with this stone. The most common is a blackish grey marble, which emits a fetid smell on being rubbed, and when portions fall down from the mountains, diffuses a highly offensive odour throughout the neighbourhood.

Many of the valleys, especially on the southern ridge, are entirely closed, and the streams which traverse them, not having a vent, find their way to different rivers by subterraneous channels, and often inundate the surrounding country. Among the most striking of these valleys are those of Korbavia and Licca, which are inhabited by a half-savage race, and abound in picturesque waterfalls. The Szluinchicza forms above forty beautiful cascades.

Besides its two boundary rivers, the Drave and the Unna, Croatia is watered by many other rivers and streams; of which the Save only does not rise within its confines; the others take their rise in the country; such as the Kulpa, Longa, Krapina, Korana, Odra, &c. nearly all of which flow into the Drave or Save, except the Zermanya and Fiumara (or Reka), which fall into the Adriatic. Croatia contains many mineral springs, which possess medicinal properties. It is however poor in metallic ores, except iron-stone, which occurs in great abundance in several places. Copper has been obtained for centuries near Czambor, the mines of which yield annually about 400 tons. Coal is found in various parts; as well as sulphur, lead, salt, &c.; occasionally also silver; gold is obtained from the sand of several of the rivers, especially the Drave.

The climate of Croatia varies considerably in different parts. The southern and more sheltered districts, such as those of Zermanya, and the narrow tract between the mountains and the coast about the gulf of Guarnero, which are defended against the north wind, enjoy an Italian climate, and produce the olive, fig, grape and almond. Here the vintage takes place in August, but in the western highlands beyond the Kulpa, the harvest does not commence till the end of August or beginning of September, when the snow begins to fall, which does not melt till April or May. On the higher summits it frequently lies the whole summer. But even in the southern regions, the winter is very severe, owing to the vicinity of the high Alps.

The scourge of this country is the wind called Bora or Bura, which blows from the north or north-east, and generally sets in between seven and eight A. M. and ceases at four or five P. M. It is accompanied by excessive cold, and blows with such violence that large stones are carried by it to a great distance. Malte Brun says that the district of Rudaicza is rendered uninhabitable and nearly inaccessible by it. There is also a very hot south or south-west wind, called Jug, which blows from Africa, but does not set in at any stated times.

The eastern and northern parts of Croatia, which are more level and less mountainous, and especially the parts watered by the Drave and Save, are very fertile in various kinds of grain, particularly barley, maize, and oats; the soil is also very favourable for fruits, among which the Damascene plum furnishes the favourite drink of the Croatians. Croatia has immense forests of oak and beech. Flax, hemp, and tobacco are only grown in sufficient quantity for domestic consumption. Croatia produces about 3,700,000 metzen of various sorts of grain, and about 400,000 kilderkins of wine. Horticulture and gardening are very little attended to; the same may be said of the rearing of horned cattle and horses, except in the counties of Agram and Warasdin. The flocks are neither numerous nor of choice breeds; but an establishment for the improvement of sheep of superior wool has lately been formed at Merkopaly, which promises to be successful. Considerable herds of swine are reared, for which the forests afford plenty of food. There are likewise extensive fisheries; and much wax and honey are produced. Timber is obtained in abundance, as the whole country abounds in forests. Only a very small portion of the inhabitants are engaged in manufactures, and these are of the rudest description. As Croatia does not raise more produce than suffices for its inhabitants, its commerce is chiefly confined to the transit trade. The three great roads for trade are the Louisa, from Fiume to Carstadt, and the Caroline and Josephine, leading into Illyria and Bosnia.

The inhabitants profess the Roman Catholic and Greco-Catholic religions. The adherents of the former are under the bishop of Agram, one of the richest prelates of Hungary, and those of the latter have their own bishop, who resides at Creutz. The public system of education is that of the national schools, which are divided into elementary, head, and normal. There are two gymnasia at Agram and Warasdin, and a superior academy or college at Agram, which has also a seminary of theology for candidates for orders in the Roman Catholic and Greco-Catholic church.

The Croatian language is a dialect of the Sclavonian; it nearly resembles the Bohemian and Moravian, and of all the Illyrian languages bears the greatest affinity to the Polish.

The antient inhabitants of Croatia were the Pannonians, after the conquest of whom by Augustus it became a province of Illyria. The Goths took possession of it A. D. 489 then the Avares or Abares, and in 640 the Croatians, a tribe of the Wends from Bohemia, who were antiently called Horwather, Hrowathes or Chrobates, settled in it, and gave their name to the country. They subdued the former inhabitants of Illyria and Noricum, and being reinforced by bodies of their countrymen, they founded the Duchies (or in their idiom *Zupanies*) of Carinthia, Friuli, Liburnia, or Croatia Proper, Jadra in Dalmatia, Sclavonia, &c. These small states submitted to Charlemagne, but they generally allied themselves with the Greek emperors, although they continued to acknowledge the supremacy of the church of Rome. Their first Archizupan of whom history makes mention, is Crescimer, who lived in the tenth century, and whose son Dircislav I. took the title of king of Croatia, which then extended over the western part of Dalmatia and Bosnia; its capital, called Biograd, appears to have been situated on the shores of the Adriatic, at the place called by the Venetians Zara Vecchia, although Büsching and some other authorities fix upon the modern Biograd, Belligrad, or Bielgrad, on the small river Pliva, as its site. Towards the year 1100 Croatia was incorporated with Hungary.

After the middle of the fifteenth century it suffered greatly from the incursions of the Turks, but the Croatians being a warlike people, ravaged in their turn the Ottoman territories, and returned to their villages laden with spoils. Croatia was afterwards annexed to the Austrian empire, and, together with Sclavonia, Dalmatia, and some parts of Hungary, was governed by a special board at Vienna under the common title of States of Illyria. More recently Croatia has preserved the name only of a kingdom, Agram, Warasdin, and the Litorale having been incorporated with Hungary, and the Generalats of Creutz and St. George with the Military Frontiers, having each of them its distinct military jurisdiction.

Although brought into more regular discipline by the Austrian government, the Croatians still retain their taste for war. Those who live at some distance from the Turkish frontiers have adopted more industrious habits. Their untutored state is accompanied by many traits of virtue and generosity, and great fidelity to their sovereign. Notwithstanding their revolt against Austria in 1755, on account of certain innovations, their despair was indescribable when they found themselves united to France in 1809. Their dwellings are merely large barns, without either win-cow or chimney, where the family and the swine lodge under the same roof.

CROCKET, an ornament of very frequent use in Gothic architecture. It consists of leafy buds growing out of the angular sides of pinnacles and the label moulding of windows and doors. There are no examples of crockets in the Norman or arched style. In the early pointed style they are meagre, as in Lincoln cathedral, but afterwards they become fuller, and a more natural representation of a bursting bud. The later examples however are larger, and have not so much the appearance of nature.

CROCODILE, CROCODILE-TRIBE, CROCODILIDÆ, a family of *Saurians*, comprising the largest living forms of that order of reptiles. Duméril and others distinguish the family by the appellation of Aspidiot (shielded) Saurians; while many modern zoologists have considered them as forming a particular order. They form the *Loricata* of Merrem and Fitzinger, and the *Emydosaurians* of De Blainville.

Cuvier in his 'Règne Animal' describes the peculiarities of the family. The tail is flattened at the sides; there are five anterior and four posterior toes, of which the three inner ones only on each foot are armed with claws; all the toes are more or less joined by membranes. There is a single row of pointed teeth in each jaw, and the tongue is fleshy, flat, and attached very nearly up to the edges, which made the antients believe that the crocodile wanted that organ. The intromittent male organ of generation is single; the opening of the vent longitudinal. The back and tail are covered by great and strong squared scales, elevated into a ridge on their middle. There is a deeply dentilated crest on the tail, at the base of which the crest becomes double. The scales of the belly are squared, delicate, and smooth. The nostrils are opened at the end of the muzzle by two small crescent-shaped slits, closed by small valves, and lead by a long and straight canal pierced in the palatine and sphenoidal bones to the bottom of the back part of the mouth. As the lower jaw is prolonged behind the skull, the upper jaw has the appearance of mobility, and so the antients wrote; but it only moves in concert with the whole of the head. The external ear is shut at will by means of two fleshy lips; and the eye has three lids. Under the throat are two small glandular orifices, whence issues a musky secretion.

The vertebræ of the neck bear upon each other by means of small false ribs, which render lateral motion difficult. Crocodiles, therefore, change their direction not without trouble, and they may be easily avoided by doubling, and escaping while they are employed in the laborious operation of turning round. They have no true clavicles *; but their coracöid apophyses are attached to the sternum, as in all the other Saurians. Besides the ordinary and the false ribs, there are a set which protect the abdomen without reaching up to the spine, and which appear to be produced by the ossification of the tendinous portions of the *recti* muscles. Their lungs are not sunk in the abdomen like those of other reptiles, and there are fleshy fibres adhering to the part of the peritoneum which covers the liver, and which present the appearance of a diaphragm, which, joined to their trilocular heart, where the blood which comes from the lungs is not mingled with that venous portion of it which comes from the body so completely as it is in the other reptiles, slightly approximates the crocodiles to the warm-blooded quadrupeds. The auditory bone (*caisse*) and the pterygoid apophyses are fixed to the skull as in the tortoises.

The eggs of the crocodiles are hard, and as large as those of the goose †; and these reptiles are considered to be animals in which the extremes of size, taking that of the newly-hatched young and that of the full grown adult as the most remote points, present the widest difference ‡. The females guard their eggs, and when they are hatched take care of the young during some months. (Cuvier.)

The dentition of the crocodiles is peculiar. The teeth are numerous, large, of unequal length, conical, hollow at the base, disposed in a single row, and planted in the thickness of the edges of the superior and inferior maxillary bones, in separate cavities which may be considered as true alveoli. These teeth are hollowed at the base in such a manner as to serve for the case or sheath of the germ of the tooth destined to replace it, and which is to be of greater volume; so that, in crocodiles, the number of the teeth does not vary with age as in many other animals

[Tooth of crocodile, showing the incipient absorption of the hollow base cone from the effect of the rising pressure of the advancing tooth.]

Great solidity and strength are the results of this double *gomphosis*, and the *alveoli* are moreover directed obliquely from front to rear. The bony edges of the jaws whence these insulated teeth spring, are covered by a kind of gum. Another peculiarity of admirable adaptation to the necessities of the animal, may be observed in the interior of the mouth of the crocodiles. Their palatine vault is nearly flat, and is not pierced by the extremities of the nasal *fossæ*, as in the majority of other reptiles. The posterior nasal apertures open in the *pharynx* behind the *velum palati*, which is sufficiently long to overspread that portion of the roof which is in front of the orifice of the *glottis*. They are probably the only reptiles which have a true *pharynx*, that is to say, a vestibule common to the posterior nostrils, the mouth, the *larynx*, and the *œsophagus*. This conformation, joined to the muscular structure of the tongue, and a peculiar expansion of the body of the *os hyöides*, produces a kind of cartilaginous disk or valve, which can be raised and applied to the *velum palati* above, so as to protect the *glottis*, to which it serves the office performed by the *epiglottis* in mammifers, while it confers on the reptile a peculiar power of deglutition and respiration, of the greatest consequence to its economy when it is below the surface of the water and has seized its prey in that situation; or, when the muzzle alone is above the surface, in carrying on respiration.

The following is a summary of the

Character of the Family.—*Body* depressed, elongated, protected on the back with solid and carinated scutcheons or shields; *tail* longer than the trunk, compressed laterally, annulated, and furnished with crests above; *feet* four, short, the toes of the *posterior* feet united by a natatory membrane: each foot with three claws only; *head* depressed, elongated into a muzzle, in front of which are the *nostrils* approximated upon a fleshy tubercle, furnished with moveable suckers (*soupapes*): *gape* of the mouth extending beyond the skull; *tongue* fleshy, adherent, entire, not protractile; *teeth* conical, simple, hollowed at the base or towards the root, unequal in length, but placed in a single row; *male genital organ* simple, having its exit from the *cloaca*, which opens longitudinally. (Duméril et Bibron.)

From the first cut in the following page a general knowledge of the osseous structure of the crocodiles may be derived; and, from the second, a fair notion of the external appearance of the adult reptile.

Geographical Distribution.—Of the three genera or subgenera which compose the family, no living species is found in Europe,* nor has any been yet detected in Australasia. The first of these genera, *Alligator*, is peculiar to America; the second, *Crocodilus*, is distributed in the Old and New World; and the third, *Gavialis*, seems to be limited to the Ganges, and the other large rivers of Continental India.

Asia, besides the Gavial of the Ganges, produces at least three true crocodiles, viz., *Crocodilus vulgaris*, *Crocodilus Galeatus*, (*C. Siamensis*, Schneid.; *C. Siamensis*, Gray ? and *Crocodilus biporcatus*. Siam seems to be the principal, if not the only locality, where the first of these has

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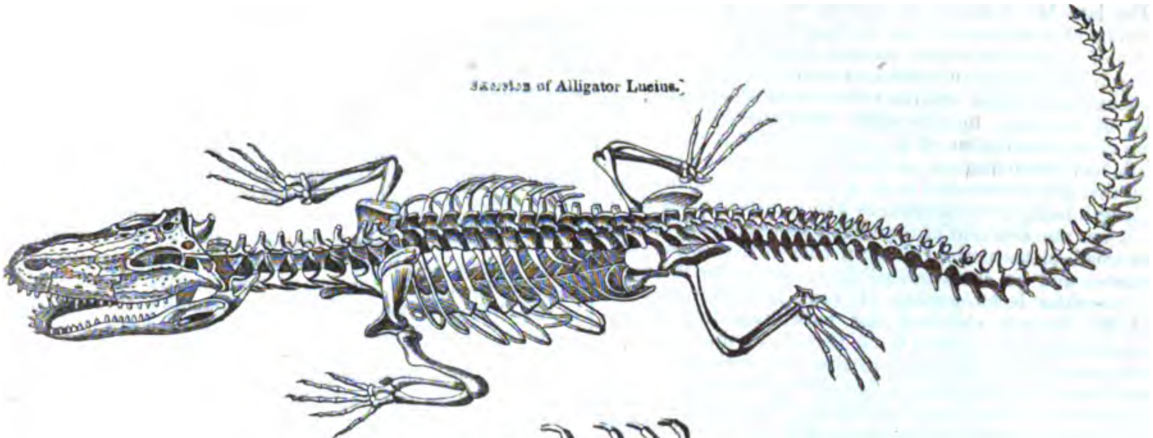
* Cuvier observes, that they are the only Saurians which want the clavicular bones.

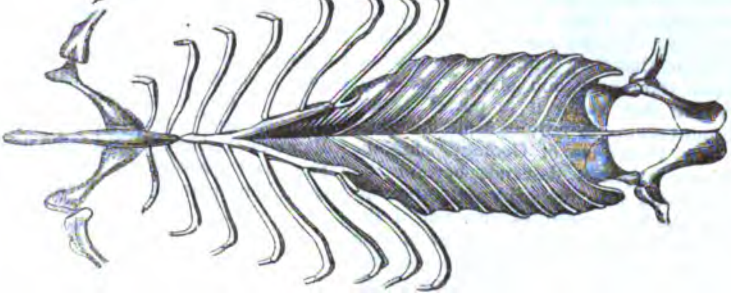
† But they are of a different shape, oblong rather than oval.

‡ An observation made by Herodotus, ii. 68.

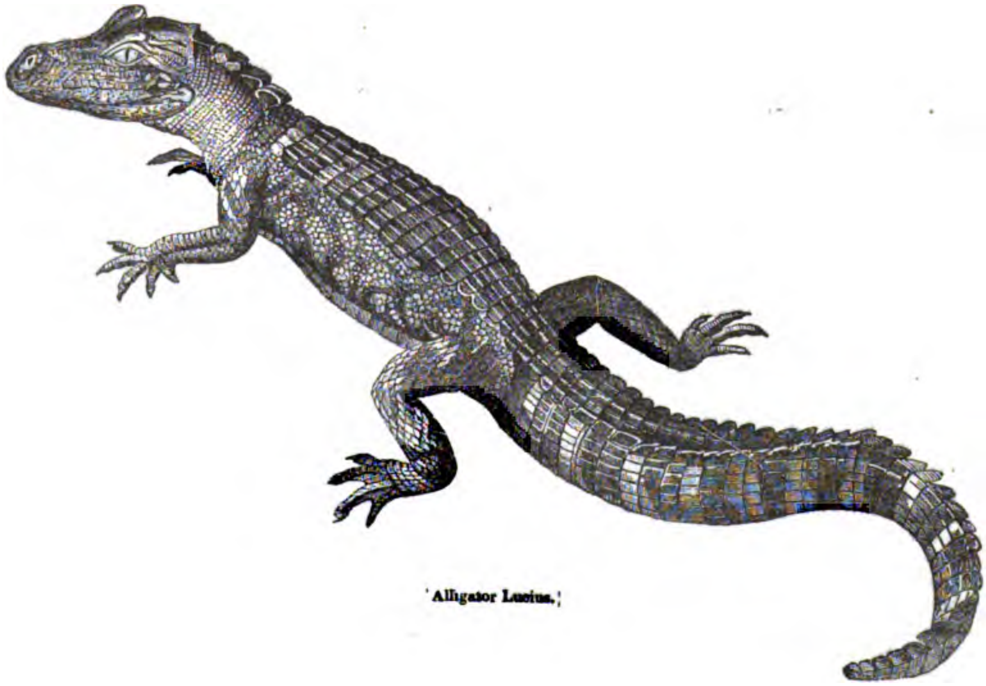
* Malte Brun (*Syst. Geog.*, vol. viii., p. 192) states, that a crocodile is still preserved at Lyons that was taken from the Rhone about two centuries ago but as Mr. Lyell observes, no particulars are given



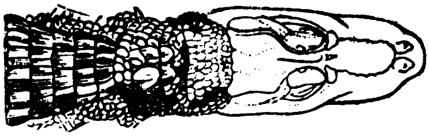
[Skeleton of Alligator Lucius.]



[Trunk of the same: ventral aspect.



[Alligator Lucius.]



[Outline of the head and anterior parts of Alligator Lucius seen from above.]

been found; while the other two appear to be natives of those rivers which have their mouths in the Indian Ocean and the Ganges.

Africa, where neither Caimans (*Alligator*) nor Gavials have yet been discovered, is the native country of the *Crocodile à bouclier*, and *Crocodilus vulgaris*: it may also be the locality of *Crocodilus planirostris* of Graves and of Gray (*Crocodilus Gravesii*, Bory de St. Vincent); and *Crocodilus intermedius* of Graves and of Gray (*Crocodilus Journei*, Bory de St. Vincent), though their geographical position does not seem to be determined. these may perhaps come from the coast of Guinea. The only part of Africa whence the *Crocodile à bouclier* has been received is Sierra Leone; while *Crocodilus vulgaris* seems to be spread over the whole of Africa, and is also an inhabitant of Madagascar. Numbers have been taken in the Nile, and one in the river Senegal. (Duméril et Bibron.)

America is most fruitful in crocodiles, and possesses more species than Asia and Africa put together, seven in all, viz., five species of *Alligator*, and two of *Crocodilus*. True crocodiles have never been detected on the Continent. *Crocodilus acutus* has been found at Martinique and St. Domingo, and *Crocodilus rhombifer* at Cuba. The northern part of America is inhabited by one species only, *Alligator Lucius*, while four species, viz., *Alligator palpebrosus*, *Alligator Sclerops*, *Alligator punctulatus*, and *Alligator cynocephalus*, inhabit the south. (Duméril et Bibron.)

The late Mr. Bennett, in September, 1835, called the attention of a meeting of the Zoological Society to a specimen of a crocodile which he had regarded, while it was living in the Society's Gardens, as referrible, on account of the length of its head and the extent of the shielding at the back of its neck, to *Crocodilus cataphractus*, Cuv. A more close examination of it, however, subsequently to its death, had shown him that its head was still more prolonged than that part is described to be in *Crocodilus cataphractus*, its length being to its breadth as 3 to 1, instead of as 2½ to 1: it was also deficient of the second post-occipital series of four small plates noticed as occurring in *Crocodilus cataphractus*, and he characterized the species under the name of *Crocodilus leptorhynchus*. It came from Fernando Po, and Mr. Bennett observed, that notwithstanding the approximation of this species to the Gavials by the elongation of its jaws, and by the extent to which the back of the neck is protected by bony plates, it has all the essential generic characters by which the crocodiles are distinguished. The two posterior pairs of nuchal plates were much smaller than the two pairs anterior to them. (*Zool. Proc.*, 1835, part 3.)

Habits, Reproduction, &c.—Cuvier says that the *Crocodilidæ* inhabit fresh water, that they cannot swallow while in the water, but drown their prey, and place it in some nook under water, where they suffer it to putrefy before they eat it. This account seems to require some modification. Mr. Lyell, in his 'Principles of Geology,' observes that the larger Gangetic species descends beyond the brackish water of the Delta into the sea: and other instances are recorded of the true crocodiles (but not of the alligators) frequenting the mouths of large rivers, and even passing between different islands at considerable distances from each other. (ALLIGATOR, vol. i. p. 350.) This should be remembered by geologists. Then, as to their inability to swallow while in the water, those authors who describe their collective fishing expeditions, entirely contradict it. True it is, according to them, that the alligators, after they have seized the fish from below, rise to the surface and toss the fish into the air to get rid of the water which they have taken in with it, catching it again in its descent: but it is clear that they swallow it without resorting to the land, though they go thither for the purpose of devouring those land animals which they have succeeded in capturing and drowning, after they have undergone some degree of decomposition. This mode of proceeding, and a general view of the habits of the Caimans, which may be taken as an example of those of the whole tribe, is stated in the article ALLIGATOR, in the first volume.

We here subjoin some information from an eye-witness, M. Ricord, as to the mode of reproduction of the crocodiles of St. Domingo, and transmitted by him to MM. Duméril and Bibron. 'L'accouplement m' a semblé se faire de préférence au bord de l'eau; la femelle se place sur le coté, et tombe quelquefois sur le dos, ainsi que j'ai pu le voir une fois; l'intromission dure assez long temps, puis ils se plongent tous deux dans l'eau.' 'The laying of the eggs takes place in April and May, and the number amounts from twenty to twenty-five, more or less, laid at many times. The female deposits them in the sand with little care, and scarcely covers them. I have met with them in the lime which the masons had left on the bank of the river. If I have reckoned right, the young come forth on the fortieth day, when the temperature is not too cold. At their birth they are five or six inches in length. They are hatched alone, and as they can do without nourishment while coming out of the egg, the female is in no haste to bring it to them: she leads them towards the water and into the mud, and disgorges for them half-digested food. The male takes no account of them.' The young preserve for some time the umbilical mark or cicatrice on the abdomen, whereby the vitellus was absorbed.

Position in the animal series. The *Crocodilidæ* are generally considered as forming a natural passage from the *Saurians* to the *Chelonians*, the last genera of which, in certain points of their conformation, and habits, approximate nearly to the family under consideration.

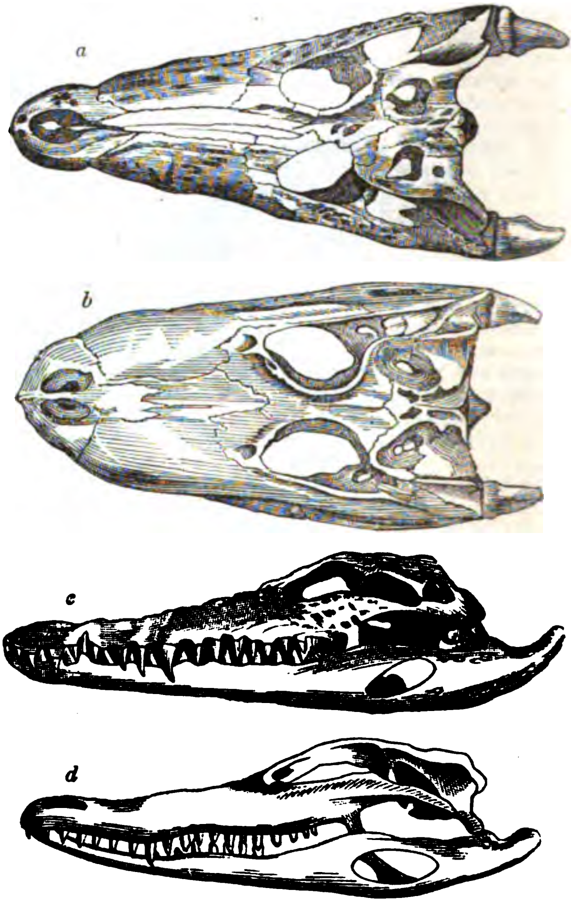
Genera. Alligator.

(See the Article, vol. i. p. 349.)

Crocodilus.

Muzzle oblong and depressed; *teeth* unequal, the front teeth of the lower jaw at a certain age pierce the upper jaw, the fourth on each side, which are the longest, pass into lateral notches of the upper jaw when the mouth is shut, and are not lodged in hollows. The *skull* behind the eyes has two large oval holes. The *hind feet* have a dentilated crest on their external border; the intervals of the toes, the external ones at least, are entirely palmated.

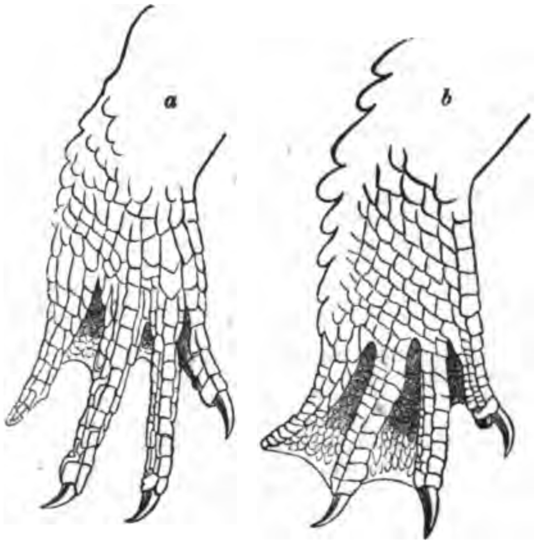
Nothing, observe MM. Duméril and Bibron, better distinguishes the *Crocodiles* from the *Alligators* than the narrowness of the muzzle behind the nostrils, a narrowness which is produced by the deep notch on each side of the upper mandible serving for the passage of the fourth lower tooth. The *Gavials*, it is true, have similar notches, which are destined for the same purpose. But at the extremity of the muzzle they have also two others for the reception of the front lower teeth; in lieu of this the front lower teeth in the *Crocodiles* pierce the upper mandible through and through. The horizontal contour of the head of the *Crocodiles* represents, in general, the figure of an isosceles triangle more or less elongated, depending upon the size of the jaws; but in no case is the muzzle wider than that of the *Caimans*, nor more slender than that of the *Gavials*. The *Crocodiles* have, like the former, their jaws festooned, as it were, on their sides, and their teeth unequal, but in less number, because they have never been observed with more than nineteen on each side above, and sixteen on each side below. The cranial holes are larger than they are in the *Caimans*, and less wide than they are in the *Gavials*. Their diameter is always found to be less than that of the orbits. The nasal aperture is oval or subcircular. There is a very small bony plate in the thickness of the upper eyelid.



a, skull of Crocodilus vulgaris, seen from above; *b*, skull of Alligator Lucius, same view; *c*, profile of skull of Crocodilus vulgaris; *d*, profile of skull of Alligator Lucius.

The same remark, as to the length of the head in proportion to its width at the three principal epochs of life, applies to the *Caimans* as well as to the *Crocodiles*. Thus, at the earliest age, it is only a little longer than it is wide; in middle age, its length is about double its width; afterwards, and when the animal may be considered adult, its longitudinal diameter is only three quarters, or even one half greater than its transversal diameter. The head of the *Crocodiles*, instead of possessing the smoothness or rugosity which marks the young and middle aged, generally becomes ver, rugged in proportion as the animals grow old. If, for example, it offered simple and regularly disposed carinations, these become ramified or divided into insulated protuberances, which completely change the physiognomy that the species presented in its two first ages. This change is particularly remarkable in *Crocodilus biporcatus*.

The greater part of the Saurians of this group have the hind toes, the three external ones at least, united to their extremity by a wide natatory membrane. There are indeed some nevertheless in which it is shorter, and one species, *Crocodilus rhombifer*, wants the membrane almost entirely, in the interval of the two inner toes. With about two exceptions, all the *Crocodiles* have the posterior border of the leg furnished with a dentilated crest, formed of flattened scales. The two species which are said not to present this character are *Crocodilus Gravesii* and *Crocodilus rhombifer*



a, hind foot of Caiman ; *b*, hind foot of Crocodile.]

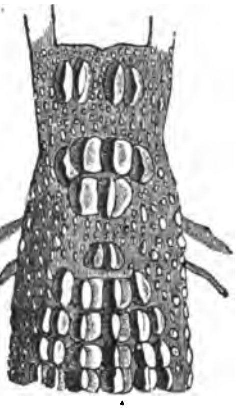
Only one species among the *Crocodiles* (*Crocodilus cataphractus*) has its cervical scales similar, in regard to the extent which they occupy on the neck, to those of the *Caimans*, that is to say, they form a long band commencing behind the nape and prolonging themselves to the first dorsal plates. In the others, the cervical armour occupies about the middle of the neck, so that there remains before and behind it a considerable space devoid of bony pieces. The scales which cover the sides of the body are flat in some, carinated in others, and there are some which are provided with both sorts. The *carinæ* springing from the tail-plates to form the crest which surmounts that part, are in general lower, of less consistence, and less stiff than those in the *Caimans*. *Crocodilus rhombifer* must however be excepted; for the caudal crest of that species is very low, and, so to speak, osseous.

Merrem appears to be the only herpetologist who has not preserved the name of *Crocodile* (*Crocodilus*) for this family: he has changed the name to *Champse*, the antient Egyptian name (*χάμψα*), according to Herodotus, for the crocodile, and a word still in common use in that country. *Crocodilus* is the Latin form of Κροκόδειλος, a name given by the Greeks to a lizard common in Greece: this name, it appears, they afterwards applied to the crocodile of Egypt, when they travelled into that country. (Herodot., ii. 69.)

Zoologists seem to be agreed in allowing that there is scarcely any genus of *Reptiles* the species of which are so difficult to be distinguished from each other as those of *Crocodilus*. This task, observe MM. Duméril and Bibron, is become comparatively easy, thanks to the labours of Cuvier, Geoffroy St. Hilaire, and others, but still all difficulty is not removed. MM. Duméril and Bibron, after extensive examination, as they state, reduce the species to eight; and even of these, they appear to consider some, *Crocodilus Gravesii* and *Crocodilus galeatus*, for example, doubtful. We select as an example *Crocodilus vulgaris*.

Description. Jaws not elongated into a narrow beak. Hind feet largely palmated; and with a festooned crest along their posterior border. Six cervical plates. Dorsal scutcheons or shields quadrangular, and surmounted by six longitudinal rows of *carinæ* but little elevated.

Syn. *Crocodilus amphibius Niloticus*, Loch. *Le Crocodile du Nil*. Daud. *Crocodilus vulgaris*, Cuv. *Crocodilus vulgaris*, Tiedm. *Le Crocodile vulgaire*, Cuv. *The common Crocodile*, Griff. Anim. Kingd.



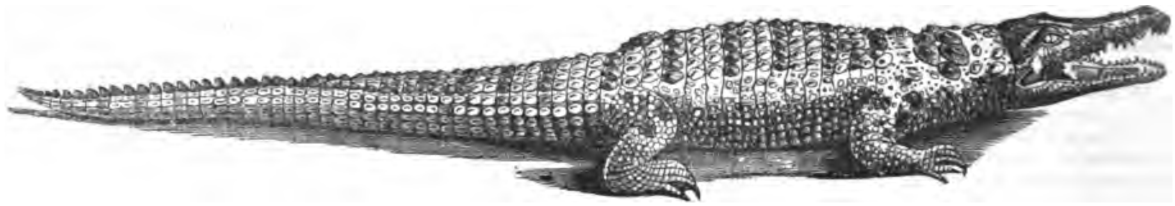
[Nuchal and cervical plates, &c. of Crocodilus vulgaris.]

MM. Duméril and Bibron make four varieties of this species. Our limits will only allow us room for a lengthened description of the first. Variety A. Muzzle a little narrowed, rather flat than arched across, with small hollows and channellings, which are now and then worm-shaped, on its surface. Table of the skull entirely flat. Back green, speckled with black: two or three oblique bands of the last-mentioned colour on each flank.

Syn. *Crocodilus vulgaris*, Geoff. Ann. Mus., tom. x. p. 67. Descript. Egyp. (Hist. Nat.) tom. i. p. 8. Atlas, pl. 2, fig. 1, 2. *Crocodilus vulgaris*, Merr. Amph., p. 37, spec. 9. *Crocodilus Chamses*, Bory de Saint Vinc., Dict. Clas., tom. v. p. 105. *Crocodilus vulgaris*, Geoff., Crocod. d'Egypte, p. 159. *Crocodilus lacunosus*, Geoff., Crocod. d'Egypte, p. 167. *Crocodilus vulgaris*, Gray, Synops. Rept., part i. p. 57, spec. 1.

This, as well as the following variety, is that to which those individuals whose jaws are the least narrowed belong. The jaws have not, indeed, the same width in all, but it may be said generally, that their width, when measured at the ninth upper tooth, is only one-seventh of the length of the head measured from the end of the nose to the occiput. The table of the cranium is flat: its form is quadrilateral, but a little wider than it is long, and the anterior border is rather narrower than the posterior border, which is not exactly rectilinear; for it presents two curvatures of the same length, the concavity of which is inside. The post-orbito-cranial holes are large and oval: their internal border is somewhat raised into a ridge. The inter-ocular space is hollowed into a sort of gutter. There are some individuals of this variety whose upper mandible presents a nearly flat surface, that is to say, the extreme edge of its contour is the only part which declines towards the lower jaw. It sometimes happens, too, that the mesio-longitudinal region is, for a certain part of its length, slightly concave. The same individuals are, besides, distinguished by having the ridges which form their internal orbital borders continued in front of the eyes so as to form a lozenge-like figure open at its anterior and posterior angles. The mandibular surface is nearly unbroken, or, at most, presents small hollows, considerably like those which are to be seen on the carapace of the *Gymnopods* or *Trionyx*. The mummied individual on which M. Geoffroy founded his *Crocodilus complanatus*, but which MM. Duméril and Bibron regard as being clearly specimens of *Crocodilus vulgaris*, is remarkable for this condition.

There are other *Crocodili vulgares* of the variety A, whose upper jaw is slightly arched across its posterior half, which presents on its mesial and longitudinal region a swelling more or less marked. In these the præorbital ridges are scarcely perceptible, and the inequalities on the surface of their muzzle are produced by numerous hollows, simply longitudinal or vermiculiform. As an example of this group MM. Duméril and Bibron refer to the individual brought from Egypt by M. Geoffroy, and which both Cuvier and himself have taken as the type of *Crocodilus vulgaris*



[Crocodilus vulgaris.]

All the individuals belonging to the first variety seen by MM. Duméril and Bibron present a strong protuberance upon the upper mandible above the ninth tooth; and, on each side of the muzzle, behind the nasal hole, a longitudinal swelling directed obliquely inwards. The edges of the jaws are strongly festooned; the teeth with which they are armed amount to thirty-six in the upper mandible, eighteen on each side, and thirty in the lower jaw, fifteen on the right side and the same number on the left. The largest of the teeth are the third and the ninth above; the first, fourth, and eleventh below.

The length of the posterior limbs is equal to the extent of the body between the shoulder and the thigh. The anterior limbs are one-third less, and have the toes entirely free. The hind toes are united by a natatory membrane.

Behind the occiput there are two pairs of scutcheons or shields placed across the nape, one on the right, the other on the left, of the mesio-longitudinal line. They are oval and strongly carinated. There are individuals which have only two of these scutcheons, and others which have three; but the proper number, and that presented by the greatest number of examples seen by MM. Duméril and Bibron, is four. After the nuchal scutcheons come two others, much smaller, which are placed one on each side of the neck, rather near the cervical shield. The plates which compose this are six in number, forming two transverse rows, one of four a little arched, the other of two. Of these six plates, which are squared or trapezoid, the two middle ones of the first rank are the largest, and the two lateral ones the smallest: their *carina* is strong and moderately elevated.

From sixteen to eighteen rows of bony scutcheons may be counted on the upper part of the body, from the shoulders to the origin of the tail. When there are seventeen or eighteen, the first is almost always composed of two scutcheons only; but in general four may be counted in the first row, from six to ten or eleven in the following rows, and four only in the last rows. The back presents six longitudinal rows of *carinæ*, but of these the two external ones are much shorter than the others. The plates which support the *carinæ* of these two external rows are of a sub-oval form. Those of the middle are four-sided, wider than they are long: those of the other two are squared. The *carinæ* of the two middle series are lower than the others. To the right and left of these six rows of carinated dorsal plates, there are four or five others smaller and oval, which are not always disposed sufficiently regularly to form a band parallel to that on the outside of which it is placed.

The tail is surrounded by from twenty-six to thirty-eight scaly rings. The crest which surmounts it is double, sometimes as far as the fifteenth, sometimes as far as the seventeenth: it is delicate, flexible, and deeply dentilated. The caudal *carinæ* of the middle region disappear after the ninth scaly ring.

The scales of the sides of the body and of the upper and lateral parts of the neck are flat: some are oval, others circular. Tuberculated and carinated scales may be sometimes seen among them. The limbs are covered by rhomboidal and simple *scutella*. The posterior border of the hind limbs is furnished with a dozen, forming a festooned crest.

The lower part of the body is protected by quadrangular *scutella*, having often each a pore towards the middle of its posterior border.

Colour.—All the upper part of the body is of an olive-green, sprinkled with black on the head and neck, and marked with the same colour on the back and tail. Two or three large oblique black bands show themselves on each flank. The lower parts of the animal are of a greenish-yellow. The nails are of a brown tint.

Dimensions.—MM. Duméril and Bibron state that they have seen eighteen individuals of this variety, from fifty centimetres to three metres in length. Those of the individuals whose locality is well proved came from Egypt or Senegal. There were eight from the latter country and among them were the smallest and the largest of the series. Among the Egyptian specimens was that dissected at Cairo by M. Geoffroy, who brought it to the French Museum, and two mummies, one a metre long, which MM. Duméril and Bibron are of opinion was erroneously considered by M. Geoffroy as belonging to his *Crocodilus marginatus* (variety C. of MM. Duméril and Bibron); the other, two metres and fifty centimetres in length, on which M. Geoffroy founded his species *Croc. complanatus.*

Variety B. *Crocodilus palustris.* Less. Voy. Ind. orient. Bell, Zool. Rept. p. 305. *Crocodilus vulgaris*, Var. E. Gray, Synops. Rept., p. 58.

Variety C. *Crocodilus marginatus.* Geoff. Croc. d'Egypte. p. 165. *Crocodilus vulgaris*, Var. B. Gray, Synops. Rept., part i., p. 58.

Variety D. Body elongated, slender. Jaws very much narrowed; the upper jaw slightly arched transversely. Chanfrein elevated; surface of the upper mandible somewhat embossed as it were. Cranial region perfectly flat. Carinæ of the two mesio-longitudinal series a little lower than the others, and also more approximated. Upper parts sprinkled with black angular stains. Syn. *Crocodilus complanatus*, *Crocodilus Suchus*, Geoff.

It may be expected that we should notice the antient history of an animal held sacred by the Egyptians and even elevated by them to the rank of a deity, for it was certainly one of the symbols of Typhon. Herodotus, Aristotle, Diodorus, Strabo, and Plutarch, will be read with interest on this subject. While it was worshipped in one part of Egypt under the name of *Suchus* or *Souchis*, it was eaten at Elephantine. Cuvier observes that the term Σοῦχος or Σοῦχις was only applied to the sacred individual, as Apis, Mnevis, and Pacis were appellations of the deified bulls of Memphis, Heliopolis, and Hermonthis respectively, and not intended to designate particular races of oxen. Geoffroy St. Hilaire is of a different opinion from Cuvier, who considered that Champsa *, as used by Herodotus, was not applied by that historian to the locality of Elephantine alone, nor to any particular species. Geoffroy observes that the crocodile still bears in Egypt the name of *Temsa*, which M. Champollion thought he recognized upon many papyri as *mshah*, a word which he regards as formed of the preposition '*m*,' 'in,' and the substantive '*sah*' 'egg.' With regard to the *Suchus*, M. Champollion, the younger, states that the Egyptians gave the name of *Souk* to a deity which they represented as a man with a crocodile's head. We refer those who wish to follow out this part of the subject more especially to the antient authors above mentioned, to M. Geoffroy St. Hilaire, to Cuvier, and to the interesting work lately published on Egyptian antiquities† as part of the 'Library of Entertaining Knowledge,' observing only that the Egyptians ornamented their tame crocodiles by hanging rings of gold and precious stones in the opercula of their ears, which they pierced for the purpose, adorned their forefeet with bracelets, and presented them in this finery to the veneration of the people. They also fed them well. Cake, roast-meat, and mulled wine were occasionally crammed and poured down their throats. Pliny, Ælian, and others did little but copy what preceding writers had written upon this subject, but we learn from the former that the Romans first saw them in the Ædileship of Scaurus, who showed five. Augustus introduced thirty-six of them into an amphitheatre at one time, where they were all killed by Gladiators.

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* Καλέονται δὲ οὐ κροκόδειλοι ἀλλὰ χάμψαι—But they are not called Crocodiles, but Champsæ.

† The British Museum. 'Egyptian Antiquities, vol. ii. London, C. Knight 1836, 12mo.

It is said that *Crocodilus vulgaris* is no longer seen in the Delta, but that it is found, sometimes in great numbers in the Thebaid and the Upper Nile.

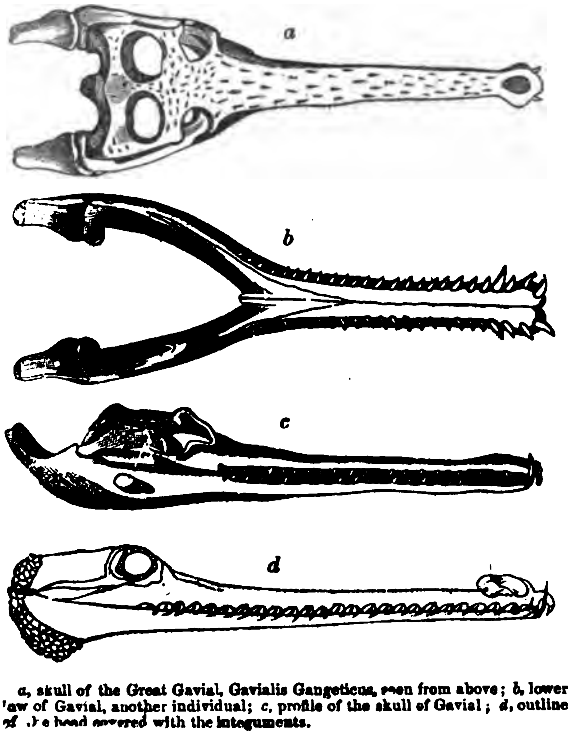
Gavialis.

Jaws very narrow, very much elongated, forming a sort of subcylindrical beak. Four notches in the upper mandible, in which are received the first and the fourth of the lower teeth.

The upper mandible of the *Gavials* is never pierced for the intromission of the teeth of the lower jaw, as it is in *Crocodilus;* but there are four large notches which serve as lodgments for the first and fourth pair of lower teeth. The *Gavials* are besides distinguished by the narrowness and length presented by the anterior part of their head and jaws, which resemble a sort of straight beak spread out at its origin, subcylindrical for the greatest part of its length, and terminating in a slight circular enlargement at its extremity. These jaws are rectilinear, and not undulated as in *Alligator* and *Crocodilus*. The number of teeth with which these narrow mandibles are armed is also greater than in either of the last-mentioned genera, amounting ordinarily in *Gavialis* to 118 or 120, all of which are equal, with the exception of those which compose the five or six first pairs above as well as below. The post-orbito-cranial holes are oval, and larger than they are in *Crocodilus*, for their diameter approaches that of the orbits themselves. The external orifice of the *nasal fossæ* or rather of the long canal, which M. Geoffroy St. Hilaire has termed *Cranio-respiratory*, is triangular. The membrane which closes this orifice has a considerable development in the males, and forms a large, oval, cartilaginous mass. This prominence is a kind of sac divided into two portions internally, the aperture of which is backwards and a little below As in the crocodiles, the eyelid contains in its substance a rudiment of a bony plate.

The hind feet of the *Gavials* are formed for the most part in the same manner as those of the majority of species of *Crocodilus;* that is to say, there are long and wide webs between the toes, and the posterior part of the leg is furnished with a dentilated crest. The cervical plates of the *Gavials* form a long band on the neck, as in the *Caimans*, and in one species only of *Crocodile*. The scales of the flanks are flat and oval. The *carinæ* which surmount the bony pieces forming the dorsal cuirass are low, but the crest of the tail is very much elevated throughout the whole of its length.

The *Caimans* and *Crocodiles*, in their youth, have the head short in proportion to the size which it exhibits at their full growth. The contrary obtains among the Gavials for in them the head is proportionally longer in youth than it is in age, so that it has the appearance of becoming shorter as the animal increases in size. (Duméril and Bibron.)



a, skull of the Great Gavial, Gavialis Gangeticus, seen from above; *b*, lower jaw of Gavial, another individual; *c*, profile of the skull of Gavial; *d*, outline of the head covered with the integuments.

The Gavials were distinguished generically by Cuvier under the name of *Longirostris*, and by Wagler under that of *Rhamphostoma*. The term generally adopted by zoologists is *Gavialis*. Example. *Gavialis Gangeticus*.

Syn. *The narrow-beaked crocodile of the Ganges*, Edw., Phil. Trans. *Crocodilus maxillis teretibus subcylindraceis*, Gronov. Zooph. *Crocodilus*, Merck, Hess. Beytr. *Lacerta Gangetica*, Gmel. *Le Gavial*, Lacép., Hist. Quad. Ovip. *Le Gavial*, Bonn., Encyc. Méth. *Crocodile du Gange* ou *Gavial*, Fauj. Saint Fond, Hist. Mont. Saint-Pierre. *Crocodilus longirostris*, Schneid., Hist. Amph. *Le Gavial*, Latr., Hist. Rept. *Gangetic crocodile*, Shaw, Gener. Zool. *Crocodilus arctirostris*, *Crocodilus longirostris*, Daud., Hist. Rept. *Crocodilus longirostris*, *Crocodilus tenuirostris*, Cuv., Ann. Mus. Hist. Nat. *Crocodilus Gangeticus*, *Crocodilus tenuirostris*, Tied., Opp. und Libosch, Naturg. Amph. *Gavialis longirostris*. *Gavialis tenuirostris*, Merr. Amph. *Crocodilus longirostris*, *Crocodilus tenuirostris*, Cuv., Oss. Foss. *Le Grand Gavial*, *Le Petit Gavial*, Bory de Saint Vincent, Dict. Class. d'Hist. Nat. *Crocodilus Gangeticus*, *Crocodilus tenuirostris*, Geoff., Mém. Mus. d'Hist. Nat. *Le Gavial du Gange*, Cuv., Reg. Anim. *Gavialis tenuirostris*, Guer., Icon. Reg. Anim. *Rhamphostoma tenuirostre*, Wagl., Naturl. Syst. Amph. *Gavialis Gangeticus*, Gray, Synops. Rept. *The Gavial of the Ganges*, Griff., Anim. Kingd.

Description.—The head of the *Gavial* may be considered as framed of two parts; one anterior and long, almost cylindrical in form, more or less flattened; the other posterior and short, presenting the figure of a depressed hexahedron, wider behind than before. The jaws constitute the anterior part or beak, which is long, straight, and of extreme narrowness, but not, properly speaking, cylindrical. It is four-sided, but the angles are rounded. It spreads out at its base and terminates in front, so as to recall to the observer the beak of *the Spoonbill*. Its vertical diameter is throughout less than its transversal diameter.

The head, properly so called, that is, the part situated behind the beak, has its sides straight and perpendicular. The upper surface is quadrilateral. The post-orbital portion is flat and smooth, except that one can perceive through the skin the subtriangular or ovöid holes with which the skull is dotted. The other portion is considerably inclined forwards, and mostly occupied by the eyes, the interval between which forms a slight gutter-like depression. The mandible is not continued from the forehead by a gradual slope as it is in the *Crocodiles*, but sinks suddenly to follow a straight and nearly horizontal direction, on a line with the inferior edge of the orbit. At the extremity of this upper mandible are the four notches for the passage of the first and fourth lower teeth when the mouth is shut. Two of these notches are very deep, and situated quite in front: the other two are moderate, and placed one on the right, the other on the left, behind the spatuliform termination of the beak, where it is slightly constricted.

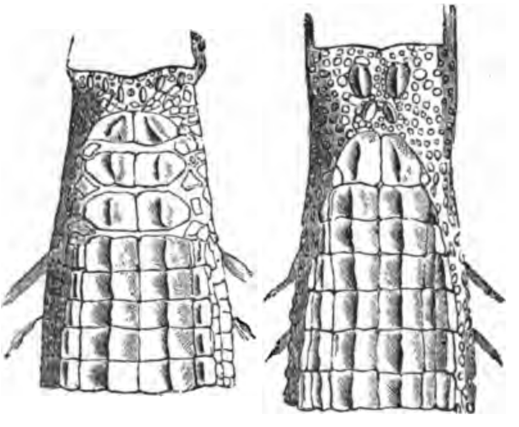
The division of the lower jaw into two branches does not commence till towards the twenty-second or twenty-third tooth. The ten first upper teeth, among which the two anterior teeth are the least separated, are implanted in the intermaxillary bone, and the greater portion of the teeth of the upper mandible are longer than the corresponding teeth of the lower jaw. Up to the nineteenth or twentieth pair they are turned a little outwards, so that when the mouth is shut the upper teeth pass over the sides of the lower jaw, and the lower teeth over the sides of the upper. The six last pairs are straight or nearly so, so that the points of the one set correspond exactly with the intervals of the other. The first, the third, and the fourth above, and the first, second, and fourth below, are the longest. They are, in general, a little curved and slightly compressed from before backwards, and are very slightly trenchant right and left. Hardly more than the eight or nine last on each side are nearly conical. Slight vertical ridges show themselves on the surface of the teeth of old individuals.

Under the throat, about the middle of the branches of the maxillary bone, are situated, one on the right and the other on the left side, the musky glands.

The external orifice of the nostrils opens on the upper side of the beak, at a small distance from its terminal border. The aperture is semilunar, at the bottom of which may be perceived a cartilaginous plate, which divides it longitudinally in two. The edges of this opening form two lips, which appear to have the power of approaching each other, so as to close the aperture hermetically. The anterior of these is curvilinear, and the posterior rectilinear: in the females and in young subjects they are very delicate and quite soft; but in the old males the anterior lip not only arrives at a cartilaginous consistence, but a development that carries it backwards as far as the seventh pair of teeth, and triples the thickness of the muzzle. This pouch or cartilaginous sac, with two compartments, is of a sub-oval form, and is notched behind so as to form two very thick rounded lobes. Above these is, on the mesial line and in front, a cordiform prominence, on each side of which is a deep fold in the form of the letter S. This sac has its opening, which is common to it and the nostrils, below. This apparatus is the nasal purse or pouch (*Bourse nasale*) of M. Geoffroy, and in his opinion performs the office of a reservoir of air for the animal when plunged beneath the surface of the water.

The anterior limb is nearly one-half longer than that part of the body which lies between the anterior and posterior limbs of the same side. The hinder limb is about two-thirds of the same interval. The third toe is longest in all the feet. The three middle toes of the fore foot are united at their base by a very short membrane: the other two toes are free, as well as the first toe of the posterior feet; but the second, third, and fourth of these last, are united by a thick membrane with a free border, which is notched as it were semicircularly between the toes. The nails are slightly arched.

The nape supports two strong scutcheons, surmounted by a *carina*, more compressed behind than it is before. Their form is oval, and their height nearly equal to their width. There is sometimes a small scutcheon on each side of these. This is the case in one of the largest individuals; viz., that described by Lacépède, and figured by Faujas de Saint-Fond in his 'History of St. Peter's Mountain,' at Maestricht. The cervical scutcheons, to the number of four pairs, form a longitudinal band, which extends from two-thirds of the length of the neck to the dorsal shield. The two first are triangular, the six others quadrilateral. Each of them have a longitudinal carina on their mesial line, and there is a large scale on the left and on the right of the last pair.



[Nuchal and cervical plates, &c., of two individuals of Gavialis Gangeticus from Cuvier.]

The upper part of the body is transversely cut by eighteen bands of osseous plates, with equal *carinæ*, which consequently form four longitudinal rows all down the back. The plates of the two lateral rows are squared and rather smaller than those of the mesial rows, which are also four-sided, but their longitudinal diameter is less than their transversal. A longitudinal row of other carinated scutcheons borders this dorsal cuirass on the right and on the left, for a part of its length. The flanks, the sides of the neck, and a portion of its upper part, are covered with oval, flat scales of moderate size. The tail is surrounded by from thirty-four to forty scaly circles, the number varying in different individuals. The dentilated crest does not become very perceptible till towards the sixth or seventh circle: its double portion terminates at the eighteenth or nineteenth. This crest is highest towards the middle of the tail, elsewhere it is delicate and flexible. The scales which clothe the lower parts of the body are quadrilateral, oblong, and perfectly smooth: there are nearly sixty transverse rows from the chin to the vent, and, like those of the flanks, they are all pierced with a small pore on the middle of their posterior border.

The limbs are protected above with rhomboidal scales: the anterior limbs on their external edge; the posterior limbs, from the hock (*jarret*) to the little toe, have a row forming a serrated edge. The surface of the natatory membranes is covered with granulous scales.

Colour. The ground colour of the upper parts is a deep water green, on which are often scattered numerous oblong, irregular, brown spots. In young subjects, the back and limbs are transversely banded with black. The lower region of the body is very pale yellow, or whitish. The jaws are sprinkled with brown. The nails are of a clear horn-colour. (Duméril and Bibron.)

The Gavial of the Ganges is supposed to be the largest of the living Saurians. The measurement of the largest mentioned by MM. Duméril and Bibron is given at five metres, forty centimetres.

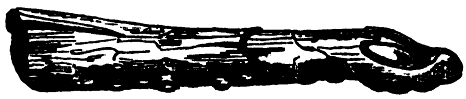
Cuvier was led to think, principally from the figures published by Faujas de Saint Fond, that there was more than one species of Gavial, and on subsequent inquiry, distinguished two, *the Great Gavial* and *the Little Gavial*; but he was afterwards satisfied from the examination of numerous specimens that age alone made the difference between them.

FOSSIL CROCODILIDÆ.

'In the living subgenera of the Crocodilean family,' observes Dr. Buckland (Bridgewater Treatise, p. 250), 'we see the elongated and slender beak of the Gavial of the Ganges, constructed to feed on fishes; whilst the shorter and stronger snout of the broad-nosed Crocodiles and Alligators, gives them the power of seizing and devouring quadrupeds that come to the banks of rivers in hot countries to drink. As there were scarcely any mammalia during the secondary periods, whilst the waters were abundantly stored with fishes, we might, *à priori*, expect that if any Crocodilean forms had then existed, they would most nearly have resembled the modern Gavial. And we have hitherto found only those genera which have elongated beaks, in formations anterior to and including the chalk; whilst true Crocodiles, with a short and broad snout like that of the Cayman and the Alligator, appear for the first time in strata of the tertiary periods, in which the remains of mammalia abound.'

In accordance with this view, we proceed to give examples of the long-beaked division, which, while it bears a strong resemblance to the living *Gavial* in the form of the head and jaws, will be found to differ materially from it in some particulars.

The genus *Steneosaurus* of Geoffroy St. Hilaire appears to come the nearest in its conformation to the living *Gavial*, and a general idea of the structure of the muzzle and anterior nasal aperture will be derived from the following cut of a specimen from Havre *;



[Muzzle of Steneosaurus from Dr. Buckland, who quotes De la Beche.]

whilst, in *Teleosaurus*, Geoff., though there is considerable similarity in the general contour of the head and jaws, the conformation of the muzzle and nasal aperture is very different from that of the living saurian, the anterior termination of that aperture forming almost a vertical section of the extremity of the upper mandible.

As an example of the more Crocodilean form, we select the cranium and the upper mandible of a specimen from the London clay of the Isle of Sheppey, figured also by Dr. Buckland in his Bridgewater treatise.

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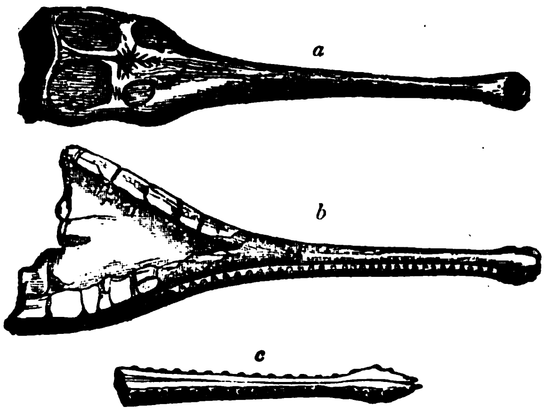
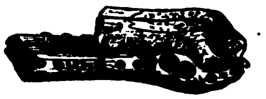
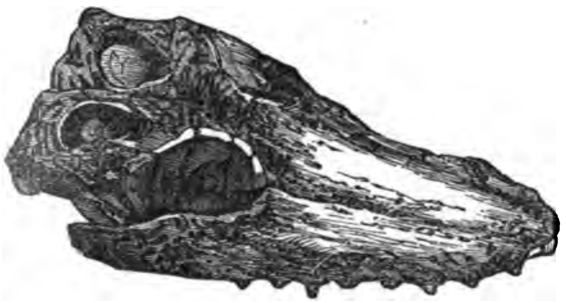
* Dr. Buckland states that the same species occurs in the Kimmeridge clay of Shotover Hill near Oxford.



[Teleosaurus Chapmanni. *a*, head seen from above; *b*, head of another individual of the same species seen from below, showing the lower jaw; locality of both, Lias in the neighbourhood of Whitby; *c*, inside view of anterior extremity of lower jaw. Locality, Great Oolite at Enslow near Woodstock, Oxon. From Dr. Buckland.]



[Anterior extremities of the beak or jaws of Teleosaurus. Locality, Great Oolite, Stonesfield, Oxon. From Dr. Buckland.]



[Skull of Crocodilus Spenceri.]

Though differing from both, it will be seen by a reference to our cuts, that this last form of head comes nearer to that of *Alligator* than to that of *Crocodilus*.

MM. Duméril and Bibron, in their elaborate work on Reptiles, from which we have drawn largely, arrange the genera *Ichthyosaurus* and *Plesiosaurus* among others, under their *Sauriens Aspidiotes Fossiles*, an arrangement to which we cannot subscribe on account of the great difference between the organization of these extinct Saurian forms and the *Crocodilidæ*. Indeed the very heading Sauriens *Aspidiotes* fossiles, would seem to be a warning to exclude *Ichthyosauri* and *Plesiosauri* from such an association.

We cannot close this part of the subject better than in the following words of Dr. Buckland.

'The discovery of Crocodilean forms so nearly allied to the living Gavial in the same early strata that contain the first traces of the Ichthyosaurus and the Plesiosaurus, is a fact which seems wholly at variance with every theory that would derive the race of Crocodiles from Ichthyosauri and Plesiosauri by any process of gradual transmutation or development. The first appearance of all these three families of reptiles seems to have been nearly simultaneous; and they all continued to exist together until the termination of the secondary formations, when the Ichthyosauri and Plesiosauri became extinct, and forms of Crocodiles approaching to the Cayman and the Alligator were for the first time introduced.' (*Bridgewater Treatise*, vol. i. p. 254.)

CROCODILU'RUS. [LACERTIADÆ.]

CROCUS, a beautiful genus of Iridaceous plants, consisting of many hardy species, some of which are among the commonest ornaments of gardens. Crocuses are chiefly found in the middle and southern parts of Europe and the Levant, three only being wild with us, namely Crocus nudiflorus, which is abundant in the meadows near Nottingham, C. vernus, and C. sativus. Botanists have found it extremely difficult to ascertain by what precise technical marks the species are to be distinguished. We do not propose to occupy ourselves with that subject, but shall rather enumerate briefly the names and localities of such as are apparently distinct; so that those who wish to form a complete collection of these pretty flowers may know where to look for them, and when their task is accomplished.

* VERNAL SPECIES.

1. *C. vernus*. This is the common purple or white crocus of our gardens in the spring. It has produced a multitude of florists' varieties, some of which are extremely beautiful and well marked. Its root-coats are finely netted, its flowers scentless, and the throat of the tube of the flower hairless. *C. albiflorus* and *C. obovatus* are varieties of it. It is said to be wild in some parts of England, but it may have been introduced. It is certainly wild on the Alps, particularly of the Tyrol, Piedmont, Switzerland, Salzburg, and Carinthia, descending to the sea-coast at Friuli. It is also found on the mountains of the Abruzzi and elsewhere in similar situations in the kingdom of Naples, associating itself with oaks, chestnuts, and similar trees, and not existing at elevations exceeding 6000 feet.

2. *C. versicolor*, the common sweet-scented, variegated, spring crocus. There are not many varieties of it, all of which are recognized by the root-coats not being cut circularly, the yellow tube of the flower bearded with hairs, and the sweet scent. It grows wild about Nizza (Nice), and in all the eastern parts of Provence.

3. *C. biflorus*, the Scotch crocus. The beautiful pencilled sepals and clear or bluish white petals of this species distinguish it at once; added to which the root-coats are cut round into circular segments, a circumstance that occurs in no other species. It is a native of the most southern parts of Italy; growing wild in sterile subalpine pastures in the kingdom of Naples, and in similar situations in Sicily. Our garden plants are merely a cultivated state of the *C. pusillus* of the Italians.

4. *C. Imperati*. This is little known in England. Its leaves appear long before the flowers, and are glaucous and spreading. The petals and sepals are a delicate violet inside, but externally white; the petals are almost whole-coloured and pale purple, except at the base; the sepals are strongly feathered with rich purple. A white and a whole-coloured variety of it are said to exist. It differs from *C. biflorus* in its root-coats being membranous, and not cut circularly, and from *C. versicolor* in the tube of the flower not being hairy. It inhabits low hills and woods in the kingdom of Naples, on Capri, on Mount S. Angelo di Castellamare, and elsewhere. It is supposed that *C. suaveolens* is at most only a variety of this.

5. *C. luteus* or *mæsiacus*, the large yellow crocus. It is characterized by very large whole-coloured flowers, and large roots, with coarsely netted coats. It is an oriental plant, but its exact locality is unknown.

6. *C. aureus*, the small yellow crocus, by no means so common as the last, of which it is probably a variety. Its flowers are smaller and deeper coloured, and it has a pale cream-coloured variety. Dr. Sibthorp found it wild on the hills of the Morea.

7. *C. susianus*, the cloth of gold crocus. This species is well known for its coarsely-netted root skin and small deep yellow flowers, the sepals of which are feathered with dark chocolate brown, and are rolled back when expanded under sunshine. It is a native of the Crimea, the Ukraine, and the other parts of south-western Russia: it is also believed to be a Turkish plant; and localities are given for it under the name of *C. reticulatus*, on mountains near Trieste, in woods near Lippizza, in Friuli, and in Hungary, in the lordship of Tolna. A remarkable variety with deep purple flowers exists, but it is extremely rare.

8. *C. stellatus* and *sulphureus* are pale and probably hybrid varieties of *C. luteus*. They have never been seen except in gardens, and are the least pretty of the genus.

* * AUTUMNAL SPECIES.

9. *C. sativus*, the common saffron crocus, an eastern plant, cultivated from time immemorial for the sake of its long reddish orange drooping stigmas, which, when dried, form the saffron of the shops. Its Asiatic localities are not known; in Europe it grows apparently wild in the south of Tyrol, and is said to have been found near Ascoli, and on the Alps of Savoy. Its British station is in all probability to be ascribed to accident.

10. *C. odorus*, the Sicilian saffron. This species, which has also been named *C. longiflorus*, is found in mountain

pastures in Calabria, and in both mountainous and maritime situations through all Sicily, where its stigmas are collected instead of those of the true saffron. Its blossoms are sweet-scented, and are known at first sight from the stigmas not hanging out of the flower, but standing upright and inclosed within it. The tube of its flower is very long.

11. *C. Thomasii*, a Calabrian plant, found in mountain woods. It is said to have coarsely-netted root-coats, fragrant saffron-like truncated stigmas inclosed within the flower, which appears long after the leaves, and has a bearded throat. Exists in English gardens, but is very rare.

12. *C. nudiflorus*. The flowers appear without the leaves, and the root-coats are slightly netted. The stigmas are divided into many deep narrow segments. The plant is not rare in many parts of Europe, flowering about the time of the Colchicum, to a small species of which it at first sight bears much resemblance. *C. speciosus*, *multifidus*, *medius*, are mere varieties or synonymous names of this plant.

13. *C. ecrotinus*. This requires to be compared with *C. odorus*, to which it approaches very nearly, if it be not the same thing.

For a florist's account of the varieties of spring crocuses cultivated in the gardens of this country, see the *Transactions of the Horticultural Society of London*, vol. vii.

CRŒSUS (Κροῖσος), the last of the Mermnadæ, son of Alyattes, succeeded his father Alyattes as king of Lydia at the age of thirty-five, B.C. 560. (Herod. i. 7 and 26.) But before this time he seems to have been associated with his father in the government. (Clinton, *Fast. Hel.*, p. 297; and Larcher *on Herod.*, i. 27.) He was contemporary with Pisistratus, tyrant of Athens (Herod. i. 59), and with Anaxandrides, king of Sparta (i. 67). He attacked and reduced to subjection all the Ionians and Æolians in Asia (i. 26), and all the nations west of the Halys (i. 28). The increase of the Persian power led him, after consulting various oracles in Europe, Asia, and Africa, to form an alliance with Amasis, king of Egypt (i. 77), and with the Lacedæmonians (i. 69), as the most powerful people of Hellas, about 554 B.C. (Clinton, *F. H.*, p. 207). He subsequently attacked and conquered the Cappadocian Syrians beyond the Halys, and engaged in battle with Cyrus, in which however neither was victorious. He returned to Sardis, intending to wait till the following year to renew the war; but Cyrus, anticipating his designs, attacked him in his own capital, defeated him, and took Sardis B.C. 546. Crœsus was made prisoner and was placed on a pile to be burnt, but Cyrus relented, and the fire was extinguished. He reigned fourteen years. After his captivity he became Cyrus's favourite companion and adviser in his future wars. When Cyrus died he recommended Crœsus to his son and successor Cambyses, as one in whom he might confide as a friend. Crœsus however did not long continue in the favour of Cambyses: he took upon himself on one occasion to admonish the king, believing him to be insane, and he had great difficulty in escaping with his life. Little is known of him after this period. While king he was visited by Solon, and Herodotus (i. 30—33) records a long conversation between them on wealth and happiness. The riches of Crœsus were so great that his name has almost passed into a proverb. It is said that he had a son who was born deaf and dumb, but who gained the faculty of speech by the effort which he made to cry out when he saw a Persian going to kill his father at the capture of Sardis. (Herodotus; Plutarch, *Life of Solon.*)

CROFT, WILLIAM (Mus. Doc.), who as a composer of cathedral music has no superior, was born in Warwickshire in 1677, and educated in the Chapel-Royal under Dr. Blow. His earliest preferment was to the place of organist of St. Anne's, Soho, when an organ was for the first time erected in that church. In 1700 he was admitted a gentleman-extraordinary of the Chapel-Royal; and in 1704 was appointed joint-organist of the same with Jeremiah Clark, on whose decease, in 1707, he obtained the whole place. In 1708 he succeeded Dr. Blow as Master of the Children and Composer to the Chapel-Royal, and also as organist of Westminster Abbey. In 1711 he published, but without his name, a volume containing the words of the anthems used by the three London choirs, with a preface, giving a brief history of English church-music; in which, on the authority of Dean Aldrich, he ascribes the anthem, 'O Lord, the Maker of all things!' to Henry VIII., and mentions Tallis as famed throughout Europe for his compositions. In 1715 Croft was created Doctor in Music by the University of Oxford; his Exercise consisted of a Latin and an English Ode, both of which were afterwards curiously engraved in score, and published under the title of *Musicus Apparatus Academicus*. In 1724 he published his noble work, *Musica Sacra*, in two volumes, folio. In the preface to this he states that his work is the first essay in music-printing of the kind, it being in score, engraved, and stamped on plates, and that for want of some such contrivance, the music formerly printed in England was very incorrectly published; as an instance of which he mentions Purcell's *Te Deum* and *Jubilate*. Dr. Croft died in 1727, of an illness produced by his attendance at the coronation of George II., and was interred in Westminster Abbey, where a monument, erected to his memory by his friend Humphrey Wyrley Birch, Esq., records his high merits as a composer, and his amiable and excellent moral qualities as a member of society. Besides his ecclesiastical music, Dr. Croft was the author of six sonatas for two flutes, six for a flute and a base, and numerous songs, which appeared in the various musical publications of his day. (Hawkins' and Burney's *Histories.*)

CROMARTY. [ROSS AND CROMARTY.]

CROMER. [NORFOLK.]

CROMLECH, a large stone placed in the manner of a table, but in an inclined position, upon other stones set up on end. Monuments of this description are numerous in Anglesea, where two of the largest Cromlechs in Britain remain at Plas Newydd. Many others are seen in Wales. They are likewise found in Scotland, Ireland, Jersey, Britany, and, in fact, wherever the religion of the Druids prevailed. Cromlechs are also described to have been found both in North and South America. Borlase, in his 'Natural History of Cornwall,' suggests that they were sepulchral. But Rowlands, in his 'Mona Antiqua,' King, Toland, and numerous other of our best antiquaries, consider them the remains of altars used for idolatrous sacrifices. They were usually placed in the centre of a circle of stones, the Druid temple; and had a single stone, of large size, occasionally near them, supposed to have served as a pedestal for some deity.

CROMWELL, THOMAS, was born at Putney, near London, where his father was a blacksmith, and afterwards a brewer. He was taught reading, writing, and a little Latin; and as soon as he grew up went to the continent, where he learned several foreign languages. He became clerk in an extensive factory at Antwerp; from whence he was taken to Rome (1510) by some citizens of Boston in Lincolnshire, who thought that he would be of assistance to them in some business that they had with the pope. During this journey he learned by heart Erasmus's translation of the New Testament, and he continued to improve himself during his residence in Italy. On his return he was received into Cardinal Wolsey's house, became his solicitor, and the chief agent in the foundation of his colleges at Oxford and Ipswich. He was also returned as a member to the House of Commons, where he increased his fame by his defence of Wolsey, who had there been indicted for treason. After the cardinal's disgrace, Cromwell was taken into the service of the king: in 1531 he was knighted, and made privy councillor and master of the jewel-house. He now rapidly rose to the most important offices in the state. In 1532 he became Clerk of the Hanaper in the Court of Chancery, and afterwards Chancellor of the Exchequer: in 1534 he was Principal Secretary of State, Master of the Rolls, and Chancellor of the University of Cambridge; in 1535, Visitor-General of English monasteries, and in 1536 Keeper of the Privy Seal. He now resigned the Mastership of the Rolls, and was created Baron Cromwell of Okeham in Rutlandshire, and appointed Vicar-General and Vicegerent, in all religious matters the next in authority to the king, who was now the supreme head of the English church. His friendship with Cranmer was intimate, and their views respecting the reformation very similar. It being Cromwell's object to destroy the pope's authority, he circulated new articles of faith, and enjoined the clergy to preach the king's supremacy, to remove images from their altars, and to promote the religious education of all young persons, teaching them the Creed, the Lord's Prayer, and the Ten Commandments. He commanded English Bibles to be placed in the churches, and took active means for the dissolution of the monasteries. These alterations, together with the great increase of his wealth, some of which it was suspected that he obtained by dishonest means, rendered him extremely unpopular, so that there were not wanting many enemies who endeavoured to prejudice the king against him. The king's esteem for him could not however be shaken in 1537 he was appointed Chief Justice of all Forests beyond Trent, and in August in the same year was elected Knight of the Garter, and nominated Dean of Wells. The long list of Cromwell's titles and official appointments is still far from completed. In 1538 he was made Constable of Carisbrook Castle, and obtained a grant of the castle and lordship of Okeham. About this time he issued various injunctions [CRANMER] to the clergy, by one of which parish-registers were established; and in 1539, after having received from the king several monastic manors and valuable estates, was created Earl of Essex, and named Lord Chamberlain of England: at the same time Gregory, his son, obtained the barony of Okeham.

Hitherto there had been little check to the career of Cromwell's prosperity: his favour at court had always been sufficient to stifle any popular complaints, but he now became aware that both Cranmer and himself were declining in the royal estimation. Gardiner (bishop of Winchester) and his party had gained some ascendancy over the king, and in proportion as the power of these advocates of the Roman Catholic faith increased, the influence of the reformers declined, and both they and their doctrines became unacceptable at court. In order to regain his former ground, or at least to intrench himself firmly in the powerful position which he still retained, Cromwell lost no opportunity of promoting Henry's marriage with Anne of Cleves, taking care to set before the king, as often as circumstances permitted, the many advantages which would arise from such a union. The cause of Cromwell's great zeal was this: Anne and all her friends were Lutherans, and Cromwell counted upon great support from a queen of his own choice, whose religious opinions were in direct opposition to the Roman Catholics. The complete failure of this scheme became the ruin of its contriver. An aversion to the promoter of the marriage quickly followed the king's disgust and disappointment at his ugly bride, and Henry now willingly opened his ears to the flood of complaints which were poured into them from every quarter. To the laity Cromwell was hateful, on account of the oppressive subsidies that he had raised notwithstanding the large sums which had accrued from the dissolution of the monasteries; to the nobility he was still more odious, on account of the titles and power that he had obtained notwithstanding the meanness of his birth; and to the Roman Catholics he was an object of aversion and jealousy, on account of the Protestant doctrines that he held and promulgated. As soon then as it was apparent that the capricious king, who had elevated him from an humble individual to be the most powerful subject in the realm, was no longer willing to support him, his downfall was certain. The numerous important acts of his administration supplied his enemies with abundant proofs of malversation and treason. He was arrested on the 10th of June, 1540, and committed to prison. The letters that he wrote to the king praying for pardon were disregarded, though the king was touched by them, and read them thrice over: he was accused on the 17th of June in the House of Lords, which sent the bill of attainder down to the House of Commons on the 19th. Here some objections were raised against the bill; but after a delay of ten days a new bill was framed by the Commons, which the Lords afterwards passed. This bill contained twelve articles of impeachment (Burnet, *Hist. Ref.* vol. i.), accusing him, among other crimes, of being 'the most false and corrupt traitor and deceiver that had been known in that reign,' 'of being a detestable heretic,' and 'of having acquired innumerable sums of money and treasure by oppression, bribery, and extortion.' To these accusations he was not allowed to answer in court, for fear, as it may be supposed, that he would prove the king's orders, directions, or consent for doing many things of which he was accused. He was kept in close custody for six weeks, when any hope that he might have entertained of a reprieve was put an end to; the charms of Catherine Howard and the endeavours of the duke of Norfolk and the bishop of Winchester prevailed, and the king signed a warrant for his execution, which took place on Tower Hill on the 28th of July, 1540. Thus fell this great minister, of whom, as indeed of most of his contemporaries, very opposite characters have been handed down to us by historians. His virtues are greatly magnified by the advocates of the Reformation, his vices by its opponents. It appears doubtful, from a speech that he made at his death, in which religion he died; but it is very probable that he was a Lutheran, and that he used the term *Catholic* Faith (which some have held was intentionally ambiguous in his speech and afterwards in Cranmer's) in the Lutheran meaning of the term. Cromwell was no patriot: his own interest, elevation, and aggrandizement seem always to have been uppermost in his thoughts. He was ambitious, unscrupulous, rapacious, hypocritical, and suspicious. To counterbalance these evil qualities he had few virtues. He is said to have shown cruelty in the condemnation and execution of some heretics, but he could scarce have been without benevolence, for about 200 persons (Stowe's *Survey*) were fed twice a day at his gate. He had a good understanding, and a very retentive memory, and his attention to business was frequent and assiduous. He was the promoter of many useful alterations in the laws, and especially in those respecting the church. These were his chief merits. In passing judgment upon him, the remembrance of the reckless tyrannical caprice of his master, of the rapidity of his own advancement, together with the licentiousness of the times, should enhance the value of his merits, and temper our condemnation of his crimes.

(Fox's *Acts and Monuments*; Stow's *Annals*, Strype's *Memorials*; Lord Herbert's and other *Histories of England*; Burnet's *Reform.*; Collier's *Ecclesias. Hist.*; the *Biog. Brit.*, &c. &c.)

CROMWELL, OLIVER, the son of Robert Cromwell, and his wife Elizabeth, daughter of Sir Richard Stuart, was born in St. John's parish in the town of Huntingdon, on the 25th of April, 1599, and named after his uncle and godfather, Sir Oliver Cromwell, a worthy member of his antient and respectable family. He grew up a stubborn mischievous boy, so little inclined to sedentary occupation, that when in 1616 he exchanged a school at Huntingdon for Sidney College, in the neighbouring university of Cambridge, he had made no great progress in his studies. At the death of his father, which occurred soon after he went to college, he was removed from the university by his mother, who in the changed state of her circumstances, thought it more prudent to enter her son at Lincoln's Inn, that he might follow the profession of the law. To such a grave study however Oliver did not feel inclined. With little intention to use them for their proper purpose, he took possession of his chambers: the vices of the town were new to him, and being no longer restrained by the vigilance of his father, he fell into profligate habits, and became addicted to gambling. Two or three years afterwards, when he returned to Huntingdon, he still continued to live so dissolute a life that he forfeited the friendship of his uncle Sir Oliver Cromwell. His mind however soon became uneasy; the diminution of his fortune and compunction for his conduct weighed upon his spirits, and on a sudden there appeared a great alteration in his life. His companions and their extravagances no longer pleased him; gay were superseded by grave thoughts, and his attention frequently rested on religious subjects. This change restored to him the countenance of his friends; and his relations, the Barringtons and the Hampdens, interested themselves in arranging an union between Oliver, who had now completed his twenty-first year, and Elisabeth, the daughter of Sir James Bourchier, a lady wanting in personal attractions, but virtuous, sensible, and possessed of a moderate fortune. Soon after his marriage, his attachment to the Puritans first appeared, and his house at St. Ives became the retreat of the disaffected clergy. As the nation was extremely dissatisfied with the court, and Oliver Cromwell's aversion to it was known, he was elected member for the borough of Huntingdon in 1628: this parliament was of short duration. The king, by its impolitic speedy dissolution, still further irritated his enemies. Cromwell's house was more than ever frequented by Puritan preachers and their hearers. His opinions became so deeply rooted, that his hospitality to those who were of the same way of thinking increased his expenses until his circumstances became again so much embarrassed that a portion of his property was necessarily sold. Whether, after this sale, he was connected with a brewery is not clear: it is certain however that he became a farmer at St. Ives, but having no knowledge of agriculture, this speculation only increased his financial difficulties. Sir Thomas Stuart, his maternal uncle, dying (1636), Oliver became possessed under his will of property in the Isle of Ely amounting to nearly 500*l.* a year. His fortunes were thus partially retrieved: nevertheless in the hope of better providing for his children, he determined in 1637 to emigrate to America, and having taken a passage to New England in a ship then lying in the Thames, embarked with his whole family. The vessel, however, was detained by a proclamation forbidding such embarkations, unless under a license from the government, which he knew that he should be unable to procure. Religion had at this time a very strong influence upon his mind; poor as he still was, we find that, from motives of conscience, he returned sums that in his youth he had won by gambling. He lived at Ely in retirement with his wife and children; but notwithstanding he saw few persons of importance, the activity and vigour of his understanding became generally known: his open advocacy of principles opposed to the government, and the zeal with which he resisted an unpopular attempt to drain some of the neighbouring Cambridgeshire fens, attracted the favourable regard of many public men. In such esteem was he held, that he was proposed for the representation of the town of Cambridge, and elected, though as some say by intrigue (Noble's *Mem.*, vol. i., iii.) in opposition to Counsellor Mewtis, the court candidate, both to the short-lived parliament of 1640, and afterwards to the Long Parliament, by which it was speedily followed.

Cromwell was now in the middle age of life; his health was strong, and his judgment matured; so far circumstances were favourable to his farther elevation. But he had deficiencies, not only in fortune, but in person and in knowledge, which precluded all foresight of the height to which he would rise. He had neither the address nor the appearance of a gentleman. He had resided so little in London, that he was wholly unacquainted with any of the leading men at court; he knew nothing of the ways of parliament or the method of government, and was altogether ignorant of foreign policy. The descriptions given of him on his entrance to the House of Commons, at the beginning of the Long Parliament, display in a striking manner his unpolished rusticity. Sir Philip Warwick gives the following minute account:—'The first time that I ever took notice of him was in the beginning of the parliament held in November, 1640, when I vainly thought myself a courtly young gentleman (for we courtiers valued ourselves much upon our good clothes). I came one morning into the house well clad, and perceived a gentleman speaking (whom I knew not), very ordinarily appareled; for it was a plain cloth suit, which seemed to have been made by an ill country tailor; his linen was plain, and not very clean; and I remember a speck or two of blood upon his little band, which was not much larger than his collar; his hat was without a hat-band; his stature was of a good size; his sword stuck close to his side; his countenance swollen and reddish, his voice sharp and untunable, and his eloquence full of fervour.' With the exception of his eloquence, this probably was a correct picture. Cromwell spoke certainly with fervour; but his biographers must be credited in their assertion that he had not the smallest pretension to rhetoric, but was confused and unintelligible in his address. In a somewhat intemperate sermon written after the Protector's death, Dr. South speaks of his appearance when attending the Long Parliament. 'Who,' says he, 'that beheld such a bankrupt beggarly fellow as Cromwell first entering the parliament-house, with a threadbare torn cloak and a greasy hat (and perhaps neither of them paid for), could have suspected that in the space of so few years he should, by the murder of one king and the banishment of another, ascend the throne, be invested in the royal robes, and want nothing of the state of a king but the changing his hat into a crown.' He had as yet had no opportunity for displaying the extent of his energy and abilities; the time was at hand when they were to be proved.

For an account of the discontents in the kingdom and the causes of the civil war, we must refer our readers to the copious histories of the time. The tyranny and maladministration of the weak and obstinate Charles became the subject (1641) of a violent remonstrance from his parliament, which at once insured their rupture with the king. Cromwell, now associated in the councils of Hampden, Pym, and the rest of the democratic leaders, strenuously supported this remonstrance; and in 1642, when the civil war commenced, eagerly raised a troop of horse, under the authority of the parliament, with which he immediately took the field in their cause. Notwithstanding the comparatively advanced age at which he first buckled on the sword, all writers bear testimony to the military abilities that he displayed throughout the succession of battles between the parliamentary and royalist forces. At Marston Moor, at Stamford, and in the second battle of Newbury, he was especially distinguished. With the title of lieutenant-general of the horse he soon became, under Fairfax, the chief mover of a victorious army; and so valuable were his services considered by the parliament, that he was exempted from obedience to the 'self-denying ordinance'—an injunction which excluded the members of either house from holding any command in the army. This measure was brought forward by Cromwell's friends, who trusted to his popularity in the parliament, and the necessity that it had for his services, to procure an exception in his favour. The result fully answered their expectations; his rivals were set aside, his power more widely spread, and a greater scope given to his ambition. At the battle of Naseby (June, 1645) Cromwell commanded the right wing, and Ireton, his son-in-law, the left; the main body of the royalists was commanded by the king in person. As the troops were nearly equal, the event of the day was looked for by each side with anxious hope. Ireton was repulsed early in the day; but Cromwell and Fairfax, taking advantage of Prince Rupert's temerity, totally dispersed the king's infantry, and took his artillery and ammunition. Elated with victory, the parliamentary army, under the same leaders, vigorously prosecuted their success, until they had reduced most of the royalists in the west. Cromwell now (1646) found leisure to return to London; the thanks of the parliament were voted to him; his services were publicly acknowledged, and rewarded by a grant of 2500*l.* a year, to be raised from Lord Winchester's estates.

The king, who had passed the winter (1645-6) at Oxford, in a condition to the last degree disastrous and melancholy, in the month of May escaped from that city in disguise, and threw himself upon the protection of the Scottish army, then encamped at Newark. After some negotiations, he was basely delivered up by the Scots to the parliamentary commissioners, who kept him prisoner at Holdenby, in Northamptonshire. In proportion as the king's power had diminished, the division between the Independents and the Presbyterians had become daily more apparent. In the army, the majority, with Cromwell at their head, were Independents; in the parliament, Presbyterians. Each body, jealous of the other's power, began to strive for the mastery. At length the army rebelled against the parliament; and Cromwell, aware of the advantage that would be gained by the possession of the king's person, directed one Joyce, a young and enterprising soldier, to rescue the king from the hands of the commissioners of the parliament, and to deliver him to the army (1647). This scheme was quickly put into execution; Cromwell maintaining with refined hypocrisy that he deeply regretted the disaffection which the army showed towards the parliament. The members, however, were not deceived. The Presbyterian leaders resolved, as soon as he should come into the House of Commons, to accuse the lieutenant-general of having promoted this schism, and to commit him to the Tower. Intelligence of these proceedings was quickly carried to the army; and Cromwell, perceiving that the crisis was desperate, and that some decided step must instantly be taken, hastened to the camp, where he dexterously procured himself to be invested with the chief command, and then, threatening the unpopular parliament, marched southwards to St. Alban's.

As long as there remained any balance between the rival powers in the state, each sought the support of the royalists, and the king's cause appeared not altogether hopeless; he was courted by the Presbyterians and deceitfully flattered by Cromwell. But when the leaders of the army established their dominion, the case was altered. At a conference at Windsor, opened with prayers poured forth by Cromwell himself with all the cant of fanaticism, he opened the daring counsel of punishing the king by judicial sentence. The time, however, was not quite at hand for this bold measure. The king was left in custody in the Isle of Wight, and Cromwell again took the field against the Scots in the north and the Welsh in the west, making preparations at the same time to resist an invasion from Holland threatened by Prince Rupert, to whom seventeen English ships had deserted. Again he was victorious; and his army returned to London, where they broke violently into the parliament-house while the members were in debate, seizing some, and excluding others, by the direction of Colonel Pride. The king's trial now (1649) commenced, and in proportion as violence increased the greater were the pretensions to sanctity. Cromwell declared to the house, 'Should any one have voluntarily proposed to bring the king to punishment, I should have regarded him as the greatest traitor; but since Providence and necessity have cast us upon it, I will pray to God for a blessing on your counsels, though I am not prepared to give you any advice. Even I myself, when I was lately offering up petitions for his majesty's restoration, felt my tongue cleave to the roof of my mouth, and considered this preternatural movement as the answer which Heaven, having rejected the king, had sent to my supplications.' (Hume.) The circumstances attending the king's trial are well known. Cromwell took an open undisguised part, and, with Ireton and Harrison, was named by the dregs of the parliament among the 133 persons chosen to constitute the tribunal. One half of this number were usually absent: but Cromwell's interest in the result was so deep that he was always present in the court. The sentence was passed, and he signed the warrant for the execution. He was now beset with entreaties to spare the king's life. To the intercessions of his son Richard he would scarcely listen with patience; to his cousin Col. Cromwell he would only reply, 'Go to rest, and expect no answer to carry to the prince, for the council of officers have been seeking God, as I also have done, and it is resolved by them all that the king must die.' The execution followed accordingly. Five days afterwards the House of Lords was voted useless, and a council of state was formed, with Bradshaw for president and Cromwell a principal member. Difficulties soon crowded round their government. A mutiny broke out in the army, which required the immediate presence of the lieutenant-general. Some regiments were pacified with little trouble, and became submissive after the execution of the ringleaders; but others continued to resist. At length Cromwell offered them a treaty, which they had no sooner accepted than he faithlessly put a large portion of them to death. By these means peace was restored.

In Ireland the majority were still hostile to the parliament, and an army had been sent there to reduce the royalists to submission. Cromwell joined the troops in August, 1649: he besieged and took Drogheda, gave no quarter to the garrison, and proceeded to capture Wexford, Kilkenny, and Clonmell. In nine months the country was nearly subdued. Satisfied with his success, he left to Ireton the conduct of the troops against his panic-struck adversaries; and having sailed for Bristol, proceeded to London, where he was received with fresh honours by the parliament.

The children of the late king had suffered deeply from their fallen fortunes: one had died of grief at her father's execution, another had been sent out of the kingdom by Cromwell, and Prince Charles, the heir to the crown, poor and neglected, had lived sometimes in Holland, at other times either in Jersey or in France. At length he was induced by the Scottish army to take shelter among them, a protection which he bought by subscription to the covenant and submission to restrictions so severe as almost to render him a prisoner. Whatever might be the circumstances under which this junction was formed, the return of Charles to his kingdom could not fail to alarm the English. It was instantly resolved to march northward with all the troops that could be raised. Fairfax, himself a presbyterian, refused to lead the forces, and Cromwell was therefore nominated to the command, and became the general of the commonwealth. This vast accession to his power induced him to resign the lieutenancy of Ireland, to which he had previously been appointed: perhaps a view of removing Ludlow to that post formed an additional reason for his withdrawal. Cromwell was jealous of the influence of Ludlow, who, though he did not receive this appointment, was ultimately set aside by his promotion to an official situation in that kingdom. After these and other preparations, he began his march with 16,000 men (1650). The miscarriage of provisions was at first severely felt; but when supplies arrived the troops regained their courage. The battle of Dunbar was gained by the English, and Edinburgh and Perth were taken. Upon this the king suddenly marched into England. Cromwell, who had not expected this movement, sent expresses to the parliament to inform them of what had taken place, and with forced marches pursuing the king, brought him to an engagement near Worcester, the result of which was a total defeat of the royalists (September, 1651). For this complete victory the parliament rewarded him with fresh honours and an additional pension of 4000*l.* a year.

How early Cromwell thought of taking into his hands the reins of government cannot be determined: whatever views or wishes of this kind he might have felt, they were not expressed, even to his friends, until after the battle of Worcester. Now however his mind was bent upon this object; but for some time no favourable opportunities presented themselves. The war with Holland occupied his attention and engrossed the thoughts of the nation. At length (1653), perceiving that the parliament became daily more jealous of his power, he determined to put an end to their authority. He first sent them a remonstrance; his next movement was to enter the House with an armed force, seize the mace, and to declare to them, 'You are no longer a parliament: the Lord has done with you; he has chosen other instruments for carrying on his work.' Loading the members with abuse, calling them adulterers, extortioners, drunkards, and gluttons, he drove them before him out of the House. Thus was the memorable 'Long Parliament' dissolved. The next step was to summon by name 139 persons, some gentry, some mechanics, all the very dregs of the fanatics, and to constitute them a parliament. It was obvious that such an assembly could in no way assist in the government of the realm; one measure only seemed to be expected from them, and that they quickly determined upon; it was to surrender their power to Cromwell, who, after their voluntary resignation, was declared 'Protector' by a council of the officers of his army, and solemnly installed into his dignity (1653).

The first charter of the Commonwealth was drawn up in December, 1653, by the same council of officers: it was called the 'Instrument of Government.' The second, called the 'Petition and Advice,' was framed in May, 1657, by the Parliament which the Protector had assembled in the previous year. Under the first charter, the English government may be ranged among republics, with a chief magistrate at its head. Under the second it became substantially a monarchy, and Oliver Cromwell, from 1657 to his death, was *de facto* king of England. (Hallam, *Cons. His.* ii. 421.) The difficulties of his administration were great, but they were surmounted by his vigorous abilities, which shone forth as much in wielding his power as in obtaining it. That he was both arbitrary and despotic cannot be denied. Such was the temper of the country, and, notwithstanding his general popularity, such the number of his open or secret enemies, that immediate and forcible action, though sometimes illegal and tyrannical, was absolutely required. The morality of his conduct cannot for a moment be defended. But if he would continue Protector there was little room to be scrupulous. There were opposed to him the royalists, who were still numerous; the nobility, to whom he was hateful; the whole body of Presbyterians, who were jealous of having no share in the power which they had helped to gain; and in the army, the mutinous and disaffected 'Levellers.' Severe measures then were requisite, and at times they certainly were used, not however without apparent reluctance. 'Cromwell's *general* policy,' says Sir Walter Scott (*Tales of a Grandfather*, vol. iii.), 'was to balance parties against each other, and to make each desirous of the subsistence of his authority rather than run the risk of seeing it changed for some other than their own.' The point that seemed most to perplex him was the calling together of parliaments: he would neither reign with them nor without them. He abruptly dissolved the House in 1654, in direct contradiction to the advice of Whitelock and his friends generally, who recollected the abuse that had been poured upon King Charles under similar circumstances. It was not the wish to attain an absolute despotism that prompted him to these acts, but rather an impatience at the opposition that he was sure to experience in their councils. In 1656 his successes at home and abroad encouraged him to assemble another parliament. Ireland being in the hands of the army, elected such officers as he nominated; Scotland was nearly equally subservient to him; still the majority was unfavourable to his policy. The next step was difficult. He ordered the doors of the House of Commons to be guarded, and that no member should be admitted unless he produced an order from his council. Thus he excluded nearly one hundred members who were obnoxious to him. Thus 'purified,' this assembly voted a renunciation of all title to the throne in the family of the Stuarts; and Colonel Jephson moved that the crown should be bestowed upon Cromwell. A conference was soon afterwards appointed (1657), at which the Protector's scruples respecting the assumption of the title of king were stated and argued: it was seen that his mind was wavering whether he should accept or whether he should forbear. But his prudence ultimately prevailed; he knew that the danger of acceding would be imminent, while the increase of power would be trifling; the odium in which the army had been taught to hold the regal title could never be overcome, and therefore he consented unwillingly to reject it.

As Cromwell's treatment of his parliaments was arbitrary, so also were his dealings with the courts of justice. He degraded three judges without just cause, and so intimidated the barristers that they feared to uphold clients whose causes were contrary to the Protector's wishes. To give an instance of this oppression—One Cory having refused to pay the unjust and exorbitant tax of ten per cent. which was ordered to be levied upon the property of all royalists, sued the collector. Three eminent counsel, Maynard, Twisden, and Wyndham, were employed in his cause, but Cromwell, without suffering them to enter into their argument, sent them to the Tower even for accepting the brief. Sir Peter Wentworth having brought a similar action, was asked by the council if he would give it up; 'If you command me,' he replied to Cromwell, 'I must submit;' the Protector did command, and the action was withdrawn. Equally shameless were the means which were used for the erection of the courts, by which, in 1654, Gerard and Vowel, and, in 1658, Slingsby and Hewit, were brought to the scaffold. These, and other similar acts, rendered Cromwell hateful to many of his subjects. He had suppressed some royalist insurrections at Salisbury, and executed the leaders in 1655; but now he entertained fears from the republicans also. Major Wildman, a republican, was arrested for a conspiracy against him; and such was the ill-will shown to him by the democratic soldiery as to cause anxiety for his personal safety. One Sindercome, who by an accident alone had been prevented from murdering him, was arrested and condemned; but to the disappointment of Cromwell, who eagerly desired to make a public example, the criminal committed suicide before the day appointed for his execution.

The foreign policy of the Protector has been variously estimated. It seems to have been imprudent but magnanimous, enterprising, and ultimately successful. 'Perhaps no government,' says Sir Walter Scott (*Tales of a Grandfather*), 'was ever more respected abroad.' Many memorable victories were achieved under the parliament and under Cromwell. 'It is just to say,' observes Mr. Hallam (*Const. Hist.*, vol. ii.), 'that the maritime glory of England may first be traced from the era of the Commonwealth in a track of continuous light.' A treaty, consequent on the successes of Blake, was honourably concluded with the Dutch. An expedition, more politic than just, was made against the West Indian colonies of Spain; it ended in failure and disappointment, although it gained for England the island of Jamaica, a greater and more advantageous possession than many triumphs have produced. An alliance was concluded with France in 1655 to act in conjunction against the Spanish forces in the Low Countries; Mardyke and Dunkirk were taken, and the Spaniards were afterwards wholly defeated at Dunes. Denmark, Portugal, and Sweden, eagerly sought the Protector's friendship; ambassadors flocked to his court, bearing the most conciliatory and adulatory messages.

The anxiety of all princes to be allied with so recent an usurper is very remarkable. The servility of some powers was extreme, as has been proved by several curious instances which have been collected by Mr. Harris. (*Life of Cromwell*, p. 352.)

Whether Cromwell could have maintained his authority for many years is doubtful; the prevalent discontents induce us to believe that he could not. 'He became,' says Sir Walter Scott (*Tales of a Grandfather*), 'morose and melancholy, always wore secret armour under his ordinary dress, and never stirred abroad unless surrounded with guards, never returned by the same road nor slept thrice in the same apartment from the dread of assassination; his health broke down under these gloomy apprehensions;' and on the 3rd September, 1658 (the anniversary of his victories at Dunbar and Worcester, and several other important events of his life), he died of fever and tertian ague, in the sixtieth year of his age. His burial was conducted with unusual pomp and magnificence at Westminster: but his corpse was not suffered to rest in peace. At the Restoration it was disinterred by the Royalists, and, having been hung at Tyburn, was cast into a hole beneath the gallows.'

Of the numerous characters of Oliver Cromwell that have been drawn by various historians, none appears to us as a whole to be more faithful than that of Dr. Smollet. (*Hist. of England.*) It should nevertheless be recollected that the bias of the writer was strongly in favour of the high prerogative of the crown. Cromwell 'inherited great talents from nature; though they were such as he could not have exerted to advantage at any juncture but that of a civil war inflamed by religious contests. His character was formed from an amazing conjunction of enthusiasm, hypocrisy, and ambition. He was possessed of courage and resolution that overlooked all dangers, and saw no difficulties. He dived into the characters of mankind with wonderful sagacity, whilst he concealed his own purposes under the impenetrable shield of dissimulation. He reconciled the most atrocious crimes to the most rigid notions of religious obligations. From the severest exercise of devotion he relaxed into the most ludicrous and idle buffoonery. He preserved the dignity and distance of his character in the midst of the coarsest familiarity. He was cruel and tyrannical from policy, just and temperate from inclination, perplexed and despicable in his discourse, clear and consummate in his designs, ridiculous in his reveries, respectable in his conduct; in a word, the strangest compound of villany and virtue, baseness and magnanimity, absurdity and good sense, that we find upon record in the annals of mankind.'

The resemblance between the fortunes of Cromwell and of him who in more recent times raised himself from insignificance to a throne, is strong enough to strike the generality of readers. Mr. Hallam has stated (*Cons. Hist.*) the most striking points in the parallel. But the conclusion of Bonaparte's life was very unlike that of the Protector; the fortunes of one had declined for years before his death, the other retained his authority to the last hour.

Cromwell was not wanting in kindness towards his family, and always showed great affection towards his wife and children. He was once married; six children, two sons, and four daughters, survived him. Of the daughters, Bridget was twice married, first to Ireton, and afterwards to Fleetwood. Elizabeth was the wife of John Clayton, Esq.; Mary married Lord Fauconberg, and Frances was wife first to Mr. Rich and afterwards to Sir John Russell of Chippenham.

(Clarendon's *Hist. of Rebellion;* Hallam's *Cons. Hist.*: Noble's *Memoirs of Cromwell's family; Tracts on the Civil Wars;* Harris's *Life of Oliver Cromwell;* Crit. Review of *Life of Oliver Cromwell; Biog. Brit.; Biog. Univer.*: W. Scott's *Tales of a Grandfather;* Villemain's *Hist. de Crom.;* Smollett's and other Histories.)

CROMWELL, RICHARD, the third son of Oliver Cromwell the Protector, but the eldest that survived him, was born at Huntingdon on the 4th of October, 1626. He was educated at Felsted in Essex, with his brothers Henry and Oliver, and thence removed to Lincoln's Inn, where he was admitted in 1647. His study of the law was only nominal, for the time which he should have occupied with reading was wasted in the pursuit of pleasure. Although he had now arrived at an age when it would have been most natural for him to have desired to join his father's troops, we do not find that he showed any inclination to do so. Besides indolence and apathy, many causes have been assigned for this want of enterprise; some have supposed that his father would not suffer him to take arms; others, that Richard Cromwell's political opinions differed from the Protector's; and that as his companions were chiefly cavaliers, and the king's health had often been drank at their carousals, he was favourable to the Royal rather than the Parliamentary cause. There is, however no very clear evidence to prove this last fact, unless we may reckon as such the fact that Richard, averse to spilling blood, when the king was condemned, petitioned his father for a remission of the sentence.

At the age of twenty-three he married Dorothy, the eldest daughter of Richard Major, Esq. of Hursley, in

Hampshire, a lady sprung from a good family, endowed with many virtues, and possessed of a considerable fortune. This change in his circumstances induced him to leave his residence in London, and to establish himself at Hursley, where he lived in complete retirement, following the sports of the field and other rural pursuits. Oliver Cromwell, until he was made Protector, was unwilling to advance his son, for fear of giving umbrage to the republican party. No sooner, however, was that dignity conferred upon him, than calling Richard from his obscurity, he nominated him for the counties of Monmouth and Southampton, for which he was elected in 1654. His appointment as first lord of trade and navigation followed his election. In 1656, he was again chosen member of parliament for Hampshire and the University of Cambridge; and in the following year succeeded his father in the chancellorship of Oxford.

An accident now befel him which nearly cost him his life. After a levee held by the Protector, whilst he and other members of parliament were standing on the upper steps within the banqueting-house, the supports gave way, and the whole staircase fell with an alarming crash; youth and a good constitution alone enabled him to recover from the fractures and other injuries that he sustained. After his health was restored, his father, still anxious for his elevation, made him a privy councillor, a colonel in the army, and leader of the newly constituted House of Lords. The reign of Oliver Cromwell was now drawing to a close; both his mind and body were overwrought by the strain of continual exertion; and in the summer of 1658, he sent for his eldest son to attend him in his sickness. Richard Cromwell immediately obeyed the summons, and found the symptoms of his father's illness such as to make him extremely apprehensive for its result; in a letter written in August to a friend near Abingdon (*Parl. Hist.* 21, p. 223), he expresses in feeling and sensible terms the fears which he entertained for his life. On the 3rd of September 1658, Oliver Cromwell died, and on the next day Richard Cromwell received the sceptre of the commonwealth.

For a short time the peace of the kingdom was undisturbed, and respect was paid to the new Protector at home by his subjects, and abroad by all foreign states. Thurloe, Whitelock, and Broghill were his chief counsellors, and it must be confessed, when all the attendant circumstances are considered, their advice was none other than judicious. But tranquillity could not long be maintained: the aspect of affairs very soon began to change. Discontents prevailed; the want of resources was felt; it became necessary to call a parliament (1659), for there was in the treasury no money with which to fulfil the engagements with foreign princes that had been entered into by the late Protector. It was feared that the elections would go against the court: and every means were therefore taken to bias them. Oliver Cromwell's reformed model of representation was abandoned, and the right of returning members was restored to small boroughs, which, from gratitude, it was thought would be favourable to the court: but notwithstanding this, and all the other efforts of the government, the number of presbyterian and republican members nearly equalled that of the ministerial party. In the parliament, then, the weakness of the Protector's government was most apparent. Still it was to this body that he must trust: for in the army he had scarce any friends at all; the whole republican party were combining against his authority; Lambert was intriguing for his overthrow: even Fleetwood, his own brother-in-law, joined the discontented officers, whose faction, from the name of Fleetwood's house, in which they met, was called the 'Cabal of Wallingford House.' Richard, who possessed neither penetration nor resolution, took no step to subdue these rebels: the parliament, more alarmed, took the case into their hands. A vote was passed that no council of officers should assemble without the Protector's consent: this brought the rupture to a crisis. The army demanded the dissolution of the parliament, which the Protector wanted resolution to deny. The dissolution was equivalent to his dethronement, and he soon afterwards signed his demission in form (22nd April, 1659). His brief reign ended, Richard Cromwell descended into humble life, to the enjoyment of which his feeble unambitious character was better adapted than to the possession of power. He had no qualities which fitted him to rule. He was burdened with debts, arising partly from the pompous funeral of his father, the cost of which, amounting to 28,000*l.*, the state unworthily suffered to descend upon him. To assist him in these difficulties, the parliament voted him 20,000*l.*, annexing a condition that he should leave the palace of Whitehall. In consequence of this grant he retired to Hampton Court, but so small a portion of the money was paid, that he was still in danger of being arrested by his creditors. To leave England was his only method of escape from them, and accordingly he resided sometimes in Geneva and sometimes at Paris. At length he ventured to return to this country: a house was hired for him at Cheshunt, near London, where at first he concealed himself under a feigned name, and continued to live in strict privacy, until the year 1712, when he died in his 86th year.

Richard Cromwell was the father of two sons and seven daughters: four of his children died young, and two only survived him: he had great reason to complain of their undutiful behaviour. It has been remarked that there exists no coin or medal stamped in his reign: perhaps this may be accounted for by his never having been solemnly instituted Protector. (Hallam's *Const. Hist.*; Noble's *Memoirs*; Hume's *Hist.*; *Biog. Brit.*, &c.)

CROMWELL, HENRY, the fourth son of Oliver Cromwell, Lord Protector, but the second and youngest that survived him, was born at Huntingdon in January, 1627-8 He was educated at Felsted in Essex, and enrolled in the parliamentary army at the age of sixteen. In 1649, having become a colonel, he went with his father to Ireland, where he behaved with considerable gallantry. He was one of the members for that kingdom in the Bare-Bones Parliament. He married, in 1653, a daughter of Sir Francis Russell of Chippenham in Cambridgeshire, and resided at Whitehall until he was appointed Lord Deputy of Ireland, being at the time (1654) a member for the University of Cambridge. During the following year he was again sent to Ireland. It had become absolutely necessary that the estates and property of the natives should be protected from the rapacity of the republican leaders, who were aggrandizing themselves at their expense; and Henry Cromwell was considered a fit person to undertake this task, both on account of his general abilities, and the great esteem in which he was held in that country. The expectations of his friends were not disappointed, for the state received considerable benefit from his services, as soon as he succeeded Fleetwood in his office. The impossibility of procuring money from England, and the limitations of his power, materially diminished his usefulness. At length, from these causes, his government became so irksome to him, that his letters are one series of complaints, interspersed with offers to resign. Still further mortification, however, was in store for him. When his brother Richard became Protector, the council, over which he had little or no control, contracted still further the power of Henry Cromwell, who, in exchange for the title of Lord Deputy, received that of Lord Lieutenant, a miserable recompense for his lost authority.

After the deposition of his brother, Henry Cromwell was desirous of keeping Ireland for the king, and it was not until his submission was forcibly required by the parliament that his object was finally relinquished. Henry now retired to Chippenham, whence, in five or six years, he removed to his estate at Soham in Cambridgeshire, where he spent the remainder of his days, and died at the age of forty-six (1673-4). There were many excellent qualities in his character: he was generous, honest, decisive, firm, and courageous. 'All historians,' says Rapin, 'are unanimous in their praise of him, and generally believe, that if he had been Protector instead of his elder brother, the officers would either have met their match, or not attempted what they did against Richard.' Henry Cromwell had five sons and two daughters: one of his children died young; the rest survived him.

CRONSTADT (Bartza Videka), a large county in the south-eastern part of Transylvania, and in that part of it called 'the Land of the Saxons.' It is also denominated Burzenland, or Burczelland (from the river Burze), and Bartzsag. It lies immediately to the north of Wallachia, and has an area of about 787 square miles. It contains 1 free city, 4 market-towns, 26 villages, and about 13,260 houses. The county is traversed by the lofty chain of the Butschescht, an arm of the Carpathians, of which the Butschescht itself is 8160 feet high. On the side towards Wallachia it is completely inclosed by the Carpathian mountains, across which lead four principal passes, called the Torzburg, Temesch, Altschanz, and Bosau. The principal river is the

Alt, which receives the waters of the Burze and several other streams. The climate, though temperate, is variable, and extremely cold during the prevalence of the east wind.

The soil produces all sorts of grain and pulse, maize, millet, flax, hemp, fruits, and wood; also gold, silver, lead, and porcelain-earth; mineral springs abound, and there are several lakes, the banks and beds of which yield soda. The country is rich in game, fish, and bees; there are large herds of horned cattle; and much timber is obtained from the forests. Agricultural pursuits constitute the chief employment of the inhabitants. The population, which amounts to about 80,900, is composed of Saxons, Magyars, Wallachians, Greeks, Armenians, and some Kalibassi, the only people of that race in Transylvania. The district is divided into 3 fiscal circles, and 4 seignorial circles. The 4 market-towns are Marienburg, or Foldoár (1700 inhabitants), Rosenau (or Rosnyo) castle (2 churches, and 3300 inhabitants), Tottlau (Prashmar) (2 churches and 3000 inhabitants), and Zeiden, or Fekete Kalam (2 churches, and 3200 inhabitants).

CRONSTADT, the capital of the county of the same name, and the largest and most populous town of Transylvania, is called by the inhabitants Kruhnen, by other Saxons, Krünne and Krohne, and in antient records, Brassó. It lies in 35° 36′ N. lat., and 25° 33′ E. long., in a narrow valley, inclosed by mountains, at an elevation of 1896 feet above the level of the sea. It is defended by a strong castle on the banks of the Farkas. The inner town, which is in the form of a rectangle, is well-built, and surrounded with towers, walls, and ditches; it contains about 615 houses, and has a population composed entirely of Saxons or their descendants. The inner town was built in the beginning of the fourteenth century, when it was called Corona. There are three suburbs, the Altstadt, the Bolonnya, or Brassovia, and the Upper Town, or Bolgár, which consists of 1500 houses, partly built on hills amidst orchards and gardens, and inhabited chiefly by Wallachians. Including these suburbs, Cronstadt has above 3400 houses, and nearly 36,000 inhabitants. The inner town has five gates, six principal streets, which are straight and regular, and a spacious market-place with two fountains. Among the chief buildings are the Protestant high church, a striking edifice, erected in 1383, in the Gothic style. It is 112 paces long, 59 broad, supported by 22 Tuscan columns, and surmounted by a tower 138 feet high, in which is a bell 6½ tons in weight. The Roman Catholic church of Peter and Paul was built in the Italian style in 1766—82. The remaining buildings of note are the town-hall in the market-place, with a handsome tower, the old Lutheran church of St. Bartholomew, the gymnasium, and the great mart, or Kaufhaus, which was erected by Apollonia Hirschin, the wife of the sheriff, in 1545. This mart is the general place of rendezvous for merchants of all nations, Saxons, Hungarians, Armenians, Greeks, Turks, Wallachians, Jews, Gipsies, and Bulgarians, who assemble here to expose their goods, while Turkish money-changers are seated outside and around the market-place for the exchange of Austrian and Turkish coins.

Cronstadt contains a Lutheran gymnasium with a library, a Roman Catholic high (*primar*) school, a military academy, a normal school, besides various elementary and girls' schools, two hospitals, a house of correction, and a house of industry.

The inhabitants, among whom are many gipsy labourers, carry on considerable manufactures, especially cloth, of which above 40,000 pieces are annually made, linens, cottons, coarse woollens; stockings are also manufactured, and form a branch of trade with Wallachia; flasks of maple wood, of which above 30,000 are annually sent to Wallachia, Hungary, and Sclavonia; woollen bobbins, of which 200,000 pieces are sent by Greek merchants to Asia Minor, &c. There is a paper-mill, and two wax bleaching grounds. Cronstadt was the first place in Transylvania where a paper-mill and printing-press were established; the earliest works issued from the latter were the 'Augsburg Confession' and the writings of Luther.

Cronstadt is the first commercial town of Transylvania, and carries on a considerable transit trade in Austrian and Turkish produce, principally cattle and wine from Wallachia; manufactured goods, corn, salt, &c., of which the annual circulation is from 500,000*l.* to 600,000*l.* The business is chiefly transacted by the Greek trading company, and at large annual fairs.

CRONSTADT, a town, fortress, and port, in the Russian government of St. Petersburg, from which city it is forty-seven versts, or about thirty-one miles distant, is situated in 59° 58′ N. lat., and 25° 49′ E. long.: it is built at the south-eastern extremity of Cotlin-Ostrof, an island in that part of the Gulf of Finland called the Bay of Cronstadt, about sixteen miles from the mouth of the Neva. This island, a bed of chalk, formerly called Rétouzari by the Finlanders, is seven miles in length and about one mile in breadth. At the entrance of the harbour, on an island opposite the citadel, lies the fortress of Cronschlott, built by Peter the Great. The passage between this fortress and Cronstadt is 2000 paces in width, and has ample depth for the largest vessels.

Besides its importance as the great naval station of the Russian fleet, Cronstadt is the harbour of St. Petersburg. All vessels proceeding to that port are searched here, and their cargoes sealed, and such as are too large for the shallow waters of the upper Neva unload their cargoes at Cronstadt, and transport them in smaller craft.

Cronstadt, which is built in the form of an irregular triangle, is strongly fortified on all sides. It has three harbours, lying to the south of the town; the outer or military harbour, which is entirely surrounded by a massive and strongly fortified mole, is a rectangle, stretching out into the sea, and is capable of containing, besides smaller vessels, above thirty-five ships of the line. It is now however so shallow at low water, that many of the ships are obliged to anchor in the middle harbour, which is properly intended for the fitting out and repairing of vessels. It contains the slips, a powder-magazine, a manufactory of pitch, tar, &c. The third and innermost harbour, which has space for 1000 vessels, and runs parallel with the middle harbour, admits only merchantmen, for which there is besides an excellent roadstead immediately outside of the port, which is defended also by the citadel, constructed on a rock in the middle of the sea of Cronstadt.

All these harbours are well secured, but in consequence of the freshness of the sea-water no vessels can be preserved in them above twenty years. They are besides detained a great part of the year by the ice in the bay of Cronstadt, which usually prevents vessels from entering after the end of November, or leaving before the end of April, or sometimes even later. Vessels are repaired and built in the large canal of Peter the Great, which runs directly into the town between the middle and merchant's harbour. It is 2160 feet long, 56 wide, and 26 deep; the side abutments, &c. are of solid masonry, and it is filled with water by means of sluices, which is again pumped out by steam-engines. It was commenced in 1721, and finished by Elizabeth. Near it are the various docks, in which ten ships can be repaired at once; the foundry, which supplies annually 1200 tons of bombs, balls, &c.; the admiralty rope-walk, tar-works, and excellent wet docks. By the new Catharine Canal, commenced in 1782, which is 1880 fathoms long, government vessels are enabled to take their stores, munition, &c. directly from the store-houses. The town is very regularly built, and contains many fine, straight, and well-paved streets, and several public squares. The houses however, with the exception of those belonging to government, are chiefly of one story, and built of wood. There are three churches and two chapels of the Greek worship; that of the Transfiguration, built of wood by Peter the Great, is very large, and covered with images; that of the Trinity is of older date; St. Andrew's church is in the Byzantine taste, and surmounted by a handsome cupola. There is a Lutheran, an Anglican, and a Roman Catholic church.

The city has three gates, and is divided into two parts, the Commandant and Admiralty quarters, which are subdivided into four districts. Between the Peter's and Catharine canal is the old Italian palace built by Prince Menkschikof, who took this island from the Swedes in 1703. It is at present occupied by the school for pilots, a large establishment, where above 300 pupils are educated for the naval service, and 20 for the merchant service. The naval hospital is a large and well-regulated institution, with accommodation for 2500 patients, and a separate building for officers of the navy. Among other public buildings we may mention the admiralty, exchange, custom-house, barracks, a Protestant gymnasium, various schools, an invalid asylum for 60 females, the nobility's club, and the house of Peter the Great, where he resided for some time: but with the exception of a few old oaks, which he is said to have planted with his own hand, there are no remains of the former garden.

The permanent population of Cronstadt. exclusive of the garrison, the pupils of the naval school, workmen, and sailors, is not considerable; during the summer it amounts to upwards of 40,000 individuals of various nations; of these, next to the Russians, the English are the most numerous. The inhabitants derive their chief support from the fleet, trade, and shipping. The town presents an appearance of great bustle and activity during the summer, but in winter all is dead and stagnant.

The town and port were laid out and the buildings far advanced by Peter the Great, who founded Cronstadt in 1710; but it did not receive its present name ('the town of the crown') until the year 1721. At the northern extremity of the island are Fort Alexander and the battery of St. John; the latter is built on piles in the Neva.

CROOKED ISLANDS, a group similar to the Caicos, situated on a coral bank, 23 miles to the eastward of Long Island, on the Great Bahama Bank. They consist of three large islands, called Crooked, Acklin's, and Fortune, besides several small keys and rocks. The edge of the bank, like most others in these seas, rises abruptly from a depth of upwards of 100 fathoms all round; and the highest land is only 200 feet above the sea. These islands form a part of the Bahama government. At the south-west end of Crooked Island there is an unsafe anchorage, with a custom-house and post-office, where the Bahama mail is left, and taken up by the Jamaica packet monthly on her voyage home. The population is very scanty, and supplies are scarce and dear; but a stock of turtle is constantly kept in ponds. The bank is contained between the parallels of 22° 5 and 22° 50′ N. lat. and the meridians of 73° 50′ and 74° 30′ W. long.

CROPS, ROTATION OF. [Arable Land.]

CROSIER, from Crocia, in the Latin of the middle age, a pastoral crook or staff, formerly used by bishops and abbots. Several writers have supposed (see Macklain's Note to Mosheim's *Eccles. History*, edit. 1758, vol. i. p. 319; and the *Antiquarian Repertory*, 1st edit. ii. p. 164) that it was derived from the *lituus*, or augural staff of the Romans: but they are mistaken. It was evidently copied from the well-known and common staff which shepherds, even to this day, make use of to catch hold of the hinder leg of their sheep in order to take them; and it has reference to the pastoral office of the bishops and clergy, according to the words of our Saviour, 'I am the good shepherd,' and to the common name of the clergy, pastors or shepherds.

These pastoral crooks were sometimes barely curled, and at others very richly ornamented; a few instances occur in which the upper part finishes in the form of a mace. The Sieur de Moteon, in his 'Voyages Liturgiques de France,' 8vo. Par. 1718, p. 272, says, many of the early crosiers were not curved. The abbot's staff was usually of a simpler form than that of the bishop. One of the earliest abbatical staffs, the form of which can be seen in England, is probably that represented on the tomb of abbot Vitalis, in the cloister of Westminster Abbey, who died in 1082. The most splendid episcopal crosier remaining is that of William of Wykeham, of silver gilt, richly enamelled, which is exhibited to visitors in the chapel of New College, Oxford, to the society of which the bishop himself bequeathed it in 1404. (See Lowth's *Life of Wykeham*, 3rd edit. 8vo. Oxf. 1777, p. 263, where it is engraved.) Crosiers in wood in antient times were usually buried with bishops and abbots in their coffins: such a one, of red wood, the top carved into the rude form of a ram's head, was found many years ago, upon opening the coffin of bishop Grosteste at Lincoln, who died in 1253. It lay across the body from the right shoulder to the left foot. At the bottom of the neck of this staff, upon a brass plate, was this inscription: 'Per baculi formam Prelati discito normam.' (Gough, *Sepulchr. Mon.* vol. i. p. 47.)

CROSNO, an antient royal town in the circle of Jaslo, in the north-eastern part of Austrian Galicia, lying in a beautiful and fertile valley between the Wyslaka and Morvava. It contains upwards of 600 houses, with about 5000 inhabitants; an old palace, a chapter-house, a handsome Gothic collegiate church, built on the foundations of a place of Arian worship, a Capuchin monastery of freestone, a Minorite cloister, and an hospital. The people are much engaged in the manufacture of inferior articles; the fairs are numerously attended, and it is a place of deposit for the wines of Hungary consumed in Galicia.

CROSS. Various religious edifices called crosses, from their being surmounted with this emblem of Christianity, have been erected in England and on the continent. Of these the most remarkable in England are those built by the command of Edward I. in memory of his queen Eleanor Three of these still remain, at Geddington, Northampton, and Waltham Cross, near London. The last, which is the most elegant, consists of four stories. It is hexagonal on the ground plan, and beautifully enriched; the story immediately above this is supported by buttresses, and formed into niches in which are three figures of the queen. The core at the back of the figures is carried up beyond the niches, and has been restored with a battlement and a cross sustained on a crocketted spire. Churches have usually crosses fixed on their gable ends. Market-crosses were formerly very common in England. They are often designed with niches and vaulted, thus forming an open chamber, as at Salisbury and Chichester. Winchester-cross, which is one of the most perfect of the crosses erected for religious purposes, is of much later date than those erected by Edward I. Near Ely, on the road to Downham-market, there is a singular cross, consisting of a long slender stone shaft, on the top of which there are richly carved niches projecting beyond the sides of the shaft. There is a representation of a cross on some terra cotta lamps in the British Museum. The largest constructed crosses are those of St. Peter's at Rome and St. Paul's, London.

In some of the Catholic processions in Rome enormous crosses, constructed of wood and card-board, are carried, balanced in a waistband round the body of a strong man.

CROSS, from the Latin 'Crux.' This cruel mode of punishment appears to have been in use from the earliest recorded periods of history. It was possibly the invention of some barbarous tribe to prevent the escape of a captive by fastening him to a tree, or used to inflict death on an enemy by leaving him to expire of want, or a prey to birds and beasts.

Crosses, whatever was the original form, were, in course of time, made of two pieces of wood. These crosses have been divided by antiquarians into three kinds. The crux decussata, or cross divided like the letter X, and usually called St. Andrew's cross; the crux commissa, or joined cross, consisting of an upright piece of timber with a transverse piece on the extreme top at right angles with the first, like the letter T; and the crux immissa, or let-in cross, in which the transverse piece of timber is let into the upright, but placed somewhat below the top of the upright in this form +. This is the cross on which Christ is usually represented to have suffered, and though there may not be any absolute authority for ascertaining the precise form of the cross used on that occasion, yet the circumstance of an inscription having been placed over his head renders the conjecture probable.

Amongst the Carthaginians, persons of all conditions, even commanders of armies, were subjected to it, but amongst the Romans it was considered as the punishment of slaves, and inflicted on that class only. With respect to the Jews, it seems doubtful whether crucifixion, as we understand it, was a mode of punishment used by them in antient times. The putting the sons of Saul to death by the Gibeonites has been adduced as furnishing evidence that crucifixion was practised by them (2 Samuel, cap. 21); but the practice does not seem to warrant the conclusion. It is however to be observed that the term 'hanging on a tree' is used in Scripture to describe crucifixion. (*Acts*, 10th chap., 38th verse.)

Previous to crucifixion the sufferer was scourged. He was also forced to carry his own cross; and this (amongst the Romans at least) probably arose from the disgust and horror with which this instrument of punishment was viewed and considered by that people, and their disinclination even to touch it. (Cicero *in Verrem.*) The criminal was accordingly condemned to bear his own instrument of torture. Previous to the infliction of the punishment, the sufferer was stripped naked, and it is probable that he was laid down on the cross for the purpose of having the nails driven in his hands and feet, or being fastened with ropes which was sometimes the case. The cross was then elevated. Afterwards the legs were broken, wounds inflicted with a spear, or other sharp instrument, to hasten death, but this was not invariably done. As death, in many cases, did not ensue for a length of time, guards were placed to prevent the relatives or friends of the crucified from giving them any relief, or taking them away whilst alive, or removing their bodies after they were dead.

The representations of crucifixions by painters are, in our opinion, calculated to give very erroneous notions both of the cross itself and the mode of punishment. It is not probable that the crosses actually used were so lofty or so large and massive as those which we see in pictures. Instruments of such dimensions would be perfectly unnecessary for the purpose. When we read in Josephus of hundreds of Jews being crucified by Vespasian and Titus in a day, we cannot suppose that so great a quantity of timber would be used on those occasions. The circumstance of the sufferer carrying his own cross weighs against the probability of its being of the size which these representations give it. It is not unusual in paintings to represent crucifixion as taking place after the cross is elevated, and the executioner is represented standing on a high ladder, and driving a nail into the hand of the crucified person. It seems much more likely that the sufferer was nailed to the cross before it was raised and fixed in the ground. 'Pone crucem, servo,' 'Put the cross to the slave,' is the expression used by Juvenal. Crucifixion sometimes took place with the head downwards, and St. Peter is said to have suffered death in this way. Death by the cross, in a strong and healthy person, must necessarily have been tedious and lingering, and instances have occurred of persons who, after remaining some time on the cross, were taken down, and survived. When the crucified person was only attached to the cross by ropes, this seems by no means extraordinary; and even when it took place by nailing, neither the wounds themselves nor the quantity of blood lost would be sufficient in all cases to bring on speedy death. During the reign of Louis XV. several women (religious enthusiasts, called Convulsionaires) voluntarily underwent crucifixion. Dr. Merand, an eye-witness at some of the meetings of these persons, relates that he was present at the crucifixion of two females, named Sister Rachel and Sister Felicité. They were laid down, fixed by nails five inches long driven firmly through both hands and feet into the wood of which the crosses were made. The crosses were then raised to a vertical position. In this manner they remained nailed, while other ceremonies of these fanatics proceeded. Sister Rachel, who had been first crucified, was then taken down: she lost very little blood. Sister Felicité was afterwards taken from her cross. Three small basins, called palettes, full of blood, flowed from her hands and feet. Their wounds were then dressed, and the meeting was terminated. Sister Felicité declared that it was the twenty-first time she had undergone crucifixion. (Justus Lipsius, *Roma Illustrata.*)

CROSS-BOW. [ARCHERY.]

CROSSARCHUS. [VIVERRIDÆ.]

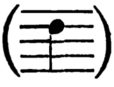
CROSSBILL. [FRINGILLIDÆ.]

CROTALO'PHORUS. [RATTLESNAKE.]

CRO'TALUM (κρόταλον), an antient musical instrument, which, it appears from medals, was used by the Corybantes, or priests of Cybele. The Crotalum differed from the sistrum, though the names are often confounded, and is by some supposed to have been of the castanet kind (*Dict. de Trevoux*). Some consider it as a cymbal of small dimensions; and from the allusions to it by Virgil, Lucretius, and others, we are inclined to be of the latter opinion.

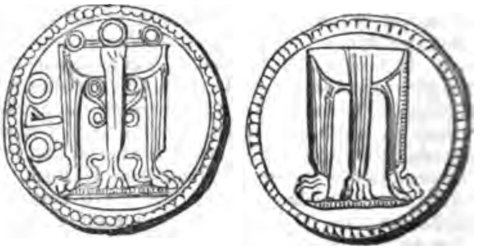
CRO'TALUS. [RATTLESNAKE.]

CROTCHET, in music, a character or note formed of a round head, and a stem descending from the left side of the upper part—



It is the fourth part of a semibreve, and in slow time (*largo*, for instance,) its duration is about one second.

CROTON (Κρότων), now Cotrone, a town on the east coast of Calabria, with a castle and a small port. [CALABRIA.] The district of Cotrone, one of the four into which the province of Calabria Ultra 2 is divided, contained, at the census of 1824, 37,175 inhabitants, chiefly employed in agriculture. Croton was one of the oldest and most flourishing Greek colonies in Magna Græcia: its circuit was twelve Roman miles. It was famed for the salubrity of its climate, the fertility of its territory, and the beauty of its women. It was engaged in wars with its neighbours of Sybaris and the Locri; it defeated the former (Herod. v. 44), and was defeated by the latter in a great battle on the banks of the river Sagra. It was afterwards taken by surprise by Dionysius of Syracuse, and subsequently devastated by Pyrrhus. During the second Punic war it was besieged by a combined force of Carthaginians and Bruttians, and the inhabitants, who were reduced to 20,000, were unable to defend the large extent of their walls. They surrendered, and afterwards sought a refuge among their antient enemies the Locri (Livy, xxiii. 30). The Romans afterwards sent a colony to Croton. This town was the birthplace of Milo the athleta, of whose strength wonderful stories are told, of several celebrated physicians and philosophers, and was also the residence of Pythagoras.



Coin of Croton.

British Museum. Actual Size. Silver. Weight 112 grains.

CROTON, an euphorbiaceous genus comprehending a large number of species, many of which have important medical properties. It is distinguished from other genera of its order by monœcious flowers; the males with a 5-parted valvular calyx; 5 petals, 5 glands alternate with the petals; and a definite number of distinct stamens; the females with a 5-parted calyx; no petals; three bifid or multifid styles; 5 glands surrounding the ovary, and a tricoccous fruit. The species are extremely diversified in appearance, some being trees, others bushes, others herbaceous plants; many with serrated or lobed leaves, many with entire ones; sometimes covered with hair, sometimes naked and now with a small compact, now with long lax inflorescence. The following are a few of the more remarkable species:—

1. *Croton Cascarilla.* Leaves lanceolate, acute, quite entire, stalked, downy on the under surface. Stem arborescent. A native of the Bahamas, St. Domingo, and Florida. Fée considers it quite certain that this species is what furnishes the cascarilla bark of commerce; but others ascribe it to *Croton Eleutheria;* and Schiede suspects that it may be rather the produce of *C. Pseudo-china*, which he found to be the real Quina blanca of the apothecaries of Jalapa.

2. *Croton Tiglium.* Leaves ovate, smooth, acuminate, serrated. Stem arborescent. Flowers in terminal spikes. Fruit smooth, the size of a hazel nut. An inhabitant of the Moluccas, Ceylon, and other parts of the East Indies. This plant is at once the most active and dangerous of drastic purgatives; every part, wood, leaves, and fruit, seems to participate equally in the energy. The leaves are so acrid as to inflame the mouth, lips, and fauces of those who merely chew them, bringing on swelling and producing a sensation of burning as far as the anus. The seeds thrown into water intoxicate fish. Ten or twenty fruits bruised with honey have been known to kill a horse by the violent diarrhœa they have produced. Hence the oil obtained from the seeds, when used medicinally, has to be administered with extreme care.

3. *Croton lacciferum.* Leaves ovate, downy, serrulated, stalked; calyxes downy; flowers in terminal spikes; fruits small and velvety. A native of the East Indies. This species is said to furnish the finest of all the sorts of lac, but scarcely ever to find its way to England. It is very pure, of a bright red, and furnishes a brilliant varnish in Ceylon.

Croton Draco, a Mexican plant, with long, heart-shaped, woolly leaves; with *C. spnærocarpum* and *sanguifluum* yields, when wounded, a resinous substance of a deep red colour, resembling dragon's blood. Others are merely aromatic; from *C. balsamiferum*, the liqueur called *Eau de Mantes* is distilled; *C. aromaticum, niveum, fragrans* and *coriaceum*, have similar qualities; and *C. thuriferum* exudes a fragrant resin analogous to incense.

[Croton Tiglium.]

Medicinal Properties.—Cascarilla bark is yielded by the Croton Cascarilla (Don), a tree or shrub, growing in the vicinity of Jalapa, and in the district of Plan del Rio, in the province of Vera Cruz, Mexico, where it is known by the name of Copalche, or Quina Blanca. It most likely comes to Europe through the Bahama islands, from one of which the appellation Eleutheria is derived; but it is not yielded by any plant indigenous to these islands. (D. Don, in Jamieson's *Journal*, vol. xvi. p. 367.)

The bark occurs in pieces about a foot long, which are tubular, or overlapping; externally covered with a cuticle, which easily peels off, so that the liber or bark is often exposed, in which case it feels soft and cork-like. The colour externally is yellowish, ash-grey, or varying to reddish-brown; this last colour is mostly owing to the presence of lichens. The surface is also marked by irregular, deep, longitudinal furrows. The inner surface is a dirty or rusty brown colour. Odour faintly aromatic: taste bitter, not unpleasant, and stimulating. No alkaloid has been detected in it, but it possesses much volatile oil; one pound of bark yields one drachm and a half of volatile oil. This bark is sometimes mixed with the cinchona barks, being called gray-fever bark; a substitution in no respect hurtful.

The action of cascarilla on the human system depends partly on its bitter principle, and partly on its volatile oil; by the former it approaches the pure bitters, by the latter the aromatic stimulants. It possesses this great advantage over almost all other tonic medicines, that it is more easily digested by the stomach, when no other affection of that organ exists than debility and inactivity. This property can only be imparted to other tonics by the addition of aromatics, while it is possessed naturally by this spontaneous combination. In the treatment of pure indigestion from weakness of the stomach and alimentary canal, cascarilla merits the preference. It is likewise of much utility in the treatment of intermittent and nervous fevers, and chronic diarrhœa dependent upon debility; provided no inflammatory condition of the mucous membranes of the stomach or intestines co-exists.

Powder or infusion is the best mode of administration; decoction is objectionable from dissipating the volatile oil.

CROTON OIL. The seeds of the Croton Tiglii were formerly used as a drastic purgative medicine, under the name of grains of Tilly, or Molucca grains; but at present the oil only is employed. The seeds are roasted and then subjected to compression; the oil is therefore termed an expressed oil. It is of a honey-yellow or brownish colour, of moderate consistence, having an odour resembling the resin of jalap; the taste is at first slightly rancid, afterwards acrid, causing a feeling of burning in the throat, which lasts for several hours.

A portion of the oil is taken up by alcohol, and more by æther; it is however soluble in every proportion in fixed and volatile oils. It is supposed to contain a peculiar principle termed Tiglin, in the proportion, when the oil is genuine, of 45 per cent. It is often adulterated with olive or castor oil, which admixtures may be detected by the process suggested by Dr. Nimmo. An artificially prepared substitute, sometimes met with, is a mixture of the resin of jalap, Canada balsam, fixed oil, euphorbium, &c. (Horst.) The oil of the seeds of Jatropha Curcas (Linn.) is also sometimes mixed with the genuine oil. In the dose of one drop (when the pure oil is used) it produces considerable purgative effect, and may be very advantageously employed when difficulty of swallowing exists, since its application to the tongue is often sufficient to ensure the purgative action. Hence in cases of apoplexy, or paralysis of the throat, the desired effect may be obtained even when the patient is insensible. In the treatment of that form of inflammation of the brain termed hydrocephalus, even when effusion appears to have taken place, and torpor or paralysis exists, croton oil will often bring about the recovery of the sufferer. (See Abercrombie on *Diseases of the Brain*, 1st edit. p. 157.) In cases of impending apoplexy croton oil is of incalculable value. It is likewise used, but sometimes very improperly, in cases of obstruction of the intestinal canal. It is however useful in aiding in the expulsion of the tapeworm, when proper anthelmintic medicines have been prescribed. The powerful impression which it makes on the intestinal canal renders it useful in some cases of dropsy. It is in most instances proper to combine it with castor oil, almond emulsion, or an alkali, to lessen its acrimony.

CROTO'PHAGA, Linn.; *Crotophagus*, Browne, Brisson; a genus of birds placed by Lesson under the third family *Hétéroramphes*, of the order *Grimpeurs* (scansores*), Cuvier; *Zygodactyli*, Temm.; *Sylvains Zygodactyles*, Vieill..

Bill short, very much compressed, arched, without dentilations, elevated, and surmounted by a vertical and trenchant crest; nostrils basilary, open; fourth and fifth *quills* longest; *tail feathers* long, rounded.

These birds are called *Ani* and *Anno* in Guiana and Brazil, and *Anno* in Paraguay. In Mexico they are named, according to Hernandez, *Cacalototl*, and in the Antilles *Bouts de petun*, *Amangoua*, *Diables de Savannes*, and *Perroquets noirs*. In Cayenne their common name is *Bouilleur de Canari*. Their general colour is black, with more or less of metallic reflections.

Geographical Distribution.—A considerable portion of America; principally the hot and humid parts, but the south more especially; and the Antilles.

Habits, Food, &c.—The anis live in flocks, and are so far from timid, that when they see their companions fall before the gun, the survivors fly but a short way, and then again pitch. Bushes, the skirts of woods, and the borders of flooded savannahs are their favourite haunts. Their food consists of small lizards, insects, and seeds. Many pairs are said to use the same nest, built on the branches of trees, and of large dimensions, when considered in relation to the number of couples occupying it, where they lay and hatch their young in concert.

Example, *Crotophaga Ani.* Black, with bronzed tints in some lights. Size rather larger than that of the common blackbird: less than that of a jackdaw. Locality, moist savannahs and the neighbourhood of water, in the West India Islands, Carolina, Brazil, Paraguay, &c. It is the *Razor-billed blackbird of Jamaica* of Catesby, the *Savannah blackbird* of the English colonists, and *the great blackbird* of Sloane.

Browne (*Hist. of Jamaica*) thus describes it. 'This bird is about the size of a Barbary dove, or something larger, black all over, and splay-footed, like a parrot. It has a long square tail, a broad compressed bill, and a short thin tongue; but the beak, or upper part of the bill, is flatted on the sides, arched and sharp above, and straight at the edges below. They live chiefly upon ticks and other small vermin, and may frequently be seen jumping about all the cows and oxen in the fields; nay, they are often observed to fly on their backs, unless they lie down for them, which, if much troubled with ticks, they generally do when they see the birds about them; but if the beast be heedless, they hop once or twice round it, looking it very earnestly in the face every time they pass, as if they seemed to know that it was only requisite to be seen, to be indulged. They are very noisy birds, and one of the most common sorts in all the pastures of Jamaica. Their flight is low and short.

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* Birds which have the external toe directed backwards.

Sloane thus describes his specimen, under the name of *the great blackbird.* 'This was thirteen inches long from the end of the bill to the end of the tail, and about fifteen inches from the end of one wing to the end of the other, both being extended; the bill was three-quarters of an inch long, and black, the under mandible being straight, the upper of a singular make, distinguishing it from other birds; for it was arched or round, raised high, flat and thin on the upper round edge. The feet have three toes before and one behind (though Marcgrave says otherwise). The legs are two inches long, and black as jet; the middle toe before is one inch and a half long, armed with a pretty sharp claw, and the other toes proportionable. The colour of the feathers all over is black. The stomach of this bird was pretty thick; it was very full of grasshoppers, beetles, &c., disjointed and partly dissolved.

'It haunts the woods on the edges of the savannahs, and is very common, making a loud noise upon the sight of mankind, which alarms all the fowl in their neighbourhood, so that they are very prejudicial to fowlers; but, on the other hand, when negroes run from their masters and are pursued by them in the woods to be brought back to their service, these birds, on sight of them, as of other men, will make a noise and direct the pursuers which way they must take to follow their blacks, who otherwise might live always in the remoter inland woods in pleasure and idleness.'

'Perhaps this bird may have the toes sometimes two before, at other times two behind.'

Sloane's doubt may have arisen from a casual examination of dead specimens. The fact is, that the external toe in some scansorial birds can be directed backwards, but not forwards to any extent.

These birds are easily tamed, and may be taught to speak. Their flesh is said to have a bad odour.

[Crotophaga Ani.]

CROUP, a specific inflammation of the air tubes, giving rise to a peculiar secretion, which concretes almost immediately it is formed, producing a false membrane, which lines the affected parts. It has been shown [CATARRH] that the mucous membrane which lines the air passages is subject to two different kinds of inflammation, each presenting distinctive characters. In one the inflammation produces a secretion which does not concrete, constituting all the varieties of bronchitis, catarrh, &c. In the other the inflammation produces a secretion which consolidates almost the moment it is formed, giving rise to the various phenomena which constitute the peculiar disease denominated Croup.

That the inflammation which terminates in the formation of the secretion peculiar to croup is of a specific nature, is argued, first, because it uniformly terminates in the production of this peculiar secretion; and, secondly, because this secretion is obviously not dependent on the intensity of the inflammatory action, since the phenomena characteristic of inflammation are often less acute in croup than in catarrh. It has been conjectured that catarrh depends upon inflammation of the secreting follicles of the mucous membrane, and that croup depends upon inflammation of the capillary arteries of its tissue, a conjecture which is probably correct, though in the present state of our knowledge it must be regarded merely as a conjecture. As the inflammation, however, presents in the essential phenomena characters so different, it is convenient to distinguish the one from the other by distinct names, and accordingly the former is termed Catarrhal, and the latter Plastic Inflammation

The false membrane, the result of plastic or croupal inflammation, moulds itself to the part inflamed; it does not extend beyond the inflamed portion of the mucous membrane; it varies in thickness from half a line to a line; it is of a white or whity-brown colour; it has the consistence of boiled white of egg, and its firmness is always greatest where it is thickest. When it is raised from the mucous membrane, the latter is always found to be reddened and swollen, but rarely to the degree common in catarrh.

This morbid secretion is most commonly poured out on that portion of the windpipe which constitutes the larynx; hence in general the larynx forms the peculiar and proper seat of croup; but the site of this adventitious membrane is by no means confined to the larynx; it often extends above to the glottis and epiglottis, and below to the bronchial tubes. When, as happens in the great majority of cases, the adventitious membrane is confined to the larynx and epiglottis, it presents the characters just described; but when it extends into the bronchial tubes it becomes modified in its appearance. It is then generally 'formed into a single cylinder, but occasionally into a series of tubes inclosed within each other in the closest contact, and forming altogether a solid body, of a thick and tolerably firm structure, and in the exact form of the tube from whence it has been abstracted. Upon making a transverse section of this polypiform substance, concentric laminæ are very apparent It adheres but slightly to the mucous surface, and may easily after death be drawn out entire, presenting a complete mould of a large bronchial tube, with all its subdivisions, down to its minutest ramifications.'

Though in the croup the deposition of the adventitious membrane is commonly confined to the larynx, yet other parts of the mucous membrane in the immediate neighbourhood of the larynx are sometimes the seat of plastic inflammation, terminating in the formation of a precisely analogous morbid secretion. Occasionally 'small yellowish-grey spots appear upon the fauces, surrounded by the mucous membrane, highly and darkly reddened. These spots enlarge, coalesce, and form a continuous false membrane, of the colour and consistence of the buffy coat of the blood, lining the throat more or less completely. Sometimes it is seen to cover the posterior half of the tongue, so that its anterior part might be elevated by a probe in a membranous form; occasionally, though not often, it passes down the œsophagus even into the stomach, but much more frequently it extends into the lung, producing all the symptoms of croup. When plastic inflammation is seated in the fauces, it gives rise to a disease called Cynanche Maligna, or Gangrenous Sore Throat, so named from the supposition that the spots on the fauces consist of gangrenous sloughs: but more careful observation has demonstrated that they consist of an adventitious membrane. Nevertheless, gangrene does occasionally, though not very rarely, co-exist with the deposition of a fictitious membrane, that is, the false membrane is deposited over a gangrenous surface.'

It is remarkable that in general the seat of plastic in flammation is strictly limited to the larynx, trachea, and bronchi in children; and to the fauces in adults· hence children are by far the most subject to croup, while those of more advanced age are seldom or never attacked with croup as a primary disease, but with cynanche maligna, or gangrenous sore throat.

The most striking and characteristic symptoms of croup of course depend on the consequences that result from the obstruction to the free passage of the air to the lungs, that is, impeded respiration and change of the voice. The respiration is impeded in proportion to the quantity of adventitious membrane that is formed, and the consequent degree in which the calibre of the air-tube is diminished; in proportion to which must of course be the diminution in the column of air admitted to the lung. The air-passage in the progress of the disease is often obstructed to such a degree as to produce a most painful feeling of suffocation, attended with all the signs that denote the imminent danger of suffocation, and death is constantly occasioned by the narrowing of the air-tube to such an extent as actually to produce suffocation. In milder cases, when not impeded to this extreme degree, the respiration is still always difficult, anxious, and distressing. The edges of the circumference of the inferior extremity of the adventitious deposit being loose, mucous, and soft, frequently adhere to each other, so as to close up the tube, and require a strong effort of inspiration to overcome the temporary obstruction. 'I have seen,' says Dr. Davies, 'a slight film of pseudo-membrane traversing the upper part of the larynx suffocate an infant almost instantly. The dyspnœa becomes always great when the concretion separates, and if it be not quickly expectorated, often destroys the patient immediately.'

Owing to the diseased condition of the air-tubes the acts of respiration and of coughing produce peculiar sounds. The inspiration is sonorous and ringing, as if the sound were formed and resounded in a brazen tube. Sometimes it is dry and hissing, resembling the sound produced by a piston forced through a dry pump, or by a crowing noise similar to that emitted by a chicken in the pip. The croupal cough is a peculiar, loud, clangous, ringing sound, which has caused it to be almost universally compared to the crowing of a cock. The voice partakes of the same character, being shrill and hoarse.

The fever excited in the system by this local inflammation is commonly acute and intense. The skin is burning hot; the face flushed, sometimes covered with perspiration; the eyes prominent, injected, or watery; the carotid arteries throb powerfully; the jugular veins are tumid, and the pulse at the wrist is frequent, hard, and wiry. Sometimes, on the contrary, the febrile symptoms are of a low or asthenic character; the skin cool, and of a dirty pallid colour; the pulse frequent, but exceedingly feeble; the breath fœtid, and the general prostration extreme.

As the disease advances, the restlessness and anxiety of the patient increase; the hand is constantly applied to the throat, which is often slightly tumified externally, and sometimes painful to the touch; the respiration becomes more and more difficult, the cough convulsive and exhausting, the countenance bloated, and the cheeks and lips either livid or exceedingly pale. In this stage the pulse becomes small, weak, and irregular, the eyes sunk, the skin cold and clammy, the voice lost, or capable only of a whisper; the head is constantly tossed back; the throat often seized as if to remove an obstacle to respiration; violent efforts are made to expand the lungs, and death at length puts an end to a state of intense suffering, either by convulsive suffocation, or by the subsidence of the restlessness and violence into a state of profound lethargy and stupor.

Croup, as has been stated, is almost peculiar to infants. It may occur at any period from the second month after birth to puberty; and the younger the child is, after it is weaned, the more liable it is to the disease. It is most apt to occur in the sanguineous temperament and the full habit. It often seizes a child not perfectly recovered from a previous illness, and is liable to a recurrence at distant intervals on exposure to causes which ordinarily produce only common catarrh. Yet it occasionally occurs in the adult, generally as a consequence of its extension from the fauces to the larynx. It is chiefly prevalent in the neighbourhood of large bodies of water, running or stagnant, salt or fresh, and especially among the ragged and half-starved children of the poor, who live on the sea-coast, or near the banks of rivers or canals. But it also occasionally prevails in other situations as an epidemic, especially during the continuance of north or easterly winds, after heavy and long-continued falls of rain.

There is perhaps no disease to which the human body is subject the progress of which is so frightfully rapid. In a few hours after the attack, the morbid secretion is often formed to such an extent, as to prove inevitably mortal; yet the inflammation of which it is the result might have been checked by immediate, vigorous, and judicious treatment. It is therefore of the last importance that those who have the care of infants and young children should be familiar with the first signs of the approach of this dreadful malady. Of these a graphic description has been given by Dr. Cheyne who had abundant experience of the disease in situations in which it is but too prevalent. After having pointed out the importance of attending to the first appearance of hoarseness, which in very young children does not usually attend common catarrh, and consequently, when observed in a child living in a district which generates croup, this symptom is always much more deserving of attention, especially if accompanied with a rough cough, than it would be after puberty, this excellent physician says,—

'In the approach of an attack of croup, which almost always takes place in the evening probably of a day during which the child has been exposed to the weather, and often after catarrhal symptoms have existed for several days, he may be observed to be excited; in variable spirits; more ready than usual to laugh or to cry; a little flushed, occasionally coughing; the sound of the cough being rough, like that which attends the catarrhal stage of the measles. More generally however the patient has been for some time in bed and asleep before the nature of the disease with which he is threatened is apparent; then, perhaps without awaking, he gives a very unusual cough, well known to any one who has witnessed an attack of the croup; it rings as if the child had coughed through a brazen trumpet; it is truly a *tussis clangosa;* it penetrates the walls and floor of the apartment, and startles the experienced mother—"Oh, I am afraid our child is taking the croup!" She runs to the nursery, finds her child sleeping softly, and hopes she may be mistaken. But remaining to tend him, before long the ringing cough, a single cough, is repeated again and again: the patient is roused, and then a new symptom is remarked; the sound of his voice is changed; puling, and as if the throat were swelled, it corresponds with the cough: the cough is succeeded by a sonorous inspiration, not unlike the kink in pertussis—a crowing noise, not so shrill, but similar to the sound emitted by a chicken in the pip (which in some parts of Scotland is called the roup, hence probably the word croup); the breathing, hitherto inaudible and natural, now becomes audible, and a little slower than common, as if the breath were forced through a narrow tube; and this is more remarkable as the disease advances. A blush of inflammation may sometimes be detected on the fauces, and in some rare instances a slight degree of swelling round the larynx, and the child complains of uneasiness in his throat, and says he is choking. The ringing cough, followed by crowing inspiration, the breathing as if the air were drawn into the lungs by a piston, the flushed face, the tearful and blood-shot eye; quick, hard, and incompressible pulse; hot dry skin; thirst, and high-coloured urine—form a combination of symptoms which indicate the complete establishment of the disease. Sometimes the symptoms enumerated subside about midnight, even in the absence of medical treatment; perhaps to return in the course of the following evening. From seven or eight o'clock till midnight this complaint is always at its height; but in general, unless the patient be treated with promptitude and judgment, the disease may be expected to terminate fatally; a new order of symptoms, the second stage of croup, as it is called, taking place in the course of the next day.'

If the diet of the child be changed from its ordinary food to that of the simplest and blandest kind, as gruel or arrowroot, the moment the hoarse cough and rough voice are perceived; if it be immediately placed and kept in bed in an equable and moderately warm temperature, and one grain or two grains of the powder of ipecacuanha be given every hour, or every alternate hour, all the symptoms may subside without any further remedies, and the threatened attack be effectually prevented; but if with this hoarse cough and rough voice the child be allowed its ordinary diet, and be exposed as usual to the open air, the attack will hasten on in the mode described until the disease is fully established; and then any treatment that may be employed, to be of the least avail, must be most energetic. The prompt employment of the most powerful remedies is indispensable; yet they must be administered with cautious and judicious boldness. It is a disease in which the inflammation, which it is the great object of medical treatment to subdue, is not so much of a violent as of a peculiar character, and this renders it necessary that the practitioner should be guarded in the administration of some of the more powerful remedies to which he must resort, and especially in the employment of blood-letting. When the fever is intense, the skin hot, the pulse full and hard, and the patient plethoric, bleeding must, indeed, be employed, and carried as far as the strength will admit; but experience has amply shown that in this disease the strength will not admit of its being carried as far as is safe and even necessary in diseases purely inflammatory. Bleeding, either by the lancet or by leeches, which latter should never be applied to the throat itself, but to its immediate neighbourhood, is a most powerful auxiliary; but it is not *the* remedy to be relied on. *That* is mercury, which should be given instantly and efficiently, that is, in doses of from one to three grains of calomel every hour, or every two hours, until the mouth be affected, the breath fœtid, or the patient relieved. If the calomel irritate the bowels, the *hydrargyrum cum creta* may be substituted, or a free inunction of the mercurial ointment, which latter may be conjoined with the calomel, or the mercury and chalk powder. Many practitioners prefer the full employment of tartar emetic to the mercurial plan of treatment. All agree that blisters are useful auxiliaries, applied at the bottom of the sternum, or between the shoulders, but never at the throat. The vomiting produced by the tartar emetic sometimes powerfully promotes the expulsion of the adventitious membrane. There are other remedies of minor importance, the judicious employment of which may assist in putting a stop to the progress of this most formidable malady. The use or abuse of these cannot be discussed here; but what has been stated may excite the attention of the mother, and guide her to the choice of efficient remedies in the first hour or two of the attack, during which it may not be always possible to obtain medical aid. (Dr. Cheyne *on Croup;* Dr. T. Davies *on the Diseases of the Lungs and Heart, in loco.* Gœlis *Tract. de Rite Cognoscenda et Sananda Angina Membranacea;* Copland, *Dict. of Pract. Med.;* and *Cyclop. Pract. Med. in loc.*)

CROWFOOT, the vulgar name of the different species of Ranunculus.

CROWLAND. [LINCOLNSHIRE.]

CROWN, the ornament of the head which denotes imperial or royal dignity, from the Latin *corona*. The radiated appears to be the earliest form of the royal crown with which we are acquainted. It appears upon the heads of the figures which are represented upon the Persian darics: radiated crowns also occur on the coins of Antiochus IV. of Syria, and of his successors; on many of those of the Greek cities; and on those of Augustus and other emperors down to the very destruction of the Roman empire. The strophium, bandelet, or fillet, and the laurel wreath, were also used as crowns in very remote times: the strophium was the most universal of all. In Constantine's time the fillet of pearls came into use; which the latter Byzantine emperors turned into a kind of coronet. Focas, as he is called upon his coins (not Phocas), has a plain low crown. Later emperors varied its form according to their fancy. Manuel Palæologus, who was crowned in 1363, is represented wearing a close crown studded with pearls. (See Du Cange, *Hist. Byzant.*, p. 242.) The trefoil upon the crown is thought to be of Gothic introduction. We find it on the crowns of Clovis and his sons, which has induced antiquaries to call it the fleur-de-lis (Montfaucon, *Monum. de la Mon. Fr.*, p. xxviii. Diss. prelim.), but the truth is, these trefoils were used on Constantinopolitan crowns before the time of the Franks (Ibid., p. xxxii.), and afterwards on those of German princes no way allied to Charlemagne. (See Montf. i., xxxiii.) Aubrey, the antiquary, was of opinion that the fleur-de-lis is really a spear-head adorned; no flower of that kind having the middle part solid.

Crowns were placed on the statues and images of the heathen gods, as well as worn by the priests in sacrificing. Some antiquaries have even thought that the crown was originally rather a religious than a civil ornament; and that it only became common to kings, inasmuch as the antient kings were priests as well as princes.

In regard to the crown as used in our own country, a fillet diadem of pearls appears on several of the Saxon Sceattæ; upon one or two others a radiated diadem occurs. (See Ruding's *Annals of the Coinage of Britain*, pl. 6, 7.) Similar diadems or fillets adorn the heads of many of the Heptarchic kings, and continue as the most common crown upon our coins through the whole of the Saxon series. The circle surmounted by three small projections first occurs upon the coins of Athelstan; on some of Edred's coins the projections end in pearls. A radiated cap appears first on a coin of Ethelred II., and the trefoil ornament upon the crown upon a few of the coins of Canute. Several varieties of arched cap and crown appear upon the coins of Edward the Confessor. (See Ruding's plates, 15—23.) The close or arched crown, which appears on some of Edward the Confessor's coins, is used on all the types of Harold, and was adopted by the earlier Norman kings. On Edward the Confessor's and the Conqueror's coins, we see labels appended at each ear; these, as we learn from an anecdote related by William of Malmsbury, in wearing the actual crown, were fastened by a clasp or button beneath the chin. On the coins of Stephen and Henry II, the open crown with fleurs-de-lis appears. Henry III. wears on his seals a crown fleury, pointed or rayed, the points raised, but not high, between the flowers; in his second seal the points are wanting, as on that on his tomb; but in Mathew Paris we read he was first crowned with a circle of gold. Edward I has a similar crown on his coins and seals to that of Henry III. as well as his queen upon her tomb; so have his successors Edw. III., Rich. II., Henry IV. and V. Evelyn (*Numism.*, p. 34) says the monarchs of England were the first who pretended to the arched crown; that is, as it appears in modern times. Selden (*Titles of Honour*, edit. 1762, b. i. chap. 8) says he had read that Henry V. was the first of them who had a crown of the kind. In a window of Ockholt-house in Berkshire, built by John Norreys, Esq., in 1465, there certainly remained, till within a very few years, the arms of Henry VI. and his queen Margaret of Anjou, in separate coats, both surmounted by the arched barred crown; from Henry VII. downward, this arched crown, with the globe and cross, has been continued.

In France Louis XII. wore a single bar arched over his crown, about 1500; before, only a cap, till he married Henry VIII.'s sister. (See his coins.) Till Francis I. an open flowery border, somewhat like our ducal coronet, was generally used. In Spain, Philip II., after he married Queen Mary, used a barred crown. In Germany, Maximilian, grandfather of Charles V., first wore an arch over a ducal coronet. In Denmark, Christian III., after he came into England, used the barred crown. James IV., on his marriage with Margaret, daughter of Henry VII., introduced it into Scotland. John Duke of Braganza was the first who used it in Portugal. (See Gough's *Sepulchr. Monuments*, i., cxxx. cxxxi.; ii. ccviii.)

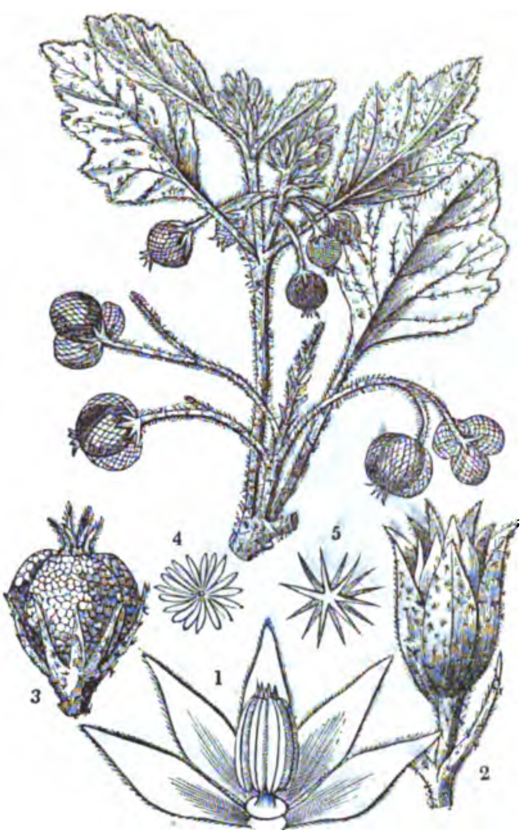
Among the Romans there were various kinds of crowns distributed as rewards for military and other achievements. The principal were the Civic, the Mural, the Naval or Rostral crown, the Obsidional, and the Triumphal.

CROWN OF THE SUN, *Ecu d'Or au Soleil*, was a French coin, first struck by Louis XI. of France, in 1475. (Le Blanc, *Traité Historique des Monnoyes de France*, 4to., Par. 1690, p. 305.) The reader is, no doubt, aware, that from an early period the circulation of foreign money, of various countries, was not only adopted but even legalized in England. By proclamation, 25 May, 14 Henry VIII., *Crowns of the Sun*, ducats, and crowns of gold not of the sun, were ordered to be received in currency, the crowns of the sun not clipped to go at four shillings and fourpence sterling. Under Edw. VI., in August, 1549, they were ordered by proclamation to pass for seven shillings: and again reduced to pass for six shillings and fourpence, by another proclamation, dated in the same year on Dec. 1. They were kept at the same rate of currency, six shillings and fourpence, by proclamations from Queen Mary I. in 1553 and 1554.

CROWS. [CORVIDÆ.]

CROYDON, a market-town in the hundred of Wallington, county of Surrey; nine and a half miles south of London: population in 1831, 12,447. The parish is very extensive, being thirty-six miles in circumference, and containing about 10,000 acres. In the survey of 1646, it is described as consisting of 836 acres, 'having herbage for all manner of cattle, and mastage for swine without stint.' The name, which in Domes-day Book is Croinedone (croie, *chalk*, and dune, *hill*), appears to be derived from the locality of the town on the edge of the chalk. The situation, from its contiguity to the Bansted Downs, is pleasant and very healthy. The houses form one principal street, about a mile in length; of neat appearance and tolerably well paved and lighted. Some antiquarians (Dr. Stukeley's *Itinerary*) identify Croydon with the Noviomagus of Antoninus, there being still, on Broad Green, in the neighbourhood, some traces of the Roman road from London to Arundel. At the Norman Conquest, the manor, with a royal palace, was given to Lanfranc, archbishop of Canterbury. This palace, during a long period, was a chief residence of the succeeding primates. It was built of timber, and was in 1278 in its original state. No part of the present structure is older than the fourteenth century; and large portions of it were rebuilt by archbishops Wake and Herring. Here queen Elizabeth and her court were sumptuously entertained by archbishops Parker and Whitgift. In 1780 it was sold, and became a calico manufactory, and the gardens were used for bleaching grounds. The present summer residence of the archbishop of Canterbury is three and a half miles from Croydon, at the mansion in Addington Park, which stands on the site of a hunting seat of Henry VIII. During the wars of the barons with Henry III. in 1264, the citizens of London retreated to Croydon, and were there defeated by the royal troops with great slaughter. Croydon Park, in the time of Richard II. was kept by the mayor of London, Sir Wm. Walworth, who stabbed Wat Tyler. Antiquities worthy of notice are a cluster of twenty-five tumuli and barrows on a hill towards Addington; and on Thunderfield common, a circular encampment enclosing with a double moat an area of two acres. Gold coins have been found of Domitian, Valentinian, and other Roman emperors. There are several antient charitable foundations, the principal of which are the hospital or almshouse of the Holy Trinity, built by archbishop Whitgift in 1596, and well endowed for the maintenance of thirty-four decayed housekeepers; and a school for girls, founded by archbishop Tennison. A school for 150 children is supported by the society of friends. The East India Company's College of Cadets at Addiscombe House near Croydon, has fourteen professors and masters, and about 140 students. The parish church of St. John's is the largest and finest in the county. It is built of freestone and flint, with a lofty embattled tower surmounted with pinnacles. The interior contains several magnificent monuments of the archbishops there interred; Drs. Herring, Potter, Wake, Abbot; and especially those of Sheldon and Whitgift. The windows were formerly remarkable for much beautiful painted glass; but in Cromwell's time the Puritans completely destroyed it. Near the church is the source of the Wandle, a small stream which flows into the Thames and abounds in excellent trout. A new church has been erected by the parliamentary commission. The town hall, in which the assizes are held, and the gaol, are commodious and substantial stone buildings. There are barracks with extensive accommodation for artillery; and a theatre. The Croydon canal communicates with the grand Surrey canal at Deptford. A railroad runs from Wandsworth to Croydon, and thence to Merstham near Reigate. A new rail-road to London is about to be constructed. Croydon is the election town for the eastern division of the county. The market on Wednesday is well supplied with corn, especially oats, and the fair on October the second is noted for the sale of walnuts. An elaborate account of the town, church, and archiepiscopal palace, is given in Dr. Ducarel's history of Croydon (inserted in the *Bibliotheca Topographica Brit.* vol. ii.). See also Lysons' *Environs of London*, vol. i. p. 170, and Britton's *Beauties of England*, vol. xiv. p. 122.

CROZO'PHORA TINCTO'RIA, a small, prostrate, hoary annual, with slender cylindrical stems, about a foot long; soft, oval, alternate, almost rhomboidal leaves, which are plaited and curled at their edge; small flowers arranged in short clusters; and drooping fruit composed of three blackish rough cells. It is a native of barren places all over the south of Europe, and is cultivated about Montpelier for the sake of the deep purple dye, called Tournesole, which it produces. Its properties are acrid, emetic, corrosive, and drastic, like the most virulent Euphorbiaceous plants.



1, a male flower cut open, showing the stamens; 2, a closed flower; 3, a nearly ripe fruit; 4, 5, different kinds of starry scales, with which all the green parts are covered.

CRUCIBLE, a chemical vessel in which substances are exposed to high temperatures. Crucibles are made of various materials, forms, and sizes, and are often called *melting pots*. Earthen crucibles are used for the purpose of assaying ores, as those of lead, copper, and tin. For these purposes the refractory kind, called Hessian or Cornish crucibles are prepared; they cannot however be employed for heating saline, alkaline, or earthy matters, as these would act upon them. Sometimes they are made of commoner and more fusible clays when not required to withstand a high temperature. Crucibles are occasionally used made of porcelain, but they are extremely apt to crack.

Black-lead crucibles, formed of about three parts of finely-powdered plumbago, and one of good clay, are also much employed, especially in melting metals; they are more expensive than earthen crucibles, but are less liable to crack.

Glass-makers' crucibles are usually made of Stourbridge clay.

In fusing the alkalis, potash and soda, silver crucibles are used; but as they readily melt, they are not much employed for other purposes.

For chemical uses platinum crucibles are principally employed; they withstand a high temperature, and are not in general easily acted upon. The alkalis however, and the alkaline nitrates, and the alkaline earths, act upon them; and those metals which readily fuse, such as bismuth, lead, and tin, immediately destroy them when heated in them. Large platinum vessels are employed for the concentration of sulphuric acid; no acid acts upon them, but they are dissolved by chlorine.

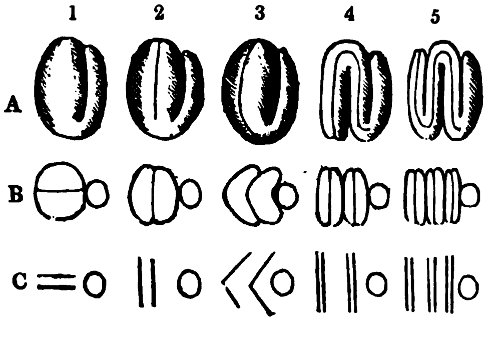
CRUCI'FERÆ, a very extensive and most natural assemblage of plants, called Tetradynamæ and Cruciatæ by Linnæus, and Brassicaceæ by others. It comprehends the mustard, cress, turnip, cabbage, scurvy-grass, radish, horse-radish, and similar plants, having a pungent principle diffused more or less in their sap, and giving them valuable antiscorbutic qualities. All the species have an inflorescence without bracts, a calyx of four sepals, four petals with long claws, and their blades placed something like the arms of a Maltese cross, whence their name; six stamens, four of which are longer than the other two; and a fruit consisting of two cells, with a central frame, to which is fitted a pair of deciduous valves, and from the sides of which under the valves is stretched a thin double transparent diaphragm. In each cell are two or more seeds, with an embryo folded upon itself and destitute of albumen. The form of the fruit is extremely variable; when it is long and slender, it is called a Silique; and when short and round, a Silicle: hence the two divisions of the Tetradynamæ of Linnæus into *Siliquosæ* and *Siliculosæ*.

About a couple of thousand species are dispersed over the milder parts of the world, refusing alike to exist beneath the severe cold of the arctic zone and the excessive heats of the tropics. A large proportion consists of inconspicuous and useless weeds: many are objects of beauty, from the size and gay colours of their petals; and the names already mentioned show that another part of the order consists of plants useful to man.

[Cheiranthus Cheiri.]

1, a flower from which the petals have been removed; 2, the stamens; 3, a section of the ovary; 4, a ripe fruit, from which the valves are separating; 5, an embryo.

Owing to the number of the species, and the great resemblance between them, the systematic arrangement of Cruciferous plants was until late years exceedingly unsatisfactory. It has however been discovered, that the embryo presents the most constant character, and that by five modifications of the manner in which it is folded up, five precisely limited divisions of the order are secured. The following cut illustrates them. Let A 1 be an embryo with the radicle applied to the cotyledons in such a way as to lie against its edges; then B 1 will be the appearance of such an embryo when cut across, and C 1 will be a sign expressing the mutual positions of the radicle and cotyledons by a circle and two bars; these are Pleurorhizeæ. Then fig. A 2 will be same embryo with the radicle applied to the back of the cotyledons; and B 2 and C 2 will give the section and sign of what are called Notorhizeæ. When the cotyledons instead of being flat are channelled so as to receive the radicle in a kind of groove, as at A 3, it gives the division Orthoploceæ. If the cotyledons are so long as to be doubled twice, A 4, they constitute Spirolobeæ; and if, as at A 5, the cotyledons are doubled three times, they indicate the division Diplecolobeæ. Upon these distinctions all recent arrangements of Cruciferæ have been formed.



CRUCIROSTRA. [FRINGILLIDÆ.]

CRUDEN. [CONCORDANCE.]

CRUSADES. Under this name are designated the religious wars carried on for two centuries between the Christians and Mohammedans, at a time when diplomatic negotiations were unknown, and the sword decided all matters in dispute between one nation and another. The cause was ultimately lost by the Christians, who sacrificed in the struggle the lives of several millions of their brethren, though their claim was originally a reasonable one. In the beginning the Christians demanded only a free pilgrimage to the holy sepulchre, but afterwards the contest was for the possession of Jerusalem. The Crusades however were by no means wars of conquest or of royal caprice; man fought against man for some higher yet mistaken principle. Hence their struggle offers something more honourable than the generality of wars, and deserves particular attention on account of its influence upon the civilization of Europe.

As long as the caliphs of Bagdad and after them the Fatemides of Egypt possessed Palestine the Christians were not checked in the exercise of the religious practice of visiting the holy sepulchre, which was in harmony with the opinions of that age: the Caliph Harun-al-Rashid had even the keys of the holy sepulchre forwarded to Charlemagne as a present. But when the Turks had effected the conquest of Palestine, the hospitality of the Arabs gave way to the brutality of the new possessors; the Christians were subjected to so many vexations, that the whole of Europe re-echoed with the complaints of the pilgrims; who instead of returning to their homes loaded with holy relics, brought back only wonderful tales of their insults and sufferings.

In consequence of this, Pope Sylvester II. (who died in 1003) began to preach a crusade against the Seljuk Turks for the conquest of the holy sepulchre. Sixty years afterwards, when only 2000 pilgrims had returned to Germany out of 7000—who had been sent to Palestine by their bishops—and the possession of Jerusalem had fallen into the hands of the Turkish chief Ortok, this untoward event filled Europe with consternation, and a desire to revenge the wrongs of the pilgrims. A single spark only was wanting to inflame the whole of the western empire to a contest with the sword for that privilege which Harun-al-Rashid had acknowledged.

Thirty years however elapsed before Pope Urban II. decreed the first Crusade. First at the Council of Piacenza (March, 1095), afterwards at that of Clermont in Auvergne (November, 1095), supported by the ambassador of the emperor of Constantinople and numerous powerful lords, he proclaimed the sacred war, and appointed the 15th of August (1096), the Day of Assumption, for the departure of the army. The minds of the Christian warriors had been previously excited by the preaching of Peter of Amiens (the Hermit), and by the loud complaints of the Patriarch of Jerusalem; who, provided with letters of credit from the pope, travelled through Europe, and filled all classes of society with enthusiasm for this holy warfare. Those who determined to set out for the Holy Land wore on their breast the figure of a red cross, and hence the name of Crusaders.

First Crusade. The departure of the army having been deferred for a year, Peter of Amiens, Walter Habenichts, Count Emiko of Leiningen, and the priest Gottschalk, impatient of delay, and prompted by religious fanaticism, set out with an immense multitude which is stated at 80,000 or 100,000 men, besides women and children, and a crowd of followers. This army, after having ill-treated and robbed the Jews in their own country, was reduced to one-third of its number in Hungary; the remainder was cut to pieces at Nicæa in Asia Minor.

The east was now threatened with a national migration from the west. The bulk of the army was twice as numerous as that of their forerunners. It was headed by the noblest knights of those times, Godefroy of Bouillon, Duke of Lower Lorraine, Baldwin his brother, Hugo the Great, brother of the king of France; Robert, Duke of Normandy, son of William the Conqueror; Raymond of St. Gilles, Duke of Toulouse, and Bohemond, Prince of Tarentum. The general indulgence proclaimed at Clermont, the feudal system, which led the vassals to join in the sentiments of their sovereigns, combined with the religious fanaticism of the many and the interested views of the few, created this formidable army. The pope had the address to dispose the heads of the Crusaders to acknowledge him formally as the sovereign of all the lands which they intended to conquer. The results of this expedition were of great importance. After crossing the sea into Asia, the Crusaders took possession of Nicæa in Asia Minor, and Laodicæa and Antiochia in Syria. Bohemond obtained the principality of Antiochia, Baldwin that of Edessa. New Christian principalities arose also in Tripolis, Sidon, Tyre, and other places. In the mean time Jerusalem was no longer in possession of the Turks. The Caliph Mostaali had taken it from the successors of Ortok (1096), and had again united it to Egypt, making a rival caliphat. [See Fatemides.]

The Crusaders however did not allow themselves to be stopped by this change of circumstances in their victorious march; they advanced with 60,000 men, the relics of their army, against Jerusalem, besieged the town, took it (1099—June 7, July 15), and preserved it, together with all their conquests, in the great battle of Ascalon, against the caliph of Egypt and the Seljuk chieftains. It is said that the number of slain in the conquered town amounted to 70,000. The Jews were burnt in their synagogues.

Consequences of the First Crusade. Kingdom of Jerusalem.—Godefroy of Bouillon was elected king of Jerusalem, a new state, with a considerable territory. The constitution of this new kingdom was regulated by a statute called 'Les Assises de Jerusalem.' Godefroy died one year after his accession to the throne; his brother Baldwin was his successor, who was followed by Baldwin II. (1118), Fulk (1131), Baldwin III. (1148), Almerich (1162), Baldwin IV. (1173), Baldwin V. (1186), who was followed by Guido of Lusignano, who reigned till 1187, when Saladin put an end to the Christian kingdom. These kings of Jerusalem were compelled to fight with a force of only about 12,000 regular troops against the power of two mighty enemies, the Turks and the Fatemide caliph of Egypt.

Crusaders' Religious Military Orders.—The first Crusade brought two military religious orders into existence, the Knights of Jerusalem, instituted by Baldwin I., and the Knights Templars, established by the joint efforts of Hugo de Payens, Godefroy of St. Adhemar, and seven other knights. The German Knights of the Cross are of later origin.

Second Crusade.—Though the Franks had extended their possessions from the mountains of Armenia to the very boundaries of Egypt, their strength was too feeble to prevent (under the government of Baldwin III., A.D. 1144) the Atabek of Mosul from taking Edessa. The Atabeks were governors of the dynasty of the Seljuks. One of the Atabeks, named Emad-eddin Zenghi, from Mosul, having made himself independent, transmitted the kingdom to his son, Nureddin the Great, who fixed his residence in Aleppo, and became an object of terror both to the Christians and to the Fatemides. In the mean time the kingdom of Egypt had passed into the hands of Selaheddin (Saladin the Great), an event which took place under the following circumstance:—In order to settle a contention about the succession, Nureddin sent a Kurd, named Shirkuh, into Egypt. The peace-maker usurped the government for himself, and bequeathed it to his brother Ayub's son, who after the death of the last of the Fatemides seated himself on the throne of these rival caliphs, and conquered Egypt, nominally for the Caliphat of Bagdad. This son of Ayub was called Saladin; and the dynasty of which he became the founder is in history known by the name of the Ayubides. After Nureddin's death, Saladin conquered almost all Asia Minor, in addition to Tripolis and Tunis, and destroyed the Christian kingdom of Jerusalem.

After the conquest of Edessa, Bernard of Clairvaux took upon himself the office of Peter the Hermit, and preached a second crusade, in consequence of which two of the greatest Christian chiefs, the German emperor Conrad III., and Louis VII., king of France, were induced to take the cross (1147). For this undertaking Western Europe armed 140,000 knights and near a million of foot-soldiers, and yet in spite of their mighty superiority the expedition failed. The changes which had taken place in the East had raised up a new enemy against the Crusaders in the emperors of Constantinople, who were less afraid of the peaceful governments of the Turks in Asia Minor and Egypt, than of the depredation and ravage which the passage of a disorderly army, such as that of the Crusaders, would cause to their possessions. Hence the artifice and treachery of the emperor Manuel Comnenus prepared the way for the destruction of the Christian armies. The German emperor, misled by treacherous scouts, lost in the defiles of Taurus the bravest of his soldiers; the relics of his army were almost destroyed at the siege of the fortress of Iconium. The troops of the French were also defeated by the Sultan of Room, and annihilated before Damascus, a town which the Christians had in vain attempted to take by storm. The relics of the two armies united in one body (1149). Thus the expedition of the Crusaders in the East was a complete failure. The only successful result of this undertaking was the retaking of Lisbon from the Moors, which was effected by the Christian navy.

Situation of the East after the Second Crusade.—Baldwin III. however did not give up his plans in despair. His army was at intervals increased by small bodies of Crusaders, who came to his assistance from Europe. Nureddin the Great felt more than once the power of the Christian warriors. Yet all these advantages were frustrated by the discord of the Crusaders, fomented by the rivalship of the Templars and the Knights of Jerusalem. Baldwin was succeeded by Almeric, called also Amauri, who was followed by Baldwin IV., who died likewise soon after the battle of Ramla. After his death Guido of Lusignano was completely defeated at the battle of Tiberias; he was taken prisoner, together with the Grand Master of the Templars, and many noble knights (1187). Saladin took possession of all the important places in Palestine, together with Jerusalem and its environs, and put an end to the Christian kingdom of Jerusalem, which had existed a century. But Saladin showed himself a generous conqueror; he granted to the Christians the possession of the Sepulchre of Christ, and allowed the prisoners to return home. The patriarch Heraclius, the clergy, the knights, and many soldiers returned to their homes, or withdrew to the few towns which the Christians still possessed on the coast of Palestine.

Third Crusade.—Bishop William of Tyre brought this bad news to Rome, which it is said caused the premature death of Pope Urban IV. The youth of Europe were again summoned to appear under the banner of the cross, not to defend the right of visiting the Holy Sepulchre, for Saladin had already granted this privilege to the Christians, but the lives of the bravest knights of Europe were to be thrown away on the insane project of again conquering the kingdom of Jerusalem. Europe obeyed the summons. The German emperor, Frederick Barbarossa, Philip Augustus, king of France, and Richard Cœur de Lion, king of England, and several German princes, enlisted themselves as Crusaders. The Italians appeared in arms under the bishops of Ravenna and Pisa. The Knights Templars, and those of Jerusalem, who were scattered about Europe, collected themselves again in strong bodies, and sailed for the Holy Land. Fifty vessels left the harbours of Denmark and Friesland and thirty-seven those of Flanders for Palestine. The expenses of the war were supplied by a tithe, called Saladin's tithe, which the pope ordered all Christians, including even the clergy, to pay. The emperor, Frederick I., a man of ability and experience, had found means to compel the Emperor of Constantinople to favour the undertaking; he was also engaged in negotiations with the Sultan of Iconium, who however betrayed him. By these means, and with a force of 600,000 armed men, this expedition might have succeeded; but the Crusaders did not carry on their military operations in one body. Several troops of Italian, Greek, and German adventurers, who advanced before the great army to place themselves under Conrad of Montferrat, Lord of Tyre, and Guido of Lusignano, made an unsuccessful attempt to take Ptolemaïs (St. Jean d'Acre). Frederick I. met with a premature death by bathing in the waters of the river Cydnus, 1190. His son, Frederick of Swabia, who died soon after, put himself at the head of the relics of the imperial army;

but was not able to give a favourable turn to the siege of Acre. At length Philip Augustus and Richard Cœur de Lion appeared on the battle-field. Richard had already taken and sold to Guido of Lusignano the island of Cyprus. The kings joined their armies before Ptolemaïs, and their united forces at last succeeded in taking this single fortress, after three years' siege and nine battles.

In consequence of these long and sanguinary struggles, the Christian army was so reduced, that the kings, despairing of success, thought of returning to Europe. Philip Augustus left Palestine soon after the capture of Ptolemaïs. Richard Cœur de Lion followed him after a short struggle with Saladin, with whom he made truce, and left him in possession of Jerusalem (1192). In the mean time Philip Augustus had made an inroad into Richard's dominions of Normandy. The mild, benevolent, and generous Saladin the Great died 1195, in Damascus, in his fifty-seventh year. During this crusade there arose a new military order, called the German Cross Knights, whose first grand master was Henry Walpode.

Situation of the East after the Third Crusade.—Conrad of Tyre had married the sister of Baldwin II., and thus acquired a claim upon the throne of Jerusalem. Guido of Lusignano however had already assumed this title. Conrad died by the hand of assassins. His widow afterwards married Guido's brother, and the two brothers assumed the name of kings of Jerusalem. One of them, named Almeric, died likewise, and the imaginary crown of Jerusalem was the inheritance of John of Brienne, the husband of the daughter of Conrad king of Tyre (1210).

Fourth Crusade.—Isaac Angelos, the Emperor of Greece, was robbed of his throne and deprived of his eyes by his own brother (1194). His son Alexius fled to Venice to ask for assistance (1203). In the mean time the enthusiast Fulk of Neuilly and Pope Innocent III. had prepared for a new crusade, which was headed by several Italian and French noblemen, such as Thiebauld of Champagne, Count Boniface of Montferrat, Count Baldwin of Flanders, and Simon of Montfort. The Doge of Venice, Arrigo Dandolo, induced the Crusaders to take the town of Zara in Dalmatia for the republic of Venice. The Crusaders, probably at the instigation of Dandolo, instead of waging war against the infidels, took an active part in the affairs of Greece, conquered Constantinople, and after having elevated to the throne or deposed several emperors, at length put the imperial crown upon the head of Baldwin of Flanders, giving him the fourth part of the empire, and dividing the rest among themselves.

This behaviour drew upon them the popish interdict, which however was of no long duration: Pope Innocent absolved them. Thus the chiefs of the Franks ruled for about fifty years over the empire of the East, around which arose three new Greek principalities, Nicæa, Trebizond, and the despotat of Ætolia. This crusade was a complete failure.

After the insignificant crusade of Andrew, king of Hungary (1217), John, king of Jerusalem, led his army against Egypt (a plan which was certainly calculated to assure the conquest of the Holy Land), and took Damietta. The sultan, Melek Kamel, fearing the consequences of a war, proposed peace and an exchange of Jerusalem for Damietta. The proud conqueror refused the offer, and proceeded without caution along the Nile towards Cairo. The sultan ordered the dikes of the Nile to be opened; the waters destroyed a large part of the Christian army, freed Damietta, and secured cessation from war for eight years, and the retreat of the relics of the Crusaders (1221).

Frederick II. of Hohenstauffen, the greatest of the German emperors, who excelled his contemporaries in wisdom, generosity, and manners, the husband of Yolanta the daughter of John of Jerusalem, had pledged himself at his coronation (1215) to a crusade. The affairs of the state, however, retarded for twelve years the fulfilment of his promises. At length, yielding to the pressing invitations of Pope Gregory IX., he sailed from Brindisi for Palestine. But after a few days' voyage, sickness compelled him to return to Otranto. This drew upon him the anger of the pontiff, who laid him under an interdict. Perhaps this was but a plausible pretext for humiliating the hated house of Hohenstauffen. Though under the pope's interdict, the emperor again appeared the next year in arms in the Holy Land, which gave the pope an opportunity of allowing his enemies to invade the emperor's Italian dominions. Even John of Jerusalem was faithless and audacious enough to occupy by force the kingdom of Naples.

The sultan, Melek Kamel, set no great value upon the possession of Jerusalem, and was willing to exchange it for an alliance with Frederick against his enemy the Sultan of Damascus. Frederick, pressed by his Italian affairs, profited by the good intentions of the sultan, and obtained from him the possession of the capital of Palestine. After putting upon his head the crown, he marched homewards with his army, and his approach to the Vatican was enough to determine the pope to take away the interdict.

Situation of the East after the Fifth Crusade.—The Khowarzm-shah Turks, pressed by the Mongols, who soon after put an end to the Caliphat, rushed into the Holy Land, and defeated near Gaza the whole of the Christian forces (1244). Jerusalem, together with Palestine, became a possession of the sultan of Egypt, as a member of their alliance.

Sixth Crusade.—Louis IX., king of France, called St. Louis, undertook in the year 1249 a new crusade. He followed the plan adopted by John of Jerusalem, and conducted his army against Egypt.

This land however seems to have offered few advantages to the Christian conquerors. Louis, after having easily obtained possession of Damietta, marched along the Nile towards Cairo, but, chiefly through the imprudence of his brother d'Artois, he lost the battle of Mansura, and with it the bulk of his army. D'Artois, and many of the bravest knights, were slain; hunger and sickness compelled the remainder to retreat. Before they were able to reach Damietta, they saw themselves overtaken and surrounded by the sultan, who made the king prisoner, together with the relics of his army. A truce was agreed on, in which the Christians were compelled to give up Damietta, and to pay a ransom of 800,000 Byzantine guilders. The Mamluks, a guard composed of Turkoman youth, who had gradually increased in power, dissatisfied with the generosity of the sultan towards the Christians, murdered him, and placed Ibek, their commander, upon the throne of the caliphs of Egypt.

Had Louis possessed fewer personal qualifications and less courage, he would never have obtained his liberty; yet these barbarians allowed him to depart, and there are some historians who pretend that if Louis had acted with more cunning, he could even have obtained from the Mamluks the object of his undertaking.

Though Louis, upon his return to France, found his kingdom in a disordered state, on account of the misery and waste caused by the revolutionary movements of bands of a fanatic peasantry called Pastorells, he could not give up the idea of reconquering Jerusalem, and a few years after his return he prepared a new crusade. This crusade however did not extend beyond Tunis, where Louis expected to make converts of the princes. This undertaking failed likewise; and Louis found his grave on the shores of Africa (1270).

Seventh Crusade.—England was the pioneer of the seventh and last crusade. While Louis was still in Tunis, Edward, the grandchild of Richard Cœur de Lion, prepared a new crusade. After the death of Louis he appeared before Tunis, but soon left Africa for Palestine to fight against the Saracens. Not being able to accomplish his plans he returned home, and was the last among the Christian princes who dreamed of conquering the Holy Land.

Situation of the East after the last Crusade.—A few towns situated on or near the coast, Antioch, Ptolemaïs, and Tripolis, were still in possession of the Christians, and were chiefly defended by the Templars and other military orders. The dispute about the kingdom of Jerusalem still continued between the descendants of the Baldwins. At length Ptolemaïs fell (1291); the other towns were either abandoned or taken; the knights fled to Europe, and the whole of Palestine and Syria again became a possession of the sultans of Egypt, and obeyed the laws of Mohammed. In short, the labour of two centuries was lost; and we may regard this epoch as a kind of oriental restoration.

Crusades in the Western Empire.—We have already observed how Emiko of Leiningen and the priest Gottschalk had persecuted the Jews in the Rhenish provinces in their expedition towards the East. This was called a crusade against the Jews. The banner of the cross was likewise displayed in the wars against the Moors in Spain, against the heathens in Prussia and Lithuania, against the

Waldenses and Albigenses in France, against all kinds of heretics, even against the house of Hohenstauffen when placed under the popish interdict; which wars, unjust in their principle, were rendered by fanaticism still more terrible in their consequences.

Object of the Eastern Crusades.—The object of the first crusades was to obtain possession of the Holy Sepulchre for the Christians in Europe; and secondly, to protect the Christians in the East against the persecutions of the Turks. The first object might perhaps have been obtained by treaties; the second, however, could not be secured as long as the Turks possessed Palestine; and hence the conquest of this country became the principal object of the Crusaders. This conquest might have been made in favour of the lawful lords of Palestine, the caliphs, but the Franks, misled by fanaticism, preferred to take for themselves that which by right belonged to others, and by a just retribution lost the fruits of two hundred years' struggle. On the other hand, if they had been guided by moderation, they might have easily obtained from the caliph Mostaali the possession of Jerusalem by treaties.

The object of the second crusade was from the very beginning inconsiderate. The possession of Jerusalem was not in danger; nothing had happened to cause a war except the taking of Edessa.

The third crusade was undertaken with the view of reconquering the Holy Land. This war may appear just to those who think that the acquisition by the sword and the possession of a few years make a good title; or even to those who, misled by diplomatic sophistry, fancy that crowns and men may be inherited like goods and chattels. The crusade of Count Baldwin was an infamous intrigue and mystification of the Doge Arrigo Dandolo: the crusade of the king of Jerusalem was an idle attempt to change his imaginary crown into a real one by taking the towns of Egypt; neither of these expeditions deserves the name of crusade, a name that might be given with more propriety to the fourth crusade undertaken by Andrew, king of Hungary.

The hatred of the pope against the house of Hohenstauffen was the cause of the fifth crusade. In spite of the impure motives of this war, however, the emperor, by his prudent conduct, succeeded in obtaining the possession of Jerusalem without the sacrifice of time or blood.

The sixth and seventh crusades were undertaken with the object of regaining possession of Palestine, which had been lost in the battle of Gaza. The chief reason why so many powerful expeditions turned out signal failures may be sought in the rivalry of the knights of the same country, and the jealousy of their respective kings; hence there was no unity of action, no discipline, no commander-in-chief, and their numerous armies were scattered and defeated like sheep without a shepherd.

Consequences of the Crusades.—Though the crusades sacrificed the lives of several millions of Christians, among whom were many women and children, and though they were one of the causes which contributed to give the popes such an overwhelming power in Europe, although they were instrumental in bringing about the religious wars or persecutions which afflicted Europe, and also in weakening the power of the eastern princes, and rendering them unable to withstand the attacks of the Mongols, it cannot be denied that the crusades were accompanied by many beneficial effects.

Such, for instance, were the increased activity of political life in Europe, the union of different nations in a common object, the consequent dissipation of international strifes and prejudices, and a tendency to a more humane reciprocal intercourse, the acquisition of scientific knowledge, improvement in manners and habits, the breaking up of the feudal system by the sale of estates to the merchants in exchange for the money required by the nobles for their military accoutrements and provisions, the increased wealth of the mercantile towns in Italy, which led to the revival of the fine arts and the sciences in that country, and finally, the diffusion of more liberal modes of thinking in matters of government and religion, occasioned by the intercourse of the western and eastern nations. The great influence of the crusades in extending commerce has been pointed out by Heeren in his 'Essay on the Influence of the Crusades.'

Before the crusades the heavy clouds of religious fanaticism hung over Europe, and mankind bore quietly the chains imposed upon their minds by the authority of the priesthood. But the knight and the soldier who returned from the crusades after having a thousand times experienced the generosity and hospitality of the Musselmans, brought home the singular tale that in those remote countries there existed a race of men noble-minded and kind, though professing a creed different from that of their invaders.

Blind submission to the authority of the priesthood was exchanged for meditation and independent reflection. The inquisition, which was instituted about this time, proves that there were men who were deemed fit subjects for an inquisition, that is, heretics and philosophers. One or two centuries after the crusades, Europe was filled with religious sceptics, as far as regarded the infallibility of the church, some of whom even dared to be religious reformers, such as Huss, Wickliffe, and others. At length Luther appeared, who by his theses and his translation of the Bible shook the very pillars of the Vatican.

Since the reformation of Luther, the Christian religion has been split into numerous sects, an event which some regard as injurious to religion. But as, in the chemical process of fermentation, in order to prepare a new and better product, it is necessary that the old matter be dissolved into minute particles (that the grape for instance be pounded and reduced to an unsightly juice, in order to make a pure and costly wine), so it is perhaps necessary that Christianity should be divided into many sects in order to clean it from all accidental impurities, and to make it fit to become the universal religion of mankind.

(Wilken, *Geschichte der Kreuzzüge*, Leipzig, 1807; Mailli, *Esprit des Croisades*, Paris, 1780; Voltaire, *Histoire des Croisades;* Michaud, *Histoire des Croisades;* Bongarii *Gesta Dei per Francos;* Robert Mons, *Historia Hierosolomitana;* Albertus Acquensis, *De Passagio Godoffredi de Bullion;* Mill's *History of the Crusades;* and lastly, Michaud, *Bibliographie des Croisades*, which gives an account of all the writers who have treated this subject.)

CRUSCA, ACCADE'MIA DELLA, a society of Italian philologists who compiled the great Dictionary of the Italian language, and who continue to discuss and decide upon questions concerning that language, its grammatical rules, and the choice, application, and etymology of its words. This academy, which is patronized by the Tuscan government, is generally looked upon by the Italians as the highest authority in matters of language. It was originally an offspring of the Accademia Fiorentina, several members of which, during the reign of the Grand Duke Cosmo I., with Leonardo Salviati at their head, left the parent assembly, and formed a distinct society for the object of producing specimens of pure Tuscan diction. Salviati himself set the example by publishing his 'Avvertimenti della Lingua sopra il Decamerone,' 2 vols. 4to., 1536. The great and laborious work of the new academy, which Salviati first promoted, but which was not completed till many years after his death, was the Dictionary which was published at Venice in 1612, at the expense of the academy, 'Vocabolario degli Accademici della Crusca.' It has since been enlarged and revised, and has gone through several editions, the last of which is that of Florence, 6 vols. fol., 1729—38, with another volume of Giunta, or additions, 1751. A reprint of this edition, with additions, was made by Pitteri in 5 vols. 4to., Venice, 1763, and another by Father Cesari, with more additions, in 6 vols. 4to., Verona, 1806. All the additions, however, contained in these two editions have not received the approbation of the academy. Since that time Monti has published his 'Proposta di alcune Correzioni ed Aggiunte al Vocabolario della Crusca,' 3 vols. 8vo., 1817—24. A long and very animated controversy was carried on for years between Monti, Perticari, and several of their friends in various parts of Italy, and the supporters of the authority of the Crusca academy in matters of language. In this dispute, as in all party disputes, exaggerations and paradoxes proceeded from the zealots of both parties, whilst the more sensible and discriminating men, on both sides, came much nearer to each other's conclusions than they themselves seemed aware of. There is a full though compendious exposition of the question at issue in No. X. of the *Journal of Education*, art. *On the Study of the Italian Language*, with a sequel in No. XII. of the same journal.

Academies, like la Crusca, the French academy, and the Academia Española, have no power to enforce their decrees, save that of public opinion, that is to say, the opinion of the majority of writers and readers. It is true that they may influence that majority so as to obtain a too servile obedience for a time, but the remedy is always in the power of spirited and well-informed writers, who may make really useful innovations and support them by proper arguments; and this is what has happened in Italy. There is no inquisition or temporal tribunal to prevent this. To complain therefore of the tyranny of La Crusca seems an absurdity. That society only states its collective opinion, which the learned of Italy may gainsay if they can find good reason for it. That society has rendered an essential service to the Italian language by fixing its rules and collecting its appropriate words from the best writers, a task which was perhaps beyond the power of any individual to undertake, or at least to accomplish with success. It has also published very correct editions of Dante, Boccaccio, and other Italian classics. Goldoni and others, in their personification of the academy, have represented him as a pedantic being, but many of the words and phrases which they have put into his mouth, are not such as are found in the works approved of by the academy. Ridicule is not always grounded on truth. In the earlier period of its institution, the Crusca, or at least some of its members, assumed too dogmatical a tone, which was in accordance with the taste and state of society in those times, especially in their strictures on the 'Gerusalemme Liberata.' [Tasso.] But those times are long gone by, and the academy now bears its honours with mild and becoming dignity. Several of the most learned men, not only of Tuscany but of other parts of Italy, are among its members.

The Academy della Crusca, having lost many of its most distinguished members, fell into comparative inertness and oblivion in the latter half of the last century, when, by a decree of the Grand Duke Leopold I., it was merged in the new Florentine Academy in 1783. The Magliabecchi Library was assigned for the sittings of the new society. In 1811 Napoleon restored the Crusca Academy to its separate existence, with 12 resident and 20 correspondent members. He founded also an annual prize of 500 Napoleons for the best written works in Italian prose or poetry, to be awarded by the decision of the academy. Micali's 'Storia d'Italia avanti il Dominio dei Romani' was one of the first which obtained the prize. When Tuscany returned under the sway of the Grand Duke Ferdinand, in 1814, he confirmed the institution of the academy and assured it of his patronage. The academy then began to publish its acts: 'Atti dell' Imperiale e Reale Accademia della Crusca,' of which several volumes have since appeared. The first volume, 1819, begins with a concise but interesting history of the academy from its first foundation. Its sittings take place in the palace Riccardi, formerly Medici, which was built by Cosmo the elder. Prizes are awarded by the academy every five years. The prize of 1830 was given to the historian Botta for his history of Italy during the French revolution and war.

The name Crusca means 'bran,' and the emblem of the academy is a 'frullone,' or sifting machine, with the legend: 'Li piú bel fior ne coglie: 'It gathers the finest part of the flour of the language.'

CRU'SIUS, CHRISTIAN AUGUST, a philosophical writer, who enjoyed a great but transient reputation in the beginning of the last century. He was born in 1712 at Leuna, in Merseburg, and died, in 1776, first professor of theology at Leipzig. His design was a reconciliation of philosophy with the orthodox theology. Considering the Wolfian philosophy the great enemy of religion, he made that the chief object of his attack. He was successful in exposing several of the dogmatical assertions of his opponents, particularly what are technically called the ontological and cosmological demonstrations of the being of a God. Unfortunately however he set up a system even more dogmatical than the one which he attempted to subvert, and he had the mortification to outlive the reputation which he had acquired.

CRUSTA'CEA, (Zoology), *Crustacés* of the French, *Krustenthiere* of the Germans, Μαλακόϛρακα (Malacostraca) of Aristotle and the ancient Greeks, a class of articulated animals, whose external covering is less solid than that of the majority of testaceous mollusks, but much firmer and harder than the skin of the naked mollusks, and whose conformation is essentially distinguishable from other classes, especially in the circulating, respiratory, and locomotive organs. *Types*, common crab [Crab] and common lobster [Astacus].

Skeleton.

As in many of the testaceous mollusks, the skeleton of the crustacea is external. It is made up of the tegumentary envelope, which, in some of the class, always continues soft, but in the greater portion is very firm, forming a shelly case or armour, in which all the soft parts are contained. In the more perfect crustaceans it is complex. The following description of its component parts is from the pen of M. Milne Edwards, who in his 'Histoire Naturelle des Crustacés' (Tome premier, Paris, 1834, 8vo.), and in the article Crustacea in the 'Cyclopædia of Anatomy and Physiology' (Vol. i., London, 1836), has given the latest and best information on a subject which would fill a volume, and of which our limits will only permit us to give a sketch. Taking the Brachyura, or short-tailed crustaceans, as his instance of the more highly developed forms of the class in which the complex structure is exhibited, he thus proceeds

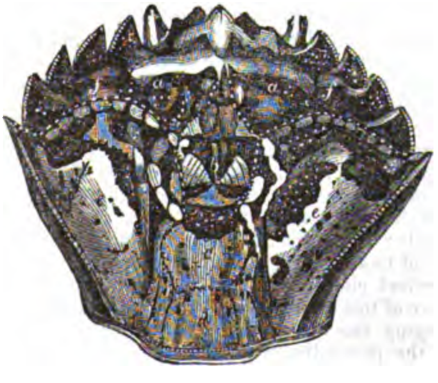
'The integument consists of a *corium* and an *epidermis*, with a pigmentary matter of a peculiar nature, destined to communicate to the latter membrane the various colours with which it is ornamented. The *corium* or *dermis*, as among the Vertebrata, is a thick, spongy, and very vascular membrane; on its inner surface, it is intimately connected with a kind of serous membrane, which lines the parietes of the cavities in the *Crustacea* in the same manner as the serous membranes line the internal cavities among the Vertebrata; these two membranes, divided in the latter order by the interposition of muscular and bony layers, which cover and protect the great cavities, become closely united when these layers disappear as they do in the *Crustacea*, in consequence of the important changes that take place in the conformation of the apparatus of locomotion. The *corium* again, among the *Crustacea*, is completely covered on its outer surface by a membranous envelope unfurnished with blood-vessels, and which must be held in all respects as analogous to the epidermis of the higher animals. It is never found in the properly membranous state, save at the time of the *Crustacea* casting their shell; at this period, it is interposed between the *corium* and the solid covering ready to be cast off, and has the appearance of a pretty dense and consistent membrane, in spite of its thinness. It forms, as among animals higher in the scale, a kind of inorganic lamina, applied to the surface of the corium, from which it is an exudation. After the fall of the old shell, it becomes thicker and very considerably firmer, owing to the deposition or penetration of calcareous molecules within its substance, as well as by the addition of new layers to its inner surface. The degree of hardness finally acquired, however, and the amount of calcareous matter deposited within it vary considerably; in many members of the class, it remains semicorneous, in a condition very similar to that of the integuments of insects, with which, moreover, it corresponds very closely in point of chemical composition; in the higher crustaceans again, its composition is very different: thus, whilst *Chitine* in combination with albumen is the principal element in the tegumentary skeleton of some species, this substance scarcely occurs in the proportion of one or two-tenths in the carapace of the *Decapods*, which, on the contrary, contains sixty and even eighty per cent. of phosphate and carbonate of lime, the latter substance particularly occurring in considerably larger proportion than the former. With regard to the *pigmentum*, it is less a membrane or reticulation than an amorphous matter diffused through the outermost layer of the superficial membrane, being secreted like this by the *corium*. Alcohol, æther, the acids and water at 212° Fahr. change it to a red in the greater number of species; but there are some species in which it may be exposed to the action of these different agents without undergoing any perceptible change. The epidermic layer hardened in different degrees is the part which mainly constitutes the *tegumentary skeleton* of the crustacea. In its nature it is obviously altogether different from that of the internal skeleton of the Vertebrata; still its functions are the same, and this physiological resemblance has led naturalists to speak of these two pieces of organic mechanism, so dissimilar in their anatomical relations, under the common name of *skeleton*. The tegumentary skeleton of the Crustacea consists, like the bony skeleton of the Vertebrata, of a great number of distinct pieces connected together by means of portions of the epidermic envelope, which have not become hardened, in the same way as, among the higher animals, certain bones are connected by cartilages, the ossification of which is only accomplished in extreme old age.'

This *skeleton*, or crustaceous frame-work, consists of a series of rings varying in number, the normal number of the body segments being twenty-one. Instances of a larger number are rare, and a less number seldom occurs; one or more rings may be apparently absent, but in such cases they will generally be found consolidated as it were. In the embryo the segments are developed in succession from before backwards; the posterior rings, therefore, are generally absent when the number is defective. Each ring is divisible into two arcs, one upper or dorsal, the other lower or ventral. Each arc may present as many as four elementary pieces. Two of these united in the mesial line form the tergum, the sides of this upper arc are framed of two other portions denominated *flanks* or *epimeral pieces*. The lower arc is a counterpart of the upper. Two of the four pieces into which it is divisible constitute the *sternum*, situated in the mesial line, and are flanked by two *episternums*. These two arcs do not cohere at their edges, but a space is left for the insertion of the lateral appendages or *extremities* which correspond with them. (Milne Edwards. Audouin.)

The one-and-twenty rings above mentioned are generally divisible into three sections of seven each, and may be considered as corresponding with the three regions which zoologists have generally consented to recognize in the bodies of the crustaceans, under the denominations of a *head*, a *thorax*, and an *abdomen*, but the student should be on his guard against the false impressions which, as M. Milne Edwards observes, are likely to arise from these terms, by their leading the mind to liken them to the grand divisions in the Vertebrata, which are defined by the same expressions.

The cephalo-thoracic portion and carapace first claim our attention, and the latter acquires its greatest development in the Decapods. 'In these animals,' says M. Milne Edwards, 'the frame-work of the body does not appear at first sight to consist of more than two portions, the one anterior, formed by the carapace, and representing the cephalic and thoracic segments conjoined; the other posterior, formed by the abdomen. In reality, the first fourteen rings of the body are covered by this enormous buckler, and are so intimately conjoined as to have lost all their mobility; the whole of the thoracic segments thus hidden below the carapace are connected with it in their superior parts; they are only joined with one another underneath and laterally; and their tergal parts, having, in consequence of this, become useless, are no longer to be found, being in some sort replaced by the great cephalic buckler; thus the whole of these rings, in conformity with this arrangement, are imperfect and open above.'

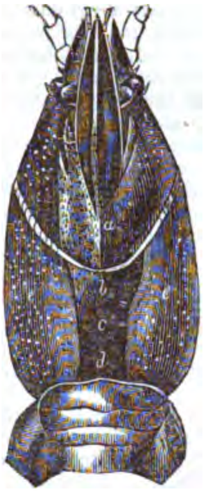
The subjoined cut represents the carapace of a Brachyurous or short-tailed crustacean, and the regions of which it is composed, named after the viscera and organs protected by them.



[Carapace of Carcinus mænas (Cancer mænas, Linn.]

a, *a*, Region of the stomach, or stomachic region; *b*, genital region; *c*, cordial region; *d*, posterior hepatic region; *e*, *e*, branchial regions; *f*, *f*. anterior hepatic regions.

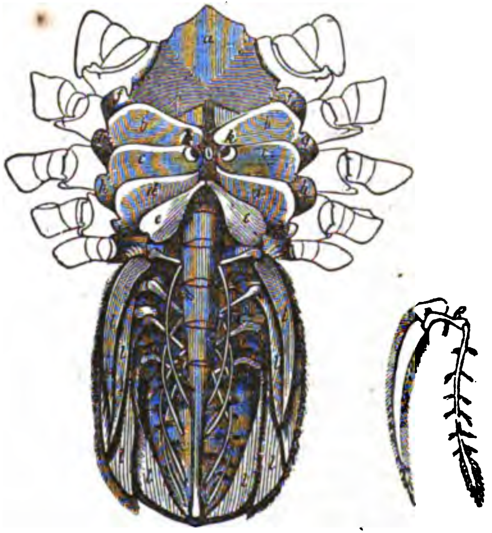
And the following represents the carapace of a Macrourous or long-tailed Crustacean.



[Carapace of Astacus fluviatilis, common crawfish.]

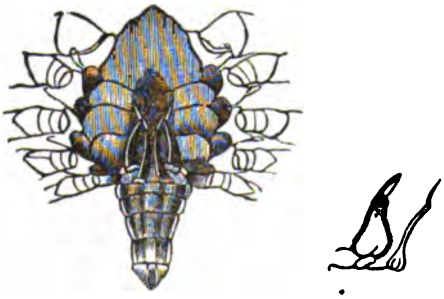
a, Stomachic region; *b*, genital region; *c*, cordial region; *d*, posterior hepatic region; *e*, *e*, branchial regions.

The *abdomen* is most fully developed in the Macroura, or long-tailed Crustaceans, in many of which it becomes a very important organ of motion, and in them there is a comparatively small development of the carapace, while in the Brachyura, or short-tailed Crustaceans, this rule is reversed, the abdomen being comparatively small, and the great development taking place in the carapace, illustrating the 'loi de balancement organique' of M. Geoffroy St. Hilaire. The types above alluded to, the *common crab* and *common lobster*, afford striking examples of this law of organic equivalents.



[View of the underside of the female, with the tail or abdomen extended.]

a, *b*, *c*, *d*, *e*, sternal pieces; *f*, *g*, *h*, *i*, latero-sternal pieces; *k*, *k*, external apertures of the female organs of generation; *l*, *l*, *l*, abdominal appendages or false feet. The detached figure represents one of these appendages removed from the abdomen.



[View of the under side of the male, with the exciting or directing organs The detached figure represents one of those organs with the abdominal appendage or false foot beneath it].

In the subjoined cuts will be seen the relative proportions and positions of the sternum and abdomen in *Thelphusa fluviatilis*, one of the Brachyura; we have given the whole of the description now to prevent trouble and confusion to the reader, who will be able to refer to the figures when the organs represented are alluded to hereafter.

Having thus endeavoured to give an outline of the tegumentary skeleton of the body of this class, we must next draw the attention of the reader to a necessary consequence of the condition of the animal, inclosed as it is in most of the class in a hard shell. If the crustaceans were not gifted with a power of throwing off this hard shell or case, all growth would be stopped, excepting increase of thickness in the shell by a succession of secretions from below. To allow, therefore, room for the expansion and growth of the body and limbs, a provision for their increase is made by means of an

Ecdysis or *Moult*, which, as a general rule, is more frequent the younger the animal is, as indeed might be expected. Thus eight moults in the short space of seventeen days have been observed in a young *Daphnia* (Branchiopoda, vol. v., p. 342, &c.) For the mode in which this liberation is performed in the Brachyurous Crustaceans the article Crab (p. 126) may be consulted; and the common crawfish, *Astacus fluviatilis*, will serve as an example of the manner in which the *Macroura* cast their shell. We have indeed more than once heard strong suspicions expressed that, in the case of the crawfish particularly, no ecdysis takes place, and that the old shell is got rid of by absorption. By those who took this view of the subject it has been somewhat triumphantly asked, 'whoever found the cast-off shell of a crawfish?' and it was not an easy question to answer for those whose pursuits had not led them to the streams which the animals haunt; but they who have looked for the *exuviæ* at the proper time and place have seen them in abundance. The crawfish does throw off its old shell towards the end of summer or in the beginning of autumn[*]; and Reaumur saw it done.

The change is preceded by a few days of fasting and sickness, and at that time the carapace becomes loosened from the corium to which it was attached. The corium begins forthwith to secrete a new shell, which is at first soft and membranous, becomes gradually harder and harder, and is at last calcareous. When all connexion with the old shell is broken off, and the corium has completely secreted the new membranous envelope, the animal begins to set about freeing itself from the old incumbrance, and becomes very restless, the symptoms of inquietude increasing in proportion as the time for emancipation draws nigh. It rubs its legs one against the other, and finally throws itself on its back. In that situation it begins to shake itself and swell itself out, till it tears the membrane which connects the carapace with the abdomen, and begins to raise the former: then it rests a while. Alternations of agitation and rest succeed each other at intervals of longer or shorter duration, the carapace is completely raised, the head, the eyes, the antennæ, are extricated. The greatest difficulty occurs in freeing the extremities, nor could they be extricated at all did not the old covering split longitudinally: and indeed it frequently happens that the crawfish leaves a limb or two behind; and is sometimes so fettered, that it perishes from inability to extricate itself. The abdomen is the last division of the body freed, and the whole change generally takes place in half an hour. Four-and-twenty hours, or two or three days at furthest, are necessary for the conversion of the soft and membranous integument which sheathes the corium or naked body into a firm calcareous case similar to the last, and presenting the same appendages, even to the hairs, which last, observes M. Milne Edwards, are not contained within the old ones as Reaumur imagined, but exist ready-formed in the new envelope, turned in towards the interior like the fingers of a glove turned in upon itself.

M. Milne Edwards observes, that the time occupied in the business of throwing off the shell varies considerably in different species, and that it also depends on atmospheric influences, and this observation applies equally to the number of days required for giving the new tegumentary sheath the consistency of the old shell; and he adds, that in the whole of the species which have been duly watched, especially those found on the French shores, the period which precedes and that which follows the ecdysis is a period of inquietude and disorder. The muscles are then flaccid, the flesh is soft and watery, and the animals are considered unwholesome and unfit for food. An exception to this remark occurs in the land-crabs (*Gecarcinus*), which, according to the testimony of all who have spoken and written on the subject, are never so delicious as during the season of change.

At the period of *ecdysis*, rounded, flattened calcareous concretions (carbonate of lime), commonly called *oculi cancrorum*, are formed at the sides of the stomach of the common *river crawfish*. (See Preparation 406 in the Museum of the College of Surgeons, and *Catal. of the Physiological Series*, vol. i., p. 406.[*])

Every one has occasionally been struck with the difference of size in the members of crabs and lobsters. One claw of these, and other crustaceans which have the claws, when perfect, nearly equal, is often found of its full volume, while the other is comparatively diminutive; for the animal, upon the limb receiving any injury, has the power of suddenly throwing it off, and the effort does not appear to be attended with pain, though it is frequently made when the system receives a severe shock. (Astacus, vol. ii., p. 514.) The point at which the separation takes place is always in the second articulation, near the basis of the limb, and from the stump, which speedily cicatrizes, a new claw buds forth with all the proper articulations, and with an entire though miniature, resemblance to the rejected member. This new claw increases slowly, and requires considerable time to attain the full size. It is generally stated, that if one of the limbs be severed in any other place than the usual point of separation the stump goes on bleeding, nor does it heal. In such cases the renovating process does not commence until the animal succeeds in separating the remains of the member at the proper point, and this it is supposed to do by a violent muscular contraction. Some time ago there were some land-crabs (Gecarcinus) at the garden of the Zoological Society, and the apparent ease with which they parted with their smaller legs in order to escape from any one who injudiciously took them up by those members was very remarkable. They did not seem to regard the loss at all, and ran away on the remainder of their legs as if nothing had happened. There was no opportunity of observing the mode of reproduction in this case, for the animals were brought to the garden from the West Indies late in the summer, and they did not survive the cold weather. We will now consider these and other

Organs of Locomotion.—Of the different writers who have treated this subject, the summary given by M. Milne Edwards appears to us to be the most instructive, and we therefore select it. It is clear and condensed, and we give it in his own words, for we know of no method equally concise of conveying adequate ideas of this curious piece of animal mechanism.

'The kind of solid sheath formed by the tegumentary skeleton of the crustacea, and which includes in its interior the whole of the viscera and other soft parts of these animals, is required to be so constructed as not to oppose locomotion; consequently there exist, either between the different rings of the body or the various constituent elements of the limbs, articulations destined to admit of motion to a greater or less extent between these different pieces. The structure of these articulations is of the most simple kind; the moveable piece rests upon that which precedes it by two hinge-like joints, situated at the two extremities of a line perpendicular to the plane in which the motion takes place. In the internal portion of the edge of the moveable piece comprised between the joints, there exists a notch of greater or less depth, destined to admit of flexion, whilst on the opposite or external side the same edge generally glides under that of the preceding piece. This kind of articulation, whilst it is the most favourable to precision of movement and to strength, has the disadvantage of admitting motion in one plane only; therefore the whole of the rings of the body, the axis of motion being entirely parallel, cannot move save in a vertical plane; but nature has introduced a kind of corrective of this disadvantage in the structure of the limbs, by changing the directions of the articular axes, whence ensues the possibility of general motions being performed in every direction. Between the two fixed points two opposed empty spaces are observed, left by the rings severally, and destined to admit of the occurrence of motions of flexion and extension. The tegumentary membrane which fills it never becomes encrusted or calcareous, but always continues soft and flexible.

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[*] The season of ecdysis in the crawfish seems to vary occasionally in different localities.

[*] There is a most interesting series of preparations in the Museum of the College of Surgeons, showing the process of moulting. See p. 192.

'The tegumentary skeleton supplies the apparatus of locomotion with fixed points of action as well as with the levers necessary to motion. The immediate or *active* organs of this apparatus are the muscles, the colour of which is white, and the structure of which presents no peculiarity worthy of notice. They are attached to the pieces which they are required to move either immediately or by the intermedium of horny or calcareous tendons, which are implanted upon the edge of the segment to which they belong. To the fixed point they are most commonly attached immediately. Their structure is simple, and each segment in fact, as has already been said, being contrived to move in one fixed and determinate plane, the muscles which communicate motion to it can constitute no more than two systems antagonists to each other, the one acting in the sense of *flexion*, by which the segment moved is approximated to that which precedes it, the other in the sense of *extension*, by which the segment is brought into the position most remote from the centre of motion. The muscles that produce these opposite effects, as might have been concluded, are found implanted into the opposite arms of the lever upon which their energy is extended.

'The motions in flexion tend universally to bring the extremities and the different rings towards the ventral aspect of the body; it is consequently upon this aspect that the flexor muscles are inserted, and these are in general the more powerful. On the contrary, and in accordance with the nature of the motion produced, it is upon the superior or dorsal aspect of the segments that the exterior muscles are attached. In the trench the two orders of muscles generally form two distinct layers, the one superficial, the other deep; the former thin and sometimes absent, the second, on the contrary, very powerful wherever powerful motions are required. The muscles generally extend from the arc above to the one immediately below, passing for the most part from the anterior edge of the upper to the anterior edge of the lower segment. The extent and the direction of the flexion of which any segment is susceptible depend on the size of the interannular spaces above or below the ginglymoid points, and as these spaces are in general of considerable magnitude on the ventral aspect, whilst the superior arcs are in contact, and can only ride one over another in a greater or less degree, it is only downwards that the body can be bent upon itself, while upwards, or in the sense of extension, it can hardly in general be brought into the horizontal line.

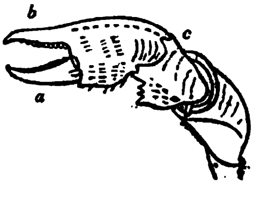
'Thus far what has been said applies more especially to the rings of the body, but the extremities present nothing that is essentially different, either as regards the mode in which the tubular segments are articulated to one another, or as regards the mode in which the muscles are inserted. Each of these indeed having but one kind of motion, and even that very limited in its extent, nature has aided the deficiency, as has been stated, by increasing the number of articulations, by which extent of motion is conferred, and in varying the direction of the articular axes, an arrangement by which the animal obtains the ability of moving in every direction, but at the expense of power, rapidity, and precision in its motions. Each segment of a limb incloses the muscles destined to move that segment which succeeds it, unless it be too short and weak for this end, in which case the muscles themselves have their origin at some point nearer to the medium plane of the body. As a general law the muscles are observed to be more powerful in proportion as they are nearer to the centre, which is to be explained by the fact, that each motion they then communicate is transmitted to a larger portion of a limb, to a lever longer in that sense in which it is disadvantageous to the power. Occasionally however the two last segments of a member are converted into a sort of hand, and in this case the penultimate segment sometimes includes a muscular mass, which may surpass in power the same system in the whole of the limb besides. Those muscles that put an extremity generally into motion are attached to the sides of the thoracic cavity, and the apodemata supply them with surfaces of insertion of great extent, and very favourably situated as regards their action. They occupy the double rank of cells formed by these laminæ, but they vary too much in their mode of arrangement to admit of our saying anything generally upon this head. The motion of translation or from place to place, the only kind upon which it seems necessary to say anything here, are effected in two modes, either by the alternate flexion and extension of the trunk, or by the play of the limbs.

'In those Crustacea which are formed essentially for swimming, the posterior part of the body is the principal agent in enabling the animal to change its place; but here the motions, instead of being lateral, are vertical; and instead of causing the creature to advance they cause it to recede: it is by bending the abdomen suddenly downwards, and bringing it immediately under the sternum, that it strikes the water, and consequently by darting backwards that the animal makes its way through the liquid. (ASTACUS, vol. ii., p. 513.) From what has now been said it may be imagined that the Crustacea whose conformation is the best adapted for swimming have the abdomen largely developed, and this is in fact what we always observe; the Amphipoda and Decapoda Macroura are examples; whilst in the walking Crustacea, such as the crabs, the Caprella, the Oniscus, &c., this portion of the body attains but very insignificant dimensions. In the swimming Crustacea, the appendages of the penultimate segment of the abdomen also become important organs of locomotion, inasmuch as they for the most part terminate in two broad horizontal plates, which, with the last segment, also become lamelliform, constitute an extensive caudal fin arranged in the manner of a fan. We have already said that the thoracic extremities alone constitute true ambulatory limbs. When destined for swimming only, their segments are lamelliform, and the palp, as well as the stem, contributes to form the kind of oar which each of them then constitutes.

'To conclude, the stemmatous portion of the thoracic extremities, whilst it still preserves the general form which we have assigned it, is modified in some cases to serve for walking as well as swimming, or to aid the animal as an instrument for burrowing with facility, and making a cavity for shelter among the sand. Thus in the Decapods that burrow, the last segment of the tarsus assumes a lanceolated form, and in the swimming Brachyura, the same segment, especially of the last pair of extremities (*Matuta*, for example), appears entirely lamellar.'

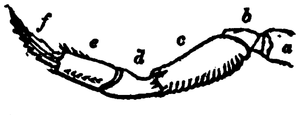
We have only further to add, that in a great number of species one or several pairs of the thoracic extremities are modified so as to become instruments of prehension; sometimes it is the last segment of the limb which, acquiring more than usual mobility, bends in such a manner as to form a hook with the preceding segment; sometimes it is this penultimate segment which extends below or by the side of the last, so as to form a kind of immoveable finger with which it is placed in opposition. In the first instance these instruments are denominated *subcheliform* claws, in the second *chelæ* simply, or *cheliform claws*.

Any one who will take the trouble of going over this excellent description with a common crab and lobster before him, will have a clear idea of the locomotive system in these animals.



[Claw (cheliform) of Thelphusa fluviatilis.]

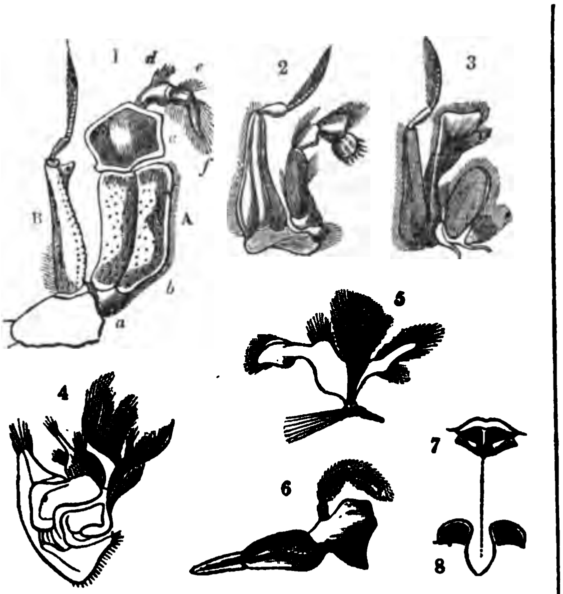
a, moveable finger; *b*, hand (manus) and immoveable finger; *c*, carpus, or wrist.



[Posterior foot of Thelphusa fluviatilis.]

a, Haunch (hanche); *b*, trochanter; *c*, thigh (femur); *d*, leg; *e*, metatarsus; *f*, tarsus, or nail.

Organs of Digestion.—The cheliform or subcheliform claws may be considered as ancillary to this important part of the organization of the Crustacea; and there are other parts, the details of which we proceed to give before we enter at large into this part of the subject.



[Jaw-feet (pieds machoires), &c. of Thelphusa fluviatilis.]

1, Right external jaw foot; A, its internal blade; *a, b, c, d, e, f*, its various articulations; B, its external blade, or flabelliform palp; 2, jaw of the fourth pair with its palp; 3, jaw of the third pair with its palp; 4, jaw of the second pair; 5, jaw of the first pair; 6, mandible with its palp; 7, upper lip; 8, tongue (langue) or lower lip.

The maxillary limbs above represented, which constitute the jaws in the *masticating crustaceans*, reach in them their highest development; whilst in the *sucking crustaceans*, which are parasites, and feed on the juices of other animals, a great difference of structure is, as might be expected, observable, certain parts of the apparatus being elongated into a proboscis or tube of longer or shorter dimensions adapted for sucking, and in the interior of which are two slender pointed processes that act as lancets, for the purpose of perforation, in lieu of the true mandibles.

The basilar articulations of the anterior thoracic extremities in many species are employed to seize, hold fast, and in a considerable degree comminute, the food; and the most perfect development of this design is manifested in the cheliform claws of the lobsters and crabs, with all their admirable modifications for powerful prehension.

The *mouth* is a mere opening of the short œsophagus; nor is it furnished with a tongue—the organ so named (*langue* and *languette*) is no more than a horny and lamellar process, performing in a degree the functions of a lower lip. The *œsophagus*, which terminates without any interruption in the stomach, and both parts, with one striking exception in the case of the latter, which we shall presently mention, present nothing remarkable, consisting as well as the whole of the intestinal canal of two membranous layers, and presenting a considerable resemblance to the same part of the organization of the higher animals. The *stomach* is globular and capacious, occupying much of the area of the cephalic cavity, and consisting of two distinct portions: 1. The cardiac region, surmounting the mouth and œsophagus; 2, The pyloric, placed behind the cardiac region.

Around the *pylorus* is situated that extraordinary apparatus of hard tubercles or sharp teeth, which operate as grinding or tearing organs on the food submitted to the action of this animal mill; and though the different pieces vary considerably in different species, their greater or less development depending upon the nature of the food taken by those species, they may be traced in all the *Brachyura* and *Macroura*. In *Squilla* this masticatory framework is reduced to two half-horny pieces, with rounded projections; and to make up for this deficiency, a branch of each mandible reaches down to the pyloric orifice.

From the *pylorus*, the *intestine* proceeds direct to the vent, there being no convolution; but in the higher crustaceans, it is distinguishable into two portions to which the names of *duodenum* and *rectum* have been applied, and which are sometimes, in the lobster for instance, separated by a valve, but more frequently are without defined limits. In the lower crustaceans the intestine is cylindrical, and offers no difference throughout its whole length from the stomach to the *vent*, which is always situated in the last ring, and has its orifice closed by muscular fibres which perform the functions of a sphincter.

The *liver* is largely developed in many of the Crustacea, especially in the Decapods; indeed, no one can eat a crab or a lobster without being struck with the large proportions of this viscus, which in those species is considered so delicious. In the Edriophthalmians, on the contrary, it is almost rudimentary, there being in them only three pairs of biliary vessels, much resembling those of insects. The organ, when well developed, consists of two symmetrical portions, generally separated from each other, and composed of a collection of cæcums, which at one of their extremities discharge their secretion into excretory ducts, which being converted by their union into longer and larger vessels, pour the bile ultimately through a double channel into the pylorus. The nature of the whitish fluid secreted by the two, and, as it is said, in some cases three, elongated blind tubular worm-like organs, the first two situated on each side of the pylorus, and the third on the middle of the intestine a short way below them, is not known, nor is its use.

The two green glandular organs placed on each side of the œsophagus are supposed to act in some degree as substitutes for *salivary glands*.

In the Museum of the Royal College of Surgeons, in London, are preparations of the stomachs of the river crawfish, the lobster, and of a large crab, Nos. 406 to 408, both inclusive.

Circulating System.—No chyliferous system, or, to speak more correctly, no system of chyliferous vessels, has yet been found in the Crustacea; and the best received supposition is, that the nutritious fluid is transferred from the intestine to the blood-vessels by imbibition. The *blood* is either without colour or of a slightly bluish tinge; very coagulable, and abounding in globules held in suspension.

Much has been written on the subject of the vascular system, one of great complexity, through which this fluid circulates; but notwithstanding the valuable labours of Willis, Swammerdam, Cuvier, and others, great difference of opinion and obscurity prevailed, till the researches of Lund, and especially those of MM. Audouin and Milne Edwards, intituled, 'Recherches Anatomiques et Physiologiques sur la Circulation dans les Crustacés' (*Ann. des Sc. Nat.*, t. ii.), appeared. The following are the conclusions to which the latter distinguished naturalists came, after a careful study, as well of the anatomical disposition of the circulating apparatus of the Crustacea, as of the progress of the blood through its interior.

'The circulation of the blood in these animals is accomplished in a manner very similar to what takes place in the Mollusca. The blood, pushed forward by the heart, is distributed to every part of the body, from whence it is returned into large sinuses situated at no great distance from the base of the branchiæ; from these sinuses it is sent on to the respiratory apparatus, which it traverses, and from which it finds its way to the heart, to recommence the same circle anew. The *heart* is consequently *aortic* and *single*. The heart is always found in the median line of the body, and lying over the alimentary canal, near the dorsal aspect. Its form is various; in the Decapods it is nearly square, and lies in the middle and superior part of the thorax; being separated from the carapace by tegumentary membranes only, and may be seen in the space included between the two vaults of the flanks. In structure it appears to be composed by the interlacement of numerous muscular fibres, fixed by their extremities to neighbouring parts, and passing to some distance over the aggregate at either end, so that the whole organ brings to mind such a figure as would be formed by the superposition of a number of stars the rays of which do not correspond. In the other orders this general form of the heart varies considerably from the figure of an oblong square of rather inconsiderable size, as it occurs in the Decapoda, to that of a long cylindrical vessel extending through the whole length of the body, as it appears in the Stomapoda and the Edriophthalmians. In the former of these it gives origin to six vascular trunks, three of which issue from the anterior edge, and three from the posterior surface; each of the six openings is closed by a valvular apparatus, which prevents the regurgitation of the blood.

'The first of the three anterior vessels is situated in the median line, and is distributed to the eyes, in consequence of which we have entitled it the ophthalmic artery. Lodged within the substance of the general tegumentary membrane, it continues its course without undergoing any subdivision along the median line through the whole length of the thorax, until, arrived opposite the eyes, it subdivides and terminates in two branches, which penetrate the ocular peduncles. On the two sides are the two antennary arteries. They run obliquely towards the antennæ, sending off numerous branches to the tegumentary membrane, in which they are at first lodged; they then plunge more deeply, sending branches to the stomach and its muscles and to the organs of generation, between which they insinuate themselves by following the folds of the same membrane which parts them. Lastly, each of these vessels sub-divides into two branches, one of which proceeds to the internal and the other to the external antenna.

'Two hepatic arteries arise from the fore part of the inferior surface of the heart, and penetrate the liver, there to be ramified; but they are only found double and distinct from one another so long as the liver is met with divided into two lobes, as it is in the crawfish and lobster.

'From the posterior part of the same surface of the heart there proceeds a large trunk, which, from its importance, might be compared with the aorta. This is unquestionably the vessel which many authors have spoken of as a great vena cava; we have entitled it the *sternal* artery. It bends forwards, giving origin to two abdominal arteries, dips into the sternal canal, distributing branches to the different thoracic rings, as also to the five first cephalic rings, which it passes over in its course. Meeting with the œsophagus, it bifurcates, but still sends branches to the mandibles and the whole of the anterior and inferior parts of the head.

'The bulb presented by the sternal artery at its origin, in the Macroura, is the part which Willis characterized as *auricle* of the heart. As concerns the two abdominal arteries, which may be distinguished into *superior* and *inferior*, and which arise from the kind of cross which it forms almost immediately after its exit, they are in precise relationship in point of size with the magnitude and importance of the abdomen itself. In the Brachyura they are mere slender twigs; in the Macroura, on the contrary, they are capacious stems, and the inferior of the two sends branches to the two posterior pairs of thoracic extremities.

'The disposition of the three first vessels is the same in the Stomapoda as in the preceding species; but the great vessel which represents the heart being extended through the whole length of the body, supplies immediately other arterial branches in pairs, and in number equal to those of the rings.

'The blood returns from the different parts of the body by *canals*, or rather *vacuities*, among the tissues (for they have no very evident appropriate parietes), which terminate in the *venous sinuses* situated close to the branchiæ.

'In the short-tailed Decapoda we find no more than a double series of these sinuses included within the cells of the planes above the articulation of the extremities. They communicate with one another, and they appear to have no parietes other than laminæ of cellular membrane, of extreme tenuity, which cover the neighbouring parts. Each of them, nevertheless, receives several venous conduits, and gives origin at its superior and external part to a vessel, which, traversing the walls of the planes at the base of the branchiæ, conducts the blood to the latter organs. This is the external or afferent vessel of the branchiæ.

'We find the same lateral venous sinuses in the Macroura; but instead of communicating with one another athwart the thoracic septa, as is the case in the Brachyura, they all empty themselves into a great median vessel, which is itself a venous sinus, and occupies the sternal canal. In the Squilla this sinus is almost the only vessel which serves as a reservoir to the venous blood.

'The blood, after being arterialized in its passage through the capillaries of the branchiæ, is poured into the *efferent vessel* which runs along the internal surface of each branchia. It enters the thoracic cells in the same manner as the afferent vessel passed out from them, bends upwardly under the vault of the flanks, and thus takes its course towards the heart. It is to this portion of the canal that we have given the name of *branchiocardiac vessel*.'

The anatomical accuracy of the above description is generally admitted, but the physiological deductions of M. Lund differ from those of MM. Audouin and Milne Edwards. He regards the heart as destined to propel, not only the pure blood from the gills, but also an admixture of venous blood which enters the cavity of the heart by four orifices, seated on its dorso-lateral aspects, and distinct from those in which the branchial veins terminate. The French anatomists have objected, that these orifices described by Lund are closed by a membrane; but we find them plainly shown, and provided with the valvular apparatus for preventing a reflux of the blood, in a preparation (No. 898 a.) added by Mr. Owen to the Hunterian Series illustrating the same subject in the museum of the College of Surgeons. John Hunter had long ago arrived at the same conclusions as to the mixed condition of the blood which is sent from the heart, and in a series of elaborate researches on the circulation in the crustaceans and insects, first discovered the diffused state of the venous blood in extensive and irregular venous sinuses; the general disposition of which, in the lobster, is well displayed in the four beautiful plates (15, 16, 17, and 18) illustrative of John Hunter's account of the circulating system of the lobster, in the Catalogue of the Physiological Collection, vol. ii.

This and other parts of the anatomy of the lobster are illustrated in the following preparations in the same collection:—Nos. 22, 60, 110, 223, 407, 408, 880, 898 a, 991, 992, 1301, 1302, 1302 A, 1303, 1303 A, 1303 B, 2204 A, 2205-2207 A; and the anatomy of the river crawfish in the preparations numbered 406, 993, 993 A, 2191-2204, the latter series being explanatory of the process of moulting.

Respiratory System.—The respiration of the crustacea is carried on generally by means of branchiæ. We say generally, because there are some forms where no special organs have been detected, and where it is presumed that oxygen is obtained from the water through the medium of the external integument. But where, as in the great mass of these animals, branchial respiration is present, the variety in form and disposition of the apparatus, and in some cases the complexity of it, are very great. Thus, in the Branchiopoda the lamellar form of all the thoracic extremities and the two external appendages corresponding to the palp and flabellum present membranous vesicles, flat in shape, highly vascular and soft, whose office it is to facilitate the action of the air upon the blood. In the *Amphipoda* and *Læmodipoda* we begin to perceive a gradual departure from this type. In the *Læmodipoda* the vesicular bodies produced by the flabelliform appendage of a certain number of pairs of the thoracic extremities, only perform the functions of branchiæ; and in the Isopoda the locomotive extremities cease to act as respiratory organs, the five first pairs of abdominal extremities being exclusively devoted to those duties. The *Stomapoda*, which in some cases are without determinate respiratory organs, in others present an organization analogous to that of the decapodous embryo, and again in the *Squillæ* and *Thysanopoda* exhibit a highly-complicated structure of branchiæ, which, though superior even to the highest type in complexity, still fall short of the perfection manifested in that type, inasmuch as the branchiæ float in the water unprotected by any envelope.

M. Milne Edwards thus reviews the respiratory apparatus in its state of greatest complexity, commencing with it in the embryo, and following it in its progressive development.

'In the earliest periods of embryotic life of the common *Astacus fluviatilis*, we discover no trace of branchiæ; but at a somewhat more advanced stage of the incubation, though still before the formation of the heart, these organs begin to appear. They are at first small lamellar appendices of extreme simplicity, attached above the three pairs of maxillary extremities, and representing the flabelliform portions of these limbs. Soon these lamellar appendages elongate and divide into two halves, one internal, lamellar, and triangular, the other external, small, and cylindrical; lastly, upon the surface of this, striæ are observed to appear, which are the rudiments of the branchial filaments. During this interval the thoracic extremities have become developed, and above their bases other branchiæ have made their appearance, presenting in the beginning the form of tubercles, and subsequently that of stilets, smooth and rounded on their surface, but by-and-by becoming covered with a multitude of small tuberculations, which, by their elongation, are gradually converted into branchial filaments similar to the preceding. During this period of the development of the branchiæ, these organs are applied, like the extremities, to the inferior surface of the embryo; but they subsequently rise against the lateral parts of the thorax, become lodged within a cavity situated under the carapace, and thus are no longer visible externally.

'The cavity destined to protect in this manner the brannial apparatus is neither more nor less than an internal fold of the common tegumentary membrane. It shows itself first under the guise of a narrow groove or furrow, which runs along the lateral parts of the thorax, below the edge of the lateral piece of the carapace. This longitudinal furrow is not long of expanding, and becomes consolidated by its superior edge with the internal surface of the carapace, which, by being prolonged inferiorly, constitutes the external wall of a cavity, the opening of which, situated above the base of the extremities, becomes more and more contracted, and ends by being almost entirely closed. The space in this way circumscribed incloses the branchiæ, and constitutes what is called the respiratory cavity of the Decapod Crustaceans.

'From what has just been said, it would appear that the embryo of *Astacus fluviatilis* presents four principal periods with reference to the state of the respiratory apparatus: 1. that which precedes the appearance of this apparatus; 2. that during which the branchiæ are not distinguishable from the flabelliform appendages of the extremities, or in which it consists of simple lamellar or stiliform processes, which appear as mere processes of other organs especially dedicated to locomotion or mastication; 3. that characterized by the transformation of these extremely simple appendages into organs of a complex structure, entirely distinct from the extremities, but still entirely external; 4. and lastly, that during which the branchiæ sink inwards, and become lodged in a cavity especially adapted for their reception, and provided with a particular apparatus destined to renew the water necessary to the maintenance of respiration.

'If we now turn to the examination of the apparatus of respiration in the different groups in which it exhibits important modifications, we shall, in the series of Crustaceans, encounter permanent states analogous to the various phases through which we have just seen the apparatus passing in the most elevated animals of the class. And, in fact, the first period which we have particularized above in the embryonic life of the Decapod is exhibited in the permanent condition of some inferior crustaceans, in which not only are there no special organs for respiration, but in which none of the appendices occur with such modifications of structure as would fit them to become substitutes for the branchiæ, in which, consequently, the process of respiration, that is the aeration of the blood, appears to take place over the surface of the body at large. The greater number of the Haustellate Crustacea, of the Entomostraca properly so called, of the Copepoda, and even of the Phyllosomata, appear to belong to this type of organization.'

The branchial character is so inherent in this class, that it is preserved even in certain species that live on the land. The land-crab (*Gecarcinus*), for example, would die if long immersed in water; but this, as well as other land crustaceans, requires a certain degree of moisture to enable the branchiæ to act, and accordingly they never remove far from damp situations.

Nervous System and Senses.—The obscurity in which this part of the subject was involved has been greatly dissipated by the light thrown on it by many authors, among whom Cuvier, Rathke, MM. Audouin and Milne Edwards, and Mr. Newport stand pre-eminent.

The principles derived from the study of the gradual evolution of the nervous system in the common crawfish are, 1. the isolated formation of the nervous centres, independently of one another. The ulterior junction of the organs constitutes the law of centripetal development of M. Serres. 2. A tendency to conjunction by a motion transversely. 3. A second motion in the line of the axis of the body, producing a final concentration of a greater or less number of nervous centres, originally independent of each other.

The first of these conditions is well seen in *Talitrus*. On each side of the mesial line in this genus is a chain of ganglions, conjoined by nervous centres of simple construction, flattened, and somewhat lozenge-like in their outline. Thirteen pairs of these correspond to the thirteen segments of the body, the two nuclei of each pair communicating together in the same way that each pair is connected with its antecedent and succeeding pair, by means of medullary cords in the first case, and longitudinal cords in the second. Each of these pairs in all essentials is a counterpart of the other, the cephalic ganglion, which sends branches to the antennæ and eyes, not excepted. In *Phyllosoma* the tendency to centralization is more obvious, and in *Cymothoë* the union of the medullary nuclei is accomplished, the approximated chains forming a single longitudinal series from head to tail.

In the types, as might be expected, the centralizing system is perfected by the actual conjunction of the nuclei, and here we must refer the student to the works above mentioned, more especially to those of Rathke, of Audouin, and Milne Edwards, and of Mr. Newport, and the beautiful preparations illustrative of this part of the organization of the crustaceans in the museum of the Royal College of Surgeons in London (Gallery, Nos. 1301 to 1303 B, both inclusive). We would particularly draw his attention to No 1302 A, presented by Mr. Newport, 'showing the anterior and posterior, or motor and sensitive tracts, which constitute the cerebral or spinal column,' &c.; and to No. 1303 A, exhibiting the nervous system of *Scyllarus antarcticus*, and 1303 B, laying open that of *Pagurus pedunculatus*, both prepared by Mr. Owen. Mr. Newport's excellent and instructive paper 'On the nervous system of the *Sphinx ligustri* of Linnæus' (*Phil. Trans.*, part ii., 1834), including beautiful illustrations of the nervous system of the lobster, and showing its identity in principle with that of the Sphinx, should be carefully studied.

The conclusion formed by M. Milne Edwards in his Histoire is that 'the nervous system of the crustacea consists uniformly of medullary nuclei (ganglions), the normal number of which is the same as that of the members or rings of the body, and that all the modifications encountered, whether at different periods of the incubation, or in different species of the series, depend especially on the approximation, more or less complete, of these nuclei (an approximation which takes place from the sides towards the median line, as well as in the longitudinal direction), and to an arrest of development occurring in a variable number of the nuclei.'

Mr. Newport appears to have been the first who pointed out the double ganglionic chain in the *Lobster*, as being composed of two orders of fibres, forming distinct and superposed fasciculi or columns, designated by him columns of sensation and of motion.

The highest degree of nervous centralization is found in *Maia*, according to M. Milne Edwards, who lays down the following principles, the result of the experiments made by himself and M. Audouin, and his deep and elaborate investigation of the subject.

'1. The nervous system is the system which entirely presides over the sensations and motions.

'2. The nervous cords are merely the organs of transmission of the sensations and of volition, and it is in the ganglions that the power of perceiving the former and of producing the latter resides. Every organ separated from its nervous centre speedily loses all motion and sensation.

'3. The whole of the ganglions have analogous properties; the faculty of determining motions and receiving sensations exists in each of these organs; and the action of each is by so much the more independent as its development is more isolated. When the ganglionic chain is nearly uniform through its whole length, it may be divided without the action of the apparatus being destroyed in either portion thus isolated,—always understood, that both are of considerable size, because, when a very small portion only is isolated from the rest of the system, this appears too weak, as it were, to continue its functions, so that sensibility and contractility are alike speedily lost. But where one portion of the ganglionic chain has attained a development very superior to that of the rest, its action becomes essential to the integrity of the functions of the whole.

'It must not be imagined, however, from this that sensibility and the faculty of exciting muscular contractions are ever completely concentrated in the cephalic ganglions, and it seems to us calculated to convey a very inaccurate idea of the nature and functions of these ganglions to speak of them under the name of *brain*, as the generality of writers have been led to do, seduced by certain inconclusive analogies in point of form and position.

'It is nevertheless to be remarked that in these animals an obscure tendency to the centralization of the nervous functions is observable in the anterior portion of the ganglionic chain; because, if, in the lobster, for instance, it be divided into two portions, as nearly equal as possible, by severing the cords of communication between the ganglions belonging to the first and second thoracic rings, sensibility, and especially mobility, are much more quickly lost in the posterior than in the anterior half, and this disproportion is by so much the more manifest as the division is performed more posteriorly; still there is a great interval between this first indication and the concentration of the faculties of perception and of will in a single organ—the brain, of which every other portion of the nervous system then becomes a mere dependency.' (*Cyclo. of Anat. and Phys.*)

Sight.—This sense is possessed by the whole of the class at some period of their lives, and in the great majority the organ is of a highly complicated structure. The parasitic crustacea, which undergo a kind of metamorphosis, possess eyes in the early stage of their existence, though they are subsequently obliterated; but the great mass of crustaceans are gifted with the power of distinguishing objects through the medium of light from their birth to their death. We will now examine the different forms presented by the visual apparatus.

Smooth or *simple Eyes.*—These consist of a smooth rounded transparent cornea, being a modification of the tegumentary membrane, immediately behind which, and in contact with it is the *crystalline lens*, generally spherical, and behind this last and in contact with it is a mass of gelatine, which performs the function of the *vitreous humour*, and touches the extremity of the optic nerve. A thick deep-coloured pigment envelops the whole and lines the inner surface of the eye-globe up to the point at which the transparency of the cornea begins. *Limulus* (Molucca crab, king crab) affords an example of this kind of eye. The simple eyes have never been found to exceed two or three in number.

Intermediate Eyes.—*Nebalia, Branchipus* and *Daphnia* present us with the *first modification* of a visual structure intermediate as it were between the *simple* and the *compound* eyes. In this organization the cornea is still undivided externally, but a number of small crystalline lenses and vitreous humours, each in its separate pigmentary sac and terminating in immediate contact with the optic nerve, present an eye consisting of a conjunction of several stemmata or simple eyes under a common cornea—*Apus* [BINOCULUS], besides its pair of simple eyes, has also a posterior compound pair. The *second modification*, which is to be found in the Edriophthalmians (*Amphithöe*, for instance), brings us still nearer to the truly compound form with distinct facets. Two transparent laminæ form the *cornea* in these crustaceans: the external is smooth and undivided, the internal divided into a variable number of hexagonal facets, each with a distinct cornea which are superposed upon the conical crystalline lens, which is an ingredient in *compound eyes* properly so called.

Compound Eyes.—The external and internal membranes, the junction of which forms the *cornea*, present simultaneously the division into facets, each of which forms anteriorly an ocular compartment. Unlike the facets in the eyes of insects which are always hexagonal, these present various figures in different crustacea. In *Scyllarus*, *Galathea*, the common crawfish, &c., for example, they are square: in *Pagurus*, *Squilla*, the crabs, &c., they are hexagons. The crystalline humour that succeeds them immediately is, according to M. Milne Edwards, 'of a conical form, and is followed by a vitreous humour having the appearance of a gelatinous filament, adhering by its base to the optic nerve.' Each of the columns thus formed is, moreover, lodged within a pigmentary cell, which likewise covers the bulb of the optic nerve. 'But the most remarkable circumstance is, that the large cavity within which the whole of these parallel columns, every one of which is in itself a perfect eye, are contained, is closed posteriorly by a membrane, which appears to be neither more nor less than the middle tegumentary membrane pierced for the passage of the optic nerve, so that the ocular chamber at large results from the separation at a point of the two external layers of the general envelope.' * * * 'The most remarkable modification of facetted eyes consists in the presence of a kind of supplementary lens, of a circular shape, and set within the cornea in front of each proper crystalline lens. These small lenticular bodies exist independently, and are perfectly distinct from the small corneal facets. In some cases they might be mistaken, (in the *Idoteæ* for example, where they may be perceived singly, and with their distinct circular forms,) and the incautious observer led to conclude that the corneal facets are merely these lenticular bodies so much enlarged that their hexagonal or square forms result from their agglomeration in a point; but there are crustacea, such as the *Callianassæ*, in which these two elements of the external cornea may be perfectly distinguished, the lenticular body being of insignificant dimensions, and occupying the centre of the corneal facet only. In general, however, the diameter of the lenticular body is equal to that of the corneal facet itself, so that their edges blend. Further, the lenticular bodies are most commonly evolved in the substance of the cornea; but there are cases in which, under favourable circumstances, they may be detached from it. Although the existence of these different modifications must not be considered as being exclusive, inasmuch as there are certain crustacea which exhibit more than one of them at the same time, for instance, *stemmata* and *compound eyes*, the latter only are the species of visual organ encountered in the great majority of cases. Their general number is two; but these are occasionally united, so as to form a single mass, and make the animal appear, at first sight, as if it had but a single eye. This peculiarity of organization can even be followed in the *Daphniæ* [BRANCHIOPODA], in the embryo of which the eyes are first seen isolated; with the progress of the development, however, they are observed gradually to approach each other, and finally to become united. *Stemmata* are always immoveable and sessile; the *compound eyes* with *smooth corneæ*, however, although in the majority of cases they present the same disposition, now and then occur moveable: sometimes they are supported by a pedicle, moveable in like manner and provided with special muscles. The eyes with facets present the same modifications, and even supply important characters in classifying these animals: thus in the *Edriophthalmia* the eyes are always immoveable and sessile, whilst in the *Decapoda* and *Stomapoda* they are supported upon moveable stems of very various lengths, and which every consideration leads us to view as limbs or appendages of the first cephalic ring. It sometimes even happens that in these animals, between the outer edge of the carapace and the base of the antennæ, there occurs a furrow or cavity, within which the eyes may be withdrawn or laid flat, so as to be out of the way of injury; this groove or cavity is generally spoken of under the name of the orbit.' (*Cyclo. of Anat. and Phys.*)

In some of the forms (*Maia* for instance) there is a fringe of hairs on the inner side of the orbit, so placed as to perform the office of a brush in wiping the eye when brought into contact with it.

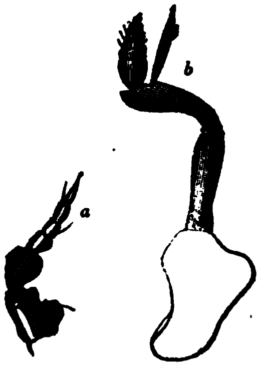
Hearing.—A cavity full of fluid, supplied with a nerve fitted for the perception of impulses of sound, forms the basis of the auditory system in the crustacea. This apparatus is assisted by certain organs, elastic membranes, and rigid stems for instance, organized so as to vibrate under the action of sonorous undulations, or to assist such vibration. The long rigid stem formed by the antennæ of the second pair assists in this function, and, according to the highly interesting experiments of M. Savart, the addition of such a rigid stem renders certain vibrations appreciable, which, without such a conductor, would be imperceptible. In many of the forms (*Maia* for instance) there is an *ossiculum auditus*.

In the museum of the College of Surgeons (Gallery, No. 1559 A) is a Hermit Crab (*Pagurus Miles*, Oliv.), prepared by Mr. Owen to show the organ of hearing, which is composed of a simple vestibular cavity situated at the under part of the basal joint of the external antennæ. The cavity is surrounded by a dense crustaceous substance, except at the internal opening, where the auditory filament of the antennal nerve penetrates it, and at the opposite side, where an elliptical opening or fenestra is left, which is closed by the acoustic membrane: the membranes of sound affect this membrane, and are transmitted to the nerve, which is exposed on the left side. (Owen., *Cat. of Physiolog.*, series., vol. iii., part 1).

Smell.—Every lobster-pot that is baited on our coasts affords evidence that the Crustaceans are endued with the sense of smelling, but where the organ is seated is doubtful. M. de Blainville placed it in the antennæ, where it certainly does not reside, according to M. Milne Edwards, who further states that the opinion of M. Rosenthal, who ascribes the function to a cavity which he discovered at the base of the first pair of antennæ, requires to be supported by direct experiment.

Taste.—Though the crustacea have no true tongue, their selection of food and the preference exercised by them, show that they are gifted with the sense of taste or a sense analogous to it. The seat of the faculty is most probably that portion of the tegumentary membrane that lines the inside of the mouth and œsophagus.

Touch.—The crust more or less calcarious with which the crustacea are covered forms a medium not calculated to convey external impressions of any delicacy. 'Nevertheless,' says M. Milne Edwards, 'in front of the head there are certain special organs which all the observations I have had an opportunity of making upon the organization of these animals lead me to regard as parts more particularly destined to be the seat of the sense of touch. These organs are the antennæ—those slender filaments possessed of a great degree of flexibility, of motility, and of sensibility. M. de Blainville was led to regard these organs as the seat of the sense of smell: but direct and conclusive experiment has satisfied us that the destruction of the antennæ has no influence whatever on the exercise of the sense of smell: and we are, on the same grounds, induced to believe them destined to the exercise of the sense of touch of considerable delicacy, unless we would imagine them as the instruments of some quite peculiar sense, the existence of which would be purely hypothetical. The number and disposition of these organs varies extremely. Some of the crustaceans at the very bottom of the series are wholly without antennæ, or are furnished with them in a merely rudimentary state. Some species have no more than a single pair; the normal number however is two pairs. In speaking of the tegumentary skeleton we have said to which of the rings these appendages belong; we shall only say further here, that they may be inserted on the superior or inferior surface of the head according to the respective development of the different pieces of which this segment is composed. They do not differ less widely in their form and composition, and under this double point of view present modifications analogous to those which we have specified as occurring in the extremities.'



a, right external antenna of Thelphusa fluviatilis; *b*, right antenna of the same. (Desmarest.)

Organs of Reproduction.

In the whole class the sexual organs are separate, that is, they never co-exist in the same individual, and the reproduction is oviparous. The apparatus is double, each branch being distinct, and in some cases, completely independent of its opposite. The celebrated hermaphrodite lobster (*Phil. Trans.*, 1730, p. 290), presented a different sexual organ on each side, and both the male and female portion were complete. In the more perfect crustacea the analogy between the male and female organs is so great as frequently to deceive the observer at first sight.

Male Organs.—Our limits do not permit us to enter into a detail of all the phases of this part of the organization in the crustacea, and we therefore select the *common crab*, not only on account of the facilities which it presents to the inquirer, but because the apparatus, especially in the season of activity, is so distinct and so highly developed. The testis is grape-like, the cluster consisting of four principal lobes, formed of numerous worm-like delicate canals, convoluted into pellets. The first portion is placed in the front of the thorax and terminated in a large coiled-up vessel situated on the side of the stomach; behind, and connected with it, is the deferent vessel, a convoluted canal of some size and of a milky colour. It is twisted about the thorax, and at last penetrates the cell of the last pair of limbs, opening outwardly on the basilar piece, the situation generally assigned to the aperture in the crustacea. 'In the ordinary state,' says M. Milne Edwards, 'the excretory canal terminates on the edges of the opening, but at the instant of sexual intercourse the extremity of the canal undergoes a kind of erection, and by becoming folded upon itself, like the finger of a glove, projects externally, so as to form a kind of penis adequate to the intromission of the fecundating fluid. This latter circumstance was long unknown to naturalists, who were accustomed to look upon the members of the first and second abdominal rings as the external male instruments. These two pairs of extremities, in fact, are distinguished from the rest by their shape, which is styliform, and their structure, which is tubular, being composed of two horny laminæ convoluted one upon another, the first including the second. But direct observation has deprived them of all claim to be considered as fulfilling any office of so much consequence in the economy of the crustacea as that of conveying the fecundating fluid from the body of the male into that of the female. At the most they can only be regarded as organs of excitation, and which the animal may perhaps employ at the same time to guide the male into the female organ.

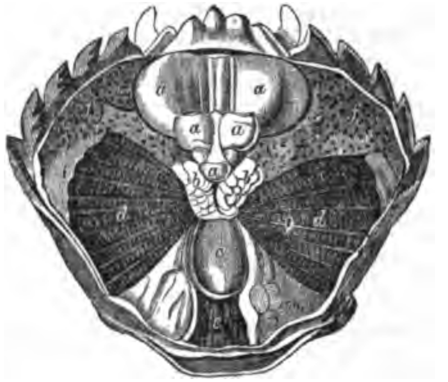
'The female reproductive apparatus of the crustacea in the highest state of complication, consists of an *ovary*, an *oviduct*, and *copulatory pouches*. The ovaries in the Decapoda brachyura resemble four cylindrical tubes placed longitudinally in the thorax, and divided into two symmetrical pairs, each opening into a distinct oviduct, yet communicating with one another by a transverse canal, and by the intimate union of the two posterior tubes in a portion of their length. The oviducts as well as the ovaries are of a whitish colour; they are short, and become united in their course to a kind of sac, the neck of which extends to the exterior of the animal's body; there is one of these on each side, and they are known by the name of the *copulatory pouches*. It is into these reservoirs that the male pours the fecundating fluid which is here stored up and applied to the ova as they pass in succession along and out of the oviducts. These, after a course which is never long, terminate at the vulvæ, openings formed in the sternal pieces of the segment which supports the third pair of ambulatory extremities.

'The *Anomoura* and Macroura have no copulatory pouches, and their vulvæ are situated on the basilar joint of the ambulatory extremities of the third pair. The mode in which fecundation is accomplished in these genera, is consequently much less apparent than in the Brachyura. Many writers are of opinion that this operation takes place in the interior of the ovaries, a process that appears by no means feasible on account of the inequality of development of the ova, which is such that the last of them are not in being even long after the first have been expelled. It would perhaps be more correct to suppose that fecundation does not take place till after the ova are laid, which we know to be the case among the *Batrachia* and the greater number of fishes.

'The female crustacean does not abandon her eggs after their extrusion. Those of the Decapods preserve them under their abdomen by means of the abdominal extremities modified in their structure. The Edriophthalmia again keep them under their thorax by means of the flabelliform appendages of the extremities belonging to the region; whilst the inferior genera, such as the Entomostraca, &c. have suspended to the external orifices either horny tubes or a pair of membranous sacs which contain and transport them from place to place. These varieties in the accessory organs of generation are, in many cases, sufficient to distinguish the sexes: thus, among the Decapoda brachyura, the females are known at a glance by their wider abdomen, which is sometimes of such dimensions as to cover the whole sternum. Sometimes these sexual organs extend to the antennæ and to various other organs; sometimes it even influences the size, and occasionally, as we have said, the general external conformation is modified to such a degree, that the male and the female of one and the same species have been taken as types of two distinct genera.'

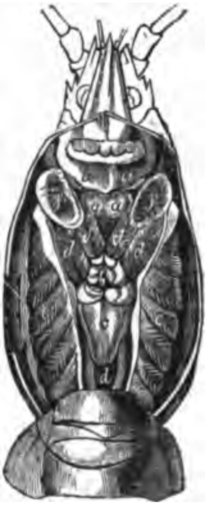
The progress and incubation of the ovum, though a subject of the highest interest, would, if detailed, occupy more space than can be allotted to the department which now occupies our attention, and we must content ourselves with stating that the majority of the class do not make their exit from the egg till the whole of the organs necessary to their condition are developed, and till their form presents but slight differences from that which is presented by the adult animal. But it is otherwise in many of the crustaceans, especially those of the lower class, which may be said to be born prematurely, and then have to pass through a series of changes which have been properly termed metamorphoses before they reach their final shape. M. Milne Edwards observes that these changes, whatever their amount, depend on the following circumstances:—1st. The continuation of the normal work of development. 2nd. The unequal growth of different parts of the body; and, 3rd. The atrophy and complete ultimate disappearance of certain parts.

The following cut will convey some idea of the relative position of the parts in the carapace, and that of Thelphusa fluviatilis (p. 189) of the relative external position of the organs alluded to.



[Carcinus mænas, open.]

a, a, a, a a, stomach · *b, b,* genital organs *c* heart *d, d,* branchiæ; *e, f, f,* liver.



[Astacus fluviatilis, open.]

a, a, a, a, stomach; *b,* genital organs; *c,* heart; *d, d, d, d, d,* liver; *e, e,* branchiæ; *f, f,* muscles of the mandibles.

Geographical Distribution.—The class is most widely distributed, and the form seems adapted for every climate.

Place in the Animal Series.—The insects and arachnidans are the forms to which the crustaceans bear the greatest relations.

Systematic Arrangement.

Almost every writer on this interesting class of animals has embodied his own views in their classification. Among the principal zoologists who have written on the subject, the names of Cuvier, Desmarest, Latreille and Leach, will, with many others, occur to the observer. We select the arrangement of M. Milne Edwards, because it is founded on anatomical investigation, and on actual experiment made in a great many instances by himself and M. Audouin.

M. Milne Edwards, then, makes the Crustacea to consist of two great divisions.

1st. Of those which have the mouth furnished with a certain number of organs, destined in an especial manner to the prehension or division of the food.

2nd. Those which have the mouth unfurnished with special prehensile or masticatory organs, but surrounded by ambulatory extremities, the bases of which perform the part of jaws. We shall take this second division first because it contains but one order, viz., the XYPHOSURA (Xiphosura). Example, *Limulus.*

But it is to the first division that the great mass of the crustaceans belong, and these are subdivided into two great groups.

1st. The MAXILLOSA or MANDIBULATA, which possess a mouth armed with jaws, &c.

2nd. The EDENTATA or HAUSTELLATA, whose mouth is prolonged in the shape of a sucker.

The MAXILLOSA are separated into four great sections.

I.

PODOPHTHALMIA.

These almost always possess true *branchiæ*, pedunculated and moveable *eyes; feet* or *extremities* vergiform, partly prehensile, partly ambulatory; and a thorax covered by a carapace.

The *Podophthalmia* contain two orders, the *Decapoda* and *Stomapoda.*

1st. DECAPODA, whose branchiæ are fixed to the sides of the thorax, and are inclosed in special respiratory cavities. The oral apparatus is composed of six pairs of members. There are five pairs of thoracic extremities, which are generally ambulatory. The DECAPODA are divided into 1st, the *Brachyura* (Cancer, Portunus, Grapsus, &c., &c.); 2nd, the *Anomoura* (Dromia, Ranina, Pagurus, &c., &c.); 3rd, the *Macroura* (Astacus, Scyllarus, Palæmon, &c., &c.).

2nd. STOMAPODA, whose branchiæ are external; sometimes rudimentary or none. Oral apparatus composed in general of three pairs of members. Thoracic extremities prehensile or for swimming; generally six or eight pairs. (Mysis, Phyllosoma, Squilla, &c., &c.)

II.

EDRIOPHTHALMIA.

True branchiæ none, but replaced by certain portions of the extremities modified *ad hoc* in their structure; eyes sessile; thoracic extremies ambulatory, almost always consisting of seven pairs; no carapace. The *Edriophthalmia* contain three orders, viz., the *Amphipoda,* the *Læmodipoda,* and the *Isopoda.*

1st. AMPHIPODA. These have the *palpi* of the thoracic extremities vesicular, and subserving respiration. The *abdomen* is very much developed, subserving locomotion, and is furnished with six pairs of limbs, the three first of which differ in form and use from the three last. (Gammarus, Talitra, &c., &c.)

2nd. LÆMODIPODA. Abdomen rudimentary. Palpi of the thoracic extremities vesicular and subserving respiration. (Proto, Caprella, &c.)

3rd. ISOPODA. Abdominal extremities well developed; the five first pairs lamellar and subserving respiration. Abdomen well developed. (Idotea, Spheroma, &c., &c.)

III.

BRANCHIOPODA.

No true *branchiæ,* but thoracic extremities lamellar, membranous, and so formed as to be subservient to respiration. The *Branchiopoda* contain two orders, *Phyllopoda* and *Cladocera.*

1st. PHYLLOPODA. No bivalve, shell-like covering. Extremities natatory, and in considerable numbers (from 8 to 22). (Branchipus, Limnadius, &c., &c.)

2nd. CLADOCERA. Carapace in form of a bivalve-shell. Thoracic members five pairs. (Daphnia, &c.)

IV.

ENTOMOSTRACA.

No *branchiæ,* nor any modification of organ apparent to supply the place of these. Eyes sessile, and commonly united into a single mass. The *Entomostraca* contain two orders, viz., the *Copepoda* and *Ostrapoda.*

1st. COPEPODA. Body divided into distinct rings, neither carapace nor valvular envelope. Thoracic and oral members in considerable numbers. (Cyclops, Pontia, &c.)

2nd. OSTRAPODA. Body without very evident annuladivisions, and entirely inclosed under a large dorsal shield having the form of a bivalve-shell. Extremities in very small number. (Cypris, &c.)

2. Edentata

The **Edentata** contain three orders, viz., the *Araneiformes*, the *Siphonostomata*, and the *Lernæiformes*.

1st. **Araneiformes.** Extremities rod-like, long, adapted for walking. (Pycnogonon, Nymphon.)

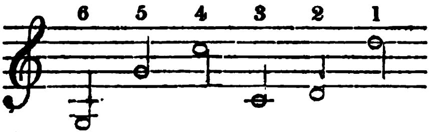
2nd. **Siphonostomata.** Extremities not adapted for walking; partly lamellar, partly prehensile. (Caligus, Dichelestion, &c.)

3rd. **Lernæiformes.** Extremities rudimentary, body presenting anormal forms (Lernæa, &c.)

Fossil Crustacea.

Crustacea occur in a fossil state throughout the series of fossiliferous beds. One form now extinct appears to have been among the earliest of the created beings whose remains have been preserved to us. The Trilobitic type is to be traced from the oldest fossiliferous strata to the coal-measures; and the Decapoda have been found below the chalk, in the chalk, and in some of the most recent deposits. Even the branchiæ and eyes of some of these fossil crustaceans are in a high state of preservation. The details of this part of the subject will be found under the heads treating of the families and genera noticed in this work whose organic remains have been discovered.

CRUTH, or CRWTH, a musical instrument of the violin kind, formerly much used in Wales. Sir John Hawkins says that 'it somewhat resembles a violin, twenty-two inches in length and an inch and a half in thickness. It has six strings, supported by a bridge, and is played on by a bow. . . . . . . The bridge is not placed at right angles to the sides of this instrument, but in an oblique direction, and one of the feet passes through one of the sound holes, and rests on the inside of the back.' The four first strings are placed as in the violin, but the fifth and sixth, which are an inch longer than the others, are fixed to the upper part of the instrument in the manner of the arch-lute [Lute], and unconnected with the finger-board. According to the same writer the notes of the Cruth were these:—



from which we are led to suppose that the strings were struck in pairs—two at a time.

The word Cruth was corrupted in pronunciation into *crowd;* hence a performer on the instrument was called a crowder. Butler, in *Hudibras,* names his fiddler *Crowdero.* (Hawkins' *Hist.*, vol. ii.)

CRUX, a southern constellation formed out of Halley's observations, by Augustin Royer, in his maps, published in 1679. It is situated close to the hinder legs and under the body of Centaurus.

Character.	No. in Catalogue of		Magnitude.
	La Caille. Fallows.	Astron. Society.	
η	1060 C	1394	4½
δ	1070 C	1406	3
ε	1076 C	1421	4
α^2	1082 C	1427	1
γ	1088 C	1439	2½
β	1107 C	1473	2
α^1	139 Fa.	1426	4

CRUZ, SANTA. [Santa Cruz.]

CRUZ, VERA. [Vera Cruz.]

CRYOLITE. This mineral is a fluate of soda and alumina; it is of a white colour, or reddish, or yellowish-brown, and its streak is white. It occurs in crystalline masses, but its primary form has not been observed; its cleavage is parallel to the terminal and lateral planes of a rectangular prism. Its specific gravity is from 2·94 to 2·963. It is not so hard as fluor spar, is translucent, and by immersion in water becomes transparent. It fuses by the blowpipe into a transparent globule, which becomes opaque on cooling.

It is found at Arksut-fiord, in West Greenland. According to the analysis of Vauquelin it consists of—

Fluoric acid and water .	47
Soda	32
Alumina . . .	21
	100

CRYPSIRI'NA. [Temia.]

CRYPT, a low-vaulted chamber, the vaulting of which is supported on columns, and the basement walls of a church or cathedral. Crypts are usually without windows, and when seen by torch-light their simple and massive architecture has a gloomy appearance. Some crypts have become the receptacle of the monuments of the dead, as at the abbey of St. Denis. Crypts are far from being common to all churches and cathedrals. There are some interesting views of crypts in Dugdale's 'Monasticon.'

CRYPTOCE'PHALUS (Geoffroy), a genus of Coleopterous insects of the section Cyclica, and family Chrysomelidæ. Technical characters:—antennæ filiform, nearly as long as the body; palpi with the joints nearly of equal thickness; head deeply inserted into the thorax, small and vertical; thorax nearly as broad as the elytra; body short and cylindrical.

Upwards of twenty species of this genus are found in this country; the most abundant species is *Cryptocephalus sericeus:* this little beetle is of a brilliant golden green colour, and about a quarter of an inch in length; it is found during the month of July in the flowers of the Hieracium and similar plants.

Cryptocephalus Lineola is about the same size as the last, and is found on oak trees, hazels, &c.; it is black and glossy; the elytra are red, and have an oblong dash in the middle, and the suture and outer margin black.

CRYPTOCONCHUS, a name given by some zoologists to those *Chitonidæ* whose shelly plates are entirely hidden by the investing border. [Chitons; and *Zool. Journal,* vol. v., p. 28.]

CRYPTOGA'MIA, the twenty-fourth class of the Linnæan system of plants. It includes all those genera the flowers of which are either altogether absent or formed upon a plan different from that of ordinary plants. Ferns, mosses, lichens, algæ, fungi, with their immediate allies, form the class, which is the same as the Acotyledons of Jussieu, and the Cellulares of De Candolle.

CRY'PTONYX. [Tetraonidæ.]

CRYPTO'PHAGUS (Herbst), a genus of Coleopterous insects of the family Engidæ. They are minute beetles, which are found in fungi and in flowers, and some of the species are common in damp cellars.

The Cryptophagi are seldom more than an eighth of an inch in length, generally of a pale brown colour, and more or less pubescent. They have the antennæ rather thick and eleven-jointed; the basal joint is thicker than the seven following, and the three apical joints form an elongated knob; the terminal joint is somewhat conical, and the two preceding joints are cup-shaped; the head is nearly triangular, inserted into the thorax as far back as the eyes; the thorax is nearly square, and the lateral margins are more or less denticulated; they usually exhibit an obtuse tooth-like process in the middle; the elytra are elongate; the sides are generally straight and parallel, or nearly so, and the apex is rounded.

About sixteen species have been found in this country. *Cryptophagus bituberculatus* is sometimes abundant in puff-balls, and probably inhabits other fungi.

CRYPTOPROCTA. [Viverridæ.]

CRYPTORHY'NCHIDES (Schoenheer), a family of Coleopterous insects (section Rhynchophora), the species of which are chiefly distinguished by their possessing a groove in the chest into which the rostrum is received when at rest.

This family contains upwards of twenty genera, of which the genus *Cryptorhynchus* may be considered as the type. The characters of this genus are:—antennæ twelve-jointed, short, funiculus seven-jointed; the first joint rather longer than the rest; club oval or oblong-oval; rostrum moderate, rather arched; thorax often broader than long, narrower towards the apex, and furnished with tufts on the anterior part; elytra somewhat ovate, covering the abdomen; scatellum distinct; legs moderate, femora often armed with a spine beneath.

Of this genus upwards of ninety species are known, only one of which inhabits England—*Cryptorhynchus Lapathi*. This beetle is less than half an inch in length, and of a dull brownish-black colour; the thorax is whitish at the sides, and is furnished on the upper part with five black tufts, two on the anterior part near the eyes, and three in a line a little behind these, one in the middle of the thorax, and one on each side; the elytra are brown-white at the base, and white at the apex, and are studded with numerous black tubercles.

C. Lapathi is found on willows, and is sometimes tolerably abundant in osier-beds in the south of England: when touched, like most of its tribe, it contracts its legs and falls to the ground.

CRYPTO'STOMA. [Chismobranchiata, vol. vii. p. 94.]

CRYPTU'RUS. [Tinamou.]

CRYSTALLINE LENS. [Eye.]

CRYSTALLO'GRAPHY, or the doctrine of the relations of crystalline forms, is in strictness an application of solid geometry; but it is practically allied to mineralogy, and may also be regarded as a subsidiary department of that science.

Minerals occur very generally in the state of crystals, that is, in certain definite and symmetrical forms, and these are regarded as crystals whether they are transparent or opaque.

A solid figure, of the shape of a common die, used in games of chance, frequently occurs among minerals, and is then termed a *cube* or *cubic* crystal.

If the corners of this cube were to be cut off, so as to take away equal portions of the three adjacent edges, a new figure would be produced, which is said to be *derived* from the cube.

If the edges were to be all cut off, so as to produce new surfaces, making equal angles with the adjacent sides of the cube, another *derived* form would result. In these cases the cube would be deemed the *primary* form, and the derived figures *secondary* forms of the cube.

Minerals are very generally known by their primary forms: but as these are of different kinds, and as natural crystals are very generally found in secondary forms, from which the primary is to be inferred, a knowledge of the exact relations of the primary and secondary forms is requisite, to enable the mineralogist to determine the primary from the secondary, and hence to arrive at a knowledge of the mineral to which any given crystal belongs.

Our subject may therefore be considered under three heads, viz.:—

Primary forms,

Secondary forms,

The laws of derivation, or the mutual relations of the secondary and primary.

To which we propose to add some account of the nature of crystallization, and of the manner in which natural crystals may be supposed to have been produced.

We must however premise a few definitions.

What we have called the *corners* of the cube will be termed its *solid angles*, and so of the corners or points of all other figures.

A solid angle or edge cut off so as to produce a new surface, or *plane* as it is termed, is said to be *truncated*.

The series of forms resulting from each of the primary forms constitutes a peculiar *system of crystallization*; there are, consequently, as many different systems as there are different kinds of primary forms.

A *prism* is a solid figure, having any number of sides with parallel edges, and its two ends parallel.

A *right prism* is one which stands upright when placed on a table; if it overhangs the base in the direction of an edge or diagonal it is termed *oblique*, and if an oblique prism is again oblique in the direction of a second edge or diagonal it is *doubly oblique*. The bases of doubly oblique prisms are usually oblique-angled parallelograms.

The edges of the sides, and the side planes of a prism, are termed *lateral*, and those of the ends *terminal* edges and planes.

1. *Primary forms.*

These are in some degree arbitrarily assumed, as it appears from the three following figures, showing the relation between the cubes and angular octahedron.

Fig. 1 is a cube.

Fig. 2, a cube, with its solid angles truncated.

Fig. 3, an eight-sided figure or octahedron, which is produced when the solid angles are so deeply truncated to obliterate all the faces of the cube.

Fig. 1

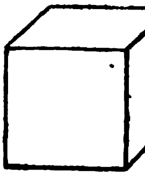


Fig. 2.

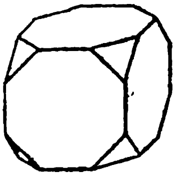
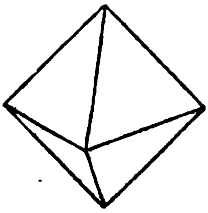


Fig. 3.



Now it is, mathematically speaking, indifferent whether we take the cube or the octahedron as the primary form of all the derived figures of this system of crystallization, for it may be readily perceived, from an attentive comparison of the above figures, that new planes which might be produced on the octahedron by the truncation of its solid angles, would correspond *in position* with the faces of the cube, and those which would result from the truncation of its edges would correspond *in position* with those which would result from the truncation of the edges of the cube. The cube might therefore be regarded as the secondary form of the octahedron, arising from the truncation of its six solid angles. Relations of the same nature subsist among the original and derived figures belonging to each kind of the primary forms, except the rhomboid. The reason for preferring the one or the other of these as the primary will be considered when we treat of the relations of the different forms of crystals.

We have, for reasons which we shall then state, assume the following figures as the primary or fundamental forms of all known crystals.

The cube, *fig.* 1.

The square prism, in which, supposing the base of this prism to be of the same dimensions as a side of a given cube, and this and the cube to be both standing on a table, the upright edges would be longer or shorter than those of the cube.

A right rhombic prism, *fig.* 4.

An oblique rhombic prism, *fig.* 5.

A doubly-oblique prism, *fig.* 6.

A rhomboid or rhombohedron, *fig.* 7

Fig. 4.

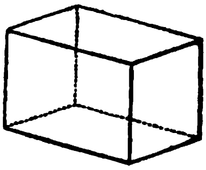


Fig. 5.

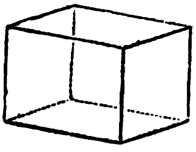


Fig. 6.

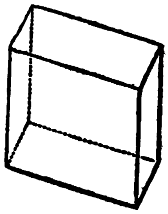
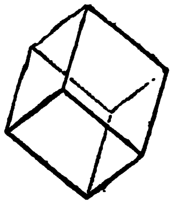


Fig. 7



The cube being bounded by six equal square planes, the minerals which assume this form are not distinguishable by the figure of their crystals; but minerals which occur under the other forms may generally be distinguished as follows:—

Those which can be referred to square prisms, by the different proportions which, in each particular case, the lateral edges bear to the terminal edges; and those which belong to the other prisms and to the rhomboid, by the angles at which their planes intersect each other. The ratios of the edges of square prisms may be determined by known algebraical formulæ from the angular measurement of some of the secondary forms, and the angles at which the planes of the other forms meet, may, in many cases, be ascertained by measurement with an instrument called a **Goniometer**, but in others they must be deduced mathematically from some of their respective secondary forms. The treatise on Crystallography in the 'Encyclopedia Metropolitana' will supply the reader with the formulæ applicable to these purposes.

These six primary forms stand in certain relations to each other, which it may not be useless to point out. If the lateral edges of the cube be supposed to be longer or shorter than the terminal edges, a square prism, as we have already seen, would be produced; if two opposite lateral edges of a square prism could be pressed towards each other, the parallelism being kept, a right rhombic prism would be formed; if this prism could be pressed in the direction of either of the diagonals of its terminal plane, so as to make the figure overhang the base in that direction, an oblique rhombic prism would be represented; and if again pressed in the direction of the other diagonal, so that it should overhang the base in both directions, a doubly-oblique prism would be formed. If we suppose a cube to be made to stand on one of its solid angles by placing the fingers on an opposite one, and if, while held in this position, the two solid angles could be pressed nearer together or drawn further apart, the altered cube would become a rhomboid.

2. *Secondary forms.*

These might be produced, and are most conveniently described, by supposed truncations of the solid angles or edges of any of the preceding forms; but as in nature the most minute crystals appear in the shape of secondary forms, it is to be inferred that these modifications of the primary are occasioned by some natural influence operating upon the first germ of the crystal, and continuing during the period of its increase in size.

Secondary crystals are sometimes altered from the primary only by single sets of planes replacing some of the solid angles or edges; in other cases both the solid angles and edges are replaced by planes in the same secondary crystal; and in others, several different sets of planes appear replacing the solid angles and edges of the same crystals, and producing very numerous and complicated secondary forms. Thus it occurs that the solid angles of the cube are sometimes replaced by three and sometimes by six symmetrical planes, of which several sets may occur on the same crystal, and perhaps with other planes replacing the edges. Similar changes of figure may also occur on each of the other kinds of the primary forms, thus producing the different systems of crystallization before referred to.

The number of known secondary forms belonging to each system is already very great; in one mineral, carbonate of lime, they amount to many hundreds; but thousands and tens of thousands more might occur under the operation of only a few of the laws of which we shall afterwards treat.

Among the secondary forms of crystals there are some which differ in their characters from those already described. Let us suppose two diagonal lines to be drawn through opposite angles, and crossing each other on the faces of the cube. It may be observed, by referring to *fig.* 2, that the solid angles at the extremities of all these diagonals are truncated to produce the octahedron; but it sometimes happens that the solid angles at the extremities of only one of those diagonals on one plane, and a transverse diagonal on a parallel plane, are truncated, producing a four instead of an eight-sided secondary figure; these are termed *hemi* forms, from their presenting only half the number of planes which might be expected from the symmetry of the primary crystal. These *defective* figures, as they may be termed, from their wanting the number of faces which might be expected on the crystal, are frequently troublesome to the mineralogist, and occasionally mislead him; but there is another, of a much more capricious deviation from the regularity of the simple forms, which is still more troublesome than the preceding; these are what have been termed *hemitrope* and *twin* crystals. In twin crystals the two individuals are united in such a manner that if one of them be made to describe a half-revolution round an axis perpendicular to a plane, which is either a face of one of the crystals or which might be one in virtue of the laws of crystallography, it comes into the position of the other.

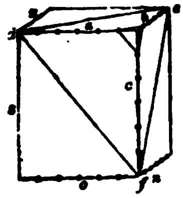
Twin crystals are produced by the union of two or more crystals according to some regular plan, so that if any number of twin crystals of the same kind of mineral should be found, they would be fashioned in the same manner. Hence these apparently capricious composite figures are subject to definite laws, and are not the results of merely accidental aggregation. There are also two other classes of irregular forms of crystals, one of which, termed by Haüy *epigene*, occurs where a crystallized mineral has undergone a chemical change without disintegration or suffering any change of figure; the form in the altered state of the mineral not being proper to the new substance, but remaining that of the original body.

The other class, termed *pseudomorphous*, appears as if they had been produced in moulds resulting from the destruction of crystals of other substances which had been inclosed or embedded in them, and which moulds being filled with some new kind of mineral, the new and intrusive matter assumes the form of the originally inclosed body, and one altogether foreign to its proper shape. Tables of the secondary forms of crystals will be found in the article 'Crystallography' already referred to, and a copious illustration of composite crystals may be seen in the 'Edinburgh Journal of Science,' vols. i. and ii.

The secondary forms of crystals are not derived from the primary by accidental and indefinite truncations of the solid angles and edges, but according to known and definite laws, so that all the possible alterations of figure which any given primary form can undergo, might be determined *à priori* if the extreme limits of the relative proportions of the edges considered to be cut off in producing new planes were known. Within well ascertained limits, however, many thousands of possible secondary form, belonging to each kind of primary, might be determined with absolute precision.

The laws according to which any secondary planes are produced are termed the laws of those planes. To illustrate the nature of these laws, let *fig.* 8 represent a square prism, whose edges *a b c* are each divided into any equa number of parts, which parts are consequently proportional to the respective edges. Now a new plane, which should cut off one proportion from each of the edges *a b c*, would evidently be parallel to the plane *d e f*, whose edges would coincide with diagonals of the primary planes. It would carry us beyond the limit to which we must restrict this paper, if we were to enter upon a geometrical consideration of these lines, and we shall therefore confine ourselves to this statement, that if on any square prism we find a set of planes truncating its solid angles, and if we assume the edges of these planes to be respectively parallel to the diagonals of the primary planes, the ratio or comparative lengths of the edges *a* and *c* may be found, and thus the distinction between prisms of different heights belonging to different minerals may be ascertained. Crystals belonging to the other primary forms may generally be distinguished, as we have already stated, by measurement of the angles at which the planes severally incline to each other. But in order to investigate the laws of their respective secondary planes, we require to know the comparative lengths of the lateral and terminal edges, which may be found by means analogous to those we have just described. The rhomboid however, whose edges, like those of the cube, are all equal does not require this preliminary investigation, but the laws of new planes may be determined from measurement alone

Fig. 8.

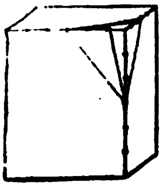


When a plane similar to that shown in *fig.* 8 occurs on one solid angle of a crystal, it generally occurs on all the others, establishing what Haüy has termed the *law of symmetry*. But, as we have before stated in reference to the cube, this law is occasionally deviated from by the production of only one-half the symmetrical number of secondary planes on a square prism. This remark also applies to such other kinds of secondary planes as we now proceed to describe.

Besides the plane shown in *fig.* 8, there are *three* other kinds affecting the solid angles.

First, such as would cut off one, two, three or more portions of the edges *a* and *b*, but at the same time some other number from the edge *c*. Thus if one portion be cut from *a* and one from *b*, there will be two, three, four, or some other number cut from *c*; or if three portions were cut from *a* and three from *b*, either one, two, four, five, or some other number would be cut from *c*, so that a numerous series of planes of this nature might occur on each solid angle.

The *second* kind of planes are those which would cut off an equal number of parts from *a* and *c*, but a different number from *b*. But in this case there would be two planes on each solid angle, for if we suppose one plane to cut three parts from *a*, and three from *c*, and two from *b*, a second plane would also be produced, cutting three parts from *b* and *c*, and two from *a*, producing two planes similar to those in *Fig.* 9.



Each of the series of planes of the first kind would have an edge parallel to the diagonal *d e*, *fig.* 8; and each of those of the second kind would have edges parallel to the diagonals *d f* and *e f* of the same figure. The planes of the *third* class also occur in pairs, and are such as would be produced by cutting off dissimilar numbers of parts from the three edges, such as two parts from *a*, three from *b*, and four from *c*, none of the edges of these new planes being parallel to any diagonal.

The secondary planes on the terminal edges may cut off any number of parts from the edges *r* and *b*, and the same or any other number from *s* and *c*. Those on the *lateral edges*, if they cut unequal portions from *a* and *o*, and *b* and *n*, will be found to occur in pairs. Single planes on the lateral edges are such as would result from cutting *a* and *o*, and *b* and *n* equally; and the secondary planes on the other primary forms are produced by laws analogous to those we have just described.

The reasons for preferring prisms to octahedrons for the primary forms may be thus briefly stated.

We have already seen that the octahedron derived from the cube might be taken as the fundamental or primary figure of that system of crystallization. An octahedron derived from the truncation of the upper and lower edges of the square prism, or of its solid angles, by planes which would intersect the terminal planes parallel to their diagonals, might be assumed as the primary form of this system; and octahedrons similarly derived from the other prisms might also be regarded as the primaries of their respective systems. And these figures have accordingly been adopted by Möhs as the fundamental forms of his system of crystallography. From the greater simplicity, however, of derivation which results from the assumption of the prisms as primary forms, and the greater mathematical facilities in determining the relations of the derived to the primary, we have been induced to retain them as the fundamental forms of our system. For the relations among these primary and their respective secondary forms are, according to our plan, dependent only upon the *proportions of the primary edges* required to be cut off to produce given secondary planes. But in taking the octahedrons as primaries, Möhs has founded the relations of these to the secondary figures upon the *relative lengths of the axes* of the derived figures, according to which view of derivation the lateral planes of the square prism would be denoted as those of an octahedron with an infinitely long axis, and the end planes as those of an octahedron with an infinitely short axis. And for all the various prisms which may occur, octahedrons must first be found, from the infinite prolongation of whose axes the given prisms may be produced. From the complexity of this method it will probably not extend far beyond the school of its highly ingenious author.

The exact relations among primary and secondary forms may be determined mathematically, sometimes from measurement and sometimes from parallelisms between certain edges of the secondary figures. And the mathematical processes may be either those of plane trigonometry, as applied by Haüy; or spherical trigonometry, as used by other authors; or analytical geometry, as applied by Mr. Whewell, in a paper in the Phil. Trans. for 1825; or by referring the planes of the crystal to the surface of a sphere, and denoting their positions stereographically, as shown in a paper by Professor Miller, of Cambridge, in the London and Edinburgh Phil. Mag. of February, 1835.

Crystallization and the circumstances under which it takes place form an interesting subject of inquiry, not only in respect of the variety of figures under which crystals present themselves, but in relation to much more comprehensive geological investigations into the formation of the early crystalline rocks and the various embedded crystallized minerals, and into the manner in which the numerous crystalline bodies found in the metallic and other veins have been produced.

From the great length of time during which these natural processes must have been in action, the slowness with which they probably have proceeded, and the hidden recesses in which they have taken place, the progress of natural crystallization can scarcely be said to have been ever observed. For the production of saline crystals at the bottom of certain lakes, and even that of iron pyrites, which are said to have been observed in a progressive state of formation, cannot be regarded as belonging to the class of phenomena we are contemplating.

Not having therefore the operation of nature open to our inspection, our only sources of information relative to the formation of crystals are those afforded by the processes of artificial crystallization, and here until very recently our experiments were circumscribed, and our views bounded by a very few modes of operation; that of the deposit of crystals from solution in some fluid; their production while gradually cooling from a state of fusion; and their volatilization by heat or otherwise. Latterly, however, by the aid of that universal agent, electricity, new methods of producing crystals have been pursued: much of the darkness in which the subject had been previously involved has been dispelled, and there can now be little doubt that all the phenomena of crystallization are governed in a greater or less degree by electric influence.

The crystallization of salts from solution in fluids generally takes place when the solutions are sufficiently evaporated, but the degree of evaporation is very different for different substances. Some salts begin to crystallize at the surface very soon after evaporation commences, and others (for example, sugar) must be evaporated to the consistence of a thick syrup before any crystals will be formed. Hot fluids will generally dissolve more matter than cold ones, and crystals are frequently produced during the cooling of the hot solution. Some soluble substances however cannot be brought to crystallize under any circumstances hitherto tried; but on the solvent evaporating, a thick pasty matter is left, which by further evaporation becomes a hard solid mass. Camphor affords an instance of the formation of crystals by volatilization. The sides of a bottle containing this body may frequently be observed incrusted with brilliant crystals.

The slags of furnaces will frequently be found to contain crystallized matter; and the common rolls of sulphur when broken will frequently present small cavities lined with thin needle-like crystals.

The later processes to which we have referred depending upon electricity, have been suggested and put in operation chiefly by Mr. Becquerel, who has by the electrical induction of chemical action effected the crystallization of mineral bodies which are wholly insoluble in any fluid which does not subject them to immediate chemical change. At the meeting of the British Association in Bristol, some experiments of the same nature were described by Mr. Fox and Mr. Cross, who it appears had been following up Mr. Becquerel's course of experiments without being aware of the extent to which they had been carried, or of the means employed by him to produce his results. Some account of these experiments will appear in one of the forthcoming London scientific journals.

CSABA, or **TSABA**, in the south-east of the county of Békes, in Hungary, one of the largest, if not the largest, village in Europe. It was built by Baron von Harruckern in 1715, and colonized with Lutheran Slowaks, who are now become identified with the native Hungarians. It is situated on the Hejo, in 46° 40′ north lat., and 21° 8′ east long. It contains a Protestant church and about 2000 houses. In 1819 the population amounted to 17,850; it has since increased to upwards of 20,000, of whom 16,700 are Lutherans, and 2700 Roman Catholics. The vicinity produces an inferior kind of wine, but very considerable quantities of grain, flax, and hemp; the grazing of cattle and sheep is carried on upon an extensive scale. The Körös flows near this village. In population it is inferior only to eight other places in the kingdom.

CSANAD, or **TSANAD**, a county of Hungary. [CHONAD.]

CSONGRA'D, a county of Hungary, nearly in the centre of that kingdom, and on each side of the Theiss. It is separated by the Marosh from the county of Toronta. Its area is about 1323 square miles; it contains 1 royal free town, Szegedin, 3 market-towns, 6 villages, and 30 extensive prædia, or privileged settlements, and has a population of 108,235 in 1825; now of about 113,000 souls, 70,060 of whom are Roman Catholics. The surface is a plain, here and there interrupted by low hills, covered with woods or vineyards; the soil is in general a black rich loam, in parts sandy or swampy. Being liable to extensive inundations, the water is not good, nor is the climate healthy. It is watered by three large rivers, the Theiss, Marosh, and Körös, besides the Kurcza, Korogy, and other minor streams. The land available for cultivation is estimated at 695,390 acres, of which about 82,800 are occupied by woods, and 176,020 by pastures; the remainder is arable land, vineyards, or gardens. It is a fine grain country, particularly for barley, maize, and oats; much flax and excellent tobacco are raised; it produces an inferior sort of wine, and maintains large flocks and herds. The Csongrád oxen are esteemed the finest in the kingdom, and there are numerous establishments for breeding horses. Swine in great numbers are fed on acorns and maize; and much wax and honey are made.

CSONGRA'D, a market-town in the north-west of the county of the same name, on a neck of land formed by the confluence of the Körös and Theiss, in 46° 43′ N. lat. and 20° 9′ E. long. It is the county-town, is well-built, and has about 13,000 inhabitants, who live chiefly on the produce of their vineyards, rearing cattle, and trading with other parts of Hungary. The old castle is fallen into complete decay.

CTENODA'CTYLA (Dejean), a genus of Coleopterous insects, of the section Geodephaga, and subsection Truncatipennes. Technical characters:—body but slightly elongated, flattened; thorax longer than broad, truncated posteriorly; terminal joint of the palpi almost oval; three basal joints of the tarsi dilated, nearly triangular or heart-shaped; claws denticulated beneath.

Dejean in his 'Catalogue des Coléoptères' only enumerates three species of this genus, all of which are from Guiana. There are however other species known. *Ctenodactyla Cheovolatii* is less than half an inch in length, of a blue-black colour above, and brown beneath: the thorax is red, and the legs and antennæ are yellowish-red.

CTENODA'CTYLUS, a genus of rodent animals of the family *Arvicolidæ*, established by Mr. Gray.

Generic Character.—Each *foot* with four toes only and an obsolete clawless wart in place of the thumb; claws small and falculated; *toes pectinated* internally, with small bony appendages. *Tail* very short and hairy. Dental formula·

$$\text{Incisors } \frac{2}{2} \quad \text{Molars } \frac{3}{3}\frac{3}{3}.\ \text{(Gray).}$$

Mr. Gray is of opinion that this subgenus appears to be most nearly allied to the Lemmings (*Lemmus*), with which it agrees in teeth and form, but differs from them in only having four free toes on each of the feet and a very obscure clawless wart in place of the thumb, and in the claws of all the feet being short and incurved, those of the hinder ones being covered with a tuft of rigid hair, more especially to be distinguished in the two inner toes, each of which also has a double, small, deeply pectinated, bony plate on its inner side. The tail is very short, scarcely longer than the fur of the back, covered with long bristly hair. The cutting teeth incurved, the lower rounded in front, the upper concavely truncated. The upper grinders are probably like the lower, which are laminar and with a two-lobed crown, the anterior lobe being transverse, narrow, round on the outer, and narrow and sharp on the inner side; the hinder, lobed, larger, and rounded, the lobe of the two anterior ones being rather wider than long, and that of the last as long as it is wide. (Gray.)

The following species is recorded by the author above quoted: *Ctenodactylus Massonii, Masson's Comb Rat.*

Description.—Fur soft, silky; upper parts fulvous brown; the hair very thin, pale lead-coloured at the base, pale fulvous at the end, with very short blackish tips, especially upon the head; chin, throat, inner side of limbs and beneath whitish, with the same lead-coloured base to the hairs. Head rather small and densely hairy; muzzle very small, black; mouth rather small; cutting teeth exposed, rounded and smooth in front, white; the whiskers very long, twice as long as the head, rigid, black, with two or three slender long bristles over the eyebrows; eyes moderate, rather nearer the ears than the end of the nose; the ears rounded, externally covered with dense short fur like the body, internally rather naked, black, with a distinct helix. Limbs short; the feet covered with shortish rather adpressed hair; the fore feet short; the toes free, the two middle ones nearly equal, the inner rather shorter, and the outer shortest of all; the claws short, subequal, incurved, black, not so long as the hinder ones; the hinder feet large with naked soles; toes free, the three inner equal, the outer rather the shortest, the two inner toes with two series of four or five bony laminæ placed side by side, forming a comb-like process, and covered with some very stiff bristly incurved hair; the tail very short, cylindrical, ending in a parcel of rather rigid black-tipped hairs. Size and shape about that of a half-grown guinea-pig. Length (stuffed specimen) from nose to base of tail, 9 inches; of the tail, 1 inch (the longest bristle extends beyond the tip); of the hind feet, 1½ inch; of the ears, $\frac{5}{12}$ of an inch. (Gray.) Locality, Cape of Good Hope.

'I am not aware,' says Mr. Gray, speaking of the comb-like appendage, 'of the same kind of process being found on the toes of any of the Mammalia. It most nearly resembles the pectinated edge of the claws of the middle toes of the feet of the Goatsuckers and Herons: it may probably be used for the same purpose to clear their coats of intruding insects, and this idea is strengthened by the fact of the two living animals in the collection of the Zoological Society, said to come from Barbary, continually scratching themselves with their hind claws. Some of the Lemmings, to which these animals are most nearly allied, are peculiar for having a very curious conformation in the claw of the index finger of the hand.'

Mr. Gray refers to two specimens in the British Museum one of which is marked in the hand-writing of his late uncle Dr. E. W. Gray. 'C. B. Spei Masson, 1744, appears to be a variation of No. 1,' which last Mr. Gray thinks is probably the other specimen in the British Museum, which is rather larger.

The species is named after Mr. Francis Masson, who was one of his majesty's gardeners, and published a paper in Phil. Trans., lxvi. (1775), giving an account of three journeys from Cape Town to the southern parts of Africa, undertaken for the discovery of new plants, towards the improvement of the Royal Botanical Garden at Kew.

The description of this curious animal is taken from Mr. Gray's 'Spicilegia Zoologica*,' where there is a figure of the species, and where the reader will find much original and valuable information illustrated by plates.

CTE'NOMYS. [MURIDÆ.]

CTENO'STOMA (Klug), a genus of Coleopterous insects, of the section Geodephaga, and family Cicindelidæ. Distinguishing characters:—the basal joints of the anterior tarsi dilated in the male sex, the third with an obliquely elongated portion on the inner side; body narrow and long; thorax long, somewhat globular in the middle, and suddenly constricted towards the base and apex; antennæ setaceous; palpi long and distinct; mentum furnished with a tooth-like process in the anterior and emarginated part.

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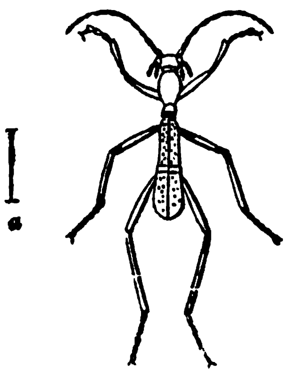
* 'Spicilegia Zoologica, or original Figures and short systematic Descriptions of new and unfigured Animals,' by John Edward Gray, F. G. S., &c. &c. part 1, 4to., London, Treüttel and Co., and W. Wood.

Ctenostoma macilentum (Klug), is about half an inch in length, and of a brassy-black colour; the elytra are distinctly punctured, and have a transverse yellowish farsia in the middle; the legs are yellowish



[Ctenostoma macilentum.]
a, denotes the natural length.

This species is from Buenos Ayres. Eight or nine other species are known, all of which inhabit South America: several are from Brazil.

Under this head may be noticed three other genera closely allied to the one just described: the genera *Therates*, *Tricondyla*, and *Colliurus*.

The species of these three genera are at once distinguished from those of Ctenostoma, by their having no tooth-like process in the emargination of the mentum. The principal characters of the genus *Therates* (Latreille) are as follows:—tarsi nearly the same in both sexes, the third joint shorter than the two basal joints, and notched at the extremity; fourth joint very short and heart-shaped; internal maxillary-palpi very small, and consisting of one joint only.

The species of this genus are of an intermediate form, between Ctenostoma and Cicindela: they are shorter and broader in proportion than those of the former, and hence approach the latter; but the thorax is of that same globular form (though short) as observed in Ctenostoma.

Only four or five species are known, and these are from Java and Guinea: their colouring is very brilliant.

Therates labiata is of a brilliant blue colour, with violet reflections; the elytra are nearly double the width of the thorax; the labrum, femora and abdomen, are of a reddish-yellow colour.

The species of the genus *Tricondyla* (Latreille) very much resemble, in form and general appearance, those of Ctenostoma; but they may be distinguished by their having the joints of the tarsi nearly equal in length, the three basal joints of the anterior tarsi of the males dilated, the third being prolonged obliquely on the inner side, and the palpi being less conspicuous from their comparatively smaller size.

Of this genus three species are known: they inhabit the islands north of Australia.

The technical characters of the genus *Colliurus* are:—fourth joint of all the tarsi prolonged on the inner side in both sexes; thorax elongate, nearly cylindrical, and constricted near the base and apex; body elongate, nearly cylindrical, broader towards the posterior part; antennæ short, slightly thickened towards the apex.

All the species of this genus as yet discovered (which amount to only four or five) are found in the southern parts of Asia, and in the islands north of New Holland.

Colliurus emarginata (Dejean), is about an inch in length, and of a dull blue colour; the elytra are coarsely punctured, and truncated at their apex; the legs are black, with the exception of the thighs, which are red.

CTE'SIAS (Κτησίας), the son of Ctesiochus, was a Greek physician and historian, who flourished about the end of the fifth century B.C. He belonged to an Asclepiad house at Cnidos, but spent seventeen years of his life at the court of Artaxerxes Mnemon. (Diodor. ii. 32.) We gather from Tzetzes (Chil. i. 1, 82), that he was taken prisoner at the battle of Cynaxa (401 B.C.), and Diodorus says, that he was raised from the situation of a captive to his post of royal physician; but it appears from Xenophon and Plutarch (*Anab.* i. 8, § 27; vit. *Artaxerxes*, c. xi.), that he was one of Artaxerxes' immediate attendants at that battle, so that of course he could not have fallen into the hands of the Persians on that occasion. It is more probable that the great estimation in which Greek physicians were held in Persia, where they had, since the time of Democedes, completely superseded the Egyptian practitioners, induced Ctesias to follow the example of some of his countrymen, and betake himself to a country where his art was so much more appreciated and so much better rewarded than in Greece. Ctesias wrote—I. Persian History, in twenty-three books, of which the first six treated of the Assyrian monarchy, and the remainder carried down the history of Persia to the year 398 B.C. (Diod. xiv. 46; and the end of the Persica in Photius.) II. Indian History, in one book. III. A Treatise on Mountains. IV. A Description of Sea-coasts. V. On the Revenues of Asia. VI. On Medicine. We have many fragments of his historical writings, especially of the Persian History, which are mainly preserved in the *Myriobiblon* of Photius: there are also fragments in Diodorus, Ælian, and other writers. Diodorus says (ii. 32), that he had access to the royal archives; but Aristotle, Plutarch, and Lucian, charge him in strong terms with inaccuracy and falsehood. The opinion of the two last-mentioned writers however is of no value. Mr. Clinton thinks that Ctesias had no intention of misrepresenting, but that his materials were not trustworthy (*Fasti Hellenici*, ii., p. 308); and an elaborate justification of his general veracity has been attempted by Bähr, in the introduction to the best edition of the remains of this author which has yet appeared. Ctesias wrote mainly in the Ionic dialect: he is much commended by Photius for the clearness and simplicity of his narrative. (*Francof. ad Mœnum*, 1824.)

CTESI'BIUS, an Alexandrian Greek who lived about B. C. 150—120, the instructor of Hero (according to Pliny), and the inventor of various hydraulic and other machines, according to Pliny, Vitruvius, Philo of Byzantium, Athenæus &c. This is all we know of Ctesibius, except that he wrote various works, which are referred to by Vitruvius, and cited (cap. 1) with those of Archimedes, where mention is made of authors on physics. A manuscript of Geodesy is said to be in the Vatican, and another entitled 'Belopoeica' in some English library (Heilbronner is authority for both, who cites Possevinus, *Bibl. Sel.*, edit. Rom., c. 8, p. 201, and the catalogue of the Cambridge library (?)). There is a life of Ctesibius by Bernardino Baldi, Aug. Vend., 1614.

Of the clepsydra we have already spoken. [CLEPSYDRA.] The remaining inventions attributed to Ctesibius are the water organ, mentioned by Pliny and Vitruvius, a pump for raising water, described by the latter, and, according to Philo of Byzantium, a machine similar in principle to the air-gun. But all these contrivances are imperfectly described, excepting only the pump, which was like what we now call a forcing-pump. The water was raised by exhaustion into a cylinder with an entering and issuing valve: it entered by means of the former, and was expelled through the latter by the descent of the piston.

CTE'SIPHON, a town of Assyria on the eastern bank of the Tigris, a little below Seleuceia, and 18 or 20 miles from the present Bagdad, was the winter residence of the kings of Parthia. (Strabo, p. 743 *c;* Tacitus, *Ann.* vi. 42.) They preferred Ctesiphon in the winter on account of the mildness of the climate: in summer they resided at Ecbatana or in Hyrcania. The town appears to have been founded by Vardanes. (Ammianus Marcellinus, xxiii. 20.) Ctesiphon was destroyed by the emperor Severus, A.C. 198. Near this place are some remains, especially the Tauk Kesra, of which a particular description is given by Ives. [BRICK WORK, p. 411.]

CTE'SIPHON, an Athenian, son of Leosthenes, of the deme Anaphlystus. He is known for a decree by which he proposed to present Demosthenes with a golden crown as a public acknowledgment of his services to the state. An accusation founded on this decree was brought against Ctesiphon by Æschines, who charged him with unconstitutional proceedings. Demosthenes replied in his celebrated oration 'on the Crown' (περὶ στεφάνου), and Ctesiphon was acquitted. The attack and the defence are both extant. The case was tried B. C. 330. (Demosthenes *on the Crown*, §§ 243, 266; Clinton, *Fast. Hel.*; ÆSCHINES; DEMOSTHENES.)

CUBA is the largest of the islands which constitute the Columbian Archipelago. The most eastern point, Cabo Maysi, is in 74° 11′, and the most western, Cabo San Antonio, 84° 58′ W. of Greenwich. Cabo de Cruz, the most southern point, is 19° 47′ 16″, and Cabo de Guanos, east of Matanzas, the most northern point, 23° 9′ 27″ N. lat.

length of the island from Cabo Maysi to Cabo San Antonio, along the curved line, is 793 miles. It is widest near the meridian of 77°, where between Punta Maternello on the northern coast, and the mouth of the Rio de la Magdalena, near the Pico Tarquino, it is 127½ miles across. Between Puerto Principe and the Havanna, which tract comprehends about four-fifths of the island, it is only 52 miles wide on an average. The western extremity is still narrower, the isthmus between the Havanna and the port of Batabano being only 28 miles across. The surface of Cuba alone, according to the latest calculations, is 42,212 square miles; and when the islands are added, which are inclosed within the numerous reefs which surround it, 43,412 square miles. Its extent is therefore about 7000 square miles less than that of England, not including Wales.

The coast-line of Cuba is above 2000 miles, but hardly one-third of it is accessible to vessels; the remainder is surrounded by banks, reefs and rocks. The coast from Cabo de Cruz to Cabo de Maysi is quite free from danger; and that from Cabo Maysi to Punta Maternello has only a few rocks. At Punta Maternello commence the numerous keys of the Old Bahama Channel, which extend for more than 300 miles to Punta de Icacos. In this part, or more precisely opposite the Cayo Cruz and Cayo Romano, the Old Bahama Channel is narrowest, being only 15 or 20 miles across. Between the keys and Cuba is an open sea, which may be navigated by small vessels. From Punta de Icacos to Bahia Honda, west of Havanna, the coast is again free from keys and rocks. To the west of Bahia Honda commences the series of shoals and rocks called Los Colorados, which extend to Cabo San Antonio. From the last-named cape to Punta de Piedras or Llana Punta, the high coast is free from shoals and rocks. But the keys and shoals commence again to the west of the Isla de Pinos, and extend to Cabo de Cruz, under the name of Jardinillos, Cayo Breton, Cayos de Las Doce Leguas, and Bancos de Buena Esperanza. Only the coast between Cochinos Bay and Puerto Casilda, near Trinidad, forms an exception, being free from banks and rocks. In the Bay of Xagua, about thirty miles east of the Jardinillos, a spring of fresh water is said to rise in the sea with such force, that boats cannot approach it without danger. It is visited by the manati. In the sea between the northern coast of Cuba and the Florida Reef, the Gulf Stream commences, but here its current is not strong, and sometimes hardly perceptible.

Only the south-eastern part of Cuba is mountainous, that which lies between Cabo de Cruz, Cabo Maysi, and the town of Holguin. This mountain group is called Sierra or Montaños del Cobre (Snake Mountains), and probably in its highest parts rises more than 7200 feet above the sea. On the southern coast the Pico Tarquino rises to a considerable height, which however has not yet been determined. From this group a chain of hills runs in a W.N.W. direction, between Puerto Principe and Villa Clara, approaching nearer to the southern, but afterwards more to the northern shores. These hills do not attain a great elevation. To the north-west of Trinidad stand the Lomas de San Juan, which terminate in peaks and needles, and rise to about 1800 feet above the sea. The elevation of the hills seems to decrease as we advance westward. To the west of the meridian of Matanzas there is only one summit that attains 1200 feet. In this part the island resembles the environs of London, its surface being slightly undulating, and rising in general only to 250 or 350 feet above the sea. Along the southern coast large tracts of low country occur. The whole space between Batabano and Xagua is nothing but a low swamp, which extends three or four miles inland.

There are no large rivers in Cuba. Some are navigable a few miles inland for small boats; others are used for irrigating the adjacent fields.

The climate of the Havanna differs considerably from that of Kingston in Jamaica, though the difference of position does not exceed five degrees. This difference however principally occurs in the cold season, when the thermometer at the Havanna nearly every year descends to 60°, and sometimes to 55°, whilst at Kingston it is never seen below 69° or 68°. The mean annual heat at the Havanna is 77°, that of the hottest month (July) 84°, and that of the coldest 70°: the thermometer rarely rises to 94°, or sinks to 55°. In the interior of the island however, thin ice is formed after the long prevalence of northerly winds, at places about 300 feet above the sea. But Cuba partakes, in some measure, of the climate of the temperate zone, which is proved by the sudden changes of the temperature, in which it, in some degree, resembles the United States. Humboldt mentions a change of 15° in the course of three hours. No snow is ever known to fall, either on the Lomas de San Juan, or on the Sierra del Cobre. Hail storms are rare; they occur only once in fifteen or twenty years, and always with south-south-westerly winds.

Hurricanes are less frequent in Cuba than in Jamaica and the other Antilles. Sometimes none occur for six or eight years. They vent their fury more on the sea than on the land, and happen, as in Jamaica, more frequently on the southern than on the northern coast. Humboldt states that they take place later in the year in Cuba than in the islands farther to the east and south. In the latter they are most frequent in August; in Cuba they occur mostly in October, never in July, but sometimes in August and September. The same writer observes, that the extremities of the long chain of islands called the Antilles are less subject to these dreadful storms than those in the middle, Tobago and Trinidad being entirely free from them, and Cuba not often experiencing their ravages. But, on the other hand, Cuba is exposed to the boisterous north winds (los nortes), which blow particularly during the cold months.

The division of rainy and dry seasons is not applicable to Cuba. No month of the year is free from rain. It seems, however, that the greatest quantity falls during May, June and July. In 1829 the quantity of rain was 48 inches, of which nearly 24 inches fell in these three months. Earthquakes frequently occur.

The aborigines who inhabited Cuba in the time of Columbus, were annihilated before the year 1560, though the Spaniards settled in this island only in 1511. The present population consists of whites, negroes, and mixed races. It amounted in 1827 to

Free people . . .		443,620
namely, whites .	337,126	
coloured .	106,494	
Slaves		286,042
		729,662

According to a more modern census (1831), it has risen to nearly 830,000 individuals. In 1775 the number was only 170,000. This population, however, is very unequally distributed over the island, nearly four-fifths of which are very thinly inhabited, especially the southern coast, except the country between Xagua and Trinidad, and that which is east of Cabo de Cruz: there are also large tracts in the interior which are only used as pasture-ground, and contain hardly more than two individuals to a square mile. The most populous portion is between the lines from Bahia Honda to Batabano, and hence to Matanzas, where nearly the half of the whole population is concentrated, and where perhaps there are 70 or 80 persons to each square mile. The following table shows the relative population of the three intendencias, and the proportion between the whites, free coloured people, and slaves.

	Square Miles.	Population in 1827.	On a sq.m.	Of every Hundred of Inhabitants.		
				Whites	Free Blacks.	Slaves
Western Int.	10,303	408,537	40	40	11	49
Central Int.	17,104	164,497	9	60	15	25
Eastern Int.	14,805	131,453	9	36	27	37
Total	42,212	704,487	17	46	18	37

The cerealia of Europe are not cultivated in any part of Cuba, and a great quantity of flour is consequently imported from the United States for the consumption of the white inhabitants. The slaves and people of colour live principally on mandioca, yams, bananas, and maize or Indian corn, with potatoes, sweet potatoes, &c. The objects raised for consumption and exportation are sugar, coffee, tobacco, cotton, cocoa, and indigo; but the three last on a very small scale. As immense tracts are not cultivated, but only used as pasture-ground, the number of cattle is very great, and hides form an article of exportation, but dry meat (tasajo) is imported from Venezuela. The surface under cultivation is supposed not to exceed one-seventeenth: the uncultiated part contains large prairies or savannas, on which the cattle pasture, but the greatest part is overgrown with large forest-trees, some of which supply excellent timber for ship-building. Gold and copper have been found in the Sierra del Cobre.

I. The *Western Intendencia* contained, in 1827, 449 plantations of sugar, 1207 of coffee, and 400,000 heads of horned cattle. It contains, besides the capital, Havanna, the towns of Guanabacoa on the other side of the Cay on which Havanna is built, with 9100 inhabitants (in 1827), and San Carlos de Matanzas, which, in 1827, contained 11,300 inhabitants. To this intendencia belongs the isla de los Pinos, more than 900 square miles in extent, with a mountain on it rising to more than 3000 feet high. It contains from 200 to 300 inhabitants; and fine forests, in which much mahogany is cut.

II. The *Central Intendencia* contained, in 1827, 246 plantations of sugar, 135 of coffee, and 605,000 head of cattle. It is the most fertile portion of the island, especially the country round the town of Santo Espiritu, and has greatly increased in population and agriculture since the ports have been opened to foreign commerce. The most populous places are inland, namely, Santa Clara, with 8500 inhabitants (in 1827), and Santo Espiritu, with 10,800. The capital Santa Maria de Puerto Principe is also at some distance from the shore, but carries on a considerable commerce by means of its port Nuevitas. It contained, in 1827, 49,000 inhabitants: it is the seat of the supreme court of justice for all the Spanish colonies in America. Besides, there is on the northern coast the harbour of San Juan de los Remedios, with 5200 inhabitants (in 1827), and on the southern, Trinidad de Cuba, with 12,500, and Fernandina de Xagua.

III. The *Eastern Intendencia* contained, in 1827, 305 plantations of sugar, 725 of coffee, and 105,000 head of cattle. Santiago de Cuba, the antient capital, has a good harbour and 26,000 inhabitants. There are also three other harbours, which are much frequented by vessels, Manzanillo, north-east of the Cabo de Cruz, Baracoa, near Cabo Mayai, and Gibara, farther west. The last is the port of Holguin, a small town in the interior.

Commerce.—In few countries has commerce increased so rapidly as in Cuba. About 1780, the exportation of its own produce amounted to little more than two millions of Spanish dollars in value: in the three years from 1831 to 1833, the average value of all goods exported had risen to between 13 and 14 millions, though in some parts a considerable smuggling trade was carried on. This increase has of late been considerable, since (in 1816) the vessels of all nations have been admitted into the ports. Though Havanna is by far the most important trading town, other places carry on a considerable commerce, as the following table shows.

PORTS.	TONNAGE OF VESSELS.			
	Inwards.		Outwards.	
	1828.	1829.	1828.	1829.
Havanna	169,889	153,834	136,259	144,487
Santiago de Cuba	33,376	31,734	32,209	24,876
Puerto Principe	4,285	5,297	3,479	5,136
Matanzas	35,523	31,331	30,151	29,770
Trinidad	18,291	18,885	17,616	17,009
Barawa	1,967	1,431	917	1,160
Gibara	1,869	2,139	1,272	2,022
Xagua	2,454	1,426	1,929	1,468
Manzanillo	8,112	3,194	5,996	2,882
	277,066	249,253	229,830	228,750

The chief articles of importation are provisions, particularly flour, rice and maize, butter, cheese, candles, and tallow, tasajo and hams, and salted fish and cod. Brandy and the wines of Spain, France, Portugal, and Germany also form a considerable branch of importation. As Cuba has no manufactures, cotton stuffs, woollen goods, linens, hardwares, and silk stuffs are imported to a large amount.

The course and amount, stated in English money, of the trade of Cuba, in the three years which ended with 1833, will be seen from the following table.

	1831.		1832.		1833.	
	Imports.	Exports.	Imports.	Exports.	Imports.	Exports.
	£.	£.	£.	£.	£.	£.
Spain	1,045,185	642,583	911,086	606,362	836,243	565,317
Former Spanish Colonies	380,394	151,528	662,907	206,958	385,183	269,524
Hanse Towns	354,649	396,013	387,251	438,432	196,325	313,356
United States of America	977,147	816,998	738,319	647,596	929,481	913,934
France	139,500	91,987	167,880	75,208	193,327	110,691
England	305,403	326,608	262,085	437,851	338,577	189,787
Italy	4,719	91,011	7,425	77,317	10,755	47,640
Netherlands	22,194	59,877	61,331	101,310	42,417	55,681
Portugal	5,817	1,376	10,983	4,677	9,401	4,548
Russia	. .	99,777	. .	223,433	10,971	207,335
Sweden and Denmark	4,298	8,609	7,050	12,879	7,138	15,867
Turkey	. .	5,120	. .	255	. .	13,833
£.	3,239,306	2,001,487	3,215,617	2,832,278	2,959,818	2,707,513

The imports in 1833 consisted of,—

Grain and flour, salted meat and fish, butter and che	£. 1,398,586
Wine, spirits. beer, and oil	329,202
Spices and dried fruits	47,038
Metals and hard wares	177,484
Cotton, linen, woollen, and silk goods	903,534

The remaining value being made up of timber, glass, earthenware, cordage, and variou other less important articles.

The quantities exported, during the three years above-mentioned, of various articles, the produce of the island, were as under·—

		1831.	1832.	1833.
Sugar	Cwt.	1,592,272	1,692,726	1,701,909
Rum	Pipes	3,838	3,429	3,227
Molasses	"	83,001	100,178	95,768
Coffee	Cwt.	475,576	457,341	572,848
Wax	"	6,663	6,741	9,271
Leaf Tobacco	lbs.	2,936,350	1,910,750	2,311,875
Cigars	"	2,285,975	11,203,075	15,442,825
Cotton	"	685,900	736,950	551,800
Cocoa	"	120,425	36,250	99,250
Mahogany	Feet	46,707	58,844	40,411
Cedar	"	25,932	25,833	29,367
Hides	Number	16,893	16,317	28,917
Preserves	Cwt.	679	524	469
Fruit	Value in £.	6,170	5,468	3,078
Honey	Pipes	1,063	2,003	2,134
Horses and Mules	Number	1,306	1,079	807
Other Produce	Value in £.	9,137	9,169	9,978

The number of vessels and their tonnage, belonging to different countries, which entered the port of Havanna in the same three years, were·—

	1831.		1832.		1833.	
	Ships.	Tons.	Ships.	Tons.	Ships.	Tons.
Spanish	384	41,758	325	38,637	379	46,247
American	496	85,105	489	84,968	509	91,625
Hanse Towns	25	4,226	34	6,344	26	4,500
Danish	8	1,078	12	2,313	10	1,729
French	19	3,975	18	4,067	48	10,163
Netherlands	8	1,068	26	4,764	8	1,477
English	54	6,403	69	12,558	46	9,067
Portuguese	2	142	4	548	5	494
Prussian	2	294	1	221	1	290
Sardinian	4	763	1	222	6	939
Swedish	1	280	1	280	6	1,061
Hanoverian	. .	. .	1	256	2	366
Tuscan	. .	. .	1	194	. .	. .
Mecklenburgh	. .	. .	. .	. .	1	159
Russian	. .	. .	. .	. .	1	176
Total	953	145,092	982	155,362	1,048	168,293

The English have not so large a share in the commerce of Cuba as in that of some other commercial countries, which may be attributed to their not admitting the productions of Cuba into their ports on the same terms as those of their own colonies, and to their not being able to satisf the demand of the island for provisions. The Americans have obtained the greatest share of this commerce, being able to supply provisions in abundance, furnishing a ready market for all the exports of Cuba, and having also the advantage of being near Spain, being now deprived of all her colonies on the continent of America, endeavours to turn to advantage her possession of Cuba, to which she sends her wines, oil, and fruits. England, with its numerous manufactured goods and the productions of the East Indies, comes next. England takes in return tobacco, coffee, and sugar. The Hanseatic towns of Germany also have come in for a share of the trade, finding no place more advantageous for exchanging their manufactured goods (linens, paper, glass, &c.), for sugar, coffee, and tobacco. France sends great quantities of wines and some manufactured goods; and Italy oil, olives, and fruits.

The internal traffic is much impeded by the badness of the roads, which for a part of the year are impassable.; but the coasting-trade is active, four thousand small vessels being used to bring the produce of the neighbourhood to the Havanna alone.

The political importance of Cuba does not rest on its extent and productions alone, but principally on its position with respect to the common routes of navigation. This route is marked out by the trade-winds and the Gulf Stream. Vessels returning to Europe from Jamaica, or the coast of South America, by sailing directly eastward, have to contend against the united force of winds and current, and are scarcely able to make either the Windward or Mona Passages, which are situated respectively at the western and eastern extremities of the island of Hayti. They are therefore under the necessity of doubling Cabo San Antonio and proceeding to Europe by the Gulf Stream. Thus the possession of Cuba gives an absolute control over the trade between Europe and all countries lying about the Caribbee Sea and the Gulf of Mexico, and consequently a great portion of the United States of America. The maritime powers, at present, seem to have come to a tacit agreement to leave Spain in the possession of Cuba, because, being the least powerful of them all, there seem to be no apprehensions of any attempts on her part to interrupt the free navigation of these seas

Cuba was discovered by Columbus on his first voyage in 1493; in 1511 the Spaniards formed the first settlement: since that time the island has remained in their possession. In 1762 the English took the Havanna, but it was restored to Spain by the peace of 1763.

(Humboldt; *Present State of Columbia by an Officer; Map of the Society for the Diffusion of Useful Knowledge;* see also *Breve Idea de la Administracion del Commercio y de las Rentas y Gastos de la Isla de Cuba durante los Annos de* 1826 *á* 1834, par D. Ramon de la Sagra, Paris, 1836.)

CUBE (κύβος), a solid figure contained by six equal squares; a box of equal length, breadth, and depth.

Owing to its being the most simple of solids, the cube is the measuring unit of solid content, as the square is that of superficial content, or area. Whatever the unit of length may be, the unit of solidity is the cube which is a unit every way: thus we have the cubic inch, the cubic foot, &c.

Cubes of different sides are to one another as the algebraical third powers of the number of units in their sides: thus cubes which are as 7 to 10 in their sides are as $7 \times 7 \times 7$ to $10 \times 10 \times 10$ in their contents. Hence the algebraical third powers are called cubes: thus $a \times a \times a$ is called the *cube* of a. [NOTATION]. If the side of a cube contain a units, the content is $a \times a \times a$ cubical units of the same kind.

The cube has no *remarkable* properties, for our eyes are so used to the figure, that its properties seem self-evident.

Its internal diagonals are found by multiplying the number of units in the side by $\sqrt{3}$, or (very nearly) by adding one half and one half of one half, and subtracting one per cent. of the result, and if still further accuracy be required, 5 for every 10,000 units:—

```
2)10000  subtract 5 presently.
2) 5000
   2500
  -----
  17500
    175
  -----
  17325
      5
  -----
  17320  feet in the diagonal
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Which is about six inches too small.

For the celebrated historical problem connected with this article, see DUPLICATION OF THE CUBE.

CUBEBS. [PIPER.]

CUBIT, a measure of length in use among the antients, and more especially among the Jews. The Hebrews called it אמה (*amma*), as the mother of other measures; the Greeks Πῆχυς (*péchus*); the Romans *Cubitus*, a word apparently formed from the verb 'cubo,' to bend for the purpose of lying down. The cubit was originally the distance from the joint or bending of the elbow to the extremity of the middle finger. Bishop Cumberland and Pelletier fix the Hebrew cubit at twenty-one inches; but it is more usually considered as a foot and a half.

The best authorities assert that there were two cubits in use among the Hebrews; one sacred, the other common. In Deuteronomy, chap. iii. v. 11, the bed of Og is said to be nine cubits long and four broad, *after the cubit of a man*. In Ezekiel, chap. xl. v. 5 and xliii. 13, we find the cubit for measuring the temple was *a cubit and a hand-breadth*, whence it appears that the larger cubit was longer than the common one by a hand-breadth, or three inches. Thus we may reconcile the two lengths of eighteen and twenty-one inches already specified. Calmet, however, is persuaded, that from the Exodus to the Babylonish captivity, there was but one cubit in use among the Hebrews, and that it was the Egyptian cubit. He says it is only *after* the captivity that Scripture notices two sorts of measures, to distinguish the old Hebrew cubit from that of Babylon, which the captives used during their abode in that city. On this, he adds, is grounded the precaution of Ezekiel, in observing that the cubit he is speaking of is the true old cubit, larger by a hand's breadth than the common cubit. Among the Greeks the cubit (*péchus*) was twenty-four fingers (δάκτυλοι), measured as already explained. See Herodotus, ii. 175. (Arbuthnot, *Tables of Coins, Weights, &c.*, and Calmet's *Dict. of the Holy Bible*, in voce.)

CUCKFIELD. [SUSSEX.]

CUCKOO. [CUCULIDÆ; CUCULINÆ.]

CUCU'LIDÆ (Cuckoos, Cuckoo-tribe), a family of scansorial birds, placed by Cuvier and Lesson next to the wrynecks, *Yunx*, and by Mr. Vigors in the aberrant group of his *Scansores*, between the *Certhiadæ* and the *Rhamphastidæ*. This aberrant group he characterizes as consisting of birds which have either three anterior toes and one posterior scansorial one, or zygodactyle but not retractile toes. M. Lesson arranges the following genera; *Cuculus*, *Coccyzus*, *Saurothera*, *Centropus*, *Leptosomus*, *Eudynamis*, *Indicator*, and *Monasa* under the family, whilst he places *Phænicophaus*, *Scythrops*, and *Crotophaga* under his succeeding family, *Les Hétéroramphes*. The *Cuculidæ* seem to have presented a good deal of difficulty to ornithologists. 'Neither do I wish,' observes Mr. Vigors in his paper on the natural affinities that connect the orders and families of birds, 'to dwell with any particularity on the succeeding family of *Cuculidæ*, the various and extensive genera of which are as yet but little understood as far as regards their natural affinities. The Linnean genus, *Cuculus*, indeed, as at present constituted, forms an extremely artificial group. There is much to be done with respect to these birds, and they would form an interesting subject for the researches of an ornithologist who might have leisure and opportunity to describe their living, manners, and economy. I shall only now observe, with respect to external character, that some genera of the family are associated with the true *Cuculus* by their curved and slender bill; others like *Indicator*, Vieill., have a shorter and stronger bill; while *Saurothera*, Vieill., by its serrated bill, evinces an approaching conformity to the *Ramphastidæ*, and a considerable number, such as *Centropus*, Ill., *Phænicophaus*, Vieill., and *Crotophaga*, Linn., indicate the same affinity by the gradual increase of the bill in length and size. The last-mentioned genus, it may also be added, bears a relation, through the medium of *Scythrops*, to the *Hornbills*; some species of that family, and one more particularly lately discovered' (*Buceros Leadbeateri*) 'in the interior of Africa, possessing, though with gigantic dimensions, the exact bill of the Ani.' [CROTOPHAGA.]

The examination here suggested by Mr. Vigors has been undertaken by Mr. Swainson, and we find in the third and fifth parts of the 'Magazine of Zoology and Botany,' two memoirs by the last-named zoologist 'on the natural history and relations of the family of cuculidæ or cuckoos, with a view to determine the series of their variation.'[*] The *Cuculidæ* are placed by Mr. Swainson also between the *Certhiadæ* and *Ramphastidæ*, and these three families constitute what he terms his third and aberrant circle of the scansores. The following is his definition of the family character. Feet not strictly scansorial, very short, nostrils naked, tail covers remarkably long; and he separates the group into the following subfamilies: *Cuculinæ*, *Coccyzinæ*, *Saurotherinæ*, *Opisthocominæ*, *Indicatorinæ*. Of the first subfamily *Cuculus*, Linn., is the type; of the second *Coccyzus*, Vieill.; of the third *Saurothera*, Vieill.; of the fourth *Opisthocomus*, Hoff.; and of the fifth *Indicator*, Sparrm.

Habits, &c.—The following account bears the stamp of actual observation, and we therefore select it. 'So faintly is the scansorial structure indicated in these birds,' says Mr. Swainson in his memoirs above alluded to, 'that but for their natural habits, joined to the position of their toes, we should not suspect they were so intimately connected with the more typical groups of the tribe as they undoubtedly are. They neither use their bill for climbing, like the parrots, or for making holes in trees, like the woodpeckers, neither can they mount the perpendicular stems, like the certhiadæ or creepers; and yet they decidedly climb, although in a manner peculiar to themselves. Having frequently seen different species of the Brazilian cuckoos (forming part of the genus *Coccyzus*) in their native forests, I may safely affirm that they climb in all other directions than that of the perpendicular. Their flight is so feeble, from the extreme shortness of their wings, that it is evidently performed with difficulty, and it is never exercised but to convey them from one tree to another, and these flights in the thickly-wooded tracts of tropical America are of course very short: they alight upon the highest boughs, and immediately begin to explore the horizontal and slanting ramifications with the greatest assiduity, threading the most tangled mases and leaving none unexamined. All soft insects inhabiting such situations laying (lying?) in their route become their prey, and the quantities that are thus destroyed must be very great. In passing from one bough to another they simply hop, without using their wings, and their motions are so quick, that an unpractised obsérver, even if placed immediately beneath the tree, would soon lose sight of the bird. The Brazilian hunters give to their cuckoos the general name of *Cat's-to* ; nor is the epithet inappropriate, for their long hanging tails, no less than their mode of climbing the branches, give them some distant resemblance to that quadruped. I have no doubt that the great length of tail possessed by nearly all the cuckoos is given to them as a sort of balance, just as a rope-dancer, with such an instrument in his hands, preserves his footing when otherwise he would assuredly fall. Remote therefore as the cuckoos unquestionably are from the typical *Scansores*, we yet find the functions of the tail contributing to that office, although in a very different mode to that which it performs among the woodpeckers, the parrots, and the creepers. The structure of the feet, as before observed, is the only circumstance which would lead an ornithologist to place these birds among the climbers, supposing he was entirely unacquainted with their natural history properly so called, or with their close affinity to the more perfect *Scansores*. The toes indeed are placed in pairs; that is, two directed forward and two apparently backward; but a closer inspection will show that the latter are not strictly posterior, and that they differ so very materially from those of the *Picidæ* (the pre-eminently typical family of the climbers), as clearly to indicate a different use. The organization of the external posterior toe of all the woodpeckers, parrots, and toucans, renders it incapable of being brought forward, even in the slightest degree; whereas in the cuckoos this toe can be made to form a right angle with that which is next it in front, from which circumstance it has been termed *versatile:* this term however is not strictly correct, inasmuch as the toe cannot be brought more than half way *forward*, although it can be placed entirely backward. Now this form, which is obviously the least developed state of the scansorial structure, accords exactly with the rank of the family, which is that of the most aberrant group in the circle, and farthest removed from the type. The cuckoos in fact are half-perching half-climbing birds, not only in their feet, but, as we have seen, in their manners. No one, from seeing them alive, would suppose they were truly scansorial birds; and yet it is highly probable that this singular power of varying the position of one of their toes, gives them that quickness of motion and firmness of holding which accompanies the habit just mentioned.'

'There is another circumstance in the history of this family of birds, which, with one solitary exception, is altogether peculiar, as they contain the only parasitic birds yet known. This term indeed has been applied, I think improperly, to other genera, which, like the frigate pelicans, the jagers, and some of the eagles, rob other birds of their food; but this is a mere act of thieving, for all these feathered robbers can, and do, habitually depend just as much upon their own industry in procuring food. But with the typical cuckoos the case is far different, for by depositing their eggs in the nests of other birds, to whom they leave the care of hatching their young and feeding them afterwards, they become as truly parasitic as any of the *Acari* or *Pediculi;* they fasten themselves, as it were, on the living animal, whose animal heat brings their young into life, whose food they alone live upon, and whose death would cause theirs during the period of infancy. Such only is a parasitic animal, and such only, among birds, belong to the typical cuckoos and their representative, the *Molothrus pecoris*.'[*] [CUCULINÆ, MOLOTHRUS.]

Geographical Distribution and Food.—Warm and temperate climates are the chosen haunts of the cuckoos. The European species—there are but two—never show themselves in our quarter of the globe, except in the warm weather, quitting it upon the first approaches of a colder temperature. 'So congenial is warmth to their nature,' says Mr. Swainson in the memoirs last quoted, 'that even the mild temperature of an Italian winter is not sufficient to retard their return to the sultry groves of Northern Africa. There is a fact regarding their structure, which appears connected with this susceptibility of cold, and which I believe has not hitherto been noticed. All the cuckoos, both of the old and the new world, which I have had the opportunity of dissecting, are remarkable for the thinness and delicacy of their skins, so much so indeed as to render their preservation in an entire state extremely difficult to inexperienced hands. Every one who has skinned the common British species must doubtless have observed this. On the other hand, as if to compensate for the delicacy of the cuticle, the feathers, more especially upon the back and rump, are unusually thick-set and compact.'

Tropical countries, and those which approach the equator, afford the greatest number of species.

The food of the cuckoos, as might be expected from this geographical distribution, consists principally of soft fruits and soft insects, especially the latter, and more particularly when they are in the larva state.

CUCULI'NÆ, Mr. Swainson's name for that subfamily of the CUCULIDÆ, which consists of the genuine Cuckoos.

Character of the subfamily.—*Bill* wider at the base than it is high, rather suddenly contracted behind the nostrils and becoming compressed; upper mandible slightly sinuous at the tip, so as to assume the form of the dentirostral notch. *Wings* considerably long, nearly reaching to two-thirds the length of the tail, and so far pointed as to diminish rapidly in length beyond the fourth quill. *Feet* remarkably short; tarsus thickly clothed with feathers, for nearly half its length, not longer than the hallux or true hind toe. Upper cover feathers of the tail thick set, narrow, generally pointed, and comparatively elongated, and in rigidity only comparable to those of the *Ceblepyrinæ*, the corresponding type in the *Laniadæ*. (Swainson, *Mag. of Zoology and Botany*.)

'Popular interest,' adds Mr. Swainson, 'has been so much confined to the parasitic habits of the cuckoo, that upon many other points of its economy we are still in comparative ignorance. Hence it is, that we cannot trace, so fully as could be wished, the influence which the structure just described exercises upon the habits and manners of such birds as possess it. We know, however, that all the genuine cuckoos fly with strength and rapidity. Most of them, in fact, are migratory birds. . . . The form of the nostrils in the typical cuckoos is very peculiar, and I believe that future observations will shew this structure to be intimately connected with their parasitic habits. The nests of those species in which the cuckoo deposits its eggs, we all know, are built in the thickest and most central part of trees and bushes, to discover which, superior powers of smell have been given to the Toucans (which feed upon the eggs or young), and, in a less degree, are probably conferred upon the cuckoos, to facilitate their search after a foster parent for their young. How far this idea may be correct, future observations will determine. Certain however it is, that this peculiar-shaped nostril is restricted to such cuckoos as are parasitic, for the whole of the *Coccyzinæ* have the aperture of a lengthened oval shape, or in the form of a slit, and all we know of these birds sanctions the idea that they are not parasitic. The shortness of the feet, in the typical cuckoos, is another important distinction, and leads to the belief that these members are much less used than those of the *Coccyzinæ*, whose habits we have already mentioned when alluding to the cuckoos of South America, all of which are excluded from the group now under consideration.'

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[*] October 1836, and February 1837.

[*] Cow Bunting.

Genera. Cuculus.

Bill broad at the base, compressed beyond, the upper mandible obsoletely notched; *nostrils* circular, with a tumid margin; *wings* long, pointed, the third quill longest, the second and fourth of equal length; *feet* slender, very short, tarsi feathered posteriorly almost to the toes; *rump* and *upper tail-covers* long, thick-set, and rigid. Inhabits the old world; parasitic. (Swainson). Type, *Cuculus canorus.*

Description.—Male. Length about fourteen inches, weight about four ounces and a half. Bill black, yellowish at the base of the upper mandible; inside of mouth red. Irides yellow. Head, and whole upper part of the bird, dark ash-colour. Throat, under side of the neck, and upper part of breast pale ash, the latter sometimes inclining to rufous brown; lower part of breast and belly white, with transverse undulating black lines. Quills dusky, inner webs barred with white oval spots. Tail-feathers ten, of unequal length; two middle ones black, dashed with ash and tipped with white, the rest black with white spots on each side of the shaft. The lateral feathers in some [illegible] white spots only on the interior webs, but all are tipped with white.

Female, rather less than male, and differing from him generally in the neck and breast being of a tawnyish brown, barred with dusky, and the coverts of the wings marked with light ferruginous spots. Tail-feathers and quills much like those of the male, but the edges of the spots incline to reddish brown. Legs in both sexes short and yellow. Outer tail-feather and first quill remarkably short.

Young.—So distinct in its plumage from the adult that it has been described as a distinct species (*Cuculus rufus*, Bris.). It is supposed not to throw off its nestling feathers till the second year's moulting, for it is stated in Montagu's Dictionary (last edit.), that in three specimens killed the same season (two males and a female), the thirteenth and three succeeding quill feathers, and the three greater coverts impending them, are barred with brown and ferruginous. In the first year the irides are greyish; the whole upper plumage is a mixture of dusky black and ferruginous, in transverse bars, except the forehead and a patch on the back of the head, which in this specimen described in Montagu was white, and the tips of the scapulars pale; the feathers of the whole under parts sullied white with distant transverse bars of dusky black. In general each feather is barred twice or thrice. The sides of the neck and breast are tinged with rufous; lateral tail-feathers and inner webs of the quills more or less barred with white. Tail coverts, which, as well as the feathers on the rump, are unusually long, dashed with cinereous and slightly tipped with white.

This well known bird is the κόκκυξ of the Greeks; *Cuculus* and *Coccyx* of the Latins; *Cucculo, Cucco, Cuco, Cucho, Cuccù* of the modern Italians; *Cocou, Coucou, Coqu*, of the French; *Kukuk* and *Kuckuck* of the Germans; *Gjok* of the Fauna Suecica; *Gjoeg* of the Danes; *Gouk* of the Norwegians; *Cog* of the antient British; *Gowk* and *Cuckoo* of the modern British.

Habits.—The common cuckoo arrives in this country early in spring. In White's 'Naturalist's Calendar,' the cuckoo is noted as first heard April 7—26, and in Markwick's, April 15, May 3, last heard June 28. By the first of July it has almost always taken its departure, but it is sometimes later. Mr. Swainson in his memoir on the *Cuculidæ* says, 'The common species comes to us every spring, from northern Africa or Asia Minor, and returns in Autumn. This we know from personal observation; for vast numbers arrive in the spring in Sicily and Naples, in company with the bee-eaters, orioles, hoopoes, and other migratory birds; but after remaining a short time, they appear to direct their flight northward, from whence they return in August and September.' Speaking of the *food*, the same author observes, 'The English cuckoo, no doubt, searches for its food among foliage, but its nature is so shy, that we have never been fortunate enough to witness its mode of feeding.' Montagu, however, one of the best authorities we can cite, says, that its principal food consists of caterpillars, so that it not only possesses the general cast of colours, and much of the structure of its prototypes, the *Ceblepyrinæ*, but actually feeds on the same description of insects.' The Editor of the Magazine of Zoology and Botany, adds, 'In an open and muirland district where the cuckoo is very common, we have always found, during May and June, that their stomachs were filled with the remains of caterpillars which fed on the various plants frequent in such localities. Among them those of the *Lasiocampæ* formed a great proportion, and hairy species seem to be preferred.' White in his 'History of Selborne,' thus writes: 'In July, I saw several cuckoos skimming over a large pond; and found, after some observation, that they were feeding on the *libellulæ*, or *dragon-flies;* some of which they caught as they settled on the weeds, and some as they were on the wing.' The following narrative from the last edition of Montagu's Dictionary will throw some light on this part of the subject: 'A young cuckoo, brought to Colonel Montagu in the month of July, just as it could fly, was, by great care, kept alive till the fourteenth of December. It had, during that time, two or three attacks of dysentery, from which it recovered by having chalk and ginger given to it; and during the time it lived no change was observed to have taken place in its plumage. For two months after this bird was caught, it never attempted to feed itself by picking; and even to the last moment seemed to prefer being fed by the hand of its mistress, rather than have the trouble of picking up its food, of which it was extremely choice. Nothing appeared to be acceptable as a substitute for insects except raw beef. Flies it would eagerly devour; but its most delicious morsel was any species of hairy caterpillar; these it seized with avidity, shook them to death, and softened by passing several times through the bill, till they were perfectly pliant, when it would swallow whole the largest of the caterpillars of the egger* or drinker† moths. Of strangers it was extremely fearful, fluttering in its cage to avoid their attentions; but it would quietly suffer itself to be handled and caressed by a young lady who had been its kind benefactress, appearing to like the warmth of her hand to its feet.'

It is the habit of the cuckoo in depositing her egg in the nest of another bird, that has made it so much an object of curiosity. Many strange stories were formerly rife on this custom, which can hardly be called abandonment, as the nest of a bird that feeds its young with insects is always selected. Among others, the hedge-sparrow, the reed-sparrow, the tit-lark, the water-wagtail, the yellow-hammer, &c., have been recorded as the birds to whom the egg has been committed, but the first seems to be most frequently chosen. White saw one hatched in the nest of the tit-lark. The nests of the green-bird, the linnet, the white-throat, and even of the wren have been mentioned as the places of deposit. Dr. Jenner's celebrated paper in the Philosophical Transactions threw great light on this subject, and many other observers have corroborated in general that author's remarks. Some indeed, and among them Dr. Fleming, have declared that in some cases the cuckoo constructs its own nest, but there can be little doubt that there is no foundation for this assertion, and as little that the nests and young supposed to be those of the cuckoo on such occasions were those of the goatsucker. Whether the bird actually deposits the egg from her body while sitting on the nest has been doubted, and if the case of the deposit of one in a wren's nest be a fact, it is almost conclusive that she does not so deposit it in all cases, for the aperture of the wren's nest is in the side, and not more than big enough to admit the wren. On this part of the subject, and indeed on every part of it, the reader will find much valuable information in the last edition of Montagu's Dictionary. He should also refer to the paper of Dr. Jenner above alluded to, and to that of Mr. Blackwall, in the fourth volume of the Zoological Journal. Our limits will not allow us to give our readers more than a brief notice of the way in which the intruder, when hatched, gets rid of the legitimate contents of the nest, and we select the following. 'Previous to the above-mentioned publication' (Dr. Jenner's) 'I had taken much pains towards investigating the several phœnomena I had noticed in this bird, and was so fortunate as to have ocular proof of the fact, related by Dr. Jenner, of a young cuckoo turning out of a hedge-sparrow's nest a young swallow I had put in for the purpose of experiment. It is needless to recite all the circumstances attending this extraordinary bird, as that gentleman has so amply explained it; I shall, therefore, only add, that I first saw it when a few days old, in the hedge-sparrow's nest, in a garden close to a cottage, the owner of which assured me the hedge-sparrow had four eggs, when the cuckoo dropped in a fifth; that on the morning the young cuckoo was hatched, two young hedge-sparrows were also excluded; and that, on his return from work in the evening, nothing was left in the nest but the cuckoo. At five or six days old, I took it to my house, when I frequently saw it throw out the young swallow for four or five days after. This singular action was performed by insinuating itself under the swallow, and, with its rump, forcing it out of the nest with a sort of jerk. Sometimes, indeed, it failed, after much struggling, by reason of the strength of the swallow, which was nearly full feathered: but, after a small respite from the seeming fatigue, it renewed its efforts, and seemed continually restless till it succeeded. At the end of the fifth day, this disposition ceased, and it suffered the swallow to remain in the nest unmolested.' This wonderful instinct is absolutely necessary for the self-preservation of the young cuckoo, which, if it did not dispose of all other claimants on the affection of the parents, must perish for want, and, as it is, the poor little birds to whose lot it falls to supply the demands of their craving and gigantic nestling, have a weary time of it. Indeed, there are well recorded instances, of their being assisted by others of their own species, and by other insectivorous birds.

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* Lasiocampa Quercus.

† Odonestis potatoria.

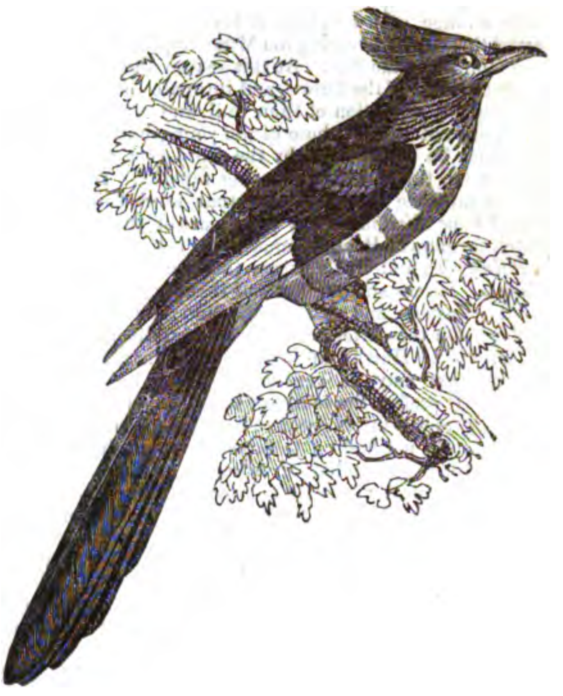
The Romans considered the cuckoo excellent eating. Pliny (Lib. x. c. 9.) says that no bird can be compared to it for sweetness of flesh.

[Cuculus canorus, male.]

Oxylophus, Sw.

Bill slender, considerably compressed nearly its whole length; upper mandible entire; *nostrils* ovately round; *head* crested; *wings* moderate, pointed, shorter than the *tail*-covers, the *fourth quill* longest; *tarsi* moderate, naked; upper *tail-covers* long but not rigid. Inhabits the Old World; parasitic. Type, *Oxylophus Levaillantii.*

Description. Head crested, the feathers pointed; plumage above, black glossed with green; band at the base of the quills, end of the tail, and under parts of the body white; throat striped with black. Wings long but rounded, fifth quill longest. Total length fifteen inches. Mr. Swainson, whose description we have given, says that, unlike the true cuckoos, these birds rear and provide for their young in the ordinary manner. *Locality,* Senegal and the western coast of Africa.



[Oxylophus Levaillantii.]

Erythrophrys, Sw.

Bill as in *Oxylophus; head* not crested; *nostrils* oval; *wings* lengthened, pointed, extending beyond the tail-covers, the third *quill* longest, the second much shorter than the fourth; *tarsi* moderate, naked. Inhabits the New World, and rear their own young. Type, *Cuculus Carolinensis,* Wilson. (Swainson.)

Description. Male. Bill as long as the head, compressed, slightly arched, acute, scarcely more robust than in many *Sylviæ;* upper mandible carinated above, its margins acute and entire; lower mandible carinated beneath, acute. Nostrils basal, lateral, linear-elliptical, half closed by a membrane. Feet short, tarsus scutellate before and behind; toes two before, separated; two behind, one of which is versatile, the sole flat; claws slender, compressed, arched. Plumage blended, slightly glossed. Wings long, the first quill short, the third longest, the primaries tapering. Tail long, graduated, of ten feathers, which are rather narrow and rounded. Upper mandible brownish-black, yellow on the margin towards the base; under mandible yellow. Iris hazel. Feet greyish-blue. The general colour of the upper parts, including the wing-coverts and two middle tail-feathers, is light greenish-brown, deeper anteriorly. Primary quills with the inner webs brownish-orange. Tail-feathers, excepting the two middle ones, black, the next two entirely black, the rest broadly tipped with white, the outermost white on the outer web. The under parts are greyish-white. Length 12½ inches, extent of wings 16: bill along the ridge 1, along the gap 1⅓.

The *female* differs very little from the male in colouring. (Audubon.)

Habits, &c. The author whose specific description we have given above, thus graphically describes the habits of the yellow-billed Cuckoo, *Cuculus Carolinensis* of Wilson, *Coccyzus Americanus* of the prince of Musignano, *Cuculus Americanus* of Linnæus, and *Carolina Cookoo* of Latham. 'The flight of the bird is rapid, silent, and horizontal, as it moves from one tree to another, or across a field or river, and is generally continued amongst the branches of the trees in our woods. When making its way among the branches, it occasionally inclines the body to either side, so as alternately to show its whole upper or under parts. During its southward migration, it flies high in the air, and in such loose flocks that the birds might seem to follow each other, instead of their keeping company together. On the other hand, early in March, the greater number enter our southern boundaries singly, the males arriving first, and the females a few weeks after. They do not fly in a continued line, but in a broad front, as, while travelling with great rapidity in a steam-boat, so as to include a range of a hundred miles in one day, I have observed this cuckoo crossing the Mississippi at many different points on the same day. At this season they resort to the deepest shades of the forests, and intimate their presence by the frequent repetition of their dull and unmusical notes, which are not unlike those of the young bull-frog. These notes may be represented by the word *cow, cow*, repeated eight or ten times with increasing rapidity. In fact, from the resemblance of its notes to that word, this Cuckoo is named *Cow Bird* in nearly every part of the union. The Dutch farmers of Pennsylvania know it better by the name of *Rain-crow*, and in Louisiana the French settlers call it *Coucou*. It robs smaller birds of their eggs, which it sucks on all occasions, and is cowardly and shy without being vigilant. On this latter account it often falls a prey to several species of Hawks, of which the Pigeon-Hawk (*Falco columbarius*) may be considered as its most dangerous enemy. It prefers the southern states for its residence, and when very mild winters occur in Louisiana, some individuals remain there, not finding it necessary to go farther south. This bird is not abundant anywhere, and yet is found very far north. I have met with it in all the low grounds and damp places in Massachusetts, along the line of Upper Canada, pretty high on the Mississippi and Arkansas, and in every state between these boundary lines. Its appearance in the state of New York seldom takes place before the beginning of May, and at Green Bay not until the middle of that month. A pair here and there seem to appropriate certain tracts to themselves, where they rear their young in peace and plenty. They feed on insects, such as caterpillars and butterflies, as well as on berries of many kinds, evincing a special predilection for the mulberry. In autumn they eat many grapes, and I have seen them supporting themselves by a momentary motion of their wings opposite a bunch, as if selecting the ripest, when they would seize it and return to a branch, repeating their visits in this manner until satiated. They now and then descend to the ground to pick up a wood-snail or a beetle. They are extremely awkward at walking, and move in an ambling manner, or leap along sidewise, for which the shortness of their legs is ample excuse. They are seldom seen perched conspicuously on a twig, but on the contrary are generally to be found amongst the thickest boughs and foliage, where they emit their notes until late in autumn, at which time they discontinue them. The nest is simple, flat, composed of a few dry sticks and grass, formed much like that of the common Dove, and like it fastened to a horizontal branch, often within the reach of man, who seldom disturbs it. It makes no particular selection as to situation or the nature of the tree, but settles anywhere indiscriminately. The eggs are four or five, of a rather elongated oval form, and bright-green colour. They rear only one brood in a season, unless the eggs are removed or destroyed. The young are principally fed with insects during the first weeks. Towards autumn they become very fat, and are fit for being eaten, although few persons, excepting the Creoles of Louisiana, shoot them for the table.' (*Ornithological Biography*, vol. i., p. 18.)

[Erythrophrys Americanus.]

Chalcites, Less.

Bill and general structure as in Cuculus. *Plumage* metallic green; upper mandible entire; *nostrils* circular; *wings* pointed, the *third quill* longest, the second much longer than the fourth; *tarsi* very short, almost entirely plumed; *rump* and *upper tail-covers* soft. Inhabits the tropics of the Old World; parasitic. Type, *Cuculus auratus* of authors. (Swainson.)

[Chalcites auratus.]

Of this genus Mr. Swainson says, 'I feel much more scrupulous in adopting the genus *Chalcites*, than in proposing that of *Erythrophrys*. The beautiful little shining cuckoos, indeed, which have thus been detached have altogether the appearance of belonging to a different type from those of the genus *Cuculus;* and this idea is strengthened, when we find there are already four or five species, all distinguished at first sight by their diminutive size and their beautiful golden-green plumage. On the other hand, their actual structure is so completely that of an European group, that I must beg to be understood as being by no means satisfied on the propriety of the separation. For the present, however, I shall adopt this genus, conceiving that these splendid little birds may probably constitute the tenuirostral type of the *Cuculinæ*, in which case they will be analogous to the humming-birds, and nearly all those genera whose plumage is ornamented with metallic colours. The attempt that has been made to define the group by its bill, nostrils, &c., as distinct from the cuckoos is singularly unsuccessful; while those light shades of difference really existing between *Chalcites* and *Cuculus* have been completely overlooked. *Chalcites*, in fact, has the bill, nostrils, feet, and wings of *Cuculus*, with this difference only, that the tip of the upper mandible is without the slightest indication of a notch; the second and third quill are longer than the fourth, and the feathers of the rump and upper tail-covers, instead of being thick-set and rigid, are of the same degree of density and softness as in ordinary birds. We have seen, that, however dissimilar in their appearance the foregoing groups of the *Cuculinæ* may be, yet that the variation of their external structure is but slight. This consideration has much weight with me in the temporary adoption of M. Lesson's genus *Chalcites*, for we have just seen an example in *Erythrophrys*, where there is an equally slight variation in external form, yet a most important one in economy and internal organization.' (*Mag. of Zool. and Bot.*,

Eudynamys, Horsf. and Vig.

Bill strong, thick, the under mandible not curved, and angulated beneath; upper mandible entire; *wings* pointed, the *fourth quill* longest; *tarsi* much shorter than the longest toe; the upper part plumed; *rump* and *tail-covers* soft. Inhabits the Old World. Type, *Cuculus Orientalis*, of authors. (Swainson.)

Mr. Vigors and Dr. Horsfield, who established this genus in their description of the Australian birds in the collection of the Linnæan Society (*Linn. Trans.*, vol. xv. p. 303), observe that the true *Cuckoos*, or that portion of the family of *Cuculidæ* which constitutes the genus *Cuculus* of authors, is distinguished from the remaining groups of the family by the comparative weakness of the bill, in which the *nares* are small and rounded, and situated on an elevated membrane; by the wings being strongly acuminated, the primary quill-feathers considerably exceeding the secondary in length; and by the feebleness of the legs and toes, the former of which are plumed beneath the knee, and are generally covered by the feathers. *Eudynamys*, they state, deviates from these characters, which may be considered typical in the family, by the greater strength of all these members. The bill is powerful, the under mandible more particularly, which is marked by a strong ascending *gonys*. The nostrils are wide and oval, and covered only on the upper part by a membrane. The tarsi and feet are particularly strong: the former are much compressed on the external side, exhibiting by this conformation a nearly flattened surface in front. In many of these particulars the group agrees very nearly with the neighbouring genera, *Centropus*, Ill., and *Phœnicophaus*, Vieill., which have equally been separated from the typical species of the family. But it may at once be distinguished from *Centropus* by the absence of the lengthened nail to the hallux; and it will be seen equally to differ from *Phœnicophaus* in its stronger, shorter, and less arcuated bill, in the wings being longer, and the tail rounded, not graduated. The compressed formation of the sides of the *tarsi* in *Eudynamys* is also wanting in *Phœnicophaus*.

Locality. The species are widely distributed over the East.

Example. *Eudynamys Orientalis, Cuculus Orientalis*, Linn. *Coucou des Indes Orientales*, Enl., 274, fol. i. *Eastern Black Cuckoo*, Lath.

[Eudynamys Orientalis.]

Description. Plumage of *male*, of which the above are the synonyms, black with metallic lustre. Bill yellow.

Female. Above shining greenish-brown spotted with white, tail-feathers banded with white; whitish beneath, transversely undulated with greenish-brown. Synonyms. *Cuculus Mindanensis*, Linn. *Coucou tacheté de Mindanao*. Enl. 277. *Mindanao Cuckoo*, Lath. (Vigors and Horsfield.)

'These birds, which now generally are considered the sexes of one species, appear to be but accidental visitors in the colony. At least, Mr. Caley informs us, that he never met with more than two individuals of the male and one of the female. The male specimen in the Society's collection seems to be a young bird changing to the adult plumage. It has several pale ferruginous feathers in the lower parts of the body, and it has a single ferruginous feather streaked with black among the secondary quill-feathers of the right wing, which forms a striking contrast with the deep black of the rest. The corresponding feather on the left wing was lost, as Mr. Caley tells us, by the shot striking the wing. This bird had berries of *Cassytha* in its stomach. The native name of the male is *Cowhat*, of the female, *Bellinging*.' (Vigors and Horsfield.)

'All the cuckoos I have yet seen,' says Mr. Swainson in his memoirs on the *Cuculidæ*, 'with more or less pointed wings, and circular nostrils, and whose habits are parasitic, will arrange themselves under one or other of the foregoing genera. Nor are there wanting considerations, drawn from their analogical resemblances in other groups, which render it highly probable that they serve to indicate a circular group. *Erythrophrys*, as the rasorial type, resembles the rufous-winged scansorial creeper; and as it is by this group that the parasitic cuckoos lead immediately to those which build nests, so we have the external characters of *Oxylophus* joined to the economy of *Coccyzus*. *Chalcites*, again, as representing the humming-birds, may be viewed as the tenuirostral type; while *Eudynamys*, with its large bill, and black glossy plumage, will become the representative of the Toucans, and of the fissirostral type. It may be questioned, indeed, whether *Cuculus* or *Oxylophus* follows *Eudynamys*; but I incline to the series in which they are here placed, from the obvious affinity of *Erythrophrys* to *Oxylophus*.' (*Mag. of Zool. and Bot.*)

Mr. Swainson promises a similar exposition of the remaining divisions, and we shall notice the other sub-families on their appearance in their alphabetical order, with the exception of the *Coccyzinæ*, which will be found in the article INDICATORINÆ.

CUCULLÆA. [POLYODONTA.]

CUCUMBER, a kind of trailing annual, whose unripe fruit is used for salads and pickles. [CUCUMIS.] Every gardener knows so much of the cultivation of this plant as to render any general description of the process unnecessary. We only notice a few points. The finest cucumbers are always obtained from shaded plants growing in a warm damp atmosphere, and therefore growing rapidly; this is exclusively owing to the ordinary action of solar light being prevented. Under bright light, evaporation goes on with great force from the surface of the cucumber plant, the quickness of growth is thus diminished, and the fruit is formed in a more solid manner than it otherwise would be, and thus its delicacy is impaired. The effect of direct light moreover is to cause the production of whatever secretions may be natural to a plant; the natural secretions of the cucumber are bitter; hence, the less cucumbers are exposed to light while growing, the less bitter, and consequently the more delicate they will be. This sufficiently explains the superiority of cucumbers forced quickly at the dull season of the year, to those produced naturally in the open ground in autumn.

When it is an object to procure very fine and long fruit, the plant should not be allowed to bear early; all the female blossoms should be destroyed until the plant has become vigorous, and well rooted in the bed; a fruit set after that time, will grow much faster than one fertilized at an earlier time.

The best sorts of cucumbers are, for gurkens, the *Russian*, for stewing, the *large white Bonneuil*, for large size, the *Longford;* and for ordinary forcing purposes, the black-spined *long prickly*, if well saved. A small sort called the *Sandy* cucumber is grown in the fields in some parts of Bedfordshire, but it is altogether inferior to the *Russian*.

CUCUMBER, SPIRTING, the English name of MOMORDICA ELATERIUM.

CU'CUMIS, the cucurbitaceous genus which comprehends the melon, the cucumber, and some sorts of gourd. It is distinguished from the neighbouring genera by its three thick split stigmas, and by the seeds having a thin margin. The fruit is in all cases pulpy internally, many-seeded, and divided into three or six cells when young. The following are the principal species:—

1. *C. Melo.** The melon. The native country of this valuable plant is unknown. Linnæus says Tartary, but his authority is not given, and in all probability is erroneous; De Candolle says Asia; Roxburgh only knew it in a cultivated state in tropical India; and Professor Royle seems unacquainted with any wild station for it in the Himalaya regions. Cashmere is the most likely to be the country whence it sprang; for it seems to be the mother of many of our other cultivated fruits; and has from time immemorial been famous for the excellence and abundance of its melons, which form a staple article of the food of the inhabitants. For the varieties and cultivation of this fruit see MELON, where they are given in some detail; we only here observe that all the melons known in Europe belong to the present species, unless it be the *Winter Melon* and its varieties, and that kind possibly originates from the following species, concerning which we give an extract from the Flora Indica of Roxburgh.

2. *C. utilissimus.* An annual, native of the higher cultivated lands of India, but generally found in a cultivated state. 'The stems exactly as in C. sativus, but not quite so extensive. Tendrils simple, leaves broad-cordate, generally more or less five-lobed; lobes rounded, toothletted; above pretty smooth, below scabrous, the largest generally about six inches each way. Floral leaves of the female flowers sessile, and very small. Male flowers axillary, peduncled, crowded, but opening in succession. Female flowers axillary, peduncled, solitary, both sorts yellow, about an inch or an inch and a half in diameter. Fruit fleshy, generally a very perfect oval; when young, downy and clouded with lighter and darker green; when ripe perfectly smooth, variegated with deeper and lighter yellow; from four to six inches long, and from three to four in diameter. This appears to me to be by far the most useful species of cucumis that I know; when little more than one half grown, the fruits are oblong, and a little downy, in this state they are pickled; when ripe they are about as large as an ostrich's egg, smooth and yellow; when cut they have much the flavour of the melon, and will keep for several months, if carefully gathered without being bruised and hung up; they are also in this state eaten raw, and much used in curries by the natives. The seeds like those of other cucurbitaceous fruits, contain much farinaceous matter blended with a large portion of mild oil; the natives dry and grind them into a meal, which they employ as an article of diet; they also express a mild oil from them, which they use in food and to burn in their lamps. Experience, as well as analogy, proves these seeds to be highly nourishing, and well deserving of a more extensive culture than is bestowed on them at present. The powder of the toasted seeds mixed with sugar is said to be a powerful diuretic, and serviceable in promoting the passage of sand or gravel. As far as my observation and information go, this agriculture is chiefly confined to the Guntoor Circar, where the seeds form a considerable branch of commerce; they are mixed with those of Holcus Sorghum or some other of the large culmiferous tribe and sown together; these plants run on the surface of the earth, and help to shade them from the sun, so that they mutually help each other. The fruit, as I observed above, keeps well for several months if carefully gathered and suspended. This circumstance will render it a very excellent article to carry to sea during long voyages.'

3. *C. sativus*, the cucumber. Tartary is assigned to this species as its native country, but upon authority equally questionable with that for the melon. No modern traveller seems to have found it wild. [CUCUMBER.]

4. *C. Colocynthis*, the Colocynth gourd. This plant furnishes the drug colocynth, so well known for its purgative properties. It is found wild in the Grecian Archipelago, Egypt, and the north-eastern parts of Africa generally. Burckhardt saw it covering large tracts in Nubia; and Roxburgh speaks of it as common on the coast of Coromandel. It is doubtful, however, whether the plant of the latter botanist is not rather *C. Pseudo-Colocynthis*. This species grows like a cucumber, but has cordate-ovate, many-cut, and lobed leaves, white beneath with hairs. Its fruit is small, round, deep yellow, smooth, hard externally, with an intensely bitter pulp. The gourds are gathered in autumn, when they are beginning to turn yellow; they are then peeled and dried rapidly in stoves.

5. *C. Citrullus*, the water-melon. Its deeply-lobed and gashed leaves, and its round fruit, with a spotted rind and a cold watery pink or white flesh, in which lie a number of black seeds, sufficiently mark this species, which is most extensively cultivated all over India and the tropics of Africa and America, and generally in hot countries, but which is of no value in the north of Europe, where high flavour is required more than cooling properties.

The other species are of little moment compared with the preceding; many are eatable, but they are in all respects inferior in quality and size. *C. Dudaim* is sometimes grown under the name of Queen Anne's Pocket Melon; but it is a mere curiosity.

CUCUMIS COLOCYNTHIS, or Bitter-apple, an annual plant, the fruit of which is about the size of but rather lighter colour than an orange; the rind smooth; when the rind has been removed, a white spongy pulp or pith is found within, which constitutes the officinal part, or the colocynth, the seeds being rejected. The rind is generally removed before reaching Europe. One hundred parts of decorticated apples consist of twenty-eight parts of pure pith, and seventy-two parts of seeds.

The active principle is a peculiar bitter principle (Colocynthin), which is of a resinoid nature, more soluble in alcohol than water; its solubility in water is much increased by union with extractive, combined with which it exists in the pulp, so that nearly all the virtues are yielded to a watery extract, which is generally employed for its administration. The compound extract, in the formation of which proof spirit is used, and to which are added other purgative substances and aromatics, is however preferable, and it is thereby rendered milder yet more certain in its action.

It is a purgative in very constant use, either alone, or more commonly united with mercurial purgatives: it is employed for the removal of constipation and visceral obstructions; at the commencement of fevers and other inflammatory complaints, it is of decided utility. As an overdose has all the poisonous effect of a vegetable acrid, it must be used with caution.

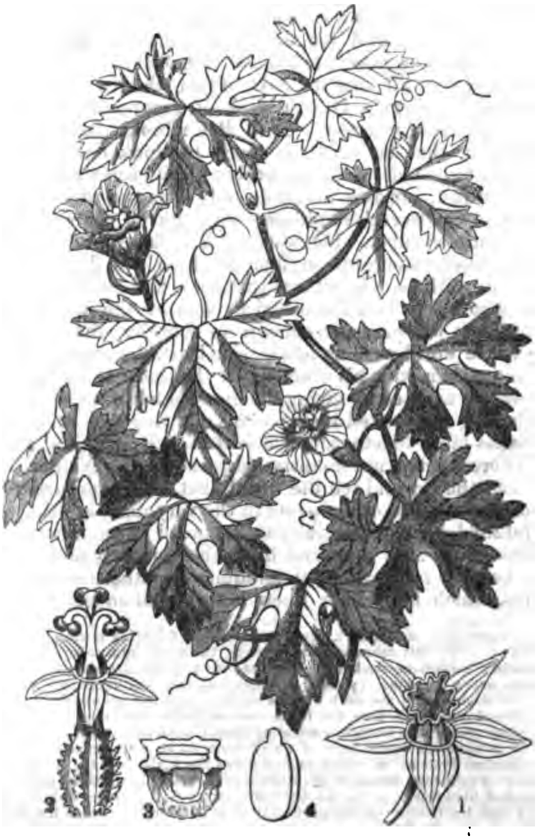
CUCU'RBITA, the genus from which the natural order derives its name. It differs from cucumis in having its petals very much grown together, and the seeds a little tumid at the edge. The common gourd, *C. maxima*, with its endless varieties, the vegetable marrow, *C. ovifera*, the orange gourd, *C. aurantia*, and *C. Melopepo*, the squash or bush gourd, are the principal types. It is not a little remarkable, that the native country of these common plants is entirely unknown.

Generally speaking, the species and varieties of cucurbita are harmless and eatable, constituting a very important part of the diet of the poorer classes in countries which are subject to long summer drought. Hence in the south of Europe, in India, and Africa, they are invaluable to the inhabitants of those countries; but the orange gourd is bitter, and the bottle-gourd, *C. lagenaria*, is a dangerous poison. This species bears fruits which are at first long and cylindrical; but as they ripen, they swell exclusively at the upper end, and acquire the form of a flask, the neck of which is their base. When ripe, they become hard enough externally to hold water, and accordingly when the pulp is removed, they form good bottles, and are extensively employed for that purpose. It is necessary however that they should be repeatedly washed out, so as to remove all trace of a bitter principle in which they abound, otherwise their use is dangerous. Some months since (1837), a sailor was poisoned at Falmouth, by drinking beer out of a bottle-gourd improperly prepared; and Professor Royle mentions, upon the authority of an intelligent native Indian doctor, attached to the gaol hospital at Saharunpore, a case of poisoning from eating the bitter pulp of this plant, in which the symptoms were those of cholera. We mention this fact here, but at the same time we should add that the bottle-gourd is not now considered a true cucurbita, but is referred to the genus *Lagenaria*.

CUCURBITA'CEÆ, a natural order of plants, consisting of climbing or trailing species with unisexual flowers, scabrous stems and leaves, a lobed foliage, and a more or less pulpy fruit with parietal placentæ. Nearly all the species climb by means of tendrils. The greater part consists of annuals, either wholly, or in so far as their stems at least. The petals are deeply veined, and usually either yellow, white, or green.

The order abounds in useful or remarkable plants, comprehending as it does the melon, gourd, cucumber, colo cynth, bryony, and all the many species approaching those types. Professor Royle, in his valuable 'Illustrations,' remarks that 'They are chiefly remarkable for the power of adapting themselves to the different situations where they may be grown. Thus, we hear of their affording large and juicy fruit in the midst of the Indian desert, where water is 300 feet from the surface (Elphinstone); and they are equally grown in the dry season on the sandy islands of Indian rivers; but excess of moisture does not appear to be injurious, as the great majority are successfully cultivated in the rainy reason; and Mr. Moorcroft describes an extensive cultivation of melons and cucumbers on the beds of weeds which float on the lakes of Cashmere; they are similarly cultivated in Persia and in China. (Vide *Hort. Trans.*, 2nd ser., vol. i. p. 468, and *Staunton's Embassy*). Being chiefly annuals which a few months suffice to bring to perfection, we find them succeeding in the summer temperature of northern climates, and thus extending from the line to 55° or 60° of northern latitude, and southwards to the Cape of Good Hope. Some of the species may be seen in the most arid places; others in the densest jungles. Planted at the foot of a tree, they emulate the vine in ascending its branches; and near a hut they soon cover its thatch with a coating of green. They form a principal portion of the culture of Indian gardens: the farmer even rears them in the neighbourhood of his wells.'

Two principles especially deserve attention in this order; the one saccharine and nutritious, the other bitter, acrid, and purgative; and the qualities of the products of the species vary according to the preponderance of the one or the other. In the melon, the gourd, and their allies, the first exists almost exclusively, and hence the edible nature of their fruit; but even here its well-known laxative quality sufficiently attests the presence of the bitter principle in some degree. In the colocynth, the bottle-gourd, various species of luffa, bryony, and others, the bitter principle is found in a state of concentration, and hence the active and even dangerous qualities of those plants, from which the cucumber itself is not exempt: only its bitterness is destroyed by the peculiar cultivation of that plant. The seeds of some kinds yield oil; and those of Cucumis Momordica are said to be ground into a kind of meal.



[Momordica Balsamina.]

1, A sterile flower; 2 a fertile flower; 3, a section of a seed; 4, the embryo.

CUDDAPAH, or KIRPA, a corruption of the Sanscrit word Cripa, signifying mercy. This division of the Balaghaut territory, ceded to the English by the Nizam in 1800, is situated between 13° and 16° N. lat., and between 77° and 80° E. long. [BALAGHAUT.] Cuddapah has been constituted a collectorate by the English, and contains seven subdivisions, viz., Cuddapah, Cummum, Dupaud, Gandicotta, Gurrumcondah, Punganoor, and Sidout: each of these subdivisions is named after its capital town. Throughout this collectorate, saltpetre, soda, and common salt are found abundantly, and to this cause it is owing that, except in the rainy season, the water is generally brackish.

The town of Cuddapah, in 14° 32′ north lat., and 78° 54 east long., stands 507 feet above the level of the sea, on both sides of the river Cuddapah, a small stream which rises in the hills to the south-east of the town. This town was long the capital of an independent Patan state, and so continued for some time after the destruction of the kingdoms of the Deccan. The palace of the former nabobs has been converted into a court of justice and a prison. In the country surrounding the town a considerable quantity of sugar is made. The celebrated diamond mines of Cuddapah are about seven miles north-east of the town, on both sides of the Pennar River. These mines have, it is said, been worked for several hundred years with various success. The places in which diamonds have hitherto been found consist either of alluvial soil or of rocks of the latest formation. The mines are pits of small depth. The diamonds are not scattered through the whole of the mine from the surface to the greatest depth, but occur in beds always harder than the adjacent soil, and usually not exceeding one or two feet in thickness. Dr. Heyne, who carefully examined these mines, has given in his statistical tracts the following description of one. 'The uppermost, or superficial stratum, consists of sand or gravel, mixed with a small proportion of loam. Its thickness scarcely exceeds a foot and a half. Immediately under it is a bed of stiff blueish or black mud, similar to what are seen in places that have been inundated; it is about five feet thick, and contains no stones. The diamond bed comes next, and is easily distinguished from the incumbent bed by the great number of large rounded stones which it contains. It is about two feet or two and a half thick, and is composed of large round stones, pebbles, and gravel connected together by clay.' The contents of this bed are put into a cistern about eight feet square and three feet deep, when water is poured into it, which separates the clay and loamy particles, leaving the gravel and small stones at the bottom These being removed are thinly spread upon a smooth surface about twenty feet square of hardened clay, and six or seven people examine the whole very carefully several times. At first they pick out the large stones; at the second and subsequent examinations the smaller gravel is carefully turned over by the hand, while they 'watch for the spark from the diamond, which invariably strikes the eye.' Cuddapah is 153 miles from Madras, and 220 miles from Seringapatam, travelling distance. Cummum, the capital of the subdivision of that name, is in 15° 37′ north lat. and 79° 10′ east long., 56 miles north-west from Ongole. Dupaud stands in 15° 58′ north lat. and 79° 23′ east long. This division, which is traversed by the Gondigam River, contains copper ore of good quality. The town and fort of Gandicotta are in 14° 51′ north lat. and 78° 23′ east long., 43 miles north-west from the town of Cuddapah. This was formerly considered a place of much strength; it is now of but little importance; there is a diamond mine in the neighbourhood. Gurrumcondah, near the verge of the eastern Ghauts, is situated in 13° 46′ north lat. and 78° 34′ east long., about 130 miles north-west from Madras. The district is well watered by several mountain streams, and is very productive. Punganoor is a fortified town, in 13° 21′ north lat. and 78° 3′ east long., 47 miles north-west from Vellore. Sidout is a fortified town, in 14° 30′ north lat. and 79° 2′ east long., twelve miles east of Cuddapah. It is surrounded by high stone walls in good repair, within which are ramparts; the fort is commanded by some of the neighbouring hills. It was taken by Hyder, who carried away the family of the nabob, and placed them in confinement. The town has much declined in population since the country has been in possession of the English, and the removal of the government offices to Cuddapah.

With great facilities for ascertaining the amount of the population throughout British India, little has been done to that end upon which reliance can be placed. The entire population of the collectorate of Cuddapah was stated to amount, in 1806-7, to 1,066,237; and in 1822-3 to 1,094,460 souls, of whom 578,461 were males, and 515,999 females. The number was stated, in 1828-9, at no more than 981,562; and it is alleged that this diminution was caused by the cholera. The great bulk of the inhabitants are Hindus. Returns were made by the collector in 1826, from which it appeared that throughout the whole of Cuddapah there were then only 494 schools, in which were instructed 6000 scholars, 5658 of whom were Hindus, and 342 Mohammedans.

(Rennell's *Memoir of a Map of Hindustan;* Heyne's *Statistical Tracts on India; Report of Committee of Commons on the Affairs of India in* 1832.)

CUDDALORE, a town in the Carnatic province, on the western shore of the Bay of Bengal, in 11° 44′ north lat., and 79° 50′ east long. The town is built on both sides of the Pennar River; the houses on the north side are modern, and many of them handsome. The dwelling of the collector, the principal resident European officer, is a large and elegant structure, with avenues of fine trees. The streets on the south side, called the Old Town, are many of them spacious, and contain several handsome houses. Altogether, Cuddalore is one of the handsomest towns in the south of the peninsula.

Cuddalore was taken from the French by the army under Colonel Coote in April, 1760, and remained under the government of the nabob of Arcot until April, 1782, when it was taken by the rajah of Mysore, assisted by a body of French troops. In June of the following year, the town was attacked by a British force under General Stuart, which was repeatedly defeated, and suffered great loss in attempts to carry the place by assault. The last of these attacks, in which the besiegers lost 600 men, occurred only two days before the arrival of the news of peace having been concluded between France and England: this event of course put an end to hostile operations. Cuddalore, with the remainder of the province of Arcot, came into possession of the English by treaty in 1795, and has so continued.

(Rennell's *Memoir of a Map of Hindustan;* Mills' *History of British India.*)

CUDWORTH, RALPH, was born at Aller, in Somersetshire, in 1617. Having been entered at Emmanuel College, Cambridge, in 1630, when he was but thirteen, he commenced residence in 1632, and became in due course of time, as his father had been before him, a fellow of Emmanuel. He acted for some time as tutor in the college, and had among his pupils the afterwards celebrated Sir William Temple. He had taken the degree of M.A. in 1639; he took that of B.D. in 1644, maintaining upon this occasion the two following theses: 1. *Dantur boni et mali rationes æternæ et indispensabiles;* 2. *Dantur substantiæ incorporeæ suâ naturâ immortales.* In 1644 he was also appointed master of Clare Hall; and in the succeeding year was elected to the regius professorship of Hebrew. On receiving this appointment he devoted himself with zeal to the subject of Jewish antiquities. He took the degree of D.D. in 1651. Though holding the two situations which have been mentioned, and besides these the living of North Cadbury, in Somersetshire, worth 300*l.* a year, to which he had been presented by his college shortly after taking his master's degree, he did not find his means sufficient for his support. It does not appear that he was a man extravagant in his habits; but owing, it is said, to pecuniary difficulties, he now absented himself for some time from Cambridge. He returned in 1654, having been chosen master of Christ's College. He now married, and the remainder of his life was spent in this college. In 1662 he was presented by the then bishop of London to the vicarage of Ashwell, in Hertfordshire; and in 1678 he was installed prebendary of Gloucester. In this last-mentioned year appeared his great work, the 'True Intellectual System of the Universe;' or rather (for though complete in itself, it is but a fragment of a larger work which he designed), the first part of the Intellectual System. This first part is devoted to the refutation of atheism. The whole work was to consist of three parts; but the second and third parts, which were to treat respectively of the nature of moral distinctions and of free will, were, though written, never published by him.*

Dr. Cudworth died at Cambridge, in 1688, in the 71st year of his age, and was buried in Christ's College. He left one daughter, who married Sir Francis Masham, and who is known, under the name of Lady Masham, as the friend of Locke.

Dr. Cudworth was one of that set of Cambridge divines, Latitudinarians, Arminians, and Socinians, as they were called by those who having nothing definite to bring against them resorted to ugly names, on whom Bishop Burnet has passed a high eulogium in his history of the reign of Charles II.* The chief others at this time were Drs. Whitchcot, Wilkins, Henry More, and Worthington. 'Dr. Whitchcot,' says Burnet, 'set young students much on reading the antient philosophers, chiefly Plato, Tully, and Plotin, and on considering the Christian religion as a doctrine sent from God, both to elevate and sweeten human nature, in which he was a great example, as well as wise and kind instructor. Cudworth carried this on with a great strength of genius and a vast compass of learning. He was a man of great conduct and prudence; upon which his enemies did very falsely accuse him of craft and dissimulation.' (*Hist. of his own Time,* vol. i., p. 321.)

The 'Intellectual System,' or that (properly the first) part of it which now passes under the name, is directed, as has been said, against atheism. This is one of three, as Cudworth conceives, false systems or hypotheses of the universe, or one of three possible modes of fatalism. They are thus briefly described in the preface:—'Of the three fatalisms or false hypotheses of the universe mentioned in the beginning of this book, one is absolute Atheism, another immoral Theism, or religion without any natural justice and morality (all just and unjust, according to this hypothesis, being mere thetical or factitious things, made by arbitrary will and command only), the third and last, such a Theism as acknowledges not only a God or omnipotent understanding Being, but also natural justice and morality, founded in him, and derived from him; nevertheless no liberty from necessity anywhere, and therefore no distributive or retributive justice in the world.' Before erecting the true intellectual system of the universe (the epithet *intellectual* being used, as he tells us, 'to distinguish it from the other, vulgarly so called, systems of the world, that is, the visible and corporeal world, the Ptolemaic, Tychonic, and Copernican'), it was his object to demolish these false systems. And the first of them, atheism, or the atheistic fate, is attempted to be demolished in the first part, which is all that we have under the name of 'Intellectual System.' It is a work of great learning, and also of great acuteness. Lord Bolingbroke has said of Cudworth, that he read too much to think enough, and admired too much to think freely; a criticism which, certainly unjust, appears plausible only from the well-known extent of Cudworth's erudition. But graver charges have been founded upon this work. 'You know,' says Lord Shaftesbury, 'the common fate of those who dare to appear fair authors. What was that pious and learned man's case who wrote the Intellectual System of the Universe? I confess it was pleasant enough to consider, that though the whole world were no less satisfied with his capacity and learning than with his sincerity in the cause of the Deity, yet was he accused of giving the upper hand to the atheists, for having only stated their reasons and those of their adversaries fairly together.' (*Characteristics,* vol. ii. p. 262.)

'There wanted not country clergymen,' says Warburton, 'to lead the cry and tell the world that, under pretence of defending revelation, he wrote in the very manner that an artful infidel might naturally be supposed to use in writing against it; . . . . that with incredible industry and reading, he had rummaged all antiquity for atheistical arguments, which he neither knew how, nor intended, to answer; in a word, that he was an atheist in his heart, and an Arian in his book.' (*Divine Legation of Moses*, vol. iii., ed. 1765. Preface.) The accusation alluded to in these passages is made in a circuitous way by a Mr. John Turner, in a 'Discourse of the Messiah.'

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* Dr. Birch, in the memoir prefixed to his edition of the 'Intellectual System,' having related the calumnious charges of atheism brought against Cudworth on the appearance of this work, goes on to quote the following remark of Warburton's:—'The silly calumny was believed; the much injured author grew disgusted; his ardour slackened; and the rest and far greatest part of the defence never appeared.' (p. 22.) Though this does not necessarily imply that the remainder of the work was not written, the inference would not be a very forced one. Nor does Dr. Birch ever explicitly state that the second and third parts were written, contenting himself with the remark—'He left several posthumous works, most of which seem to be a continuation of his "Intellectual System," of which he had given the world only the first part.' (p. 31.) A reference merely to Dr. Cudworth's preface, in which he makes a division of his subject, or to the beginning of his first chapter, would have shown that the treatise on Eternal and Immutable Morality, which has been published since his death, is the second part, and the treatise on Liberty and Necessity, which is still in MS., is the third part of the work.

* An account and defence of these divines is to be found in a tract entitled 'An Account of the new Sect of Latitude-men at Cambridge,' which was reprinted in the second volume of the Phenix, London, 1708.

In attacking atheism, or the atheistic fate, Dr. Cudworth describes the atomic physiology which, as held by Democritus, and other antient philosophers, involved atheism. It being his object to demolish atheism under every form, and therefore the atomic atheism, he yet adopts the atomic physiology, contending that 'so far from being either the mother or nurse of atheism, or any ways favourable thereunto (as is vulgarly supposed), it is indeed the most opposite to it of any, and the greatest defence against the same.' For the better confutation of other forms of atheism, to which he gives the names Hylozoic and Cosmo-plastic, he makes the hypothesis of an 'artificial, regular, and plastic nature,' working in complete subordination to the Deity. And to avert an argument brought against the oneness of the Deity, from its unnaturalness as shown by the general prevalence of Polytheism among the Pagan nations, he contends that 'the Pagan theologers all along acknowledged one sovereign and omnipotent Deity, from which all their other gods were generated or created,' and that their Polytheism was but a polyonymy of one God.

The 'Treatise on Eternal and Immutable Morality' corresponds to the second part of the 'Intellectual System.' It is directed against those who 'affirm justice and injustice to be only by law and not by nature;' among which affirmers he places, erroneously in our opinion, Hobbes.

Besides the 'Intellectual System,' Dr. Cudworth published, 1. 'A Discourse concerning the true Notion of the Lord's Supper,' in which he maintains, as Warburton has since maintained, that the Lord's Supper is a feast upon a sacrifice; 2. A Treatise, entitled, 'The Union of Christ and the Church Shadowed, or in a Shadow;' 3. 'A Sermon on John ii. 3–4, preached in 1647 before the House of Commons on a day of Public Humiliation;' 4. 'A Sermon preached in 1664 at Lincoln's Inn, on 1 Cor. xv. 57;' 5. A Treatise, entitled, 'Deus Justificatus, or the Divine Goodness vindicated and cleared, against the assertors of absolute and inconditionate Reprobation.'

He left several works in manuscript, only one of which has yet been published; viz., the 'Treatise concerning Eternal and Immutable Morality,' which appeared with a preface by Dr. Chandler, Bishop of Durham, in 1731. The rest are, 'A Discourse of Moral Good and Evil;' 2. 'A Discourse of Liberty and Necessity, in which the grounds of the Atheistical Philosophy are confuted, and Morality vindicated and explained;' 3. 'A Commentary on Daniel's Prophecy of the Seventy Weeks;' 4. 'Of the Verity of the Christian Religion against the Jews;' 5. 'A Discourse of the Creation of the World, and Immortality of the Soul;' 6. 'A Treatise on Hebrew Learning;' 7. 'An Explanation of Hobbes's Notion of God, and of the extension of Spirits.' These manuscripts, after having passed through many dangers, were finally purchased for the British Museum, in which institution they now are.

An abridgment of the 'Intellectual System' was published in 1706 by Mr. Wise, Fellow of Exeter College, Oxford, in two volumes, 4to. In 1733 a Latin translation was published by Dr. Mosheim, at Jena; in which the numerous errors in Cudworth's numerous quotations are corrected, and whose style is less complicated than that of the original: a French translation, which had been commenced by M. Bourdelin, a member of the French academy, was prevented from being finished by the death of the translator. That part of the 'Intellectual System' which treats of the 'plastic nature' gave rise to a controversy between M. Bayle and M. Le Clerc; the former of whom contended that such an hypothesis went to show the possibility of Hylozoism, while the latter defended Cudworth by representing it as a mere instrument of the Deity. M. Le Clerc's articles, which are valuable commentaries on this part of Cudworth's work, are in the *Bibliothèque Choisie*, tom v., vi., vii., ix. (Kippis's *Biographia Britannica;* Mosheim's and Birch's *Lives.*)

CUE'NÇA, a province of Spain, in New Castile, is bounded to the north by the provinces of Guadalaxara and Soria, on the east by Aragon and Valencia, south by Murcia and La Mancha, and west by Guadalaxara and Toledo. It is one of the most elevated provinces of Spain, its north and east parts being occupied by the high central chain, which runs nearly north and south on the borders of Aragon and Castile, being a continuation of the Sierra de Oca, and assumes in succession the names of Sierra de Molina, Sierra de Albarracim, in Aragon, and lastly, of Sierra de Cuença. [CASTILLA.] The Tagus, several affluents of the Guadiana, and the Xucar, have their sources in the province of Cuença. This region formed part of the country of the Celtiberi. It is now divided into three partidos or administrative districts, Cuença, Huete, and S. Clemente. There are two cities, Cuença and Huete, 245 small towns or boroughs, and about 200 villages. The mountainous part abounds with timber trees, fit for house and ship building. The inhabitants of the mountains are chiefly shepherds, and have numerous flocks of sheep. Wool is one of the staple products of the country, part of which is exported, and part manufactured into coarse cloth, carpets, baize, &c., the manufactures of which were once very flourishing in this province, but are now much decayed. There are also manufactories of leather, paper, and soap. The west and south parts of the province consist of arid and in great part uncultivated plains. Cuença is altogether one of the thinnest peopled provinces in Spain. The country produces corn, oil, wine, honey, wax, fruit, and saffron, which last forms an important article of exportation. It also abounds with game, and the rivers and lakes with trout and other fish. There are several small but very deep lakes, one of which, near Montealegre, is salt. Jasper of various colours, and silver, copper, iron, coals, and alum, are also found. The length of the province from north to south is about 120 miles, and its medium breadth between 70 and 80; and the population, as given by Miñano, is 326,000. The same author gives the following statistics of the annual income or produce of the country: land in possession of the laity, 15,870,000 reales de vellon; ditto belonging to the church and convents, 4,646,000 reales; rent of houses belonging to the laity, 3,244,000; ditto belonging to the clergy, 5,221,000. (*Diccionario Geografico estadistico de España*, 1830.) The climate is generally healthy; the inhabitants are laborious and honest, and much attached to their native soil, which few of them are induced to quit.

CUE'NÇA, the town of, stands nearly in the centre of the province, on a steep hill, surrounded by higher mountains, and just above the confluence of the Huecar and Xucar, 80 miles east by south of Madrid. It is a bishop's see, and is one of the cities which sent deputies to the old cortes of Castile. It has many churches, seven convents of Monks and six of Nuns, two hospitals, besides one for foundlings, three colleges, and a clerical seminary. The cathedral is large and handsome; the interior is rich in jasper and other valuable stones; one of the altars, which is dedicated to St. Julian, is much admired for the beauty of the materials and workmanship. Several of the convents are possessed of good paintings. The population is stated by Miñano to be 7,800. Cuença is surrounded by walls: the streets are mostly very steep; the town is well supplied with water. There is a handsome bridge over the Huecar outside of the town. Cardinal Gil de Albornoz and Alonso de Ojeda, one of the discoverers and conquerors of America, were natives of Cuença.

CUERS. [VAR, Department.]

CUIRASS or **CUIRASSE**, a piece of defensive armour, made of plate well hammered, serving to cover the body from the neck to the girdle, both before and behind; the front called the breast, the hinder part the back-plate· these were fastened to each other by straps, buckles, hooks, or some other contrivance. The name is supposed to be derived from *Curatia or Curassa*, a Latin word of the middle age, which occurs in charters at least as early as the fourteenth century (Meyrick's *Glossary of Military Terms*), originally derived from the French *cuir* or the Latin *corium*, 'a hide,' the earliest cuirasses being made of leather, though afterwards chiefly of metal, both brass and iron.

This species of armour was known to the Greeks and Romans. A breast and back-plate of Roman workmanship are preserved among the Hamilton antiquities in the British Museum, which, when worn, appear to have been held together by strings or wires, fastened to nipples in front. In later ages the cuirass was disused, and was not revived in Europe till about the beginning of the fourteenth century. In England it was disused after the reign of Charles II., except in one instance; but has of late years been revived for our cavalry. The cuirass was stated in Col. Lygon's evidence before a committee of the House of Commons on army and navy appointments, in 1833, to have been introduced as a part of the accoutrements of the Life-Guards within the preceding twelve years. To a question, 'Can you state what was the purchase-cost per man of the cuirass;' he answered, 'I apprehend they cost nothing; they have been lying in the Tower for years, and were worn at the battle of Dettingen.'

In the Romish calendar, under October 14, we find the name of St. Dominic, who is called *loricatus* or the cuirassed, a title given to a saint of the eleventh century, who constantly wore an iron cuirass next to his skin.

CUIRASSIERS, heavy cavalry armed with cuirasses. Most of the German powers, especially the emperor of Austria and the king of Prussia, have regiments of cuirassiers. They also form a portion of the French cavalry. In England we have no regiments which go by this denomination, although what are called the life-guards now wear the cuirass.

CUJA'CIUS, CUJAS, JACQUES, was born at Toulouse in the year 1520. The day of his birth is unknown. His father, a tanner of Toulouse, was named Cujaus, which the son changed into Cujas, for the purpose of making the name better suited for the Latinized form of Cujacius. In the latter part of his life he often signed De Cujas. Cujas, at an early age, distinguished himself by his talents and assiduity, and is said to have learned Greek and Latin by himself without any teacher. He studied law at Toulouse under Arnold Ferrier, for whom he entertained a high respect all his life; but he acquired the best part of his extensive knowledge by his own industry. With unwearied labour he studied all the works of the best civilians, and exercised himself in discussions with his fellow-students. In 1547 he began to lecture on Justinian's Institutes with great applause, and soon acquired such a reputation that the most distinguished men of the country, as President Dufaur and John de Foix, sent their sons to Toulouse to study under Cujas. In 1554 a professorship of the Roman law being vacant in the university of Toulouse, Cujas was a candidate, but, by the intrigues of his enemies, a man of very moderate talents, Stephen Forcadel, was preferred. Shortly after, being invited to Cahors as professor of law, he removed there with the greater part of his pupils. In the following year Margaret de Valois, at the suggestion of the Chancellor l'Hôpital, invited Cujas, as professor of law, to the university of Bourges. At that time there were two celebrated lawyers in Bourges, Hugh Doneau (Donellus) and Francis Duarin (Duarenus), both of whom became the rivals and enemies of Cujas. This was particularly the case with Duarin, who excited the students against Cujas to such a degree that, as Cujas also had a party of his own among the students, great disturbances would have arisen if he had not left the place. Having removed to Paris he was invited by a deputation from the city of Valentia to accept a professorship in that university. Cujas accepted the invitation; but Duarin having died in the year 1559, he returned to Bourges, where he resided till 1566. In the meantime Margaret de Valois, his patroness, had married the duke of Savoy, who gave Cujas an invitation as professor to the university of Turin. Not liking Italy, he returned to Valence as professor, and lived there till 1575, with some short interruptions, when he left on account of the religious quarrels which disturbed that city. During his residence in Valence the reputation of Cujas rose to its height. Young men from all parts of Europe, and particularly from Germany, not only students of law but those who were devoted to other sciences, came to Valence to study under Cujas. Among his pupils was Joseph Scaliger, the most celebrated philologist of his time, and James Augustus de Thou (Thuanus), the French historian. Henry III. of France made Cujas counsellor in the parliament of Grenoble, and loaded him with honours. In 1575 Cujas returned to Bourges as professor; but to avoid the religious troubles he again left Bourges for a year, during which he lectured on the civil law at Paris. Returning to Bourges he resided there till his death, having refused an invitation from Pope Gregory XIII., as professor in the university of Bologna.

The latter years of his life were greatly troubled by the religious disturbances which then distracted France. On the death of Henry III. the party of the Cardinal de Bourbon made great promises to Cujas, if he would write in favour of the cardinal against the rights of Henry IV. Cujas refused the proposals, and the fanatics of Bourges being excited against him by his enemies, he nearly lost his life in a tumult. On the 4th October, 1590, Cujas died of grief, as it is said, for the wretched situation of his country, in which civil war had dissolved all social order. Both friends and enemies united in honouring him with a splendid funeral.

Cujas was twice married. He had a son of great talents, who died in 1581; and a daughter by his second marriage, who was notorious for her disorderly life.

Cujas was distinguished both as a teacher and a writer. His merits principally consisted in substituting a more rational system in place of the unscientific method of Bartolus, and in grounding his interpretation of the civil law on a profound study of the original authors, and of the manuscripts of the Roman law. He possessed in his own library 500 MS. on the Roman law. His knowledge of archæology also and his exact acquaintance with the antient languages gave him a decided superiority over other civilians. In teaching as well as in his writings he followed the exegetical method, in which he may still be considered as a model.

The works of Cujas are very numerous. They are commonly divided into Opera Priora, which were published in his life by himself: first at Paris, 1577, 5 vols. fol., and again in 1583; and Opera Posthuma, which were edited by his friends after his death. Both the Opera Priora and Posthuma were first collected and edited by Alexander Scot, Lyon, 1614. The most complete edition is that by Fabrot, Paris, 1658, 10 vols. fol. As it is very difficult to find what we want in the works of Cujas, the 'Promptuarium Operum Jacobi Cujaci; auctore Dom. Albunensi, Naples, 1763, 2 vols. fol. is of great assistance.

The works of Cujas consist: 1. Of editions of the original works on the civil law, principally of the Codex Theodosianus, Pauli receptæ sententiæ, Justinian's Institutes, of the three latter books of the Codex Justinianeus; of the Consuetudines Feudorum with notes, and a translation of the sixtieth book of the Basilika, of which he also published an edition; 2. Of commentaries, notes, and interpretations relating to most parts of the Institutes, Pandects, Code, and Novels; a Commentary on the Decretals; and Lectures on many passages of the Pandects; 3. Other important works, as his Observationum and Emendationum libri xxviii., a work which civilians in the time of Cujas called 'opus incomparabile et divinum.' It contains corrections of the original works on law and of a great number of other authors, both Greek and Latin. This work is a real treasure to philologists; 4. Paratilla ad Digesta, et in libros ix., Codicis, which is a summary of the titles of the Pandects and the Constitutions of the Code.

(*E'loge de Cujas*, par Bernardi, Lyon, 1775; *Histoire de Cujas*, par Berriot; Saint Prix, *History of the Roman Law*, which is the best biography of Cujas; *Ed. Spangenberg; Cujas und seine Zeitgenossen*. Leipzig, 1822.)

CULEX. [CULICIDES.]

CULI'CIDES (Latreille), a family of dipterous insects of the section Nemocera. Technical characters:—Proboscis long and slender, projecting forwards, usually straight, terminated by two little lip-like appendages; sucker composed of six slender bristle-like members: palpi five-jointed, generally elongated; antennæ filiform, covered with hairs —in the male sex resembling little plumes; eyes contiguous: no ocelli; wings inclined, lying close to the body when at rest, and having one marginal and two sub-marginal cells.

The Culicides, according to Latreille, constitutes the first family of dipterous insects, and is the same group as that designated by Linnæus *Culex*. It is divided into three genera, distinguished principally by the following characters:

Palpi equal in length to the proboscis in both sexes; genus 1, *Anopheles* (Meigen).

Palpi of the males longer than the proboscis, and in the females very short; genus 2, *Culex*.

Palpi shorter than the proboscis in both sexes; genus 3, *Œdes*.

We are but too well acquainted with the torment inflicted by the insects of this tribe, which are known in this country by the name of *Gnats*, are called in France *Cousins* and in America *Mosquitoes*.

The pain and irritation are caused by their piercing the skin to feed upon the blood (by means of the little bristles forming part of the proboscis), and injecting at the sam time a poisonous fluid. It is said the females alone are the persecutors.

The humming noise accompanying their flight is produced by the vibration of their wings. Gnats seldom appear during the day-time, except in thick woods, and they always abound most in damp situations, a circumstance owing to the habits of their larvæ, which reside in stagnant waters.

The female gnat deposits her eggs (which amount to 200 or 300 in a year) one by one; and as they are deposited, they are joined together, and form a little raft, which floats on the surface of the water. The eggs are hatched in about three days' time, and produce little greenish larvæ, which have a distinct head and lengthened body, composed of numerous segments. The head is furnished with two ciliated organs, which are in constant motion. This motion appears to be for the purpose of creating a current, by which means minute animalculæ, or other substances which may constitute the food of the animal, are drawn into the mouth. Two other appendages, furnished with tufts of hair, appear to co-operate with the former for this purpose.

The breathing apparatus of the larva consists of a tube, terminated by radiating setæ situated at the apex of the body; through this tube the air is conveyed to the tracheæ, and for this purpose it is brought to the surface of the water, so that the animal is then in an inverted position. There is another apparatus also, situated at the tail of the animal, opposed to the breathing apparatus, which serves as a fin, and enables the larva to swim and dive with considerable velocity.

These larvæ are full grown in about fifteen days' time; they next assume the pupa state; the animal then appears to have a rounded form, owing to the apex of the body being recurved. It still inhabits the water, and is active; the position of its breathing apparatus is, however, altered, it being now situated on the anterior part of the body, and consists of two little tubes, which, as before, are applied to the surface of the water for the reception of air. When about to assume the imago state, the skin which covered the pupa being loosened from the animal within, and the space between the two being occupied with air, it floats upon the surface of the water; the gnat breaks through the upper part, and stands on the skin it has quitted, and which now serves as a little boat, upon which it floats until it has attained strength to fly.

Culex pipiens, Linn., the common gnat, is less than a quarter of an inch in length; the palpi and antennæ are brown; the thorax is of a yellowish brown, with two darker lines; the abdomen is of a pale grey colour; the legs are brown, and the base of the thighs yellowish.

The insect which is so troublesome in the island of Cuba, the mosquito (*Culex mosquito*), is not quite so large as the common gnat. Its proboscis is black; the palpi are spotted with white; the head and thorax are spotted with silvery white, and the latter has a curved band of the same hue. The edges of the segments of the body are also of a silver-like colour.

CULLEN, WILLIAM, was born in Lanarkshire, in the year 1712. His parents being in humble circumstances, he commenced the study and even the practice of physic under certain disadvantages; and after serving an apprenticeship to a surgeon-apothecary in Glasgow, he became surgeon to a merchant vessel, trading between London and the West Indies. He soon returned to his own district, and practised in the country parish of Shotts, a region proverbial, even in Scotland, for bleakness and poverty. Here an incident occurred which was perhaps his first gleam of good fortune, or, in other words, the first accident of which his genius availed itself to further his success. The duke of Argyle, while on a visit to a gentleman in the neighbourhood, was amusing himself with some chemical experiments, for which the apparatus in his possession proved insufficient: his host recollected Cullen as a person likely to supply the deficiency; he was accordingly invited to dinner, introduced to the duke, and acquired his good opinion. He soon removed to Hamilton, where he was admitted a councillor in 1737, and was chief magistrate in 1739 and 1740. Here he formed a partnership with a young man destined to attain equal celebrity, William Hunter. The chief object of this connexion was to enable them to improve their medical education; and accordingly they agreed that one of them should alternately be allowed to study during the winter at some medical school, while the other should carry on the business in the country for the profit of both parties. Cullen took the first turn, and passed his winter at Edinburgh. Hunter, when his turn arrived, went to London, where he soon recommended himself to Dr. Douglas, a lecturer on anatomy and midwifery, who engaged him as an assistant. Thus ensued a premature dissolution of partnership; for Cullen of course threw no obstacles in the way of his friend's advancement, but readily cancelled the articles. They maintained ever after a cordial communication by letters, though it does not appear that they had ever after a personal interview.

It was during this period of country practice that Cullen was united to Miss Johnston, the amiable daughter of a neighbouring clergyman. She married him when he had no worldly advantages to recommend his suit, presented him with a numerous family, and enjoyed the gratification of sharing his dignified prosperity until 1786, when she died.

The duke of Hamilton having been suddenly taken ill at his palace, sent for Cullen, who not only benefited him by his skill, but attracted him by his conversation. It appears to have been the interest of this nobleman which procured him the situation of lecturer of chemistry in the University of Glasgow; and having previously taken his doctor's degree, he began his first course in 1746. His medical practice daily increased; and when a vacancy occurred in 1751, he was appointed by the king to the professorship of medicine. It was now that he began to show the rare and most precious talent of giving science an attractive form, diffusing clearness over abstract subjects, and making the most difficult points accessible to ordinary capacities.

In 1756 he was called to Edinburgh to fill the chair of chemistry, vacated by the death of Dr. Plummer. While holding this office, he for several years delivered clinical lectures at the royal infirmary. Alston, the professor of materia medica, died in 1763, and was succeeded by Cullen, who, though now in the middle of his chemical course, began his new subject a few days after his nomination. So great was his popularity, that while only eight or ten pupils had entered under Alston, he attracted above a hundred. On the death of Dr. Whytt, in 1766, Cullen took the chair of theoretical medicine, resigning that of chemistry to his pupil Black. The chair of practical medicine next became vacant by the death of Dr. Rutherford. Gregory started as a rival candidate to Cullen; but by an amicable compromise it was agreed that the chairs of theoretical and practical medicine should be shared between them, each lecturing on both subjects; but when Gregory was suddenly cut off in the prime of life, Cullen occupied the practical professorship alone, till within a few months of his death. As a lecturer, Dr. Cullen was the greatest ornament of Edinburgh in the days of its greatest celebrity; and, like all who have excelled in that difficult branch of the profession, he carried with him not merely the regard but the enthusiasm of his pupils. Alibert bears testimony to the impression he made upon the foreign students who resorted to his lectures, and who preserved indelible recollections of his power to convince and to awaken. He lectured from short notes, and this nearly extemporaneous delivery no doubt contributed to that warmth and variety of style which tradition ascribes to his lectures, but which are certainly not the characteristics of his published works. Cullen was great to the last; and his life was extended to the 5th of February, 1790, when, in the words of his French biographer, he closed his glorious career. The following is a list of Dr. Cullen's works I. First Lines of the Practice of Physic, Edin., 1777, 4 vols 8vo. This work has been frequently reprinted, and has been translated into French, German, Italian, and Latin. Dr. Cullen's system, as delivered in this book and in his lectures, superseded that of Boerhaave, of which the humoral pathology forms a part. This theory however which supposes diseases to arise from a degeneracy of the animal fluids, not only harmonizes with the instincts of mankind, but has been of late years so confirmed by chemical analysis, that it bids fair to rear up its head again in the schools of medicine. Even Cullen, the great opponent of the humoral doctrines, in his remarks on scorbutics, admits that this disease depends on a particular condition of the fluids of the body. Cullen's division of diseases into four classes is so simple, and yet so ingenious, that it is still adopted by some English lecturers. The first class contains the Pyrexiæ, or febrile diseases; the second, the Neuroses, or nervous diseases; the third, the Cachexiæ, or diseases of an ill habit of body; the fourth, the Locales, or local diseases. To give an example of each, pleurisy belongs to the first class, epilepsy to the second, scurvy to the third, and tumours to the fourth.

The doctrine of *spasm*, which is used by Cullen to solve so many difficulties in the theory of medicine, is no longer universally admitted; but the practice which he founded upon it is so good that we cannot refuse him the honour of having been one of the great improvers of the art of healing; and we concur with that excellent judge, Dr. Thomas Young, who declares the 'First Lines' to be 'an extremely elegant and valuable introduction, rather encumbered than injured by some hypothetical speculations.' (*Medical Literature*, p. 125, 2nd edit.) As Cullen's system is founded on that of Hoffmann, it seems in its turn to have given birth to that of Brown, which is perhaps merely a rude simplification of his great master's theories. [Brown.]

II. Institutions of Medicine, Edin., 1777, 12mo. This is a treatise on physiology, which was translated into French, German, and Latin.

III. An Essay on the Cold produced by evaporating Fluids, and of some other means of producing Cold, Edin., 1777. This is annexed to Dr. Black's Experiments upon Magnesia alba, &c.

IV. A Letter to Lord Cathcart, president of the Board of Police in Scotland, concerning the Recovery of Persons drowned and seemingly dead. Edin., 1784, 8vo. At the end of the letter is the date 1774, and afterwards there is an extract from the Journals of the Board of Police, also dated 1774.

V. Synopsis Nosologiæ Methodicæ. Edin., 1785, 2 vols. 8vo. The first volume contains the nosologies of Sauvages, Linnæus, Vogel, Sagar, and Macbride; the second contains Cullen's own, which is by far the best. This work was translated into German, with some additions. Leipzig, 1786, 2 vols. 8vo.

VI. A Treatise of the Materia Medica. Edin., 1789, 2 vols. 4to. Translated into French and Italian, and twice into German; one of the German translations is by Hahnemann. Leipzig, 1790, 2 vols. 8vo.

Cullen's clinical lectures were published in 1797, Lond. 8vo. Dr. Young (*Med. Liter.*), after the title of the book, puts the word *surreptitious*, so that it was probably printed from the note-book of some student.

(*The Bee*, by Dr. Anderson, vol. i.; *Lives of British Physicians; Biographie Universelle.*)

CULLO'DEN, a house and estate belonging to the family of Forbes, about three miles north-east of Inverness, which has given name to the battle fought April 16, 1746, which put an end to the Rebellion. On the night preceding, the Highlanders had intended to surprise the duke of Cumberland in his camp at Nairn; but this scheme having failed, they took up a position on the Moor of Drummossie, their left wing towards the house of Culloden, where the declivity of the hill was soft and marshy, their right slightly protected by a stone wall. The ground, however, was unfavourable, being on the whole well suited to the operations of cavalry and artillery. Many of the Highlanders were absent, strong reinforcements were daily expected, and those who were present were weakened by hunger and fatigue. The question had been strongly debated, whether it would not be expedient to withdraw to the hills; but the difficulty of finding subsistence for the men and the importance of protecting Inverness determined the prince, Charles Edward, and his councillors to venture a battle, which was fought under every disadvantage, of which not the least was the indecision or incompetency of the leaders. Drawn up in line in the position above mentioned, while waiting for the signal to charge, the Highlanders suffered greatly from the English artillery. Exasperated at last beyond endurance, the centre rushed forward. This, the last charge of the Highlanders under their patriarchal discipline, and with their peculiar arms, is vividly described in Chambers's 'History of the Rebellion,' a small work replete with interest.

'A Lowland gentleman, who was in the line, and who survived till a late period, used always, in relating the events of Culloden, to comment with a feeling of something like awe upon the terrific and more than natural expression of rage which glowed in every face and gleamed in every eye as he surveyed the extended line at this moment. Notwithstanding that the three files of the front line of English poured forth their incessant fire of musketry, notwithstanding that the cannon, now loaded with grape-shot, swept the field as with a hail-storm; notwithstanding the flank fire of Wolfe's regiment, onward onward went the headlong Highlanders, flinging themselves into, rather than rushing upon, the lines of the enemy, which indeed they did not see for smoke till involved among their weapons. It was a moment of dreadful agonizing suspense, but only a moment, for the whirlwind does not sweep the forest with greater rapidity than the Highlanders cleared the line. They swept through and over that frail barrier almost as easily and instantaneously as the bounding cavalcade brushes through the morning labours of the gossamer which stretch across its path; not however with the same unconsciousness of the events. Almost every man in their front rank, chief and gentleman, fell before the deadly weapons which they had braved; and although the enemy gave way, it was not till every bayonet was bent and bloody with the strife.

'When the first line had been completely swept aside, the assailants continued their impetuous advance till they came near the second, when, being almost annihilated by a profuse and well-directed fire, the shattered remains of what had been but an hour before a numerous and confident force, at last submitted to destiny by giving way and flying. Still a few rushed on, resolved rather to die than thus forfeit their well-acquired and dearly-estimated honour. They rushed on, but not a man ever came in contact with the enemy. The last survivor perished as he reached the points of the bayonets.' It is said that, in one place, where a very vigorous attack had been made, their bodies were afterwards found in layers three or four deep.

The right wing of the Highlanders, advancing at the same time, was attacked in flank by the English cavalry and broken; the left withdrew almost without sharing in the fight. About 600 men were killed on each side. The battle, however, was decisive, and the prince fled to the mountains, and some days after gave notice to his partisans to provide for their own safety, declining to continue the contest with 8000 men, who were ready to meet him in Badenoch. The conduct of the English, especially of the duke of Cumberland, after the battle, was disgraced by extreme cruelty.

This memorable event has given occasion to many plaintive popular songs.

> Drummossie Muir, Drummossie day,
> A waeful day it was to me!
> For there I lost my father dear,
> My father dear and brethren three.

(Chambers, *Hist. of Rebellion*; Hogg, *Jacobite Relics.*)

CULM, the stem or straw of grasses.

CULM or **KULM**, one of the thirteen circles into which the government of Marienwerder in the province of Western Prussia is divided. Its area is about 341 square miles, and its population about 33,200. It contains two towns, Culm, and Briesen (about 1150 inhabitants). The country is watered by the Vistula in the west, where the soil is rich and productive: the more elevated parts are also fertile. Much grain, flax, tobacco, and fruit is raised, and cattle-breeding is extensive. The inhabitants are Germans and Poles intermixed.

CULM, the chief town, stands on a hill at the foot of which the Vistula flows, in 53° 21′ N. lat. and 18° 25′ E long. It was founded by the knights of the Teutonic order in 1229, who instituted an academy or public school here in 1387, for which a gymnasium has been substituted in modern times.

Culm is surrounded by walls, and has 5 Roman Catholic and 1 Protestant church, a chapel, 3 nunneries, an infirmary, a Catholic ecclesiastical seminary, a cadet academy, and 3 other schools. It gives its name to the bishopric of Culm, the diocesan of which has his residence and chapter at Culmsee. The number of houses is about 400, and of inhabitants about 5100. The chief occupations of the townsmen are the manufactures of woollens, tanning, fishing, and trading. Culm was formerly one of the Hanse Towns.

CULM. [Anthracite; Bideford, pp. 388, 389.]

CULMBACH, a bailiwick in the northern part of the Bavarian circle of the Upper Main, the chief town of which bears the same name, and is situated in a fertile and agreeable country on the left bank of the White Main, in 50° 5 N. lat., and 11° 27′ E. long. It is a well-built town about 500 houses and 4500 inhabitants, of whom about 180 only are Roman Catholics, the remainder Lutherans. It has three churches, a Latin school, hospital, infirmary, several breweries, potteries, a well-known earthenware manufactory, tile-houses, tanneries, &c. In the neighbourhood much potter's clay is raised; and on a mass of rock close to the town stands an old castle, the Plassenburg, at present used as a house of correction, the prisoners in which (about 400) are employed in weaving carpets and coarse woollens, and spinning yarn. The outworks of the castle were razed by the French in 1808.

CULMINATION (culmen, the summit of a thing). A star culminates, or comes to its highest point, at the moment when it is on the meridian. [TRANSIT, MERIDIAN.]

CULTIROSTRES (Ornithology), a name given by Cuvier and others to a family of birds consisting of those species which were united under the genus *Ardea* by Linnæus, and whose bill is large, long, and strong, and most frequently pointed also, such as *Cranes*, *Herons*, *Storks*, &c.

CULVERIN. [ARTILLERY.]

CUMÆ (Κύμη), an antient town on the coast of Campania, about ten miles west by north of Naples, which has been long since totally ruined. It is said to have been built by a colony of Chalcidians from Eubœa, and was one of the earliest Greek colonies on the coast of Italy. A colony from Cumæ originally founded Zancle, afterwards Messene, in Sicily (Thucyd. vi. 4), in the eighth century B.C. Cumæ seems to have rapidly attained great wealth and importance through its maritime trade. The Etruscans are said by Dionysius to have sent an army against Cumæ, which, however, was defeated near the banks of the Vulturnus. Athenæus (xii.) describes, from older writers, its former splendour and the wealth of its citizens. According to Livy (viii. 22), the people of Palæopolis, afterwards Neapolis, were also a colony from Cumæ. The story of the Sibylline books being offered to Tarquin, attributes them to a Sibyl or prophetess, who at some remoter period resided at Cumæ. The same Tarquin the Proud, after vain attempts to recover his sovereignty, died at Cumæ, where he had sought an asylum under Aristodemus, who, himself an exile from Messenia, and driven away by the Lacedæmonians, had come to Cumæ, and usurped the sovereign power. We find, about 417 B.C., at the end of the Latin War, the people of Cumæ included in the general peace with Capua and other towns of Campania. (Livy, viii. 14.) During the second Punic War, Cumæ was still independent, and had its own senate, which, instead of siding with Hannibal, like the Campanians, took part with Rome, and by its timely information to the consul, Sempronius Gracchus, enabled him to surprise the Campanians while offering their sacrifices, and to kill a great number of them. Upon this Hannibal hastened from his camp on Mount Tifate to attack Cumæ, which was defended by Gracchus, who repulsed the Carthaginians with great loss. (Livy, xxiii. 35, 37.) Under the Romans, Cumæ gradually declined from its former importance; the superior attractions of Baiæ, owing to its more sheltered situation and more genial climate, probably contributed to the decline of Cumæ. Juvenal (*Sat.* 3,) speaks of it as comparatively depopulated. It suffered afterwards in the wars between the Goths and Narses. It was at one time a bishop's see, but the town being completely destroyed by the Saracens at the beginning of the thirteenth century, its see was incorporated with that of Naples. The town lay partly on the hill, which is rocky and steep, and partly on the sea-shore. There are the remains of an amphitheatre in the plain towards the south. The temple of Apollo stood in the Acropolis on the hill which is now called Rocca di Cuma. The ground is here strewed with prostrate columns, capitals, and fine marble slabs with Greek inscriptions, half-covered with aromatic herbs, wild flowers, and the leaves of the vine-trees, which grow here luxuriantly. A farm-house on the hill is still called the House of the Sibyl, and the people pretend to show her baths, which are now converted into wine-presses, and her grotto, which is an excavation in the rock, leading to several subterraneous galleries half-filled with rubbish, and said to extend as far as Averno and Baiæ. Many statues have been found in this neighbourhood. (Ferro, Scotti, Jorio, Paolini, &c.) From the summit of the rock there is an extensive view, quite different in character from those near the shores of the Bay of Naples. It has a grander but more solitary and desolate aspect, extending on one side over the wide expanse of the Mediterranean, and on the other over the lakes of Fusaro, Licoli, and Patria, and the low lands of the coast as far as Gaeta, while to the east the Mons Gaurus separates it from the coast of Pozzuoli and the Bay of Naples. The plain is strewed with the ruins of temples, villas, baths, and sepulchres. Many farm-houses are scattered about: for the country is fertile, though unwholesome in summer. The road from Pozzuoli to Cumæ passes under a fine arch or gateway, inclosed between two rocks, through which the road has been excavated. This arch, probably a work of the Roman period, is now called Arco Felice. (Paoli, *Antichita di Pozzuoli*, &c.) Petronius Arbiter, the discarded favourite of Nero, put himself to death at Cumæ in the manner related by Tacitus, *Annal.* xvi., 19.

CUMANA', a town in South America, in the republic of Venezuela, and the capital of the department of Maturin, 10° 27′ 52″ N. lat. and 64° 9′ 27″ W. long. It stands in an extensive plain, somewhat above a mile from the sea, at the entrance of the gulf of Cariaco: the port is spacious and safe. The gulf of Cariaco, which extends nearly 40 miles east and west, and is from 7 to 9 miles wide, offers excellent anchorage, being in the middle from 60 to 80 fathoms deep, but not so deep towards the shores. The entrance of the gulf, however, is not without danger; a sand-bank extends from Punta Araya for some miles, and on the southern coast there is a shoal, called Morro Roxo, which extends 550 feet east and west, and has only from one to three feet water upon it.

The plain on the southern shores of the gulf extends about 10 miles inland to the offsets of the Cerro del Bergantin, which is about 5000 feet high. On this plain rises a group of isolated hills, at the foot of one of which the town is built. On this hill, which is to the south-east of the town, and rises with a steep ascent to the height of about 180 feet, stands the castle of S. Antonio. The town is inclosed on the south and west by a small river, called Manzanares, which divides it from the three suburbs, which are nearly as populous as the town itself. The whole population probably does not exceed 12,000 souls. There is no steeple or dome in the town, and only a few trunks of tamarind, cocoa, and date trees rise above the houses. All the houses are low and slightly built, on account of the frequent earthquakes. The roofs are flat. There is only one parish church and two convents, but no remarkable building. The climate is very hot, but as the air is dry it is more healthy than other places on this coast. The articles of exportation are cattle and dried meat (tasajo), salted fish, and salt. The two first come from the llanos of the Orinoco; the fish is taken along the coast and in the gulf, and the salt prepared on the peninsula of Araya. These articles are principally carried to Caracas and the Windward Islands. Excellent cables of the bark of the mahet are made here. The inhabitants of the town are white and of the mixed race; there are very few negroes. The suburbs are inhabited by the Indians, especially the Guayquerias or Gauyguerias. (Humboldt, Depons.)

CUMANIA, GREAT, an independent district in the western part of the Hungarian province 'beyond the Theiss,' lying between 47° and 47° 40′ N. lat., and 20° 30′ and 21° 10′ E. long., independently of a small district on the right bank of the Körös, and another on the left bank of the same river The whole surface is a low plain, containing an area of about 424 square miles, and rendered so swampy by the inundations of the Berettyó, Hortobágy, and Kakad, that nearly one half of Cumania is a mere bog. The upper part has been reclaimed to a great extent by the construction of an immense dam in the year 1786. Such portions of the soil as admit of cultivation are extremely productive, and yield plentiful crops of grain, particularly wheat and barley, melons, &c. The meadows and pastures afford excellent fodder and hay, and the rearing of cattle is carried on extensively. The land is full of bulrushes, which, with straw and dung, supply the place of fuel. The population amounts to about 43,000, of whom 5600 are Roman Catholics, and 37,000 Protestants. They are an athletic robust race of men, very fond of rural pursuits. There are no large land proprietors, or feudal lords, as in most parts of Hungary; the people have independent jurisdictions of their own; and send representatives to the Hungarian Diet. They are altogether a rich, happy, and independent people. Great Cumania contains one market-town (*Kardszag Uj Szállás*) 47° 20′ N. lat., and 20° 55′ E. long., on the Sàrret, which has about 1450 houses, and 11,100 inhabitants, and is a thriving mart for the grain, fruit, wine, and cattle, which the exuberant fertility of the surrounding country enables the people to raise), and 5 villages, viz., Turkevi (6450 inhabitants), Madaras (7440), Kunhegges (6160), Kis Uj Szállás (6760), and Kun St. Márton (4970).

CUMANIA, LITTLE. This district, situated between the left bank of the Danube and the right bank of the Theiss, and in the Hungarian province 'this side of the Theiss,' consists of two large and three small tracts of country. The larger tracts adjoin the county of Csongrád on the east, and the counties of Bacs and Csongrád on the south; their northern boundary is the county of Pesth: two small tracts lie to the east of them, the one, next the county of Heves, consisting of two prædia, or privileged settlements; and the other, of Latzháza, with its small territory and two prædia, on the Danube, between Ratzkévy and Bugyi. With the exception of a few sand-hills, the whole of Little Cumania is a complete level. Its area is altogether about 1003 square miles, and its population about 53,000, of whom 27,000 are Roman Catholics, and 26,000 Protestants. The country has no stream whatever but a brook called the Kigyòs, which flows near Szabad and Filep-Szállás, but it is full of swamps and sheets of water. Most of the land is either occupied by these swamps, or partially covered with sand; but the available surface is fertile in grain and contains fine tracts of rich loam. Besides an abundance of grain, Little Cumania produces tobacco and large quantities of excellent melons; considerable herds of cattle and sheep and a great number of horses are reared on its rich pastures. Much limestone and soda are obtained. Thó Palatine of Hungary is the immediate governor both of Great and Little Cumania; the Kapitányoks, or chiefs of districts, and justices of circles, are subject to his authority. The people of Little Cumania are as independent, robust of make, and rich as their brethren in Great Cumania. Little Cumania contains 3 market-towns, 5 villages, and 37 prædia. The towns are Halas, on the banks of the Halastó, a large sheet of water, in 46° 36′ N. lat., and 19° 32′ E. long. It has a population of about 10,900, and a considerable trade in grain and wine. Felegyháza, to the south-east of Ketskemét, has 12,970 inhabitants, and is embellished with a handsome edifice, where the Cumanians have their courts of justice and keep their archives. Near this place several Roman urns have been dug up. There is an extensive traffic here in grain, fruit, wine, and cattle. Kun Szent-Miklós lies on the Baker, to the south of Pesth, and has about 4300 inhabitants.

CUMBERLAND, one of the northern counties of England, lies between 54° 6′ and 55° 7′ N. lat., and 2° 13′ and 3° 30′ W. long. On the north it is bounded by the Solway Frith and Scotland for 30 miles; on the south by Westmoreland for 48 miles, and Lancashire 21 miles; on the east by Northumberland for 51 miles, and Durham 7 miles; and on the west by the Irish Sea 67 miles. The extreme length of the county is about 74 miles, and its greatest breadth 34 miles. Its circuit is 224 miles, and the area 1523 square miles, or 974,720 acres. According to the agricultural survey published in 1793, there were 470,000 acres of old inclosed land; 150,000 acres of common that might be brought into cultivation, 342,000 acres chiefly occupied by mountains, and above 8000 acres by lakes and rivers.

In consequence of the cultivation of extensive commons and waste lands, the aspect of the country has been completely changed. Without reverting to the survey made in the time of William the Conqueror, when there was 'a goodly great forest, full of woods, red deer and fallow, wild swine, and all manner of wild beasts, called the Forest of Englewood;' or to the time of Edward I., when that king, during a few days which he spent in Cumberland for the purpose of hunting, is said to have killed 200 bucks in the same forest; even within half a century, and since the last agricultural survey, more than 200,000 acres have been inclosed. Many of the commons, which previously afforded only a scanty pasturage to a few half-starved sheep and cattle, are now covered with fertile corn-fields and profitable herbage, have proper hawthorn fences, good roads, and commodious farm-buildings. A scarcity of wood forms a peculiarity in the general aspect of the country, for which two reasons may be assigned—the lords of some manors claim the wood, and the farmers dislike it on account of the injury which it does their corn-crops. In area Cumberland ranks the twelfth county in England, and in population the twenty-eighth. In 1821 the population was 156,124. In 1831 it amounted to 169,681—81,971 males and 87,710 females.

Surface, Hydrography, and Communications.—The east and south-west parts of the county are very mountainous, rugged, and uneven; the north and north-west parts are low and flat, or gently undulating. Hills, valleys, and ridges of elevated ground occupy the midland part. To a traveller, the mountainous district in the south-west is the most interesting. This part contains Saddleback, Skiddaw, and Helvellyn, and the lakes of Ullswater, Thirlmere, Derwent-water, and Bassenthwaite. This magnificent assemblage of lofty mountains and beautiful lakes annually attracts tourists from all parts of the kingdom. Several of the other districts, though not mountainous, are hilly, and present an endless variety of landscape; some of the valleys are traversed by rivers, and afford perhaps a greater variety of delightful scenery than any other county. Besides the lakes already mentioned, there are several of smaller size, equally celebrated for their diversified and picturesque scenery. Buttermere, Crummock-water, Lowes-water, Ennerdale, Wast-water, and Devock-lake, are frequently visited by travellers in their excursions. There are also several tarns, or small pieces of water, the chief of which are Overwater, not far from Uldale; Burn-moor-tarn, at the head of Miterdale; Tarn Wadling, near High Hesket; Talkintarn, in the parish of Hayton; and Martin-tarn, in that of Wigton.

The following is a tabular view of the principal lakes of Cumberland.

LAKES.	Nearest Market-towns.	Length in miles.	Brèadth in miles.	Depth in feet.	Height in feet above the sea.
Ullswater . .	Penrith	9	1	210	460
Thirlmere . .	Keswick	2½	1	108	473
Derwent-water	Ditto	3	1½	72	222
Bassenthwaite	Ditto	4	1	68	210
Buttermere .	Ditto	1¼	½	90	
Crummock .	Cockermouth	3	¾	132	260
Lowes-water .	Ditto	1	½	64	
Ennerdale .	Whitehaven	2½	½	80	
Wast-water .	Ravinglass	3	½	270	160

The most remarkable phenomena connected with the lakes are the Floating Island and Bottom-wind, both of which are occasionally observed at Derwent-water, and neither has yet received a satisfactory explanation. All the lakes are well stocked with fish, particularly with trout, pike, and perch. Ullswater, Ennerdale, Crummock, and Buttermere, contain char; the first of these lakes abounds with eels and skellies. Salmon pass through Bassenthwaite lake to deposit their spawn in the rivers Derwent and Greta. Trout and eels are found in the tarns. Tarn Wadling produces some of the finest carp in the kingdom. There are several fine waterfalls, of which the following are the principal, with their respective situations and heights:—

	Feet.
Scale Force, near Buttermere . . .	190
Barrow Cascade, two miles from Keswick .	124
Lowdore Cascade, near Keswick . .	100
Sour Milk Force, near Buttermere .	90
Airey Force, Gowbarrow Park . .	80
Nunnery Cascade, Croglin . .	60

The following are the names and altitudes of the principal mountains, and the districts in which they are situated:—

		Feet.
Scaw Fell (high point)	Eskdale . .	3166
Helvellyn .	Keswick . . .	3055
Skiddaw .	Keswick . .	3022
Bow Fell .	Eskdale . .	2911
Cross Fell .	Aldston . .	2901
Pillar .	Wast-water .	2893
Saddleback .	Keswick . .	2787
Grassmere Fell .	Keswick . .	2756
High Pike .	Hesket New Market .	2101
Black Comb .	Duddon mouth .	1919
Dent Hill .	Egremont . .	1110
Scilly Bank .	Whitehaven .	500

The offsets of the western or Skiddaw range of primitive and transition mountains extend within five miles of Carlisle, and four miles of Wigton. Those of the secondary (Cross-fell, or Penine chain) do not reach quite so far north as Tindale-fell, near Brampton.

The principal rivers in Cumberland are the Eden, the Esk, and the Derwent. The Eden enters the county on the south, where it unites with the Eamont, runs to the east of Penrith, passes Kirkoswald, Armathwaite, Corby, Warwick-bridge, and Carlisle, and discharges itself into the Solway Frith, near Rockliff, where it forms a fine æstuary. The scenery along the course of the Eden in this county, which is about thirty-five miles, is very varied and beautiful. The mansions and pleasure-grounds of Skirwith Abbey, Eden-hall, Nunnery, Armathwaite, Low-house, Corby Castle, Warwick-hall, and Rickerby, adorn its banks.

The Esk enters Cumberland from Scotland, and passes Kirk-Andrews and Netherby, flowing through a beautiful valley in a south-west direction to Longtown. After receiving the Line, which is formed by the junction of two streams arising near Christenburgh Crags, called Black Line and White Line, it falls into the Solway Frith, near Rockliff Marsh. Its course in this county is about 10 miles.

The Derwent takes its rise from Sparkling-tarn, among the crags at the head of Borrowdale, passes through Styhead-tarn, and forms the lake of Derwent-water, at Keswick, where it is joined by the Greta. It then pursues its course to Bassenthwaite and Cockermouth. At the former place it forms Bassenthwaite-water, and at the latter it receives the Cocker. After running about 33 miles and passing many pleasant seats and villages, it falls into the sea near Workington.

There are numerous streams of smaller size. The Caldew issues from the south-east side of Skiddaw and Caldbeck-fell, from whence it takes a northerly direction. At Haltcliff Bridge it enters a subterraneous passage, in which it runs about four miles. The river emerges at Sebergham, then passes Rose Castle and Dalston, and after a course of about 20 miles, in which it puts in motion several corn and cotton mills, print works, &c., joins the Eden at Carlisle. The Peteril rises in the parish of Greystock, near Penruddock, runs by Plumpton, Barrock-lodge, Wreay, Woodside, Newbiggin-hall, and Upperby, and enters the Eden near Carlisle. The Irthing runs several miles in a southern direction between this county and Northumberland, passes Gilsland-spa, about a mile from which it enters Cumberland, then turns westward by the two Dentons, Naworth Castle, Lanercost, Walton-house, Irthington, and Edmond Castle. After a very winding course of about 13 miles in this county, in which it receives King, Cambeck, and several lesser brooks, it falls into the Eden near Newby, above which place it is joined by a small river called the Gelt, which rises in Croglin-fell. The Liddel rises in Scotland, and forms the boundary for about eight miles between that kingdom and Cumberland. It joins the Esk near the entrance of that river into the county. The Sark runs between Cumberland and Scotland for about six miles near Solway-moss. The Wampool rises in Brocklebank-fells, passes Crofton-hall, and at Dockray joins the Wiza, which springs near Rosley, and runs by Old Carlisle and Wigton. The Wampool runs past Glamblesby to the sea, which it enters near Kirkbride. The Waver has its origin in Brocklebank and Caldbeck fells, and takes a similar course to the æstuary. By diverting the channels of these two rivers near their termination, 4000 acres of land might be reclaimed at small expense. The Ellen rises from Caldbeck-fells, and passes by Ireby, Bolton, Aspatria, Ellenborough, and Nether-hall, and enters the sea at Maryport after a course of about 18 miles. The Cocker takes its rise near the black-lead mines, in Borrowdale, flows through the lakes of Buttermere and Crummock, unites with the stream of Lowes-water, and falls into the Derwent at Cockermouth. The Greta has its principal source in a curious lake or tarn on Saddleback. At Threlkeld it receives a stream from the vale of St. John and Thirlmere, and then runs to Keswick, near which place it joins the Derwent. The Eamont flows from the lake of Ullswater, which is partly situate in Cumberland and partly in Westmoreland. It divides the two counties in its course, passes Dalemain, Carlton-hall, and Brougham-hall, and joins the Lowther and the Eden, the former about a mile to the west, and the latter about five miles south-east of Penrith. The Duddon rises in Cumberland, near the junction of the county with Westmoreland and Lancashire, and in its course to the sea of about 20 miles forms the boundary between the first and last mentioned counties. A large tract of sand here seems also capable of being recovered from the sea. The Croglin rises on Thackthorn-fell, contributes to the beautiful and romantic scenery of Nunnery and Staffold-hall, near which places it falls into the river Eden. The Nent rises in the south-east extremity of the parish of Alston, and joins the South Tyne near the town of Alston. The South Tyne has its source in a swamp or bog-ground about seven miles east by south from the summit of Cross-fell: it runs by Garrigill and Alston, and a little below the latter place enters Northumberland. The Tees rises in the same swamp, about a mile from the source of the South Tyne, and for nearly four miles forms the boundary between Cumberland and Westmoreland. Besides these, there are the Carn, which rises from King Harry; the Ehend (or End) from the lake of Ennerdale; the Irt, Mite, and Esk, and numberless small rivulets and brooks. The larger rivers abound with salmon, trout, brandling, and various other kinds of fish, and the smaller with trout and eels. Salmon fishing commences in the Eden, January 1st; in the Solway Frith and Esk, March 10th. It closes in all th Cumberland rivers on the 25th of September, except the Derwent, in which it continues from the 10th of February to the 10th of October. Salmon taken in the Eden is often sold to purchasers in London, Liverpool, and Manchester, particularly when it first comes in season. Game, especially grouse, is sent in great quantities to the south of England.

The ship canal from Carlisle to the Solway Frith is the only canal in the county. The Newcastle and Carlisle railroad, which was opened from Carlisle to Blenkinsop in July, 1836, (and not from Newcastle to the latter place in 1816, as is stated by a misprint in the article CARLISLE,) is the only railroad for the conveyance of goods and passengers this railway and the Carlisle canal will complete the communication between the east and west seas. A survey is now making for lighting and buoying the Solway Frith, which will be a great advantage to its navigation; and floating-docks are about to be constructed at Port Carlisle, a new and flourishing little seaport at the junction of the canal with the Frith, from whence two steamers sail weekly to Liverpool. A railroad has lately (1837) been projected from Carlisle to Maryport, and nearly all the shares are taken. Two important turnpike-roads cross the county: one passes from east to west and the other from south to north; the latter is one of the principal roads between London and Glasgow and Edinburgh, and enters the county near Penrith, a market-town, 18 miles from Carlisle. It passes through that city, and then through Longtown, nine miles north of it, to Edinburgh; previously giving off a branch three miles north of Carlisle to Glasgow, by Gretna, which crosses the Esk by a cast-iron bridge. The road from east to west extends from Newcastle to Carlisle 56 miles, and from the latter place to Whitehaven 41 miles. It passes through Brampton, nine miles east of Carlisle: on the west, through Wigton, 11 miles, Allonby 11, Maryport 5, Workington 6, and Whitehaven 8 miles. There is a turnpike-road from Penrith to Alston 20 miles; and one also from the former place to Keswick 18 miles, from thence to Cockermouth 13, to Whitehaven 13 miles. From Wigton there is a road extending to Cockermouth 16 miles; one also to Keswick, through Ireby, 22 miles; and another to Penrith, through Sebergham, 21 miles. From Whitehaven to Duddon Sands, on the road to Ulverston, are Egremont, 5 miles, Calderbridge 4, Ravenglass 7, Bootle 6, Whicham 4, and Duddon-bridge 6 miles. A turnpike-road extends from Brampton to Longtown 11 miles: there is one also from Keswick to Ambleside 16 miles, which passes through a pleasant and picturesque country.

Geological Character.—Cumberland is situated in the red marl district, which lines the western base of the great chain of mountains denominated the British Apennines, or the Back-bone of England extending from the Tweed into Derbyshire. This district extends in a northerly direction from the north-west corner of the Cheshire plain, along the western coast of Lancashire, into Cumberland and the south of Dumfriesshire. White and red sandstone, but chiefly the latter, may be found almost everywhere within the limits described. St. Bees' Head is entirely composed of new red sandstone. At Whitehaven the red marl formation is seen reposing on the coal formation, covered by the marl-beds containing gypsum: the same formation is seen filling up the great space between the Cumberland group of mountains and the British Apennines at Cross-fell. At Newbiggin and Coat-hill, near Carlisle, gypsum is found lying in red argillaceous marl, between two strata of sandstone: the former quarry is much wrought, and gypsum is exported in great quantities from Carlisle.

At Barrock, three miles to the south of Newbiggin, is a large rock of greenstone, much used on the public roads. A trap or basaltic rock is also observed near Berrier, at the hill called Binsey, and also on the north side of the Derwent, near Cockermouth. The primitive and transition group of the Cumbrian mountains consist of granite, sienite, hypersthene, greenstone, slate, old red sandstone, and mountain limestone. A grey kind of granite is found in the bed of the Caldew, on the north-east side of Skiddaw; and also in a branch of the river Greta, between Skiddaw and Saddleback. Sienite is met with at Irton-fell, Muncaster-fell, and Nether Wasdale; and hypersthene, in conjunction with quartz and felspar, commonly referred to the class of sienite, at Carrock-fell. A reddish felspar porphyry is found on Ambroth-fell and on both sides of St. John's Vale, near Keswick. Varieties of slate, intersected by dykes of trap or greenstone, constitute the great mass of Skiddaw, Saddleback, and the adjacent mountains. The common stone of the Keswick district is called blue rag, schistic earth, or whintin. At Borrowdale, Eskdale, and Patterdale, Scaw-fell and Helvellyn, and some adjacent places, grey slate is associated with hornstone, amygdaloid and argillaceous porphyry, constituting the towering crags and lofty precipices of these districts. Many of the cataracts of the lakes fall over rocks of this description. Quartz, garnets, calcareous spar, chlorite, epidote, and sometimes agate, opal, and chalcedony, are found in these rocks. The old red sandstone occurs near Melmerby. Metalliferous limestone, productive of lead ores, abounds in the mountains of the east, and also of the west of the county. Boulder-stones, from the granite rocks of Dumfriesshire, occur in the eastern parts of the county; and some, of the granite of Caldew and of the sienite of Carrock, near Carlisle. Shap-fell boulders are found on the shores of the Solway Frith; and boulders from the sienite of Buttermere and Ennerdale, on the west coast of the county.

The minerals are silver, copper, lead, iron, plumbago, limestone, and coal. The principal lead-mines are situated at Alston, and are almost exclusively the property of Greenwich Hospital, to which institution they were appropriated by act of parliament on the attainder of the earl of Derwent-water. The number of mines now working is about 40, some of which are very productive. Silver and copper are found in some of the mines in the same veins with the lead-ore. Silver and lead are at present got in great abundance at Greenside and Eagle-cragg in Patterdale. Veins of lead-ore have been found and worked between Skiddaw and Saddleback, in Buttermere, Newlands, and Thornthwaite. There are copper-mines at Alston, Caldbeck, and at Wythburn. There is one also below the level of Derwent-water, and another in the parish of Lowes-water. A very rich vein of gold is said to have been discovered at Newlands by a German, in the time of Queen Elizabeth, but the working was discontinued in consequence of a law-suit between that queen and the earl of Northumberland, then the lord of the manor of Derwent-fells. Iron-ore is raised in great abundance near Egremont; the thickness of the band of ore, which is hard solid metal, is said to be between 24 and 25 feet. The quantity of iron-ore shipped from Ulverston and Barrow is very great 300 carts of ore are taken daily from Lindale to Barrow for exportation. The ore of this county produces upwards of double the quantity of metal that is got from iron-ore in general. Coal is worked to a large amount at Whitehaven, Workington, and in the vicinity of Maryport, from whence it is exported to Ireland and the west of Scotland. The eastern part of the county also abounds in coal, particularly Tindale-fell, Talkin, and Blenkinsop, which produce the chief supply for Carlisle, Brampton, Penrith, and the intermediate country. Some of this coal is now exported at Port Carlisle to Ireland and Scotland. There are collieries at Gilcrux, Arkleby, Oughterside, Bolton, and Hewer-hill. Limestone is very abundant in many parts of the county. In some places it is burnt in great quantities for exportation, particularly to the west of Scotland. At Catlands the limestone is overlaid by the coal measures on all sides. Plumbago, or black lead is found, in irregular masses in a rock of grey felspar porphyry at Borrowdale near Keswick. This mine was formerly opened at stated periods, to prevent a superabundance in the market; but latterly, on account of the demand being greater, and the mine less productive, it has been worked for a succession of years. A little cobalt has been got at Newlands, and antimony near Bassenthwaite. Lapis calaminaris, small quantities of manganese, galena, iron pyrites, and spar of various kinds and of different colours and forms, are found in several places. Slate of a pale blue colour and of the finest quality is plentiful in Cumberland, particularly in the neighbourhood of Keswick and Ullswater.

Climate.—In consequence of the great extent of coast and the numerous high mountains, the climate is various. The mountains and high grounds are cold and piercing, the lower parts are mild and temperate: the whole county is exposed to wet and variable weather, particularly in the autumn, yet it is healthy, and many instances of longevity occur. The oldest inhabitant on record is John Taylor, of Garrigill, who died in 1772, aged 135 years. Mr. R. Bowman, of Irthington, another extraordinary instance, died June 13th, 1823, in the 118th year of his age; and it was a singular coincidence, that the oldest tree in Cumberland, an oak, of which there is an authentic account of its standing 600 years in Wragmire-moss, Inglewood Forest, fell from natural decay on the same day. With regard to the salubrity of the climate, the results of the observations made at Carlisle in 1787 by the late Dr. Heysham, are said to represent the lowest mortality ever recorded under any circumstances. How far that city may deserve this high character, since it has become a manufacturing town, has not been ascertained.

The annual mean quantity of rain at Carlisle is about 30 inches; at Wigton, 34 inches; at Whitehaven, 50 inches; and at Keswick, 68 inches. April on an average is the driest month of the year. July, August, September, and October, are wet months: about twice as much rain falls in each of these months as in the month of April; and about one-third less rain falls in the first six months of the year than in the last six months.

Agriculture, &c.—The soil of this county varies much: it often differs in the same parish, and sometimes even in the same field. The mountainous districts are bleak and barren; the most prevalent soil being mossy or dry gravel covered with heath. They are chiefly used as sheep pastures and preserves for moor-game. Some good land of dry brown loam is found in the valleys, and on the sides of some of the smaller mountains. On the margins of the rivers is much valuable ground, consisting of rich brown loam. On the coast the soil is light sandy or gravel. The lowland country, extending from Carlisle in every direction for many miles, is fertile, though a considerable portion of it is cold wet loam and black peat earth: this land has latterly been much improved by draining, which is now carried to a very great extent. There is a good deal of fertile clayey loam in the neighbourhood of Wigton. Sand and light loam prevail near Brampton, and likewise near Penrith. In the west of the county there is some wet soil on a clay bottom, and also some hazel mould. The subsoil in many places is a wet steril clay. About two-thirds of the county are held under lords of manors, by what is called customary tenure, a species of feudal oppression which subjects them to the payment of certain annual rents and fines, and of arbitrary fines and heriots, with other boons and services, on alienation, or on the death of the lord or tenant. A part of the county is freehold, a part leasehold under the bishop of Carlisle, the dean and chapter of Carlisle and others, and a small part is copyhold. The tithes are generally paid in kind, and have been great obstacles to improvement. The agriculture of the county has improved considerably within the last thirty years, and great quantities of corn and produce of various kinds are now exported. The chief exports are from Port Carlisle, Whitehaven, Workington, and Maryport, and consist of cattle, sheep, poultry, grain, potatoes, butter, bacon, &c. The land being divided into small farms, the dairies are necessarily on a small scale, though their produce is excellent, and bears a high price in the market. Many of the farms do not exceed 100 acres, and some are not more than 30 or 50 acres. They are possessed on verbal or written contracts, or on very short leases. There are very few farms let on leases of 14 or 21 years. Many persons, provincially called *lairds* or *statesmen*, occupy their own lands, which in some instances, have passed for several centuries in a regular line of descent in the same families. Some of these persons have an air of independence which forms a peculiar trait in their character. A small part of the land, in some places, lies in open town fields, which cannot have the benefit of the common improvement in husbandry. The land usually lies in ridges of variable width, upon which the grazing cattle that are herded do frequent injuries to the crops. In other places there are certain common lands that are annually stinted with cattle and horses, on a fixed day, by the owners or occupiers. These lands are always in grass. In high and mountainous districts the chief object of the farmers is their sheep stock, though of late years a considerable quantity of high-lying land has been brought into cultivation, which, on account of the steep declivities, is very laborious. In some of these places the climate is cold, the corn backward, and the harvest late. The valleys and low ground are cultivated chiefly for grain, and produce excellent crops of wheat, barley, and oats; these are alternated with turnips and potatoes or fallow. Some of the lands that are well supplied with water are kept as meadows or pastures for dairies, and for rearing and fattening cattle. Although the Cumberland farmers are in general good agriculturists, and have their lands clean and in good condition, many of them take too many white crops, particularly on new inclosures, which impoverish the land; they also keep their lands too long in tillage, without renewing by laying down.

Candlemas is the usual time for entering upon farms, and the rents are paid half yearly, in even and equal portions, at Lammas and Candlemas. The buildings and premises, in many instances, are delivered in good repair to the farmer, who at his own cost amends and keeps them in sufficient repair, except the roof and main timbers, which are repaired by the landlord. In other instances, the tenant lends all materials wanted for repairs, and finds meat and lodging to the work-people. The landlord pays the wages of the work-people, and the cost of the materials. The modern farm-houses and buildings have a handsome appearance, being generally built of stone, and roofed with blue slate. The old farm-buildings and cottages have clay or mud walls, and are thatched with straw. The following rotation of crops is often adopted on good soils. After the land has been in grass two or three years, it is ploughed up, and one crop, and in a few instances two crops of oats, are taken, then a fallow, or green crop of turnips or potatoes, which is followed by a crop of wheat, and this last by a crop of barley, when the land is laid down with clover and grass seeds. A crop of hay is taken the ensuing year, and then the land is kept in grass. On poor and light soils, only one white crop is taken after a green crop or fallow, and the land is laid down with seeds. Beans and peas are occasionally cultivated, but less frequently than in the south of England. The farmer cuts almost every sort of grain with the sickle. He does not sell or dispose of any hay or straw, but consumes them upon the farm; he keeps up his usual quantity of stock until the end of his term, and leaves all the manure, ashes, and compost, that may arise or be made upon the premises, for the benefit of the succeeding tenant. At the expiration of the term, he is allowed to sell or remove the remainder of his crop. He does not plough or convert into tillage more than one half of the arable lands in any one year, except some small part for soiling. Such part as shall be mown twice he covers with manure, compost, or ashes. When the land is in fallow for wheat, and also before it is sown with barley, and with clover seeds and grass seeds, it is well manured. In the former state, it has about twenty, and in the latter, ten cart loads of manure per acre. The quantity of clover seeds is usually six pounds of red and three pounds of white clover seeds to each acre. The farmer does not depasture any horses or cattle upon the seeds after the barley is reaped. In the last year of his term he summer-fallows, plants with potatoes or sows with turnip seeds a certain number of acres (perhaps a tenth part of the arable land), which he is required to manure well. The potatoes or turnips are pulled up and carried away from the land on or about the tenth of October preceding the expiration of the term, after which time the succeeding tenant is at liberty to enter upon this land, and to plough, manure, and sow it with wheat or other grain, and also to take the manure then upon the premises for the manuring of the land. The farmer is required not to do any injury to this wheat land by depasturing horses, cattle, or sheep upon it. Hay, straw, and clover are sold by some farmers in the vicinity of market-towns, from which ashes and manure are taken to the farms. When land is drained with tiles, the landlord, in many instances, finds the tiles only; in others, he is also at the expense of cutting and making the drains, and the tenant lends the tiles, sets them, and fills and covers the drains in a proper and satisfactory manner. Lime is much used in many places, and lately bone-dust has been employed by a few persons. The variety of oats called potatoe-oats, which is now so generally cultivated in every part of the kingdom, was first discovered by a farm-servant of Mr. Jackson of Arkleby, in this county, in 1778. The horses in common use are light and of rather small size. Waggons are rarely, if ever, employed by the farmer. A single horse-cart, and a pair of horses to a plough are in general use. Several improved implements of husbandry have been lately adopted. Scufflers are used by a few persons. Thrashing-machines and drills of various kinds are now become common on the larger farms. There is a great variety of cattle and sheep. Many persons have the improved short-horned cattle; some have galloways; and a few prefer cattle of the long-horned breed. The last, which was, not many years ago, the most common, is now superseded by the two former. A peculiar breed of sheep, called *Herdwicks*, from their being farmed out to herds at a yearly sum, is met with on the mountains, at the head of the Duddon and Esk rivers. The ewes and wethers, and many of the tups are polled; their faces and legs speckled, and the wool short and coarse. They are lively and hardy little animals. The tups are in great request to improve the hardiness of other flocks. There are four agricultural societies and several cattle shows in the county, which give a stimulus to agriculture, and encourage improvements in the breed of live stock, by distributing rewards and premiums. The late Mr. Curwen of Workington-hall deserves mention as one of the greatest promoters of agriculture in Cumberland. At Carlisle, Whitehaven, and Penrith, are horticultural and floral societies, which are well supported, and are of service in exciting attention to the cultivation of fruits and flowers. About ten acres of boggy land near Tarn Wadling are kept exclusively for the production of cranberries, which are uncommonly fine and much esteemed.

Cumberland farmers are a temperate, social, and intelligent people. They are strong and robust, and generally very frugal and industrious. They rise early and labour hard. They wear clogs, and coarse plain dresses, take oatmeal porridge to breakfast, and often bacon and salt meat to dinner. Their bread is commonly made of barley, or of barley and rye. In some places, oaten bread formed into thin cakes, and *scons*, or unleavened cakes, are chiefly used. Milk, potatoes, and skimmed milk cheese are universally consumed. Tea, wheat bread, and animal food are now fast superseding these simple articles of diet. About half a century ago they wore *kelt* cloth, which was of a grey colour and home spun, and hence the name of *grey-coats*, which the Cumbrians received. At present home-spun clothes are only worn by a few persons in the mountain districts. The Cumbrians have been undeservedly said to be litigious, which has arisen from the minute division of property and extensive commons occasioning frequent law-suits. The peasantry pay great attention to the education of their children. In some rural districts, where the quarter pay is not adequate to support the master, he is allowed a *whittle-gate*, or the privilege of dining in rotation with the parents of his pupils—a custom which formerly prevailed also in some places with the poorer clergy. Farm-servants are hired at Whitsuntide and Martinmas, at the fairs held at the larger market-towns. They stand in the market-places, and are distinguished by having a piece of straw or green branch in their mouths. Men get, for half a year, which is the general term, from 4*l.* to 8*l.*; and women from 2*l.* to 4*l.* After the hiring is over, the remainder of the day and of the evening are dedicated to mirth and festivity. Cumbrian peasantry have various festive meetings, called the *kirn*, or harvest-home, sheep-shearing, merry nights, and upshots. Bridewains and bidden-weddings are still held in some parts of the county. Wrestling, running, and leaping are the favourite amusements and athletic exercises of the peasantry.

The following are the principal fairs in Cumberland. Noted horse-fairs are held at Cockermouth, February 18th; Wigton, February 20th; and at Longtown, Thursday before Whitsuntide. Fairs for cattle and horses, at Rosley, Whit-Monday, and continued every Monday fortnight until Michaelmas; Abbey-Holme, Thursday before Whitsuntide, and October 29th; Carlisle, August 26th and September 19th; Hesket-New-market, the first Friday in May, and continued every fortnight afterwards until Whitsuntide. Ireby, February 21; Aiston, last Thursday in May, Friday before September 27, and first Thursday in November. Fairs for cattle, Wigton, April 5; Brampton, the second Wednesday after Whitsuntide, and the second Wednesday in September, April 20, and October 23; Bootle, April 5 and September 25; Egremont, the third Friday in May, and September 18; Workington, May 18 and October 18; Keswick, the first Thursday in May, and every Thursday fortnight for six weeks, the Saturday before Whitsuntide, and on the Saturday nearest the festivals of St. Michael and St. Martin, or on the festivals if they happen on Saturday; the Martinmas fair is noted also for rams and cheese. Sheep-fairs are held at Low-wood-Nook, August 20; Uldale, August 29; Nether Wasdale, first Monday in September; Borrowdale, first Wednesday in September; Threlkeld, first Thursday in September; Ennerdale, second Tuesday in September; Ireby, October 18; Hesket-New-market, last Thursday in August, and second Thursday in October; Lowes-water, second Friday in September; and Newlands, the last Friday in September.

Cumberland has four newspapers; two are published at Carlisle, and two at Whitehaven weekly.

Divisions, Towns, &c.—This county is divided into six wards, or hundreds, known by the names of Allerdale above Derwent, Allerdale below Derwent, Derwent, Cumberland, Leath, and Eskdale wards. It contains one city, Carlisle; the parliamentary boroughs of Cockermouth and Whitehaven, and 17 market-towns.

Allerdale above Derwent is situate in the south-west of Cumberland, comprehending many of the mountains and lakes, as well as the principal seaports. It contains six market-towns: Whitehaven, Workington, Harrington, Egremont, Ravenglass, and Bootle.

Whitehaven is a well-built seaport of considerable importance, situate in a creek on the western shore. In the reign of Queen Elizabeth it was only a small fishing village, containing six houses. In 1831 the township population amounted to 11,393, and the parish of St. Bees, including Whitehaven, contained 20,012 inhabitants. The streets are regular, generally spacious, and cut each other at right angles. In the vicinity of the town and also immediately under it are extensive collieries. In the year 1791 18 houses were injured, and the inhabitants greatly alarmed, by the falling in of some old coal works. Some of the collieries are wrought to the extent of two miles under the sea, so that the water above them is of sufficient depth for ships of great burden. Some of the coal-seams are 8 and some 11 feet thick. From the pits to the quays are railways and wooden galleries, at the end of which the contents of the waggons are shot down large wooden trunks called hurries into the holds of the vessels. The harbour is commodious: some additions lately made have not answered, and are about to be altered. Several improvements in the harbour entrance are contemplated. A narrow vale extending to the village of St. Bees, supposed to have been formerly occupied by the sea, might be cut through and made navigable for large vessels at a moderate expense; but this project seems to be lost sight of. There are four batteries for the protection of the port, which were repaired after the hostile attack of the notorious Paul Jones in 1771, but are now in a state of decay, being no longer necessary. At the entrance of the harbour are two lighthouses. The manufactures are of sail-cloth, linen, check, earthenware, candles, soap, &c. There are also large roperies and yards for ship-building. The trade chiefly consists in the exportation of coal, lime, iron, freestone, gypsum, and grain, and importations of West Indian, American, and Baltic produce. Tea has lately been imported direct from China. Upwards of 200 vessels are employed in the export of coal. Steam vessels sail weekly between this port and Liverpool, and occasionally to Dublin, Isle of Man, and Dumfries. There are three churches or chapels; seven meeting-houses for religious worship; marine, national, Sunday, and other schools; an infirmary; house of correction; mechanics' institution; custom-house; theatre; salt-water baths; workhouse; public office; news-room and library. There is a neat market-house in a handsome area. The market-days are Tuesday, Thursday, and Saturday—the principal market is on Thursday. A fair or great market, August 12th, has been nearly discontinued. At the approach from the north is a handsome portico of red freestone, above which is a railway for coal waggons; and at the S.E. end of the town is an elegant mansion of the earl of Lonsdale, called the Castle. Dr. Brownrigg, an eminent chemist and mineralogist, who died in 1800, practised medicine here. Whitehaven sends one member to parliament. In 1836 the number of voters registered was 476. A few miles from the town are the clerical institution and the free-school of St. Bees (the latter founded by Archbishop Grindall, a native of the parish), and the lofty promontory of St. Bees' Head, upon which is a lighthouse.

Aggregate amount of Shipping and Tonnage belonging to the Ports of Cumberland.

Ports.	April, 1810.		January, 1822.		January, 1828.		January, 1836.	
	Vessels.	Tonnage.	Vessels.	Tonnage.	Vessels.	Tonnage.	Vessels.	Tonnage.
Whitehaven	188	29,348	181	26,220	195	30,960	450	66,742
Workington	134	18,941	117	18,094	126	19,930		
Maryport .	101	13,580	128	13,495	134	17,136		
Harrington	42	4,960	38	4,976	43	5,479		
Carlisle .	.	..	35	2,413	39	2,706	39	3,419
Total .	465	66,823	499	70,198	537	76,211	489	70,161

Workington stands on the south bank of the Derwent, which is navigable for ships of 400 tons burden, and falls into the sea about a mile distant. Coals constitute the chief export; timber, cattle, bar-iron, and flax, the chief imports. Nearly 100 vessels are employed in the coal trade to Ireland. Sail-cloth and cordage are the principal manufactures. Ship-building is carried on to a considerable extent. A few years ago a patent Leghorn manufactory, and a joint-stock banking company were established. There are two churches; five chapels for dissenters; a national, an infant, and Sunday schools; subscription library; dispensary; assembly-room; theatre, and custom-house. Township population in 1831, 6415. The market-days are Wednesday and Saturday: on the former day is the principal market. It is remarkable that this is the only large market-town in the county at present (1837) not lighted with gas.

Workington-hall, on the east side of the town, afforded an asylum to Mary Queen of Scots, when she landed at Workington. At Seaton, a little above Workington, are extensive iron-works, and the antique ruins of Borough walls.

Harrington is a small flourishing seaport between Whitehaven and Workington. The harbour is well constructed, and the trade gradually increasing. Coal is exported from this place to Ireland, and lime to Scotland. In the former trade upwards of 40 vessels are employed, and in the latter are several hundred sloops. Here are two yards for ship-building, a ropery, and a vitriol and copperas manufactory. The parish church is a plain structure, without a tower. There are two Methodist chapels, a Lancasterian school, and a clothing society. Parish population in 1831, 1758. This place and the manor gave name to the antient and baronial family of Harrington, and was possessed by Lady Jane Grey. Iron-stone and fire-clay are found in the vicinity: about 2000 tons of the former are annually exported.

Egremont is a neat little town five miles from Whitehaven, and about two miles from the sea. It is said to have been an antient borough, which was disfranchised at its own petition to avoid the expense of representation in parliament. The manufactories are of check, linen, paper, leather, and sail-cloth. There are a parish church, Methodist meeting-house, a national school, and a poor-house. Saturday is the market-day. Parish population in 1831, 1741, which is the same number as returned by the census of 1821. It is from this place that the earl of Egremont takes his title. On the west side of the town are the ruins of an old castle, supposed to be coeval with the entry of the Normans into Britain. In the parish are some productive iron-mines. The seats of Gill-foot and Hale-hall are near to the town. Calder-abbey and Ponsonby-hall are at a short distance.

Ravenglass is a small market-town and seaport, situated at the confluence of the Esk, Mite, and Irt. There is a fair held here, with very singular customs and ceremonies, August 5th. It has a market on Friday; a large work-house, and an endowed school. Near this place are Muncaster-house, and the ruins of Walls Castle. Oysters abound on the coast between this town and

Bootle, which is one of the smallest market-towns in the kingdom, has a very antient church, an independent chapel, and two endowed schools. Parish population in 1831, 737. A small weekly market on Saturday. Near it are the ruins of Barnscar, supposed by some to have been a British and by others a Danish city.

Derwent division consists of a portion of the county taken from the wards of Allerdale above and below Derwent, by an order of the magistrates made at the quarter-sessions of 1833. It contains most of the lakes, the borough of Cockermouth, for which see article COCKERMOUTH, and the market-towns of Maryport and Keswick.

Maryport is a neat modern seaport on the river Ellen. In 1750 there was only one house on the present site of the town. The trade and manufacture connected with ship-building are flourishing. A very handsome market-house has been lately erected, and a new harbour is now building. The vessels belonging to the port are about 130 in number, and are chiefly employed in exporting coal, lime, and stone, and in importing cattle, timber, flax, and iron. A steamer sails weekly to Liverpool in the winter, and also to the Isle of Man and Dublin in the summer season. In the town are a chapel of ease, five dissenting places of worship, a national school, and a school of industry. Chapelry population in 1831, 3877. Market-day, Friday. In the vicinity are the mansions of Nether-hall and Unerigg, and the village of Ellenborough, from which the late Lord Chief Justice Law derived his title. At a short distance are Tallantire-hall and Dovenby-hall.

Keswick is a small and pleasant town, standing on the banks of the Greta, near the lake of Derwent-water. It is much resorted to by visiters to the lakes, and is celebrated for the beautiful and romantic scenery in its vicinity. The parish church of Crosthwaite is about half a mile from Keswick. John Marshall, Esq. is now erecting a new church on the opposite side of the town. Char is potted here, and sent to London, and to almost every part of the kingdom. This place is also noted for black-lead pencils. Woollen goods, fancy waistcoatings, and edge-tools are manufactured here. The Town-hall is a small edifice. There are two good museums; a national school, and a Sunday-school; a free-school, and workhouse. Township population in 1831, 2159. There is a weekly market on Saturday. Sir John Banks, chief justice of the Common Pleas, was born at Keswick; and on his death, in 1642, bequeathed property worth upwards of 200*l.* per annum to the poor of his native town. Robert Southey, the present poet-laureat, resides at Greta-hall near Keswick.

Allerdale below Derwent comprises a part of the west of the county, and contains four very small market-towns, Allonby, Abbey Holme, Ireby, and Hesket-New-market.

Allonby is pleasantly situated on the sea-shore, and is much frequented for bathing. It has a chapel of ease; a school with a small endowment, and a Friends' meeting-house. A good building, containing warm and cold baths, has been lately erected. The inhabitants are chiefly engaged in fishing. Chapelry population in 1831, 783. Market-day, Saturday. Captain Huddart, who constructed the much esteemed nautical charts, was a native of Allonby, where he worked some time as a mechanic and also as a fisherman, and gradually advanced to be captain in the East India service, and elder brother of the Trinity-house, London. Hayton-castle and Brayton-house are situated a short distance from Allonby.

Abbey-Holme, about six miles from Wigton, has a small market on Saturday, in summer only. Quarter population in 1831, 861; parish population 3056. In this parish was an abbey of Cistercians, said to have been founded about the year 1150, by Prince Henry, son of David, king of Scotland; part of the ruins is remaining, and has been converted into the parish church. In the reigns of Edward I. and Edward II. the abbots of this religious house were summoned to several parliaments. Woolsty-castle, of which there is now scarcely a vestige, was a strong fortress. Near it is the famous Green-Row academy.

Ireby is a very old town, having had a market granted to it 600 years ago, but so little benefit has it derived from the grant, that in 1831 the entire parish contained only 449 inhabitants. The church is small. The salary of the present clergyman, who has filled the office above half a century, was only 25*l.* a year until recently augmented by Queen Anne's Bounty. The school has a small endowment. Clea-hall, Whitefield-house, and Snittlegarth, are in this neighbourhood.

Hesket-New-market is a small but neat town, situate on the banks of the Caldew, 9 miles south of Wigton and 13 south-west of Carlisle. It has a weekly market on Friday.

Leath Ward comprises the south and south-east parts of the county, and has within its limits an inexhaustible store of mineral treasures. It contains three market-towns, Penrith, Kirkoswald, and Alston.

Penrith is an antient and well-built town, 283 miles from London, situate in a fine fertile vale at the south extremity of Inglewood forest. It has no manufactories of consequence. The church is a neat and elegant structure: on one of its walls is the following inscription: 'A. D. 1598 ex gravi peste quæ regionibus hisce incubuit obierunt apud Penrith 2260, Kendal 2500, Richmond 2200, Carlisle 1196. Posteri, avertite vos et vivite.' In the church-yard is an antient monument, consisting of two pyramidal stones twelve feet high, called the Giant's Grave. Here are six dissenting chapels; a free grammar-school; several charity-schools, and a house of correction. Penrith was several times pillaged and twice burned by the Scots in the turbulent times that preceded the union. On an eminence to the west are the ruins of a castle which was inhabited by Richard III. when duke of Gloucester, and was destroyed in the time of the Commonwealth. The Beacon stands on a high mount, about a mile from the town, and commands a view of the country for more than 100 miles in circumference. Parish population in 1831, 6059. Market-day, Tuesday. Sir Richard Hutton, judge of the Common Pleas, was a native of Penrith. In its vicinity in this county are the following mansions: Eden-hall, Carlton-hall, Hutton-hall, Skirsgill, Dalemain, and Hallsteads. Greystoke-castle and Dacre-castle are each about six miles distant. The former was the antient seat of the duke of Norfolk; the latter is supposed to have been the original mansion of the Dacre family, and is now converted into a farm-house.

Kirkoswald is situated in a beautiful vale on the Eden, fifteen miles from Carlisle. The church was dedicated to St. Oswald, the celebrated martyr and king of Northumberland; and in the reign of King John belonged to Hugh de Morville, one of the murderers of Thomas à Becket. Near the town are the remains of an antient castle, and a mansion called the College. A paper-mill and a mill for carding and spinning wool are the only manufactories. Township population in 1831, 768. A weekly market on Thursday, and great markets on Thursday before Whitsuntide, and August 1st. Caleb Threlkeld, a famous botanist, was born here in 1675. John Aglionby, a learned divine, who had a considerable hand in the present translation of the New Testament, and Dr. Leake, the founder of the Westminster Lying-in Hospital, were natives of the adjoining parish of Ainstable. A peculiar wind, called the *Helm-wind*, sometimes blows with great fury in this part of the country. It is believed by some persons to be an electrical phenomenon.

Alston is situate in a wild and mountainous district, on the confines of Northumberland, near the Tyne, and has valuable lead-mines in its vicinity; a good modern church, four chapels for dissenters, a national school, grammar-school, and subscription library. Parish population in 1831, 5244. Market-day, Saturday. The lead-mines are let to the London Lead Company and several other persons, who pay one-fifth part of the ore raised for rent. On an average, the mines produce 7600 tons of lead annually, and from every ton about thirteen ounces of silver are extracted. Copper is also worked in several of the mines.

Cumberland Ward is situate in the north-west. It is the most fertile and most central ward, and contains the city of Carlisle (an account of which may be found under the article CARLISLE), and the market-town of

Wigton, which is a well-built town, seated near the Wiza, in a beautiful part of the county. It was burned by the Scots in the fourteenth century, when they plundered the monastery of Holm Cultram. The principal manufactures are checks, ginghams, and calicoes. Here are gas-works, extensive print-works, and a dyeing establishment. In 1725 an hospital was founded here for six indigent widows of episcopal clergymen. In 1788 a handsome new church was built. The Quakers, Independents, and Methodists have neat and commodious chapels. A Catholic chapel is now building. There are also an endowed grammar-school, a news-room, and a parochial library. Township population in 1831, 4885. The market is held on Tuesday; a great market on St. Thomas's Day. The Rev. John Brown, a distinguished writer, author of 'Barbarossa,' &c., was educated at Wigton. About one mile south of Wigton are the remains of a Roman station, called Old Carlisle. At Brookfield, one mile to the west, is a large Quakers' academy.

Eskdale Ward is the most northern division; being situate on the borders of Scotland, the remains of numerous towers, castles, forts, and encampments are scattered over it. This ward contains only two market-towns, Brampton and Longtown.

Brampton is a very antient town, and has a weekly market on Wednesday. The new chapel was consecrated in 1789, and greatly enlarged and improved in 1827. A new town-hall, of an octagonal form, and a national school, were erected by the earl of Carlisle in 1817. Gas-works are now being established. Here are four dissenting chapels, three Sunday schools, a grammar-school, and an infant school. The old church, a part only of which is remaining, is situated a mile and a half from the town, on an eminence near the village of Irthington. The principal manufactures are the weaving of checks and ginghams for the Carlisle manufacturers, some of whom have large establishments at Warwick-bridge, Carlisle, and Dalston. Township population in 1831, 2842. The Mote is a natural mount at the east end of the town, probably an antient fort. It rises 360 feet above the level of the streets, and commands an extensive prospect. Upon a rock on the banks of the Gelt, one mile and a half to the south, a Roman inscription is still legible. About two miles to the east are Lanercost-abbey and Naworth-castle. The former was founded in 1116, and exhibits some beautiful ruins: the latter was a strong fortress, and the baronial mansion of the lords of Gilsland; it is now the property and occasional residence of the earl of Carlisle. The seats in the neighbourhood are Walton-house, Edmond-castle, and Stone-house. Gilsland Spa is a much frequented watering-place on the banks of the Irthing, about nine miles distant. The parish of Brampton gave birth to Dr. Guy Carlton, bishop of Bristol and afterwards of Chichester, and to James Wallace, Esq., attorney-general, father of the present Lord Wallace.

Longtown is a modern town on the borders of Scotland, in the parish of Arthuret, which parish in 1831 contained 2053 inhabitants. The streets are regular and spacious. Thursday is the market-day. Cranberries in the season are brought to this market in great quantities from the moors of Scotland. On Monday a market is held for bacon and butter, in which articles there is an extensive trade. Arthuret church, a very elegant Gothic structure, about half a mile distant, was built in 1609. In the town are a Presbyterian meeting-house and two charity-schools. Netherby is pleasantly situated on the banks of the Esk, about two miles from Longtown. Liddel Strength, the site of an antient castle, is about four miles distant.

Divisions for ecclesiastical and legal purposes.—The whole of the county is in the diocese of Carlisle, with the exception of the ward of Allerdale-above-Derwent, in the diocese of Chester, and the parish of Alston, in that of Durham. The gross yearly value of the see may be estimated, upon an average of seven years, at 3000*l.* The commissioners appointed to consider the state of the dioceses in England and Wales recommend that the sees of Carlisle and Sodor and Man be united; and that the diocese consist of the present diocese of Carlisle, of those parts of Cumberland and Westmoreland which are now in the diocese of Chester, of the deanery of Furness and Cartmel, in the county of Lancaster, of the parish of Alston, and of the Isle of Man. An act for carrying into effect the reports of the commissioners was passed in the session of parliament, 1836.

There are 3 deaneries, Carlisle, Penrith, and Wigton; 1 archdeaconry; 104 parishes; 400 townships; 41 rectories; 28 vicarages; 59 perpetual curacies and chapelries; and 7 small extraparochial places and hamlets. The Roman Catholics have 6 chapels; the Independents upwards of 20; the Church of Scotland 7, and the Secession 7; the Quakers about 20; the Antipædobaptists 6; and the Methodists, comprising the Wesleyans, primitive and reform, upwards of 70. The corporation of the dean and chapter of Carlisle consists of the dean, 4 prebendaries, and 6 minor canons. The surplus revenue, after the yearly payments and temporary charges, amounts, on an average of seven years, to 3510*l.*, which sum is divided into six equal parts, two of which go to the dean, and the remainder equally among the four prebendaries. Houses are also assigned for their residences, which they respectively occupy, and are bound to keep in repair.

Cumberland is comprehended in the province of York, and in the northern circuit. The assizes are held at Carlisle twice a year. The quarter-sessions are held twice at Carlisle and twice at Cockermouth annually; the Easter and Michaelmas sessions at the latter place, and the Midsummer and Christmas at the former, each commencing on Tuesday. The county returns four members to parliament (two having been added by the Reform Act); two for the eastern division, which includes Cumberland, Leath, and Eskdale Wards, and two for the western division, comprising the wards of Allerdale-above-Derwent, Derwent, and Allerdale-below-Derwent. Carlisle sends two members, the borough of Cockermouth two, and Whitehaven one (the last also given by the Reform Act). The members for Carlisle and the eastern division are elected at Carlisle; the members for Cockermouth and the western division at Cockermouth; and the member for Whitehaven at Whitehaven. The polling-stations for the eastern division are Carlisle, Brampton, Wigton, Penrith, and Alston. The number of voters by the registration of 1836 was 4638. The polling-stations for the western division are Cockermouth, Aspatria, Keswick, Bootle, and Egremont: the number of voters registered in 1836 was 4437. The number for the borough of Carlisle in 1836—freemen, 328, householders, 684: total, 1012.

History and Antiquities.—The earliest inhabitants of Cumberland of whom we have any account, were the Brigantes, a bold and warlike people, conquered by the Romans about A. D. 121, when the famous Roman or Picts' Wall was erected by Hadrian, to prevent the ravages of the Caledonians, who bore an inveterate hatred to the Romans. This barrier was formed of earth, and connected a chain of forts erected by Agricola in 78. being found insufficient, Severus, in 210, built one of stone, 73 miles in length, from near the mouth of the Tyne to the Solway Frith. The last was strengthened by an outward ditch, and guarded by towers and a chain of forts and stations. Remains of both walls, but particularly of that of Severus, may still be traced in several places. At a very early period, the inhabitants, who were the true and genuine Britons, were called Cumbri: and hence probably the name of the district, Cumberland. In almost every part of the county are remains of British and Roman antiquities. About three miles from Kirkoswald is a Druidical temple, consisting of a circle of sixty-seven unhewn stones, called Long Meg and her Daughters. Another and more entire circle of stones is situated a mile and a half south-east of Keswick. This county has been a perfect magazine of Roman antiquities. The remains of Roman garrisons or stations are still distinctly observable at Maryport, Old Carlisle, Old Penrith, and Bewcastle. Several altars, inscriptions, coins, instruments, utensils, &c. have been discovered at these places. After the retreat of the Romans, the country was laid waste and the city of Carlisle reduced to a complete state of ruin by the Scots and Picts. The country had also to endure the ravages of the Danes. During the Saxon Heptarchy it was joined to the kingdom of Northumberland, but was governed by its own chieftain under what was called the Danish law, until the Norman Conquest. In 945 Cumberland was granted to Malcolm, king of Scotland, and was for a long time the scene of war and bloodshed between the two crowns, being sometimes under the dominion of the kings of England and sometimes under that of the kings of Scotland. At the time of the Conquest, the county was in such a state of poverty and desolation, that it was not rated in the Domesday Book, William the Conqueror having remitted all its taxes. Walter, one of his countrymen, laid the foundation of a priory at Carlisle, which was afterwards converted into an episcopal see. In 1237 Cumberland was finally annexed to the crown of England by Henry III. at a conference held at York; but the feuds between the two kingdoms continued for more than three centuries afterwards, and this county, situate on the borders, and containing the *debatable land*, was often the scene of contention rapine, and bloodshed. In 1307 Edward I. died, on an ex

pedition towards Scotland, at Burgh Marsh, near Carlisle, where a monument has been erected to his memory. The inhabitants of the county at various times suffered many cruelties and deprivations, had several towns burnt and monasteries destroyed, and were not relieved from hostile attacks and inroads until the union of the two crowns by the succession of James I. Even after this time, outrages and robberies were frequently committed. During the civil war between king Charles and his parliament, and also during the time of Cromwell, Carlisle was besieged, and the inhabitants were much harassed and distressed. This county was the scene of hostilities in the rebellions of 1715 and 1745. In the latter, Carlisle was taken possession of by Charles Stuart and his followers, and was retaken by the king's forces under the duke of Cumberland.

There were formerly several monasteries and antient hospitals in Cumberland. The Austin monks had a priory at Lanercost and another at Carlisle. The Benedictines had priories at Wetheral, Nunnery, St. Bees, and Seaton. The Cistercians had an abbey at Holm Cultram and another at Calder. There was a convent of grey friars at Penrith; one of black friars and another of grey friars at Carlisle. There were religious houses of antient foundation at Carlisle, St. Bees, and Dacre. A nunnery is said to have been founded at Carlisle by David, king of Scotland, at which place there was an hospital for thirteen lepers, dedicated to St. Nicholas. At Wigton, an hospital and free chapel were dedicated to St. Leonard. Many of the old churches exhibit remains of the Saxon and early Gothic architecture. Specimens of the former may be seen in the churches of Aspatria, Torpenhow, and Kirklinton; and of the latter in the abbeys of Lanercost and Holm Cultram. The west end of the last-mentioned abbey is the only specimen of the latest Gothic in the county. The churches of Burgh-on-Sands, Newton Arlosh, and Great Salkeld have strongly-fortified towers, which probably served as places of refuge for the inhabitants of these villages in the time of an invasion.

(Nicholson and Burn's *History and Antiquities of Cumberland;* Hutchinson's *History of Cumberland;* Conybeare and Phillips's *Geology of England and Wales;* Otley's *Guide to the Lakes;* Scott's *Do.;* Lysons' *Beauties of England and Wales;* Bailey and Culley's *Survey of the Agriculture of Cumberland;* Housman's *Topographical Description of Cumberland, &c.;* Ridpath's *Border History of England and Scotland; Communications from Cumberland.*)

Statistics.—*Population.* Cumberland is both an agricultural and manufacturing county. It is the twenty-eighth on the list of agricultural counties. The population, in 1831, included 40,614 male inhabitants of twenty years of age and upwards. Of this number, 15,466 were engaged in agricultural pursuits, and 3214 in manufactures or in making manufacturing machinery. The latter were thus distributed: the manufacture of cotton employed 2200; calico and ginghams, 300; woollens, 174; sail-cloth, linen, and linen thread, about 100; pottery, 5; and about 250 in the manufacture of cordage, sail-cloth, twine, worsted, and tobacco, most of them at Whitehaven.

The following summary of the population taken at the last census (1831), shows the number of inhabitants and their occupations in each ward, &c. of the county.

WARDS*, &c.	HOUSES.				OCCUPATIONS.			PERSONS.			Males twenty years of age.
	Inhabited.	Families.	Building.	Uninhabited.	Families chiefly employed in agriculture.	Families chiefly employed in trade, manufactures, and handicraft.	All other families not comprised in the two preceding classes.	Males.	Females.	Total of persons.	
Allerdale — above Derwent . .	7,967	8,261	41	478	2,444	2,360	3,457	18,950	20,968	39,918	9,053
Allerdale — below Derwent . .	5,031	5,354	24	229	2,040	1,469	1,845	12,837	13,559	26,396	6,368
Cumberland . .	3,848	4,140	40	184	1,701	1,699	740	10,159	10,445	20,604	5,225
Eskdale . . .	4,161	4,593	22	120	2,223	1,428	942	11,987	12,004	23,991	6,005
Leath	5,094	5,443	24	286	1,973	1,396	2,074	13,830	13,543	27,373	6,937
Carlisle (city) . .	2,696	4,326	50	116	249	2,886	1,191	9,450	10,556	20,006	4,890
Whitehaven (town)	2,220	2,703	12	99	..	788	1,915	4,758	6,635	11,393	2,136
Totals . . .	31,017	34,820	213	1512	10,630	12,026	12,164	81,971	87,710	169,681	40,614

The population of Cumberland at each of the four enumerations was:—

	Males.	Females.	Total.	Inc. per Cent.
1801	54,377	62,853	117,230	..
1811	63,433	70,311	133,744	14
1821	75,600	80,524	156,124	17
1831	81,971	87,710	169,681	10

Showing an increase between the first and last periods of 52,451 persons, or nearly 44¾ per cent., being 12¼ per cent. below the general rate of increase throughout England.

County Expenses, Crime, &c.—The sums expended for the relief of the poor at the four dates of—

1801 were	£27,603,	which was 4*s.* 8*d.*	for each inhabitant.
1811 ,,	44,985	,, ,, 6*s.* 8*d.*	
1821 ,,	52,352	,, ,, 6*s.* 8*d.*	
1831 ,,	46,167	,, ,, 5*s.* 5*d.*	

The sum expended for the same purpose in the year ending 25th March, 1836, was 34,883*l.* 7*s.*; and assuming that the population has increased at the same rate of per-centage since 1831 as in the ten years preceding that period, the above sum gives an average of 3*s.* 11*d.* for each inhabitant. All these averages are below those for the whole of England and Wales.

The sum raised in Cumberland for poor's-rate, county-rate, and other local purposes, in the year ending 25th March, 1833, was levied upon various descriptions of property, as follows:—

	£.	*s.*	*d.*
On land . . .	43,405	14	0
,, dwelling-houses . .	12,080	6	0
,, mills, factories, &c. . .	1,182	10	0
,, manorial profits, navigation, &c.	1,575	14	0
Total money levied by assessment .	58,244	4	0

The amount expended was:—

For the relief of the poor .	46,901	15	0
In suits of law, removal of paupers, &c.	2,197	4	0
For other purposes . .	9,585	10	0
Total money expended .	£58,684	9	0

In the returns made up for the three succeeding years, the descriptions of property assessed for local purposes are not distinguished.

	1834.	1835.	1836.
The total money levied, was	£57,919 13 0	54,396 15 0	46,811 1 0
Expended for relief of poor .	43,067 2 0	38,966 8 0	34,883 7 0
,, in suits of law, removal, &c. . . .	2,315 13 0	1,857 3 0	1,655 6 0
Payments for or towards county rates . . .	.. ..	8,651 16 0	5,925 8 0
Expended for all other purposes	11,894 1 0	5,130 6 0	4,507 14 0
Total parochial rates expended	57,276 16 0	54,605 13 0	46,981 15 0

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* A new division has been made since the census was taken, which is mentioned in the previous part of this article.

The saving effected in the sums expended for the relief of the poor in 1836, as compared with the expenditure of 1835, is therefore rather less than 10¼ per cent. The amount of the other items is however still less in proportion than that of the preceding year, reducing the whole amount of saving to nearly 14 per cent.

From a parliamentary report on the subject, made in 1836, it is found that the number of turnpike trusts in Cumberland is 14; the number of miles of road under their charge is 215; the annual income arising from the tolls and parish composition, in 1834, was 17,365*l.* 15*s.* 2*d.*; and the annual expenditure, 17,655*l.* 11*s.* 11*d.*

The amount of expenditure of county-rate in the year 1834 was 11,161*l.* 15*s.* 8¼*d.*—thus disbursed.

	£.	*s.*	*d.*
Bridges, building, repairs, &c.	6,437	7	10
Gaols, houses of correction, &c., and maintaining prisoners, &c.	1,552	19	3
Shire halls and courts of justice—building, repairing, &c.	44	9	7
Prosecutions	1,078	13	8
Clerk of the peace	448	11	11
Conveyance of prisoners before trial	123	4	3
,, of transports	132	12	0
Vagrants—apprehending and conveying	147	12	7
Constables—high and special	200	0	0
Coroner	278	8	3
Miscellaneous	717	16	4¼

The number of persons charged with criminal offences in the three septennial periods ending with 1820, 1827, and 1834, were respectively 351, 408, and 477; making an annual average of 50 in the first period; of 58 in the second, and of 68 in the third period.

The number of persons tried at quarter-sessions in respect of which any costs were paid out of the county rates in each of the years 1831, 1832, and 1833, were 33, 38, and 50, respectively:

	1831.	1832.	1833.
Total number of felonies so tried	25	33	42
„ misdemeanors	8	5	8

The total number of commitments to the quarter-sessions in each of the same years was 38, 43, and 42, respectively: of whom

	1831.	1832.	1833.
The number convicted was	29	33	34
„ acquitted	5	8	6
Discharged by proclamation	4	2	2

At the assizes and sessions in 1835, 100 persons were charged with crimes in Cumberland; out of which number 17 were charged with offences against the person, 10 of which were common assaults; only 1 was committed for housebreaking; 66 for offences against property committed without violence; and of the remaining 16 one was committed for forgery, 1 for uttering counterfeit coin, 4 for perjury, and 10 for riot, &c. Of those committed 86 were convicted, and 14 acquitted, or no bill found. The 86 who were convicted, were punished as follow:—1 was executed, 2 transported for life, 1 for 14 years, and 15 for 7 years; 4 imprisoned for 2 years or upwards of 1 year, 21 for 1 year, or more than 6 months, and 40 for 6 months or under; 2 were discharged on sureties. Of the offenders 79 were males and 21 females. Among the whole number 50 could read and write, 22 could read only, 24 could neither read nor write; and of the remaining 4 the degree of instruction could not be ascertained. The proportion of the offenders to the population in 1835 was 1 in 1697.

The number of persons qualified to vote for the county members of Cumberland were, in

	1834.	1835.	1836.
The eastern division	3992	4623	4638
The western division	4149	4406	4437
	8141	9029	9075

which is 1 in 14 of the whole population, and 1 in 4 of the male population above 20 years of age. The expenses of the last election to the inhabitants of the county were 361*l.* 2*s.* 2*d.*, and were paid out of the general county rate.

There are six savings-banks in this county. The number of depositors and amount of deposits on the 20th of November were in the respective years:—

	1832.	1833.	1834.	1835.
Number of depositors	3979	4215	4543	4898
Amount of deposits	£125,537	133,827	140,399	149,414

The various sums placed in the savings-banks in 1834 and 1835, were distributed as under:—

		1834.		1835.	
		Depositors.	Deposits.	Depositors.	Deposits.
Not exceeding	£20	2307	£19,293	2402	£19,501
„	50	1403	42,730	1568	47,157
„	100	553	38,401	641	41,739
„	150	176	20,763	175	20,614
„	200	85	14,563	93	15,903
Above	200	19	4,649	19	4,500

Education.—The following particulars are obtained from the parliamentary papers on the subject, delivered after the sessions of 1835:—

	Schools.	Scholars.	Total.
Infant Schools	11		
Number of infants at such schools; ages from 2 to 7 years:—			
Males		377	
Females		486	
Sex not specified		—	
			863
Daily Schools	632		
Number of children at such school, ages from 4 to 14 years:—			
Males		9688	
Females		7149	
Sex not specified		3831	
			20,668
Schools	643		
Total of children under daily instruction			21,531
Sunday Schools	185		
Number of children at such schools, ages from 4 to 15 years:—			
Males		6100	
Females		5553	
Sex not specified		3039	
			14,692

Assuming that the population between 2 and 15 years increased in the same ratio as the whole of the population between 1821 and 1831, and that it has continued to increase in the same ratio since, we find that there must have been living in Cumberland in 1834 (the time this education inquiry was made) 54,860 persons between those ages. Of these a large number attend both daily and Sunday schools. Only four Sunday schools are returned from places where there are no other schools, and where the children, 258 in number, who are instructed therein, cannot be supposed to attend at any other school; at all other places Sunday-school children have the power of resorting to other schools also; but in what number or in what proportion duplicate entry of the same children is thus produced, must remain uncertain. Twenty schools, containing 1380 children, which are both daily and Sunday schools, are returned from various places, and duplicate entry is therefore known to be thus far created. After making deductions for this, we may conclude that much below two-thirds of the children receive instruction.

Maintenance of Schools.

Description of Schools.	By endowment.		By subscription.		By payments from scholars.		Subscrip. and payment from scholars.	
	Schls.	Scholars.	Schls.	Scholars.	Schls.	Scholars.	Schls.	Scholars.
Infant Schools	—	—	2	115	4	80	5	668
Daily Schools	94	2050	14	1,297	501	15,077	23	2144
Sunday Schools	4	306	171	13,654	1	30	9	762
Total....	98	2356	187	15,066	506	15,187	37	3614

The schools established by dissenters, included in the above statement, are:—

	Schools.	Scholars.
Infant Schools	—	—
Daily „	3	225
Sunday „	44	5197

The schools established since 1818 are:—

Infant and other daily Schools	308	8,910
Sunday Schools	143	10,114

Seven boarding schools are included in the number of daily schools as given above.

No school in this county appears to be confined to the children of the parents of the Established Church, or of any other religious denomination; such exclusion being disclaimed in almost every instance, especially in schools established by dissenters, with whom are here included Wesleyan Methodists, together with schools for the children of Roman Catholic parents.

Thirty-nine schools in Cumberland have lending-libraries attached to them.

CUMBERLAND, RICHARD, was born in the parish of St. Ann, near Aldersgate, in London, on the 13th of July, 1632. He received the early part of his education at St. Paul's school, and went thence to Magdalen College, Cambridge, in 1649. After taking his master's degree he thought of entering the medical profession, and accordingly studied medicine for a short time; but he soon relinquished this intention, and took orders. In 1658 he was appointed to the rectory of Brampton, in Northamptonshire, where he remained till 1667, when Sir Orlando Bridgman, who had been his contemporary at Cambridge, and had now become lord keeper, first made him his chaplain, and shortly after bestowed on him the living of Allhallows, in Stamford. In both places he performed the duties of minister with the most exemplary assiduity. In Stamford he regularly preached three times every Sunday, having taken upon himself a weekly lectureship in addition to his parochial duties. His 'Inquiry into the Laws of Nature,' which was written while he was chaplain to Sir Orlando Bridgman, appeared in 1672, the year in which Puffendorf published his 'Treatise on the Law of Nature and Nations.' His 'Essay on Jewish Weights and Measures,' a work of great learning and acuteness, was published in 1686.

After the Revolution, Dr. Cumberland was raised to the see of Peterborough, in the room of Dr. Thomas White, who refused the new oath. The manner in which the many bishoprics that thus became vacant were filled up by William is thus described by Bishop Burnet: 'It was visible that in all these nominations, and the filling the inferior dignities that became void by their promotion, no ambition nor court favour had appeared; men were not scrambling for preferment, nor using arts or employing friends to set them forward; on the contrary, men were sought for and brought out of their retirement, and most of them very much against their own inclinations.' (*Hist. of his Own Time*, vol. ii. p. 76.) These remarks are particularly applicable to Dr. Cumberland's case. 'The king was told,' says Mr. Payne, his chaplain, to whom we are indebted for a brief, and that the only, memoir of Cumberland, 'that Dr. Cumberland was the fittest man he could nominate to the bishopric of Peterborough. Thus a private country clergyman, without posting to court,—a place he had rarely seen,—without suing to great men, without taking the least step towards soliciting for it, was pitched upon to fill a great trust, only because he was fittest for it. He walked after his usual manner on a post-day to the coffee-house, and read in the newspaper that one Dr. Cumberland, of Stamford, was named to the bishopric of Peterborough; a greater surprise to himself than to any body else.' (Preface to Sanchoniathon's *History*, p. xii.) This was in the sixtieth year of his age; but his health was still good, and he entered with great zeal on the performance of his new duties. He had commenced, some years before, a critical examination of Sanchoniathon's Phœnician History; and this work still occupied him for some years after he was made a bishop. It led him to several cognate inquiries, the results of which were published some time after his death under the title of 'Origines Antiquissimæ, or Attempts for Discovering the Times of the first Planting of Nations.' Neither was the series of dissertations on Sanchoniathon's History published during his lifetime. They were both edited by Mr. Payne, and published, the latter in 1720, the former in 1724. At the age of eighty-three Dr. Cumberland, having been presented by Dr. Wilkins with a copy of his Coptic Testament, then just published, commenced, like another Cato, the study of Coptic. 'At this age,' says Mr. Payne, 'he mastered the language, and went through great part of this version, and would often give me excellent hints and remarks as he proceeded in reading of it.' He died on the 9th of October, 1718, in the eighty-seventh year of his age.

Dr. Cumberland's private character appears to have been a perfect model of virtue. 'When I read,' says Mr. Payne, 'the character given in Scripture of Moses, that "he was very meek above all the men that were upon the face of the earth," and that given to Nathaniel by our Saviour, that "he was an Israelite indeed, in whom was no guile;" I cannot but apply them to this extraordinary person, for I think there never could be a man after them whom these characters do more truly fit.' He was a man also of most extensive learning. 'He was thoroughly acquainted with all the branches of philosophy: he had good judgment in physic, knew everything that was curious in anatomy, had an intimacy with the classics. Indeed he was a stranger to no part of learning, but every subject he had occasion to talk of, he was as much a master of it as if the direction of his studies had chiefly lain that way. He was thoroughly conversant in scripture, and had laid up that treasure in his mind. No hard passage ever occurred, either occasionally or in reading, but he could readily give the meaning of it, and the several interpretations, without needing to consult his books.'

The Inquiry into the Laws of Nature[*] was called forth by the political and moral works of Hobbes. Hobbes is charged therein with atheism; he is represented, as he is also represented in Cudworth's 'Eternal and Immutable Morality,' as denying any standard of moral good and evil other than one fashioned by human law; he is upbraided for the forms of expression that in a state of nature all men have a right to all things, and that the state of nature is a state of war. These differences between Hobbes and Cumberland may be all traced to a misapprehension of the former's meaning. As regards Cumberland's own views of moral science, they are substantially correct. Objections may be made to the phrases, 'law of nature' and 'right reason,' by which last he denotes the set of faculties employed in the determination of moral good and evil. But though in a science where the chief disputes that have arisen are verbal disputes, phraseology cannot be accounted unimportant, and though that phraseology, combined with clumsiness of style and arrangement, has prevented a general perception of the substantial merits of the work, we must, while we regret the defect and its consequences, do justice to a really correct system. Tendency to affect the general good is made the standard of morality. To endeavour to effect the greatest amount of general good, is the one great duty, or the one great 'law of nature;' and we know, according to Cumberland, that it is a duty or law of nature, or law of God, because we know that an individual derives the greatest happiness from the exercise of benevolence, and that God desires the greatest possible happiness of all his creatures. Carrying out the fundamental principle, that the greatest general good is to be sought, he deduces the several particular duties or particular 'laws of nature.' He founds government upon, and tests it by, the same principle.

Sir James Mackintosh, after passing one or two other criticisms on Cumberland's system, observes: 'He had a momentary glimpse of the possibility, that some human actions might be performed with a view to the happiness of others, without any consideration of the pleasure reflected back on ourselves. But it is too faint and transient to be worthy of observation, otherwise than as a new proof how often great truths must flit before the understanding before they can be firmly and finally held in its grasp.' The pretty sentiment of the second sentence is doubtless the secret of a criticism, which, passed upon a system that makes the general good the end, and spoken of the good accruing to one's self from the pursuit of the general good only as an index to the will of God, is, at best, unmeaning. Sir James afterwards says: 'Throughout his whole reasoning, he adheres to the accustomed confusion of the quality which renders actions virtuous with the sentiments excited in us by the contemplation of them.' 'The quality which renders actions virtuous' is, according to Cumberland, their tendency to increase the general good. 'The sentiments excited in us by the contemplation of them' are, the sentiments of moral approbation and disapprobation. Does Cumberland confound these sentiments with a tendency to increase general good? Can this, which Sir James Mackintosh calls an 'accustomed confusion,' ever have taken place? (*Dissertation on Ethical Philosophy*, sec. v.)

The 'Inquiry', as may be inferred from the Latin title which has been given, was written in Latin. It was printed in a most inaccurate way, and the innumerable errors of the original edition have been perpetuated in the several German and London reprints. Dr. Cumberland left an interleaved copy with a few corrections and additions; in this same copy the whole text was revised by Dr. Bentley; and thus enriched, the copy was presented to the library of Trinity College, Cambridge, by Richard Cumberland, the great-grandson of the bishop, and grandson of Dr. Bentley. An abridged translation was published by Mr. James Tyrrel in 1701, during Dr. Cumberland's lifetime. Mr. Maxwell, an Irish clergyman, published a translation in 1727, prefixing and appending some original dissertations. M. Barbeyrac published a translation into French in 1744, having been allowed the use of the interleaved copy containing the author's and Dr. Bentley's corrections. A third English translation by the Rev. John Towers, D.D., appeared in 1750. (Payne's Preface to Cumberland's Sanchoniathon's *History*; Kippis's *Biographia Britannica.*)

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[*] The following is the title in full of the work:—'De Legibus Naturæ Disquisitio Philosophica, in qua earum forma, summa capita, ordo, promulgatio, et obligatio, e rerum natura investigantur; quinetiam Elementa Philosophiæ Hobbianæ, cum moralis tum civilis, considerantur et refutantur.'

CUMBERLAND, RICHARD, a favourite dramatic writer and miscellaneous author of the last century, great-grandson of Richard Cumberland, bishop of Peterborough, and grandson by the mother's side of Dr. Richard Bentley, was born February 19, 1732,* in the lodge of Trinity College, Cambridge. He was placed successively at the public schools of Bury St. Edmund's and Westminster; and at the early age of fourteen commenced his residence at Trinity College, Cambridge. Though during his two first years he had entirely neglected his mathematical studies, he distinguished himself highly by readiness and skill as a disputer in the schools, and obtained the degree of tenth wrangler. Two years after, he was elected fellow of Trinity. It was his intention to enter the church, and devote himself to literature and the duties of his profession. From these views he was withdrawn by being appointed, in the same year, private secretary to the earl of Halifax, then first lord of trade, whom he accompanied, on his appointment to be lord lieutenant, to Ireland in 1760. Through this connection his father became bishop, first of Clonfert, afterwards of Kilmore. To Cumberland himself the connection brought little benefit. But after passing through one or two subordinate offices, he was appointed secretary to the Board of Trade, soon after Lord George Germaine became first lord in 1775, and held that office until the suppression of the board in 1782. In 1780 he was sent on a confidential and secret mission to the court of Madrid. This seemingly fortunate appointment proved the source of no small loss and vexation, in consequence of his necessary expenditure to the extent of 4500*l.* beyond the money which he received at starting, of which no portion ever was repaid. On this subject we have only his own *ex parte*, but uncontradicted, statement: there is every appearance that he was exceedingly ill used.

After the reduction of the Board of Trade he received a compensation allowance, and retired to husband his diminished means at Tunbridge Wells. He now devoted himself altogether to literature, which had hitherto been only his amusement; and tried his powers in the multifarious departments of opera, farce, comedy, tragedy, occasional, lyric, and sacred poetry, pamphlets, novels, essays, and even divinity: but he will hardly be remembered except as an essayist, and as the author of several successful comedies, of which only the West Indian, the Wheel of Fortune, and the Jew need be mentioned. The West Indian obtained great popularity on its first appearance, and is still a stock piece: it was in Major O'Flaherty, one of the chief characters, that the eminent comedian Moody made his first favourable impression on the public. The Jew was an honourable attempt to combat popular prejudice against the Jewish nation. The Wheel of Fortune is identified with John Kemble, who made Penruddock one of his very effective characters. Many other of his dramatic pieces, of which there are at least thirty-two, were popular at the time of their production; and even those which had little sterling merit added for a time to his reputation, by keeping his name continually before the public: but to the best of our recollection there were no others which now require notice.

As an essayist, he rode to fame on the shoulders of Bentley, from whose manuscripts he derived the learning of those series of papers in the 'Observer,' on Greek poetry, which contain a rich collection of translated fragments of the comic poets. The merits of the translations, however, belong to Cumberland. There are also a number of valuable critical essays, chiefly on the drama. The entire work proceeded from Cumberland's pen, and affords honourable evidence of the author's fertility of imagination, knowledge, humour, and varied power of composition. His translation of the 'Clouds of Aristophanes' is elegant, but he has altogether missed the spirit of the original.

One of Cumberland's pamphlets that appeared without his name, entitled 'Curtius rescued from the Gulph, or the Reply Courteous to the Rev. Dr. Parr, in answer to his learned pamphlet, entitled "A Sequel,"' &c., is no unfavourable specimen of the author's powers of humour and sarcasm, and his readiness at paying off a mass of learned quotations in coin of the same but a more current kind.

His memoirs, published in 1806, is a very amusing book, full of interesting anecdotes of the men of his time, which will give the reader a thorough insight into the vain and irritable character of the author. His reputation was unblemished in the discharge both of his public and private duties; and his society was much courted for his brilliant conversation. He is recorded to have had one weakness quite at variance with the pride of character to which he lays claim, a habit of flattery which was succeeded by bitter sarcasm as soon as the objects of it had turned their backs. For such a practice it is a poor excuse to say that we suppose it to have originated not in malevolence, but in the straits to which a talker by profession may be continually put to maintain his reputation.

Mr. Cumberland died, after a few days' illness, May 7, 1811.

CUMBRIAN MOUNTAINS. These form a group in the north-western part of England, occupying rather more than a third of Cumberland, perhaps one-fifth of Westmoreland, and a small part of North Lancashire. The road leading from Kendal to Carlisle through Shap, may be considered as its eastern boundary; but the Shap Fells are united by high land to the Pennine Mountains, which extend farther east between Westmoreland and Yorkshire, and likewise north and south from their junction with the Cumbrian range. The highest part of that road is 1187 feet above the sea. From this line the mountains extend westwards, and terminate with Dent Hill, a few miles from Whitehaven. The most northern point of the mass is Fell Top, near Hesket-new-market in Cumberland, and the most southern the slate quarries near Ulverston in Lancashire. From north to south the group measures about 37 miles, from east to west about 35 miles. The whole system probably covers a surface little short of 700 square miles.

This group consists properly of one immense mass of rock, furrowed by narrow and deep valleys, the direction of which is towards all the points of the compass. By these valleys a large number of ridges is formed. That part which is connected with the Pennine range by the Shap Fells may be considered as the line of its axis, which in its western direction passes through Helvellyn (3055 feet), embraces Red Pike and Pillar (2893 feet), and terminates with Dent Hill (1110 feet). The high cape of St. Bees Head (222 feet), which lies in the prolongation of this line, is separated from Dent Hill by low ground.

Several high peaks occur to the north of this line. One extensive mass of rocks, lying to the east of Bassenthwaite Water, is overtopped by the three high summits of Saddleback (2787 feet), Skiddaw (3022 feet), and High Pike near Hesket-new-market (2101 feet). To the south-west of Bassenthwaite Water is Grasmere Fell (2756 feet). On the south of the axis, the highest summits are due south of Pillar. In this part are Scaw Fell (3092 feet), and Bow Fell, near Eskdale (2914 feet). East of them, Coniston Fell (2577 feet) is more isolated. Black Comb (1919 feet) is much farther south, near Duddon mouth, on the west side of that aestuary.

According to the recent observations of Professor Sedgwick, the greatest part of this cluster of mountains is formed by stratified deposits of slaty texture. More than the northern half consists of green quartzose roofing slate, and the southern portion of grauwacke slate. The line separating both formations runs from the northern extremity of Winandermere Lake to Shap Fells on the east, and nearly in a straight line. On the west it continues at some distance from the northern extremity of Coniston Water, and then runs southward to Broughton on Duddon mouth. A narrow band of limestone and calcareous slate separates the two formations. Black Comb consists of old black slate. Granite is found between Black Comb and Wast Water, on the north side of Ennerdale Water, in Skiddaw, and between the northern part of Ullswater and Penrith. A broad band of coal encircles on the north the mountain limestone, and runs from Whitehaven by Workington, Maryport, a little south of Wigton and a little north of Hesket-newmarket, to nearly as far as Penrith.

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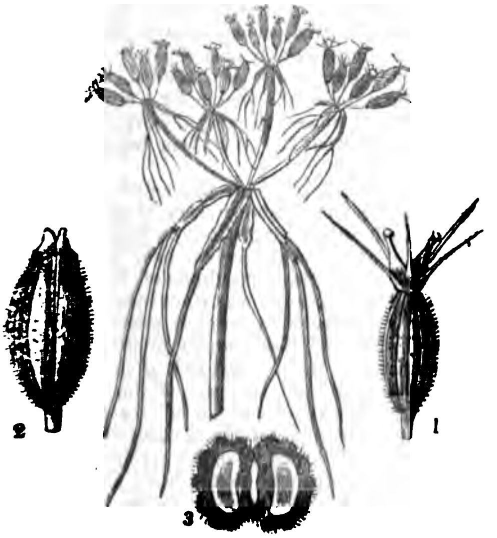
* In the last edition of the 'Encyclopedia Britannica' this date is erroneously given February 29, 1732.

This group of mountains is well known for its picturesque scenery. The mountains rise with steep acclivities, especially those west of Helvellyn, inclosing narrow but in some parts well-cultivated valleys, which derive a great part of their beauty from the numerous lakes which occupy the widest part of them. To the north of the central range, proceeding from east to west, are Hawes Water (714 feet), Ullswater (460 feet), Thirlmere (473 feet), Derwent Water (222 feet), Bassenthwaite Water (210 feet), and Crummock (260 feet above the sea). To the south of the axis, proceeding from west to east, are Ennerdale Lake, Wast Water (160 feet), Coniston Water (105 feet), Grassmere (196 feet), and Winandermere (116 feet above the sea). The whole mountain mass declines more rapidly to the north than to the south, as the different elevation of the lakes evidently shows. For particulars on the lakes and valleys, see Borrowdale, Cumberland, Westmoreland, and Lancashire. (*Geography of Great Britain and Ireland*, by the Society for the Diffusion of Useful Knowledge; Sedgwick in *Geol. Trans.*, Sec. Series, vol. iv., first part, 1835.)

CUMI'NGIA. [Conchacea, vol. vii. p. 430.]

CUMI'NUM CY'MINUM, or CUMIN, is an umbelliferous plant of annual duration, found wild in Egypt and Syria, and cultivated from time immemorial for the sake of its agreeable aromatic fruit, which, like that of Caraway, Dill, Anise, &c., possesses well-marked stimulating and carminative properties. Cumin grows about a foot high, and is very little branched; it is smooth near the ground, but slightly downy near the end of its branches. Its leaves are deeply cut into long capillary segments. The partial and general involucres consist of similar leaves, but smaller. The flowers are white or reddish: the fruit is contracted at the side, surmounted by a calyx with long bristle-pointed divisions, and has each of its halves marked by nine unequal elevated ridges, all of which are slightly muricated, especially the secondary ones, under each of which there is a vitta. Two vittæ are present on the commissure, and the albumen is not involute.

Cumin is said to be employed in flavouring Dutch cheese.



[Cuminum Cyminum.]

1, a young fruit, with the calyx still adhering; 2, a ripe fruit; 3, a transverse section of the latter, showing the ridges, the vittæ, and the commissure.

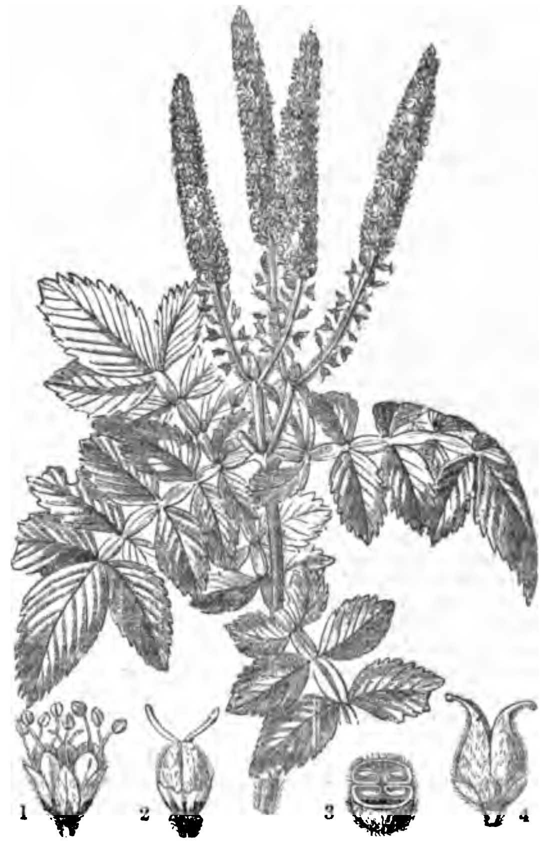
CUNE'O. [Coni.]

CUNITZ, MARIA, born at Schweidnitz, in Silesia, about the beginning of the seventeenth century. She was remarkable, according to report, for the great variety of her knowledge, but the only published specimen is her 'Urania Propitia, sive Tabulæ Astronomicæ,' &c., printed at Oels in 1650, and at Frankfort in 1651. This work was composed in a Polish convent, the civil troubles having driven the authoress from her country. It is an attempt to simplify the methods derived from Kepler's laws, and in particular to avoid the use of logarithms; more remarkable from the circumstance of the writer being a female than from any particular merit.

The principal instructor of Maria Cunitz in astronomy was a countryman of her own, named Loewen, whom she married on the death of her father. The preface and dedication of the tables were written by him. She died at Pitschen, in Silesia, probably after 1669. (Delambre, *Astron. Moderne*; Lalande, *Bibliog. Astron.* The latter cites Desvignoles, *Bibl. Germ.*, vol. iii., and Scheibel, *Bibl. Astron.*, p. 361—378.)

CUNNINGHA'MIA SINENSIS, an evergreen Chinese tree, formerly called Pinus lanceolata. It has narrow oval lanceolate stiff pungent leaves, which, when the plant is old enough, collect into cones, after the manner of an Araucaria. The plant will live near London, in the open air, with a little protection in winter.

CUNONIA'CEÆ, a small natural order of polypetalous apocarpous Exogens, allied to Saxifragaceæ, with which they were formerly united. They are trees or shrubs, inhabiting Southern Africa, South America, and very sparingly the East Indies. In most respects their flowers are constructed like those of Saxifragaceæ, but the styles are more consolidated, and they have a dense spiked or racemose inflorescence instead of a few loosely-arranged blossoms. The leaves are opposite, and furnished with interpetiolar stipules, and being pinnated in most cases, give the plants a peculiar aspect. Little is known of their properties, except that their bark is sometimes very astringent and used for tanning purposes.



[Cunoniaceæ Weinmannia pubescens.]

1, a perfect flower; 2, an ovary; 3, a transverse section of the same; 4, a ripe fruit.

CUPAR FIFE (so named in contradistinction from the small towns of Cupar Angus and Cupar Grange in Perthshire), is the county town of Fife, and has separate jurisdiction as a royal burgh, in which capacity it formerly enjoyed many municipal privileges, being called by Camden 'Burgus Insignis.' At present it is the most important place in the county, not only as the seat of the county courts for the administration of justice, by which it is made the residence of numerous legal practitioners, but on account of its manufactures, corn-market, and numerous fairs for agricultural produce. It is situated nearly in the middle of the peninsula of Fife, at the confluence of the small streams Eden and Lady Burn, or St. Mary, and about 10 miles west of St. Andrews; having, on the south, a range of high hills, and on the north a fertile country, diversified with hills and numerous woods. The site of the town is only 25 feet above the level of the sea, from which it is distant 6 miles; the temperature of the air is mild, and is said to be very favourable to longevity. It is a place of great antiquity. In the parliamentary rolls of David II. are the names of commissioners from 'the royal burgh of Cupar,' and on a mound, called the Castle Hill, there formerly stood a castellated fortress which was the head-quarters of the chiefs of the family of Macduff, the feudal earls or thanes of Fife. At the foot of the Castle Hill was a convent of Dominican monks, or Black Friars. Of these establishments no vestiges now exist; but in opening the surface of their sites several skeletons and other relics have been discovered. A green esplanade before the castle, still called the Play Field, was antiently used for the performance of the religious shows called *mysteries* and *moralities:* and here, in 1555, was acted the famous David Lindsay's witty drama of the 'Three Estates,' a popular satire on the priesthood, which greatly promoted the subsequent religious revolution.

Cupar consists principally of one long street, extending from west to east, but several others contain new and handsome houses. The public buildings are neat and convenient, with the exception of the gaol, which, with an exterior resembling a gentleman's mansion, affords very bad accommodation for the prisoners. Besides the parish church, which is plain and commodious, there are various dissenting meeting-houses and an episcopalian chapel. The number of ale-houses, not including shops for the sale of spirits, is 53. The town has a cleanly and very respectable appearance, the vicinity being ornamented with some neat villas and gardens. Spring and well water is abundant. The streets are lighted with gas, and are partially paved, a luxury seldom found in the country towns of Scotland. The number of resident procurators who practise in the county courts is about 30; making, with their clerks, a total of about 90 inhabitants who subsist by the legal profession. There are two reading-rooms, and a subscription library consisting of 4000 volumes. The schools of Cupar are in high repute. In addition to a large grammar-school on the Castle Hill, several others are established on Dr. Bell's system, so that no child in the town at the age of five is unable to read. There are two printing-presses, one of which is famed for the beautiful and accurate impression of Dr. Hunter's editions of several of the Latin Classics. The chief manufacture is linen. Three spinning-mills for flax employ about 240 hands. The water of the Eden is made available for the movement of machinery of 80 horse-power, and about 900 weavers of linen are constantly engaged in their own dwelling-houses. A snuff-mill, worked both by water and steam, manufactures annually 60,000 lbs. of Scotch snuff. There are two tan-yards, and breweries; and from an immense bed of clay in the vicinity a great quantity of bricks and coarse earthenware is made. Building materials are supplied from four quarries of white sandstone. Many of the inhabitants of the parish are employed in agriculture, which is carried on very successfully, all the adjacent land being arable, and producing the finest crops of wheat and turnips. Excellent races are held under the patronage of the Fife Hunt, and a subscription pack of fox-hounds is kept.

The town of Cupar, jointly with St. Andrews and Craill, the two Anstruthers, Kilkenny, and Pittenween, sends one member to parliament. The population, in 1831, of the burgh and parish was 6473. (*New statistical account of Scotland;* Carlisle's *Topog. Dict. of Scotland;* Chambers's *Gazetteer of Scotland.*)

CUPEL, CUPELLATION. [ASSAYING.]

CUPID (Cupído, *desire*), in Latin mythology, the god of love. Cicero (*Nat. Deor.*, iii. 23) enumerates three deities, or rather three forms of the same deity, bearing this name, each the son of a different Venus, by a different father. Of these the principal, and the one who is usually meant when the name of Cupid occurs without qualification, is the son of Mercury and Venus daughter of Dione. He is represented by the poets as a child armed with bow and arrows, as an emblem of the inspiration of love, through the eye from a distant object. Hence the metaphorical expressions of 'darts of love,' 'eyes darting desire,' and the like. Often he is represented as blind, in reference to the ill-assorted connections, the unrequited affection, or the neglect of reason and duty, of which a hasty passion is often the cause. By artists he is variously designed; sometimes riding on a lion, or breaking Jupiter's thunderbolts, to signify that the strongest yield to the influence of love: often with a butterfly, in allusion to his amour with Psyche. [PSYCHE.] Athenæus (xiii. 2) quotes a beautiful passage from the Phædrus of Alexis, to show the impossibility of representing Cupid to the senses.

CUPOLA. [DOME.]

CUPPING is of two kinds; one by which some blood is taken away, generally simply termed cupping; the other when no blood is abstracted, which is accordingly termed dry cupping. The preliminary steps of the operation are the same in both cases: the part to which it is intended to apply the cupping-glasses is washed with warm water, or a warm cloth is merely applied to it, in order to attract blood to the part. A small bell-shaped glass, a portion of the air of which has been expelled by holding it for an instant over the flame of a spirit-lamp, is immediately applied to the spot which has been prepared. The usual amount of pressure on the part being diminished, the blood flows to the part, and produces distension of the vessels and elevation of the surface, as well as a purple or livid colour. If it be intended to take away blood, the cupping-glass is speedily removed, and an instrument called a scarificator, containing a number of lancets, sometimes as many as twenty, is applied, and made to act so as to inflict a corresponding number of incisions on the skin and subjacent vessels. 'The instrument is so constructed, that the depth to which the lancets penetrate may be made greater or less at the option of the practitioner.' It is not in general advisable that the depth should be very great, as more blood flows, and the vessels will continue to bleed longer, if only partially divided, than if completely cut through. The cupping-glass, exhausted as before, is to be immediately replaced, and if skilfully applied, and the air has not been too much rarified, by which too great pressure is made by the edges of the glass, a considerable quantity of blood will flow into it. When nearly full, or if the blood begin to coagulate, the glass is to be carefully removed, the wounded part quickly washed with a sponge with warm water, and the glass having been emptied and washed, is to be again applied, if a sufficient quantity of blood should not have been obtained by the first application. Two or more glasses may be applied to different spots at the same time, so that the quantity of blood desired, or necessary to obtain the object in view, may be more quickly abstracted.

'Where dry cupping only is intended, the glasses may be permitted to remain on the skin for a few moments, and replaced five or six times with a little variation of their position, in order to prevent the skin from being hurt by their pressure.'

Cupping by which blood is abstracted is used either where general bleeding is unnecessary, or as supplementary to it, for the removal of congestions or local affections. It is analogous to the use of leeches, over which, however, when the situation of the part admits of the application of the glasses, it has in general many advantages. The blood is more rapidly abstracted, a point of great importance in inflammatory diseases; the quantity removed can be more exactly ascertained; there is less risk of subsequent bleeding from the wounds; and the part of the body subjected to the operation is exposed to the air for a much shorter time. Cupping is also preferable in cases where the application of leeches is followed by severe erysipelas of the skin.

'In all inflammations and congestions about the head cupping on the back of the neck and between the shoulders is a most useful mode of abstracting blood; and this operation is also particularly applicable for the removal of blood from the parietes of the chest and abdomen in diseases of the different viscera. Its use however is only admissible when it can be employed without exciting pain, and irritating the diseased organ.' Many cases of impending apoplexy may be warded off by the timely application of cupping-glasses to the neck, aided by a quickly-acting cathartic. Where the abstraction of blood is inexpedient or unnecessary, dry-cupping is often resorted to with benefit. In adynamic states of fever, especially where the lungs are complicated in the diseased action, if 'farther depletion cannot be ventured upon, dry-cupping on the back or chest will sometimes be serviceable.' (Copland's *Dictionary of Medicine*, p. 930.) Dry-cupping often affords great and immediate relief in many pains of the side, not inflammatory, but hysterical, which occur in females. The pains of the back which likewise occur in females at particular times may be much mitigated by dry-cupping.

Another and most important application of cupping is the prevention by its means of the absorption of poisonous fluids from wounds. For this purpose anything by which a partial vacuum over the wounded part can be produced will answer, such as a wine-glass, tumbler, or tea-cup with a smooth margin, from which the air has been partially expelled by holding it for a moment over a lighted candle. This mode was in use among the antients, has been revived among the moderns, and is practised by the South Americans in cases of the bites of venomous serpents, by means of a funnel-shaped calabash. The Greeks called a cupping instrument *σικύα* (*sikua*), from its bearing some resemblance to the form of a melon or gourd. (Empson's *Narratives of South America*, p. 66; Wardrop *on Blood Letting;* Cooper's *Surgical Dictionary*.)

CUPRESSUS, a coniferous genus, distinguished from the firs and pines by its leaves being mere scales, its cones formed of a small number of peltate woody bracts, and the seeds very small, angular, and several to each bract. Botanists mention several species, but of these three only are suited to the climate of Great Britain.

C. sempervirens, the common upright cypress, is a native of the warmer parts of Europe, but has long since been transferred to gardens for the sake of its deep evergreen branches and leaves, and the gloomy air it imparts to the situations which it occupies. Its timber is of great durability: it is probable that gopher-wood, which some have referred to the cypress, was rather the timber of *Thuja articulata*. It is not much cultivated in England, the climate being too damp and cold for it in summer; otherwise it is sufficiently capable of resisting the cold of winter. Its formal mode of growth moreover is not to the taste of the people of this country.

C. horizontalis, the spreading cypress, is a far handsomer species, partaking in all the excellent qualities of the last, being more hardy, and becoming a beautiful object with its graceful spreading branches, loaded, as they usually are, with large round cones. Miller has rightly pointed out the difference between this and the last, but it is nevertheless exceedingly uncommon in the collections of this country. The spreading cypress of the nurseries is nothing but a very slight variety of *C. sempervirens*.

C. lusitanica, the cedar of Goa, differs from the two preceding in its much freer mode of growth, and in its leaves having a singularly glaucous colour. It is said to be of Indian origin, but has long since been naturalized in Portugal, where, about Cintra, it acquires a large size. In England it will only succeed well in the warm parts of the southern coast.

CUPRESSUS DI'STICHA. [Taxodium.]

CUPRESSUS THUIOIDES. [Thuja.]

CUPULE, a kind of cup or involucre surrounding certain kinds of fruit, and composed of bracts more or less grown together. In the oak the cup of the acorn is the cupule; in the hazel-nut it is the husk; in the beech and chestnut the prickly shell; and in the hornbeam the lobed bract.

CUPULI'FERÆ. [Corylaceæ.]

CURAÇOA or **CURAZAO**, an island in the Caribbean sea, near the coast of Venezuela, in 12° 6′ N. lat., and 69° 3′ W. long. Its length from north-west to south-east s 35 miles, and its greatest breadth 6 miles. The island is generally low on the eastern side, but there is a high hill on the north-east, and another still higher on the south-east. There are also some high hills on the west side, which are seen from a considerable distance at sea. The sland is wholly dependent upon rain for water, and the soil o wanting in fertility that the inhabitants are partly supplied with provisions imported from other places. It yields a small quantity of tobacco, and affords a large supply of alt. The shores are so bold that vessels of considerable ize may sail round the island within a cable's length. There are several harbours; the principal one, Santa Anna, is on the south-west side of the island. The entrance is very narrow; on the eastern side is Fort Amsterdam, and on the opposite side of the harbour is the town of Curaçoa, said to be one of the handsomest in the West Indies.

Curaçoa was settled by the Spaniards early in the sixteenth century; it was taken in 1632 by the Dutch, and was captured by the English in 1798, but restored at the peace of Amiens. It was again taken by the English in 1806, and finally given up to Holland at the general peace in 1814.

CURACY and **CURATE.** [Clergy.]

CURA'TOR (from curare, *i. e. to care* or *take care*), one who is appointed to take care of anything · in this general sense there were many kinds of curators.

In the civil law the word denotes one who is appointed to administer the estate of any person who is not legally competent to manage his property. 1. There was the curatorship, *i. e.* guardianship, of minors (cura minorum). Every person who was sui juris, *i. e.* not subject to paternal or domestic dominion, but who was still under age, was put under the superintendence of a guardian. But the Roman law distinguishes two kinds of guardianship; viz. tutelage (tutela) and curatorship (curatela). (Ayliffe's *New Pandect*, book ii., tit. xxxix.) The former kind of guardianship was in use if the minor was impubes, *i. e.* if a male minor was not fourteen and a female not twelve years old. The guardian in this case was called tutor, and the minor, pupillus. After the tutelage was ended, the minor received a curator till he was twenty-five years of age. This distinction had some important consequences in the civil law, which have only recently fallen into disuse even in countries where the Roman law is still in force. According to the strictness of law, the curatorship terminated with the twenty-fifth year of the minor; but it could also be determined by a solemn declaration of the emperor that the minor should be of age. (C. 2, tit. 45, de iis qui veniam ætatis.) This was called receiving veniam ætatis, and it could take place in the case of males in their twentieth, and females in their eighteenth year. 2. As spendthrifts and deaf and dumb persons could not legally administer their estates, they also were put under the superintendence of a curator. 3. A third kind of curators was the curator bonorum, *i. e.* a trustee for the administration of the estate of absent or deceased persons and insolvent debtors. Between this curatorship and that of a minor there was this important difference; the latter was regarded as a public office, which could not be refused, except for such reasons as the law allowed.

(Heineccius, *Jus. Civ. secundum ordinem Pandectarum*, pars iv., § 288, 398, 400-403; vi. 275.)

Curators in antient Rome were also public officers of various kinds, particularly after the time of Augustus, who established several officers with this title. (Suet., *Vit. Aug.*, cap. 37.) 1. Curatores viarum, *i. e.* curators who superintended the laying out and repairing of the public roads. This office existed under the Republic, but it was only held as an extraordinary office, and was conferred only for special purposes. 2. Curatores operum publicorum, aquarum, cloacarum, who had the superintendence of the public buildings, theatres, bridges, aqueducts, and cloacæ. 3. Curatores alvei Tiberis, who were the conservators of the Tiber. 4. Curatores frumenti populo dividundi, whose duty was to distribute corn among the people. Under the emperors we find other officers with the name of curatores, as, for instance, the curatores ludorum, who had the superintendence of the public amusements: and curatores reipublicæ, also called logistæ, whose duty it was to administer the landed property of municipia.

CU'RCUMA LONGA, the Turmerick plant, is an herbaceous fleshy-rooted plant, found wild in various places in the East Indies, where also it is extensively cultivated. It belongs to the natural order Zingiberaceæ, in the general aromatic qualities of which it slightly participates. The root is divided into several fleshy fingers, of an oblong form, and as thick as the thumb. The leaves spring at once from the crown of the root, have a lanceolate figure, sheathe each other at the base, are about a foot long, and produce from their centre a short thick leafy spike, in the axil of whose bracts are seated the inconspicuous pale cream-coloured flowers. Dr. Roxburgh gives the following account of the manner in which the plant is cultivated: 'the ground must be rich, friable, and so high as not to be drowned in the rainy seasons, such as the Bengalees about Calcutta call Danga. It is often planted on land where sugar-cane grew the preceding year, and is deemed a meliorating crop. The soil must be well ploughed and cleared of weeds, &c.

It is then raised in April and May, according as the rains begin to fall, into ridges, nine or ten inches high, and eighteen or twenty broad, with intervening trenches, nine or ten inches broad. The cuttings or sets, viz. small portions of the fresh root, are planted on the tops of the ridges, at about eighteen inches or two feet asunder. One acre requires about from nine hundred such sets, and yields in December and January about two thousand pounds weight of the fresh root.'

CURDISTAN. [Kurdistan.]

CURFEW. The custom of covering up their fires about sun-set in summer, and about eight or nine at night in winter, at the ringing of a bell called the *couvre feu*, or curfew bell, is supposed to have been introduced by William I., and to have been imposed upon the English as a badge of servitude. Henry, in his *History of Britain*, 4to. edit., vol. iii., p. 567, however, says this opinion does not seem well founded, for there is sufficient evidence that the same custom prevailed in France, Spain, Italy, Scotland, and probably in all the other countries of Europe, in this period; and was intended as a precaution against fires, which were then very frequent and very destructive, when so many houses were built of wood. Henry I. restored the use of lamps and candles at court in the night after the ringing of the curfew bell, which had been prohibited by his predecessors. (Will. Malmesb., fol. 88.)

Thomson, in his *Seasons*, countenances the opinion of the tyranny of this custom:—

> 'The shivering wretches, at the curfew sound,
> Dejected sunk into their sordid beds,
> And through the mournful gloom of antient times
> Mused sad, or dreamt of better.'

But we find the curfew mentioned to a very late period as a common and approved regulation. Among the charges directed for the wardmote inquests in London, in the mayoralty of Sir Henry Colet, A.D. 1495, it is said, 'Also yf there be anye paryshe clerke that ryngeth curfewe after the curfewe be ronge at Bowe Chyrche, or St. Bryde's Church, or St. Gyles-without-Cripelgate, all suche to be presented.' (Knight's *Life of Dean Colet*, p. 6.) The same charge remained in the wardmote inquest, as printed in 1649. Hutchins, in his *History of Dorsetshire*, vol. ii., p. 267, speaking of Mapouder church, in that county, mentions land given 'to find a man to ring the morning and curfew bell throughout the year.' In the same volume, p. 422, under Ibberton, is mentioned an acre given for ringing the eight o'clock bell, and 4*l.* for ringing the morning bell. Bishop Hall, in his *Virgidemiarum*, printed in 1599 (b. iii. sat. 4), speaks of the gift of a new rope to ring the curfew bell as of occasional occurrence in his time:

> 'Whoever gives a paire of velvet shoes
> To the Holy Rood, or liberally allowes
> But a new rope to ring the curfew bell,
> But he desires that his great deed may dwell,
> Or graven in the chancel-window glasse,
> Or in the lasting tombe of plated brass.'

The curfew bell, strictly as such, had probably fallen into disuse previous to the time of Shakspeare, who in *Romeo and Juliet* applies the term to the morning bell:

> 'The second cock hath crow'd,
> The curfew bell has rung, 'tis three o'clock.'

In the *Antiquarian Repertory*, old edit., vol. i. p. 89, is an engraving of an iron implement which is called a curfew, or cover-fire, formerly belonging to Gostling, the historian of Canterbury, and presumed to be of very antient if not of Norman origin, but which in reality is no more than an *ex tempore* oven, lately if not still used in many parts of England for baking small viands: the hearth is first heated, the viand placed upon it, and then covered with this implement, the embers being raked round and above it. Either Gostling's, or a cover-fire like it, is still shown among the curiosities of the late Lord Orford's villa at Strawberry Hill.

Milner, in his *History of Winchester*, vol. i. p. 189, says the curfew was first enforced in Winchester, and thence extended to other places: but there is no authority whatever for this surmise, beyond the circumstance that William the Conqueror made Winchester one of the chief places of his residence.

CURIA. [Comitia.]

CURISCHES HAFF, a kind of bay on the north-eastern shores of East Prussia, supposed to have originated from the throwing up of the sand and the retiring of the waters of the Baltic. From Labiau, in the south, to its opening into the Baltic at Memel, it is about 60 miles in length; at its greatest breadth, between Oranzkukren and Juwendt, nearly 28 miles: it contains altogether 588 square miles. Its confluence with the Baltic is formed by what is called the 'Memel Deeps,' which are from 800 to 1200 feet in width. It cannot properly be called a part of the sea, inasmuch as its waters are fresh, like those of the other Haffs in this quarter. It is separated from the Baltic by a very narrow neck of land, called the 'Curische Nehrung,' formed by a series of low sand banks, almost destitute of vegetation, about one to two miles in breadth—except where they taper to a point as they approach Memel—and about 70 miles in length. On this neck of land there are a few villages. The bed of the Haff is unequal and variable, and the navigation is therefore very precarious; hence the only description of vessels used here is a peculiar kind of large flat boats, and even these are unable to land along many parts of the coast. In stormy weather the navigation is very dangerous. The Dange, the Minge, and the Memel, discharge their waters into this Haff.

CURL. [Potatoes.]

CURLEW. [Scolopacidæ.]

CURNOUL, a principality formerly governed by an independent chief, and now forming one of the subdivisions of the Balaghaut ceded districts. Previous to its passing into possession of the English, the country had been subdivided into a great number of petty jaghires, and the government of the principality was so badly administered, that a great part of the lands were allowed to revert to a state of nature, and were overgrown with rank weeds and jungle. From this cause the revenue, which had amounted to twenty lacs of rupees (200,000*l.*), was reduced to one-half that sum. The family of the present nabob of Curnoul has held possession of the country by a tenure amounting almost to independence since 1651, when Curnoul was conferred as a jaghire on Khizzer Khan, by Aurengzebe, the governor of the Deccan. On the death of the nabob, Azif Khan, in 1815, the chief authority was usurped by Muzuffer Khan, his youngest son; but the lawful heir, Munawer Khan, speedily obtained his right through the intervention of the governor of Madras, who sent a detachment of troops to the capital for that purpose. [Balaghaut.]

CURNOUL, the capital, is a populous town, on the south side of the Toombuddra, in 15° 44′ north lat. and 78° 2′ east long. It is surrounded on all sides by the rivers Toombuddra and Henday, which are there from 700 to 800 yards wide. Some strong works have been erected on the western side of the town; but in 1815 the place held out against the assaults of the English, only one day after which it was surrendered at discretion. The buildings in the town are partly of stone and partly of mud. Travelling distance from Madras, 279 miles, and from Hydrabad 127 miles.

(Rennell's *Memoir of a Map of Hindustan; Report of Committee of the House of Commons*, 1832.)

CURRANT, a well-known hardy fruit produced by two species of the genus Ribes. The one *R. rubrum*, is remarkable for the mixture of sweet and acid in its fruit, and for the beauty of its semitransparent red or yellow berries. Of this the finest varieties are Wilmot's red and the white Dutch, and the sweetest Knight's sweet red and the common white. In the fruit of *R. nigrum*, the black currant, a powerful and agreeable aromatic principle takes the place of acidity; of this species the best variety is the Black Naples.

The currants of the grocers' shops are the dried berries of a small kind of grape, chiefly cultivated in the Morea and the Ionian Islands, Corfu, Zante, &c.

CURRENCY. It is the object of this article briefly to state some general facts relating to our currency, reserving for a more advanced stage of this work an examination of the conflicting theories that prevail on the subject of our monetary system.

I. *Metallic Currency.*—The metallic circulation of the United Kingdom consists of gold, silver, and copper. The actual amount of gold and silver coin in circulation at any given time within the country cannot be estimated by the amount of the metal coined; for gold and silver moneys are exported whenever a profit can be made by their exportation. The amount of moneys coined at the Mint in the year 1835 (the last return is of that year) was as follows:—gold, 1,109,718*l.*; silver, 146,665*l.*; copper, 2688*l.* It has been asserted that the average amount of our gold currency, exclusive of the amount retained by the Bank of England, is 30 millions; but the data for such an estimate are necessarily shifting and uncertain. The circulation of silver coin in this country is of very inconsiderable amount. This is the main difference between the metallic currency of the United Kingdom and that of the rest of the world. The total existing quantity of gold, when compared with the existing quantity of silver, has been stated to be as about 1 to 50, and the relative value of gold to silver is as 1 to about 15; consequently the value of the general silver currency of the world as compared with the gold currency, is somewhat more than as 3 to 1. In this country, however, gold is the only legal tender for sums above forty shillings, and consequently the metallic currency is essentially gold, the silver coins being, like the copper, only a sort of tokens auxiliary to the gold. By the present Mint regulations, a seignorage, or duty, is charged on the silver coinage, amounting to 6$\frac{1}{16}$ per cent: upon the gold coinage no seignorage whatever is charged. A pound troy of the metal of which our silver coin is made consists of 11 oz. 2 dwts. of pure silver and 18 dwts. alloy; it is coined into 66 shillings. Our gold coins contain 11 parts fine gold and 1 part alloy; a pound troy of which mixture (called standard gold) is coined into 46 sovereigns and 14*s.* 6*d.* The bullion value of the silver coinage being therefore more than 6 per cent. less than the gold coinage, that portion of our metallic currency remains perfectly subsidiary to the gold currency; there is no necessity for determining the relative values of the two species of currency by an agio; the silver of the world necessarily goes to other countries where it forms the basis of the currency, either exclusively or in connexion with gold. Our metallic system of currency was established by law in 1816, although in practice the same principle had long prevailed, in consequence of the relative values of gold and silver in our Mint regulations. The English system gets rid of the complexity of a double standard, but there is reason to apprehend that this apparent simplicity may be purchased at too high a price. Our standard being that of the metal which is 50 times less in quantity and more than 3 times less in total value than the standard adopted by other nations, the fluctuations in the value of our standard are necessarily more frequent and more extensive than in the standard of silver, or in a standard of gold and silver exchangeably. Gold possessing large value in small bulk is in greater demand than silver when money is required for the purposes of governments. Mr. Rothschild told the Bank Charter Committee in 1832, that 'When the Emperor of Russia made war in Poland lately, gold which went from Hamburgh to Petersburgh and Warsaw was paying from three to four and five per cent profit.' Such operations of course suddenly affect the price of gold; and their results in altering the exchangeable value of commodities, and in contracting the entire currency, are most severely felt where gold is the standard.

II. *Paper Currency.*—This may be divided into—1. Bank Currency: 2. Private Currency. The paper currency proceeding from banks of issue consists of the notes of the Bank of England, and the notes of country banks, whether private or joint-stock banks. The circulation of the Bank of England in October, 1836, was 17,936,000*l.*; that of the private banks in September, 1836, was 7,764,824*l.*; and that of the joint-stock banks at the same date was 3,969,121*l.*; making a total bank currency of 29,669,945*l.* This bank currency of about 30 millions is based upon our metallic currency, and is convertible into that upon demand. Bank of England notes are legal tender, by the Bank Charter of 1834, by country banks; but at the Bank of England and its branches, Bank of England notes are payable in gold. The Bank of England therefore requires a sufficient supply of bullion to meet the possible demand for specie. That demand in recent times has arisen not from any want of confidence in the solvency of the Bank of England at home, but from the state of the foreign exchanges, which causes specie to be sent abroad. It is held that the only sound principle of managing a currency consisting partly of coined money and partly of paper money, is to have some authority presiding over the issues of paper which will be adequate to preserve the currency in the same state with reference to other countries as if it were purely metallic; and that the Bank of England, holding this authority, ought invariably to allow the currency to expand and contract under the action of the foreign exchanges. The monetary crisis of 1836-7 has been asserted to have been produced by a neglect of this principle, the drain upon the bullion of the Bank not having been followed by a proportionate reduction in the circulation of its notes. The examination of this and other questions affecting our currency may be better postponed to future articles. [EXCHANGES; MONEY.] 2. *Private Paper Currency* consists of bills of exchange and cheques upon bankers. The total amount of this credit currency in the United Kingdom is enormous. It is peculiarly liable to abuse; but the vast commercial business of the country could not be carried on without bills of exchange, which, passing from hand to hand, discounted and re-discounted, perform the functions of money. The deposits of individuals with bankers are considered by some economists to perform the same function; in both cases credit becomes a substitute for currency. The doctrine that 'bank deposits perform the functions of money,' has been lately brought forward by Colonel Torrens, but it was first promulgated by Mr. Pennington in 1829 We subjoin the statement of this doctrine in the words of Colonel Torrens, leaving for the present any examination of the probable extent of the operation of the principle:—

'Let us assume that the merchants and dealers within the metropolitan district require for the conducting of their business circulating money to the amount of 10,000,000*l.*, and that they actually hold this amount in coin and Bank of England paper. This being the previous state of things, let us assume again, that these merchants and dealers open accounts with the London bankers, and place with them, as deposits, the 10,000,000*l.*, in coin and notes, which they before kept in their own desks. Now this change in the manner of keeping the cash required to meet the current demands of the market, would not leave the merchant and dealer with a less command of money, with a less power of making payments and of making purchases, than they before possessed. By drawing checks upon their bankers to the amount of 10,000,000*l.*, they can come into the market just as effectually as they could before have done by bringing out coin and notes to that amount from their own cash boxes. If the whole of the 10,000,000*l.* in coin and notes deposited with the bankers were locked up in their coffers until drawn out in payment of the checks of the depositors, this locking up of coin and notes would have no conceivable effect in depriving the depositors of the power of drawing checks, and of making payments or purchases to the amount of the 10,000,000*l.* It is evident, therefore, that transferring coin and bank paper from the desks of merchants and others, and placing them for safe custody as bank deposits, could have no effect whatever, either in contracting or in expanding the currency, even if the whole of the coin and bank paper so transferred were locked up in the coffers of the bank until withdrawn in payment of the checks of the depositors. But the whole of the coin and notes deposited with the banks would not be locked up until required in payment of the checks drawn by the depositors. Bankers make their profit by lending, upon available securities, the greater part of the sums deposited with them by their customers. When our merchants and dealers deposited 10,000,000*l.* with the banks, the bankers would retain a part of the sum—say 2,000,000*l.* as a reserve, or rest, for the purpose of making occasional payments over their counters, and would employ the other 8,000,000*l.* in the purchase of stock, or of exchequer bills, or in the discount of bills of exchange. Now, it is self-evident that this would occasion an extension of the general medium of exchange. The merchants and others who had deposits with the bankers to the amount of 10,000,000*l.* would be just as able as they were before to come into the market and make payments and purchases to the amount of 10,000,000*l.*; while the persons who sold the stock and the exchequer bills, or who obtained the discounts, would be able to come into the market, and effect payments, and make purchases, to the amount of 8,000,000*l.* Thus, in this case, which has been taken for illustration, the operation of the private banks in receiving deposits, and in investing them in available securities, would have the effect of increasing the circulating medium by 8,000,000*l.*' (*Letter to Lord Melbourne*, 1837.)

CURRENT. Current water is opposed to stagnant water, and commonly used to express the motion of water in rivers, produced by the continuous but varying inclination of the bed of the streams. The word current is likewise applied to the rapid motion of the air. Further, it is used to designate the great masses of moving water, which, in modern times, have been found to exist in the ocean, and which constitute the currents of the sea.

CURRENTS AT SEA are large masses of water in the ocean or in closed seas, which are in continual motion in a certain direction; and so far they may be compared with the currents of rivers. But they occupy a much greater extent of surface, running sometimes two or three thousand miles, with an average breadth of two or three hundred miles. Though their existence was doubtless known to some of the early navigators, it is only in modern times that they have attracted general attention, and that a few facts respecting them have been collected, most of which are found in Major Rennell's very valuable treatise on the currents of the Atlantic Ocean.

Some of these currents traverse the ocean near the equatorial line, and generally run east or west, if they are not deflected from their course by the opposing land. Others, which seem to have their origin near the poles, generally run in a southern direction as far as the tropics, and sometimes farther. The currents at sea run in some parts with an increased, and in others with a decreased, rapidity; and, as might be naturally inferred, the water of these currents is either of a lower or higher temperature than the adjacent sea, according to their line of approach from a warmer or a cooler climate. This difference in some places amounts to 10° Fahrenheit; and the skilful mariner may often learn from his thermometer, the probable error of his latitude by the log.

Humboldt, ascribing the formation of these currents to the rotation of the earth, calls them currents of rotation. But he does not distinguish between the proper currents and the drift-water, which latter produces a slight western current on the surface of the ocean between the tropics. This latter motion indeed is probably caused by the united effects of the rotation and the trade-winds on the wide expanded surface of the ocean. The small degree of velocity in this current, however, shows that the stronger currents near the equator cannot arise from the same cause. Rennell, the first writer who carefully distinguished the currents from the drift-water, thinks that the equatorial currents are caused by the accumulation of great masses of drift-water near the equator by the north-easterly and south-easterly trade-winds. But this opinion will be found inadmissible when it is considered that such accumulation could only produce a superficial current, and that many instances adduced by himself evidently show that these currents are not superficial, but probably reach the bottom of the sea, and certainly go to a very great depth.

The currents which flow from the higher latitudes towards the equator are supposed to have their origin in the melting of the masses of ice which encompass the poles. But if this supposition were true, these currents would cease during the winter, unless we also suppose that the melting of the ice continues to take place even during that season at a great depth beneath the surface of the sea, an assumption which in the present state of our knowledge on this subject can hardly be admitted.

If however both these opinions respecting the origin of the currents were allowed to be true, we should still have to account for the origin of other currents, in the formation of which neither the drift-water between the tropics nor the melting of snow near the poles can possibly have any share. Of such a description is the current which seems to be formed between the southern coast of Ireland and Cape Finisterre in Spain [Atlantic Ocean], and runs along the western coast of southern Europe and northern Africa to the Bight of Benin.

CURRIE, JAMES, M.D., was born 31st May, 1756, at Kirkpatrick-Fleming, in Dumfries-shire, of which parish his father was clergyman. Being originally intended for a mercantile life, as soon as he had received the rudiments of a liberal education he went out to Virginia; but upon the breaking out of the American war in 1776 he returned home, and soon after commenced the study of medicine at the University of Edinburgh. Having completed the usual course, he took his degree of M.D. at Glasgow in 1780, and immediately proceeded to London. His intention now was to go out to Jamaica, where there appeared to be a favourable opening for the exercise of his profession; but a sudden attack of illness prevented him from sailing after he had taken his passage. On his recovery he settled and began to practise in Liverpool, in 1781. Here he soon met with great success in his profession. His first publication was a biographical memoir of a deceased friend, which was printed in the 'Transactions of the Manchester Philosophical and Literary Society' for 1785. In 1790 a paper on tetanus and convulsive disorders, which he communicated to the 3rd volume of the 'Memoirs of the London Medical Society,' considerably extended his professional reputation. In 1792 he was elected a Fellow of the Royal Society. In 1793 he published a pamphlet, under the title of 'A Letter, Commercial and Political, addressed to the Right Hon. Wm. Pitt, by Jasper Wilson, Esq.,' which attracted a good deal of attention: it was an exposure of the impolicy of the war with France. In 1797 appeared the work on which his professional reputation principally rests, entitled 'Medical Reports on the Effects of Water, cold and warm, as a remedy in Febrile Diseases.' The method of treatment here recommended by Dr. Currie, affusion in cold water in cases of fever, though a remedy not to be trusted except to the most skilful hands, has since been applied in suitable circumstances with extraordinary success. A second volume of the Reports appeared in 1804, and the author was preparing a new edition of the whole work when he died. The name of Dr. Currie is best known to general readers by his edition of the works of Robert Burns, including both his Poems and Letters, which he published for the benefit of the poet's family, in 4 vols., 8vo., in 1800. It was introduced by a criticism on the writings of Burns, and 'Some Observations on the character and condition of the Scottish Peasantry,' both of which papers were drawn up with much elegance and ability. This edition has formed the basis of every succeeding collection of the poet's works. In 1804 Dr. Currie felt his health rapidly giving way; and leaving Liverpool, he spent some time in Bath and Clifton. In March, 1805, he considered himself to be so far restored, that he took a house and commenced practising in Bath; but his illness soon returned, and he died at Sidmouth on the 31st of August in the same year. (Chalmers's *Dictionary*, from a Memoir in the Magazines drawn up by Dr. Aiken.)

CURRU'CA. [Black-cap; Sylviadæ.]

CURSO'RIUS, COURSER (Ornithology), a genus of birds of the order *Cursores*, Temm. established by Dr. Latham.

Generic character.—*Bill* as long as head; mandibles arched, and compressed towards their extremities; base depressed; tip sharp and entire; *nostrils* basal, oval, with an oblong lateral opening. First *quill* longest. *Legs* long: three front toes separated throughout; middle toe much the longest, with a serrated claw. Type, *Cursorius Isabellinus.*

Geographical distribution.—Africa seems to be the country principally inhabited by these birds, and there they are to be found generally at a distance from the sea, and in the arid inland tracts, where they run with great swiftness.

Example, *Cursorius Temminckii, Black-bellied Courier*, Sw. The following is Mr. Swainson's specific character and description.

'Cream-coloured brown; top of the head and breast ferruginous, nuchal collar double; the lower, with the quills and middle of the body, black; the upper and the sides of the body white. Total length from the bill to the tail eight inches; bill one inch from the gape, and half from the end of the nostrils. Legs three inches from the naked thigh to the tip of the middle toe, the claw of which is serrated internally. Tail round; the middle feathers not spotted; the two next with a black dot near the tip, which, in the next pair, is further broken into two white dots; the outer pair white.' (*Zool. Illust.* pl. 106. first series). *Locality.*—Africa (Abyssinia).

The Type, *Cursorius Isabellinus*, Meyer, Temminck. *Cursorius Europæus*, Ind. Orn., *Le Courvite*, Buff. Cream-coloured Plover, Lath. Gen. Syn. *Cream-coloured Courser*, Penn. Br. Zool., *cream-coloured Swift-foot*, Selby, has been seen in France and England, but only as an occasional visiter. Thus we find (Mont. *Orn. Dict.* last edit.) that one was killed in France, where it was seen to run with great swiftness; another was shot near St. Alban's in East Kent, the seat of William Hammond, Esq., on the 10th of November, 1785, and he presented the prize to Dr. Latham. Mr. Hammond first met with it on some light land; and so little fearful was it, that having no gun with him at that time, he sent for one, which did not readily go off, having been charged for some time, and, in consequence, he missed his aim; the report frightened the bird away, but after making a turn or two, it again settled within one hundred yards of him, when he was prepared with a second shot, which killed it. He observed it to run with incredible swiftness, considering its size, and at intervals to pick something from the ground: it was so bold as to render it difficult to make it rise in order to take a more secure aim on the wing. The note was unlike that of any known bird. Colonel Montagu says that one was shot in North Wales in the year 1793, and preserved in the collection of the late Professor Sibthorp at Oxford. Mr. Atkinson, author of 'The Compendium of Ornithology,' was also in possession of a specimen shot at Netherby, in April, 1816.

Another of these birds was taken in Austria; and the young bird in the Darmstadt Museum, alluded to by M. Temminck, was probably killed in Europe. Mr. Fox (*Zool. Journal*, vol. iii., p. 492) records the death of one shot on the 15th October, 1827, under Timberwood Hill, in Charnwood Forest, Leicestershire, by a tenant of Mr. T. Gisborne's. He described it as coming flying over his head, uttering a cry with which he was unacquainted, and it settled near him. Some idea of the enormous prices which were at one time given by collectors for rare birds killed in Britain, may be formed from the sum which Dr. Latham's specimen produced: Mr. Fox says it was purchased for eighty-three guineas.

[Cursorius Temminckii.]

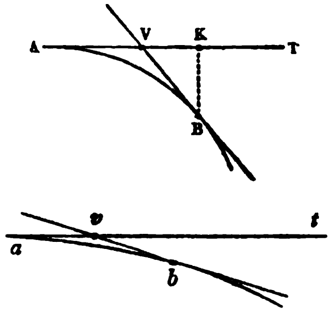
C. Bonaparte, Prince of Musignano *(Speechio comparativo)* places the form in the family Pressirostres of the order Grallæ, between *Otis* and *Œdicnemus*.

CURTATE (shortened), a term sometimes applied in geometry or astronomy to a line projected orthographically upon a plane. [PROJECTION.]

CURTEIN, or **CURTANA**, the name given to the first or pointless sword, carried before the kings of England at their coronation; also called the sword of King Edward the Confessor. It is mentioned by both these names in Matthew Paris, under the year 1236, when detailing the marriage ceremonial of Henry III. In antient times it was the privilege of the earls of Chester to bear this sword before the king, which, in an emblematical form, is considered as the sword of mercy.

CURVATURE, a mathematical term expressive of the comparative degree of bending which takes place near the different points of a curve. If we imagine a point to describe a curve, to be continually changing the direction of its motion, it may change this direction either more or less rapidly, that is, describe a line which is more or less curved. As in the article CONTACT, we shall first take a rough method of illustration grounded on the notions we derive from experience, and show how the accuracy of mathematics is introduced into the definition. We must suppose the reader to have gained the ideas which are introduced in the articles DIRECTION and VELOCITY.

Two points, A and *a*, are describing two curves, the directions of motion at A and *a* being AT and *at*. That the first curve is more curved than the second, we may easily see; and if we wished to give some notion of the comparative degree of curvature, we might proceed as follows. Measure off equal arcs AB and *ab* (remember this equality throughout), say of one inch each; ascertain the direction BV and *bv*, from which A and *a* are proceeding when they arrive at B and *b*, and measure the angles BVT and *bvt*. If we find the first to be twice as great as the second, then the phenomenon by which we recognize curvature (change of direction) is twice as great in the first as in the second. Hence we say that the curvature of the first is twice as great as that of the second.



But here arises a difficulty of the same kind as that explained in VELOCITY. The preceding ratio of two to one is that of the whole effects of curvature from A to B, and from *a* to *b*. If the change of direction were uniform, that is, if every tenth (or other) part of AB gave a tenth (or other) part of the change of direction, it would then be indifferent whether we chose an inch for AB and *ab*, or any other length. But if the curvature vary unequally, the comparison of the united effects of all the curvatures from A to B, and from *a* to *b*, does not give a proper ratio of the comparative curvatures at A and *a*. The only curve in which this is the case is the circle, which is the curve of uniform curvature, just as the straight line is the line of uniform direction. But we immediately perceive that if AB and *ab* had each been the hundredth part of an inch instead of an inch, this objection would have held in a less degree; if the thousandth part of an inch, still less, and so on. Hence, as in VELOCITY, it is not by the proportion of the angles BVT and *bvt* that we get an exact and unalterable notion of what is taking place at A and *a*, but by the limit to which that proportion approaches, as B and *b* move back towards A and *a*, and the angles in question diminish without limit. This is the accurate terminal notion on which the mathematical theory of curvature is founded.

If the two curves had been circles (or curves of uniform curvature) it is found that the limit of the proportion of these angles (or the proportion of the angles themselves, which for circles is the same as its limit) is inversely as the radii of the circles; that is, doubling the radius of a circle halves its curvature, and so on. This suggests an absolute measure of the curvature at A. Let the second curve be a circle, so taken that BVT and *bvt* shall have a limiting proportion of 1 to 1, or shall continually approximate to equality (EQUALITY, APPROACH TO). The circle *ab* has then at *a* the same curvature as the curve at A, and its radius (called the radius of curvature) being determined, the degree of curvature at A is known, as compared with that of any point of any other curve whose radius of curvature is known. This radius of curvature is thus determined· Draw the perpendicular BK and the chord AB. Then if the chord AB be always represented by the fraction c of an inch, and BK by k of an inch, the limit towards which $c \times c \div k$ approaches, as B is made to approach towards A, is the diameter of the circle of the curvature, or double of its radius. Or if through A and B a circle be always conceived to pass, which touches both AV and VB at A and B, the limiting position of that circle is the circle of curvature.

If the curve be referred to rectangular coordinates, and if x and y be those of the point A, $y = \phi x$ the equation of the curve, and ϕ' and ϕ'' the first and second differential coefficients of ϕx, then

$$\text{Radius of curvature at A is } \frac{(1 + \phi'^2)^{\frac{3}{2}}}{\phi''}$$

If ϕ be the angle made by the tangent with the axis of x, and s the arc from any given point to A.

$$\text{Rad. of Curv. at A is } \frac{ds}{d\phi}$$

for this subject see **Involute**, **Evolute**.

When the curve is not a plane curve, imagine it orthographically projected upon a plane. Its change of direction is then partly parallel to the plane, partly perpendicular to it, and the curve is said to have *double* curvature. But as this subject, together with that of the curvature of surfaces, is not of an elementary character, we shall not proceed further here, but refer to **Surfaces**, and to all works which treat largely of the Differential Calculus.

The circle of curvature is also the circle of contact, or the nearest circle which can be drawn to the curve, just as the straight line of direction is also the line of contact, or the tangent. An infinite number of circles can be made to present the appearance of touching the curve at A, [**Contact**] of all of which the circle of curvature comes the closest. Moreover, it always cuts the curve which it also touches (in the mathematical sense), except only at particular points. That is to say, the circle of curvature has in general a contact of the second order with its curve, in which case the circle always passes through the curve. But if at any particular point the contact should be of a higher and odd order, the circle of curvature does not pass through the curve.

CURVE, and CURVES, THEORY OF. A curve is a line which has *curvature*. Though the second of these terms be derived from the first, yet it is the notion explained in the preceding article which is preliminary to the explanation of the general term *curve*. Let a point move with a perfectly gradual change of direction, and it describes a curve.

Curves are said to be of the same species, in which the motion of the describing point is regulated by the same mathematical law. Thus the general law of the circle is, that all its points are equidistant from a given point. This law is the characteristic of the species: one circle is distinguished from another by the length of the constant distance supposed in the law of formation.

And in like manner as 0, or nothing, is classed under the general name of number or quantity, so the straight line itself (or the line without curvature) is, in algebra, spoken of under the general term *curve*. Or, in the last-mentioned science, the word means any line which is described by a point moving under one and the same law through every part of space which is consistent with the law.

The connexion of algebra with the doctrine of curves depends upon the method of coordinates (**Abscissa**, **Ordinate**, **Coordinates**), by means of which every algebraical function whatsoever is connected with the properties of a curve. This is the point of greatest utility in the theory, namely, the power which it gives of representing to the eye all the varieties of magnitude which an algebraical function undergoes, while one of its letters passes through every state of numerical magnitude.

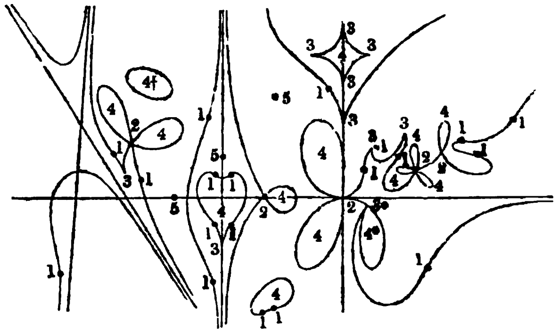
The number of curves which have received distinct names, out of the infinite number which may be drawn, is very small; we subjoin the names of those which are of most usual occurrence, referring to the several articles for further information.

1. Circle
2. Ellipse
3. Hyperbola
4. Parabola
5. Semi-cubical Parabola
6. Cissoid of Diocles
7. Conchoid of Nicomedes
8. Trisectrix
9. Lemniscata
10. Cycloid
11. Companion of the Cycloid
12. Harmonic Curve
13. Trochoid
14. Epicycloid and Cardioide
15. Hypocycloid
16. Epitrochoid
17. Hypotrochoid

Trochoidal Curves.

18. Curve of sines, cosines, tangents, &c. [**Sines**, **Tangents**, &c., **Curves of**.]
19. Exponential or Logarithmic Curve
20. Spiral of Archimedes
21. Logarithmic Spiral or Equiangular Spiral
22. Reciprocal Spiral
23. Lituus
24. Quadratrix of Dinostratus
25. ——— of Tchirnhausen
26. Catenary
27. Tractory
28. Syntractory
29. Tractrix
30. Ovals of Cassini
31. Watts's Parallel motion curve

The general characteristics of curves are extremely varied, and very few of them have received names. We subjoin a diagram, which will show all the varieties of figure most commonly considered in works on the Differential Calculus, premising however that we do not actually know any curve which contains them all. It would appear as if our figure contained several curves, but it must be remembered that in the algebraical sense many curves exist with branches completely unconnected, but all described under one law.



The several parts of the preceding are of continual occurrence; the following are the names and references:

(1). Points of inflexion or contrary flexure (**Flexure**, **Contrary**).

(2). **Multiple Points**, double, triple, &c. according to the number of times the curve passes through them.

(3). **Cusps**: the terms are hardly sufficiently well settled to enable us to say whether the 3* is to be considered a double point, a triple point, or not a multiple point at all.

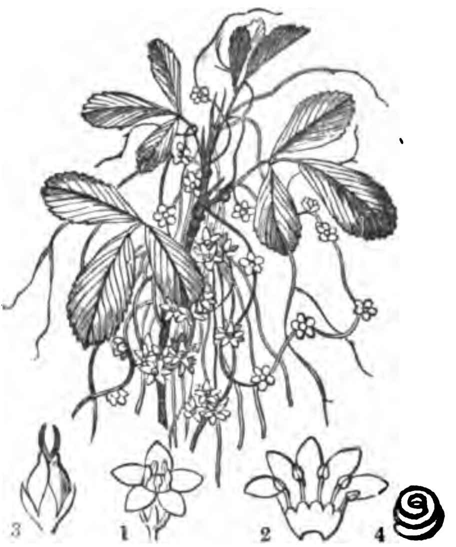
(4). It is customary to call any part of the curve which encloses space an **oval**, though, according to the common meaning of the term, there is no oval in our diagram except 4†. Of 4* we hardly know whether it would be called an oval or not.

(5). Conjugate points [**Conjugate**]; when of a general law of description which gives ovals, a particular case is taken in which an oval disappears, it generally leaves behind it, so to speak, a single point which is included under the equation to the curve, but has no contiguous points. We should propose to call these points *evanescent ovals*, and shall give some instances in the article **Oval**. [**Involute**, **Evolute**, **Caustic**, **Contact**, **Tangent**, **Arc**, **Area**, **Asymptote**, **Maxima** and **Minima**, &c.]

CU'RZOLA, or CORZOLA (formerly Corcyra, Strabo, p. 315), an island in the Adriatic, comprised in the circle of Ragusa and in the Austrian kingdom of Dalmatia. The channel of Curzola separates it from the peninsula of Sabioncello. Including the adjacent islets of Agosta and Torcola, the area is about 231 square miles. Curzola contains one town, a market-town, and about 6500 inhabitants. The surface is chiefly occupied by woods and forests, which furnish good ship-timber; the vineyards annually yield about 80,000 hogsheads of wine, and the fisheries on the coast are productive; but little grain is raised, and the fresh water is scarcely usable. Curzola, the chief town, is situated on a neck of land upon the channel (here called canal), in 42° 57′ N. lat. and 16° 50′ E. long.; it is surrounded by walls, and has a cathedral, two monasteries, about 800 houses, and 1800 inhabitants. It is the seat of a bishopric, builds vessels, and traffics with the produce of the island.

CUSCUTA'CEÆ, a small natural order of monopetalous exogens, cut off from Convolvulaceæ because of their imbricate corolla, which does not fall off after flowering, their seeds with a spiral acotyledonous embryo, and their leafless parasitical habit. Cuscuta, or Dodder, is a genus met with in most temperate climates, the species fixing themselves on the branches of woody or other plants, twisting round them, striking a number of minute suckers down upon their bark, and thus attracting from the system of the plants and from the air, the sustenance necessary to their own support. Hence they are true parasites although they do not actually, like miseltoe, plunge their roots into the wood and incorporate themselves with the tissue.

Common Dodder, Cuscuta europæa, is a white or reddish-looking annual, which flings its thread-shaped arms like a cluster of living threads round the branches of heath, furze.



[Cuscuta minor, twining round Lucerne.]

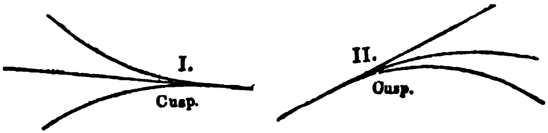
1, a perfect flower; 2, a corolla cut open; 3, an ovary with its calyx; 4, the embryo.

&c., on commons and dry wastes. It has no leaves, except tiny scales that stand in their room; and it bears small clusters of white bell-shaped blossoms, each of which has five scales at the base of its tube. The fruit is a little membranous capsule, opening transversely like a soap-box, and dropping four seeds upon the soil. There is a common prejudice that these seeds actually strike root into the plant; but that this is a popular error is sufficiently shown by the following observations translated from De Candolle: 'The seed of Dodder differs from that of other Convolvulaceæ by the absence of cotyledons, as the Dodder itself differs from them by the absence of leaves; the latter are either entirely absent, or are reduced to almost imperceptible scales. The germination of the Dodder is effected, like that of plants in general, in the earth, and without requiring the presence of other vegetables. The embryo, deprived of its cotyledons, is nourished, in its first development, at the expense of the central albumen which it envelopes. The slender and simple radicle descends into the earth; and the plumule, equally simple and cylindrical, rises like a thread: if it finds no other living plant near it, it dies; if it finds one, it surrounds the stem, and from the points of contact proceed hollow tubercles or suckers which plant themselves in the bark, and suck the juice which has been elaborated by the plant attacked; then the root becomes obliterated and dies, and the plant lives from that time forward by its suckers only. Whilst it was not a parasite, it rose vertically; as soon as it became one, it was no longer tempted to direct itself either vertically, or towards the light. Its shoots dart from one plant to the other, and thus are conveyed to new victims when the old ones are exhausted. Often the seeds germinate before they quit the capsules, and the new plant immediately becomes a parasite; this is particularly observed in the Cuscuta monogyna, which attacks the vines in Languedoc.

'The Dodders, called by the French cultivators teigne, rache, perruque, &c., are very dangerous to the fields of leguminous plants which they attack, and upon which they multiply themselves with singular rapidity. They destroy the plants either by depriving them of their nourishment, or by strangling them in their folds. It is difficult to guard against them on account of the rapidity of their vegetation, the facility with which they pass from one plant to another, the abundance of their seeds, and the double power which they possess of germinating either in the earth or in the capsule. M. Vaucher cleared his artificial fields from dodder pretty well by perpetually breaking and dividing their stalks with a rake. The means which appears to me really efficacious are immediately to mow all the portions of artificial meadow where Dodder has been seen to develope itself, and to do it before it can have produced seed. If it appear in fields of flax, the plants attacked must be cut down, or rooted up; and if it appear among vines, the branches must be cut before the seed is matured. If these precautions have been neglected, and a portion of the land should be infested with these seeds, the crop which has been attacked must be replaced by crops of corn or of grasses. Thus time is given to the seeds of Dodder which have been concealed in the soil, to develope themselves, when they may perish without doing any harm, since the soil finds itself covered with plants which cannot nourish them. As to the seeds of leguminous plants which may be infested by a mixture with those of the Dodder, the best means to get rid of them is to sift them in a tolerably fine sieve, so that the seeds of the Dodder, which are very small, may pass through, leaving those of the trefoil or of the lucerne. In this operation the seed must be shaken rather violently, so as to break the capsules of the Dodder, and to force their seeds out.'

CUSP (Cuspis, a pointed end), a mathematical term used where two branches of the same or different curves appear to end in a point. Thus, in an eclipse of the sun, the borders of the sun and moon make two cusps at their point of intersection.

In the theory of curves, the cusps which appear are always such that the two branches have a common tangent at the cusp, and they are distinguished into the cases in which the tangent lies between the branches or on one side of both.



In the actual determination of the position of cusps by means of ordinates to a given axis, there are two distinct ways of proceeding.

1. For cusps whose tangent is perpendicular to the given axis.

2. For cusps whose tangent is not perpendicular to the axis.

The first case ought in part to fall under the theory of maxima and minima; ϕx being the ordinate, it is the case where $\phi' x$, the differential coefficient, becomes infinite and changes sign; or becomes infinite and afterwards impossible, having previously had two values of the same sign for each value of x. These cases give cusps of the first and second kinds, as shown in the two diagrams.

All other cusps (namely, those whose tangents are oblique or parallel to the axis) are found by observing the points at which $\phi'' x$, the second differential coefficient, takes the form A, having previously had that of $A \pm B$; that is, in $\phi'' x$, the points must be found at which a term of double value vanishes and then becomes impossible. If for points immediately preceding, the $A+B$ and $A-B$ were of different signs, the cusp is of the first species; if of the same sign, of the second species. It would be useless to attempt separation of the theory of cusps from the general theory of curves, further than is contained by the preceding rules.

CUSP, a term given by Sir James Hall, in his 'Essay on the Origin of Gothic Architecture,' and now commonly applied to the points terminating the internal curves of the trefoiled, cinquefoiled, &c. heads of pointed arch windows.

CUSSET, a town in France, in the department of Allier, on the little river Sichon (which flows into the Allier on its right or east bank), and close to Vichy, on the Allier, a town much frequented on account of its mineral waters. Cusset is about 215 miles from Paris by the road through Fontainebleau, Montargis, Nevers, and Moulins, in 46° 8′ N. lat., and 3° 27′ E. long.

This town owes its origin to a Benedictine nunnery, established here during the reign of Charles le Gros, A.D. 886, by Emmène, bishop of Nevers, and raised to the rank of an abbey, A.D. 1236, by Hugues, bishop of Clermont, who established at Cusset, the same year, a collegiate church. There was also, before the Revolution, a convent of Capuchin monks just out of the town. Cusset is surrounded with walls, and is in a country fertile in wine, fruit, excellent hemp, and especially in all kinds of grain. There is a coal-pit near the town. The inhabitants in 1832 were 3740 for the town, or 4910 for the whole commune. There is a large paper-mill, in which 100 workmen are employed.

CUSTARD APPLE, a name given in the West Indies to the fruit of Anona reticulata. [ANONACEÆ.]

CUSTOM-HOUSE, the building in which the business is conducted of collecting that part of the public revenue which is derived from duties charged upon the importation or exportation of merchandise. In common parlance, the term custom-house has a more extensive signification, and is understood to embrace the establishment by means of which that branch of the public revenue is collected and its regulations are enforced.

CUSTOMS, or USAGES, in law (consuetudines), are either general or local. The first kind consists of those usages which having prevailed throughout England from time immemorial, but, without their original institution having been handed down to us in records or writing, have been recognized by judicial decision *, and form that common law, or lex non scripta, which is the chief foundation of English jurisprudence. To like immemorial usage is to be ascribed the existence of such parts of the civil and canon laws, as from the earliest times have formed the rule in the king's ecclesiastical, military, and admiralty tribunals, and also in the courts of the two English universities. These laws of foreign origin subsist however only as inferior branches of the customary law, subject to the superintendence and control of their proceedings by the superior temporal courts, and to a strict observance of the rules of construction assigned by these last to the statute law.

These general customs of the realm, which form the common law, properly so called, alone warrant the existence and jurisdiction of the king's superior courts; and can only be drawn into question there. These general customs, as originally methodized by the Saxon kings, and in some cases modified in the early Norman reigns, supplied those fundamental rules by which, in cases not provided for by express enactment, the course of inheritances, the interpretation of acts of parliament, and most of the remedies for civil and criminal injuries are regulated. Numerous axioms essential to the administration of common justice have no other binding force than antient and uninterrupted usage, which has obtained the force of law by the recognition of the courts. [COMMON LAW.]

Among these general customs must be enumerated those laws which govern the particular bodies of men to which they relate; merchants, innkeepers, carriers, owners of lands adjoining the sea coast, &c. &c., as well as the inhabitants of particular counties or boroughs, in the particular instances of gavelkind and Borough English. That custom called the law of the road, by which riders and drivers are expected to keep the left hand, as well as that respecting servants hired at yearly wages, by which either master or servant may determine the contract at a month's warning, or on paying a month's wages, have been recognized by the courts from time to time as parts of the common law. These, like the rest, originated in general convenience, and being gradually drawn more into notice by frequent recurrence, have been finally sanctioned by judicial authority. For immemorial customs may be extended to things and circumstances which arise at the present times. Thus a custom from time immemorial that all officers of a court of justice shall be exempt from serving other offices includes offices created within the time of legal memory, but cannot be enlarged beyond the extent to which the use has been carried; for that, and not the reason of the thing, determines the courts in declaring what the law is in such cases.

The customs by which the king's superior courts of Westminster Hall regulate their administration of justice, are popularly termed their practice. These rules are founded on antient usage, and, in respect of their universality, form a part of the common law without its being necessary to allege custom or prescription to warrant them.

Where a custom is already part of the common law, the superior courts will take judicial notice of its existence as such, without requiring it to be stated in the written pleadings. Thus each of these tribunals will take judicial notice of its own customs or practice as well as of that of the rest; whereas the practice of inferior courts, as well as particular or local customs, extending to certain persons or districts only, being therefore different from and contrary to the common law, must, with the exception of gavelkind and Borough English, be set forth with due precision.

This, though an observation apparently technical only, forms in its application the test by which we distinguish general from the local or particular customs just described. These latter customs must necessarily have had their origin in the peculiar wants of their respective districts, and are the remains of that multitude of similar usages from which Alfred and his Saxon successors collected those laws which may be considered as forming the common law of the nation at the time.

Many of these customs, for reasons now forgotten, were permitted to remain in some counties, cities, and manors, &c., in their former vigour, though at variance with the laws of the rest of the nation, and are confirmed by Magna Charta and other acts of parliament. Such are the customs of gavelkind (abolished in Wales by stat. Henry VIII.), by which all the sons inherit alike, of Borough English, by which lands held in burgage tenure descend to the youngest, instead of the eldest son; and of some boroughs, that widows shall have dower of all, instead of a third of their husband's lands. A more striking instance is that custom in many cities and towns to hold courts for trial of causes without royal grant. The particular customs of manors as to descent, &c., are also of this kind, and bind the copyhold and customary tenants. The existence of every such local custom, with the exceptions above noticed, as well as its application in each particular case, must be alleged in the pleadings, and proved, like any other fact, before a jury: sometimes they are open to evidence without being pleaded. Under no circumstances can these questions be entertained by an ecclesiastical court without the consent of the party impugning the custom.

Such customs of London as do not concern the property of the corporate body itself are proved by a peculiar mode, that of a certificate to the superior courts of law from the lord mayor and aldermen, conveyed by the mouth of their recorder in a solemn ceremonial; without this certificate these courts will not take judicial notice of them.

A particular custom to be valid must have been used 'from time whereof the memory of man runneth not to the contrary.' This is 'prescription,' or 'title by prescription;' and more accurately describes what is commonly called 'time immemorial,' which means, says Littleton, 'that no living witness hath heard any proof or had any knowledge to the contrary,' and as lord Coke adds, 'that there is no proof by record or writing or otherwise to the contrary.' It has been doubted whether a prescription (in its proper sense) and a custom can coexist. There is some curious learning on this point collected in the arguments and judgment in Blewett *v.* Tregoning, 3 Ad. and Ellis. It was held that a custom in a particular market that every pound of butter sold in it should weigh 18 oz. was bad, being directly contrary to a statute of Charles II., which enacted that every pound avoirdupois throughout the kingdom should weigh 16 oz. only. The right to a particular custom must have been continued within time of memory peaceably and without lawful interruption, and will not be lost by mere disuse for ten or twenty years, though in such case to establish it by proof becomes more difficult. But it cannot stand against an express act of parliament to the contrary, for that itself proves a time when the right to such a custom could not exist. It must also be so far reasonable, according to the standard warranted by authority of law, that though no particular origin can now be assigned for it, or though the state of things in which it is known to have arisen has been altered, no good legal reason can be given against its continuance. If it may have had a legal and reasonable origin, it shall be presumed that it actually had it; and its varying from the general law forms no objection, for that is the very essence of a particular custom; but if it be so contrary to any known rule or principle of law, or to the good of the public, or of a multitude of persons, that it cannot be presumed to have had a reasonable commencement in voluntary agreement for some beneficial object, as for securing possessions, promoting trade, or suppressing fraud, it will be void. Thus no length of usage would render good a custom of the secretary of state's office to issue warrants in general terms against the authors, printers, and publishers of a libel, without naming them; that course being contrary to clear and well-settled principles of law, which will not suffer a mere officer to decide on the individuals to be imprisoned. Again a custom in an inferior court to try causes by six jurors was held bad, as contrary to the common law, though saved in Wales in some instances by a statute of Henry VIII., confirming such custom where it then existed. But long usage and acquiescence in one uniform payment, or in exempting persons particularly situated from contributing to it, are cogent evidence that it is reasonable; for as Lord Mansfield once said, it cannot be presumed that during a long period of years one half the parties were knaves in wrongfully receiving that to which they were not entitled, and the other fools for submitting to an unjust demand. It belongs to the judges of the courts to decide on what is reasonable when brought judicially before them.

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* Bracton's definition of a custom is this—'Consuetudo vero quandoque pro lege observatur, in partibus ubi fuerit more utentium approbata, et vicem legis obtinet longævi enim temporis usus et consuetudinis non est vilis authoritas.' (Bracton, fol. ii., ed. Lond. 1569.) This is no inapt definition of a custom observed as if it were law, by those who find it convenient and reasonable; but we can hardly conclude from this passage that this excellent old writer clearly saw that custom could not be law till made so by the sovereign power, or those to whom the sovereign power has delegated parts of its authority.

Where a custom is harmless in itself, and affords recreation to a number of persons, though to the temporary inconvenience of an individual, it will be upheld and referred to a legal origin. Thus a custom for the inhabitants of a parish to play at cricket, or dance on private property in the parish, was held good, as the lord might have annexed this condition to his original grant of the land. A custom must also be certain as to the description of parties benefited, and compulsory, without its depending on the caprice of any third person whether it can be acted on or not. It must also be consistent; for repugnancy to any other local custom would be plainly contrary to that origin in common consent on which alone it stands· and lastly, it must be strictly pursued, being derogatory of the common law.

Local custom varies from prescription in this: the former is alleged in legal forms as existing not in any person certain, but within a certain named district, without showing any legal cause or consideration for it; whereas prescription must have a presumed legal origin, and is either a personal right, always claimed in the name of a person certain and his ancestors, or those whose estate he has, or by a body politic and their predecessors, or else is in a *que* estate; viz., a right attached to the ownership of a particular estate, and only exercisable by those who are seised of it. All customs of cities, towns, and boroughs, by which persons not freemen were prevented from keeping shops or using trades or handicrafts within them, were abolished by 5 & 6 William IV., cap. 76, sec. 14. [PRESCRIPTION.]

Customs of traders, or seamen, as also of agriculture, mining, &c., will be followed in the construction of contracts, unless they are inconsistent with their express terms, and, subject to that condition, they are admissible even to annex incidents to them as to which they are silent. The 'custom of the country' means the custom of all parts of the country to which it can in its nature be applied. Thus a custom that land accruing imperceptibly to the sea-shore belongs to the owners of the shore, applies to all such parts of the realm as adjoin the sea, unless limited in terms to a particular district.

The immemoriality of a particular local custom may be sufficiently proved by living witnesses attesting regular existence for twenty years, unless contradicted by contrary proof. Upon this doctrine will be found to depend a great variety of public as well as private rights to antient offices, estrays, treasure trove, wreck, nomination of juries, &c.; as well as to tolls of markets, port duties, tithes, antient rents, &c., and to exemptions from those burdens. The numerical amount of instances in which the privilege claimed can be proved to have existed must be considerable or not according to the frequency or the rarity with which they may be naturally expected to recur. Thus in a copyhold custom of surrendering in fee so as to bar an entail, a single instance of user, though incapable of making a custom, is evidence sufficient to support it, if not unreasonable in itself.

Reiterated facts of user make a custom of trade; but the mere opinion of merchants is not sufficient for that purpose; nor can any course of action pursued under colour of a custom of merchants alter a general rule of common law when established by judicial decisions.

A long continued usage for exempting particular persons from a local burden, will, if necessary, be supported by presuming that it originated in an act of parliament now lost, though no length of usage will countervail the terms of a statute to the contrary.

CUSTOMS-DUTIES consist for the most part of taxes levied upon goods and produce brought for consumption from foreign countries; such duties are sometimes collected upon exports made to foreign countries, and upon goods and produce passing from one port to another of the same country. Of this nature were the duties on coals, slate, and stone, carried coastwise from one port in the United Kingdom to another, which duties were repealed in 1831. With the exception of a small-rated export duty upon coals, hare-skins, rabbit-skins, and sheep's wool, and an *ad valorem* duty of one-half per cent. on the shipment to foreign countries of some articles of British production, the whole customs-revenue of this kingdom is now derived from duties charged upon the importation for consumption of foreign and colonial merchandise.

The earliest statute passed in this country, whereby the crown was authorized to levy customs-duties, was the 3rd of Edward I. The mode long employed in the collection of these duties was to affix a certain rate or value upon each kind or article of merchandise, and to grant what was called a *subsidy* upon these rates. This subsidy was generally one shilling of duty for every twenty shillings of value assigned in the book of rates. The early acts granting these duties speak of them as subsidies of tonnage and poundage. The word tonnage was applied to a specific duty charged on the importation of each tun of wine and the exportation of each tun of beer; and the word poundage was applied to other articles valued as already explained.

The first 'book of rates agreed upon by the House of Commons,' is believed to be that compiled by a committee in 1642, during the reign of Charles I., and published under the authority of the House by Lawrence Blaiklock. The next book of rates of which we have any record, was also published by order of the House of Commons in 1660, the year of the restoration of Charles II. In the fifteenth and twenty-second years of the reign of that king, the principle of poundage was altered as respected some articles, and upon those articles specific duties were charged instead, though the system was still followed with regard to the great bulk of articles. But in the reigns of William III. and Anne many additional specific rates were imposed, in place of the valuation for the subsidy This course of substitution was continued from time to time, and some other innovations were adopted by which the simplicity of the antient plan was destroyed; so that in a work of authority, published by Mr. Henry Saxby, of the Custom-House, London, in 1757, we find as many as thirty-nine principal branches of customs-duties, with subdivisions applying to different kinds of goods, thereby introducing a degree of complication into the subject which must have caused great embarrassment to traders.

The difficulties here mentioned were increased by the great number of acts of parliament passed from year to year for altering the duties or regulations of this branch of the revenue; and the great bulk and intricacy of the customs-laws had caused such inconvenience that about the year 1810 the lords of the Treasury employed Mr. Jickling to prepare a digest of those laws. Five years were employed in completing this task, and some idea may be formed of the laborious nature of the work, and of the necessity for its performance, from the fact that the digest forms a large octavo volume of 1375 pages. The work is intituled 'A Digest of the Laws of the Customs, comprising a Summary of the Statutes in force from the earliest period to the 53rd George III. inclusive.' The effect of the numerous fresh enactments to impair the usefulness of this exposition of the revenue laws was very soon apparent, and in 1823, Mr. Hume, the secretary of the Board of Trade, then comptroller of the Customs in the port of London, was appointed by the Treasury 'to undertake the preparation of a general law or set of laws for the consolidation of the Customs of the United Kingdom.' In the performance of this duty, Mr. Hume prepared 11 bills under the following heads:—

An Act	for the Management of the Customs,	6 George IV., cap.	106.
,,	for the general Regulation of the Customs,	,, ,,	107.
,,	for the Prevention of Smuggling, . .	,, ,,	108.
,,	for the Encouragement of British Shipping and Navigation, ...	,, ,,	109.
,,	for the Registering of British Vessels, .	,, ,,	110.
,,	for granting Duties of Customs, . .	,, ,,	111.
,,	for the Warehousing of Goods, . .	,, ,,	112.
,,	to grant certain Bounties and Allowances of Customs, ...	,, ,,	113.
,,	to regulate the Trade of the British Possessions abroad, ...	,, ,,	114.
,,	for regulating the Trade of the Isle of Man,	,, ,,	115.
,,	for regulating Vessels carrying Passengers to foreign Parts, ...	,, ,,	116.

These several acts received the royal assent in July, 1825, and were respectively brought into operation on the

1st January, 1826. In their effect they have rendered the greatest benefit to the commerce and the revenue of the country, by substituting simplicity for complexity, and certainty for the conflicting opinions and varying practice of those by whom the previous statutes were practically administered. The number of those statutes, many of which were obsolete, that were repealed by the first of these 11 acts, amounted to 443. Many subsequent acts affecting the customs-revenue have certainly been passed, but the whole customs-laws of this country now in force are contained in one moderately sized octavo volume, in which the subject appears cleared from all complexity.

The amount of customs-duties collected in the United Kingdom during each of the last ten years has been as follows:—

1827	£21,009,052	1832	£19,684,574
1828	20,608,710	1833	18,575,182
1829	20,571,837	1834	21,118,920
1830	21,084,524	1835	22,990,877
1831	19,645,939	1836	23,796,622

The great bulk of this revenue is collected from a very small number of articles. Upon six of these, viz., spirits, sugar, tea, timber, tobacco, and wine, the amount collected in 1836 exceeded 19 millions, and 22 out of 23¾ millions in the same year was afforded by 17 articles, the least important of which furnished 102,108*l.* to the revenue. The eleven articles which, with the six already enumerated, make up the 22 millions of duty, are butter, cheese, coffee, currants, raisins, molasses, seeds, silk manufactures, tallow, cotton, and sheep's wool. The remaining amount, less than two millions, is levied upon a long list comprising several hundred articles of merchandise, as to a large proportion of which the disadvantage to the foreign trade of the country must be out of all proportion greater than the benefit yielded to the revenue.

CÜSTRIN, one of the eighteen circles into which the government of Frankfort, in the Prussian province of Brandenburg, is divided. Its area is about 294 square miles, and it contains about 40,800 inhabitants; an increase of 11,900 since the year 1817. It lies on each side of the Oder, into which the Warthe flows at Cüstrin. The western parts are wholly composed of marsh land and swamps, and contain the 'Oderbruck,' or swamp of the Oder: the eastern parts are at a greater elevation, and are well wooded. The principal employment of the inhabitants is cattle-breeding; the circle, however, grows corn enough for its consumption, besides flax, hops, and tobacco.

CÜSTRIN, the capital of the circle, in 52° 35′ N. lat. and 14° 40′ E. long., is a strong fortress placed at the confluence of the Warthe with the Oder, and encompassed on all sides by marshes and water. The first fortifications were constructed by John, Margrave of Brandenburg, in 1568: it fell into the hands of the Swedes in 1631. All but three houses were destroyed in a bombardment by the Russians, of eight days only, in August, 1758; it surrendered unconditionally to the French, November 1, 1806, and was given up by them, March 1, 1814. The town itself and its fortifications are of small extent; but without them it comprises the new town, the intrenchments on the left bank of the Oder, which is connected with the new town by a wooden bridge 875 feet long, and a long suburb running along the right bank of the Oder, as well as two smaller suburbs. Cüstrin has two Protestant churches, a gymnasium, hospital, and bridewell; about 600 houses, and 5600 inhabitants. The manufactures consist of woollens, stockings, starch, brandy, and beer. Much grain and cattle are sold, but the vicinity of Frankfort renders its external trade comparatively insignificant.

CUTCH, a principality lying between 22° and 24° N. lat. and between 68° and 72° E. long. It is bounded on the north by the Great Sandy Desert, on the east and the south by the Gulf of Cutch, and on the west by the Koree or eastern outlet of the Indus. The country is naturally divided into two portions, of which that towards the south is an irregular hilly tract; the northern part, called *The Runn*, is an extensive salt morass, 160 miles long from east to west, and varying in breadth from 4 to 60 miles. During the rainy season the Runn is completely covered with water, and the country to the south is quite insulated. During the dry monsoon the waters retire, and the Runn assumes a diversified appearance. In some parts it is still an impassable salt swamp; in other parts there are great banks of dry unproductive sand, covered occasionally with saline incrustations, while other parts afford tolerable pasture. During the rainy season, the Runn can be traversed with difficulty, and only in certain parts, by horsemen.

The soil of the habitable part of the country is for the most part clay, covered with about five inches of deep sand. Towards the east the soil is loamy, and near the hills the surface is covered with volcanic matter, and abounds with specimens of metallic scoria. A range of hills, named the Lakhi, running east and west through the centre of this part of Cutch, divides it into two nearly equal portions. These hills are one continuous mass of rock, destitute of soil and of water, except during the rainy season, when the water forms channels for itself, through which it rushes to the plain on each side. A high bank of sand extends along the shore the whole distance from the Indus to the Gulf of Cutch. But little wood is found in the principality. A few common trees have been planted about the villages, and among them are date-trees, which yield fruit of good quality. The cultivation of cotton is carried on extensively, and the produce exported in return for grain, of which a sufficiency is not grown for consumption, and which is procured from Gujerat and Sinde. Iron ore occurs generally throughout the country, and in most parts coal is found in abundance. Great expectations were at one time formed as to the advantages to be derived from the coal, but the quality has not proved such as to encourage the expense of creating mining establishments. A mine situated about three miles from Bhooj was worked experimentally by order of the Bombay government in 1826, but was soon abandoned. The coal that was worked lay in two seams, each seven inches thick, and about twelve inches apart. Another mine was opened in 1828 at Seesaghud, about 19 miles from Mandavee, where also there were found two veins, the upper one only a few inches in thickness, and the other 13 inches thick.

The horses of Cutch are much esteemed; the oxen are of a very inferior description. Goats and sheep are very numerous. The wool of the latter is of long staple but coarse, answering well for the manufacture of blankets and carpeting: the weight of the fleece averages from four and a half to five pounds. Coarse woollen cloths are made and used by the inhabitants. Towards the north, and near the Runn, wild asses are very numerous, and are met with in herds of sixty or seventy together. This animal is larger and stronger than the tame ass. It is fierce and untameable in its nature, and when unable to procure pasturage in the desert lands, advances into the inclosed country, and does much damage to the grain crops: the flesh is said to be good eating.

The principal towns of Cutch are, Anjar [ANJAR], Bhooj, the modern capital, Luckput Bunder, Mandavee, Rohu and Tahrah. Bhooj was founded about 200 years ago by Rao Bharra: it stands on the south-west side of a hill, i 23° 18′ N. lat. and 69° 50′ E. long. The fortifications ar extensive, but being badly planned afford little protectio to the place. The town has a handsome appearance fro a distance; it contains several mosques and pagodas o white masonry, interspersed with plantations of date-tree but on a nearer approach there are found to be a large pr portion of mean dwellings. The palace of the rao is a lar and well-built structure, covered with a kind of whi enamel, which gives it a very handsome appearance. Th population amounted, in 1818, to 20,000, among wh were many ingenious goldsmiths and jewellers. Luck Bunder, formerly called Bustabunder, but which obta its present name in 1793, when the fort of Luckput wa built, stands near the east side of the Koree, in 23° N. lat., and 68° 56′ E. long., 75 miles north-west fr Bhooj. The town is built on the brow of a hill, whi rises from a swampy plain; it contains only about 2 inhabitants, and is principally important as being on th high road from Bhooj and Mandavee into Sinde. Previ to the great earthquake of 1819, the communication fr this town to the head of the æstuary of the Koree was b means of a small shallow creek, navigable only by sm boats, but the effect of this convulsion was to deepen th water to eighteen feet, and effectually to open the naviga tion; it is however not a place of much trade.

Mandavee, the principal sea-port of Cutch, is situated the shore of the Indian Ocean on the north side of th entrance to the Gulf of Cutch, in 22° 51′ N. lat., and 69° 3

E. long Mandavee is the most populous place in the principality, and contains 50,000 inhabitants, who are principally Bhattias, Banyans, and Brahmins: there are but few Mohammedans. The port is an open roadstead with a creek; there are 250 vessels belonging to the place, by means of which a very considerable trade is carried on with Zanguebar and the whole east coast of Africa, with the Red Sea and Arabia, with the Persian Gulf, Mekran, and Sinde, and with India as far as Ceylon. The vessels employed in this traffic vary from 25 to 200 tons burthen; they carry a large lateen sail, and have two masts, but are never decked; they are navigated by native pilots, who have acquired the use of the quadrant, and steer by charts. The natives assert that the foreign trade of Mandavee has existed for a very long period, but it appears that the nautical skill of their mariners received great improvement from the instructions of a native Rajpoot named Ram-Sing, who was carried to Holland about a century ago, and after a residence in Europe of some years' duration, returned home 'with a knowledge of astronomy, navigation, ship-building, and other arts, which have been ever since preserved.' The most valuable branch of the trade of Mandavee is that carried on with the eastern coast of Africa, a distance of 3000 miles, whence the merchants of Cutch procure ivory, rhinoceros hides, and other valuable articles. The principal article of export is cotton. Rohur, also a seaport, is situated in the Gulf of Cutch opposite to Wumania on the Gujerat peninsula, and is in 23° 2′ N. lat., and 70° 21′ E. long., about twelve miles from Anjar: the depth of water in this part of the gulf does not admit the passage of any but small vessels. The chief trade of Rohur is carried on with Gujerat. Tahrah, a populous place, inhabited principally by Hindus, is a fortified town about thirty miles south-east from Luckput Bunder, on the road between that place and Mandavee.

The population of Cutch is estimated to amount to 400,000 souls, about one-half of whom are Mohammedans, and the greater part of the remaining half Hindus. The Jharejah tribe of Rajpoots, who were estimated in 1818 to amount to 12,000, are believers in the Koran, and at the same time adhere to many Hindu observances. This tribe, the chief of which is the Rao or sovereign prince of Cutch, is remarkable for the almost universal practice of female infanticide, a practice which the English government has vainly endeavoured to suppress. Captain Macmurdo, the political resident at Bhooj, expressed his opinion that the total number of females belonging by birth to the Jharejah tribe who were alive in 1818 did not exceed thirty. The morals of the tribe are in other respects said to be very degraded; they are ignorant, indolent, and almost universally addicted to the immoderate use of intoxicating liquors: their wives are all necessarily procured from among other tribes.

Engagements of amity were entered into between the British and the government of Cutch in 1809, ostensibly with a view to the suppression of piracy, but really for the exclusion of foreign Europeans from the country, a precautionary measure adopted in anticipation of a threatened invasion of India by the French. In 1815, in consequence of depredations committed by the subjects of Cutch on the territory of the Guicowar, our ally, an English force was sent into Cutch, the Rao was deposed, and a new chief placed upon the throne, who engaged to receive a subsidiary force; but the Rao whom the English installed having thrown the country into disorder by misgovernment, he was in turn deposed likewise in October, 1819, and his infant son, Mirza Rao Sree Dessuljee, set up in his stead, under a council of regency, of which the British resident was a member: this in effect placed the government of the country in the hands of the English. In 1822 a further treaty was made, restoring Anjar, which place had been ceded to the English in 1816. In return for this the government of Cutch agreed to pay 88,000 rupees per annum, in addition to an annual subsidy of two lacs of rupees previously payable. It was calculated that these sums, which together amounted to 28,800*l.*, would have absorbed about one-fourth part of the revenues of the state, but it was found in practice that they greatly exceeded one-half the net revenue, and repeated remissions of a considerable portion have been found necessary. In the political letter addressed by the Court of Directors to the Bombay government on 26th May, 1830, some of the evils are pointed out, which appear to be almost unavoidable under the system of interference adopted by the Anglo-Indian governments. 'You have been led,' say the Directors, 'into a much more minute interference in the internal administration of Cutch than entered into your contemplation when you formed the present arrangement for the government of that country. This extension of your direct authority has taken place, as is usual in such cases, by insensible degrees, evils having been found to be produced by partial interference which it required a greater interference to remedy.'

(*Reports of Committees of House of Commons on the Affairs of India in* 1830 *and* 1832.)

CUTICLE, the external skin of a plant. It is composed of one or more layers of empty flattened cells, which adhere firmly to each other, and serve as a protection to the succulent tender tissue placed beneath them. The thickness of the sides of the cells renders them well adapted to repel mechanical violence, and the air cavities which it contains give the cuticle great efficiency as a slow conductor of caloric, enabling it on the one hand to prevent the escape too rapidly of the internal heat of a plant, and on the other to guard the tissue against scorching by the too powerful action of the sun. Accordingly we find the cuticle thickest and most completely organized where it is most exposed to the action of the air, while in submerged plants, which never are exposed to the atmosphere at all, it is absent. When plants inhabit damp shady places, it is thinner; when they grow on hot dry rocks, it is thicker than usual; and it is in all cases found to be affected in a similar manner. Once removed it is never renewed.

Sometimes it has openings through it into air-chambers placed below it, and such openings are guarded by a pair of oblong parallel cells, which, by their expansion and contraction, close or widen the orifice. These organs are called stomates, and are supposed to be more particularly intended to assist in the respiration of plants.

CUTTACK, a district in the province of Orissa, bounded on the east by the Bay of Bengal, on the north-east by the province of Bengal, on the west by various Maharatta states; and on the south-west by the Northern Circars. Its length from north-east to south-west is 180 miles, and its average breadth 110 miles. On the coast, and for twenty miles inland, the country is low and covered with wood, and being subject to inundation at spring-tides is very marshy. Beyond twenty miles from the sea the country rises considerably, and the soil is dry and fertile. At a further distance inland of twenty miles it swells into hills, and is well wooded; some of the trees are valuable for cabinet work, and others are used in dyeing. The forests are much infested by wild beasts. The region thus lying beyond the marshy delta is called the Mogulbundy. Beyond this is a third region, which is hilly, and extends westward as far as Gundwana. This region is parcelled among sixteen hereditary Zamindars, who are under the protection of the English, and are considered as tributary rajahs, paying at the rate of about one-tenth of the net produce of their estates. The country is subdivided under these Zamindars into a great number of estates, which are also held by hereditary succession. A great variety of minerals are found in this hilly country: iron is met with in many parts; and inferior garnets in great quantities.

Cuttack is watered by numerous streams, which, during the rainy season, become large rivers. The principal of these are the Mahanuddy and its numerous branches, the Bhamnee, the Byturnee, and the Subunreeka. The Bhaminee rises in the mountains of Gundwana, and flowing first to the south and then to the east, traverses the district of Cuttack; uniting with the Beroopah, a branch of the Mahanuddy, it joins the sea near Point Palmyras. The Byturnee rises among the mountains of Chuta Nagpore in Bahar, and flows south through Gangpore in Gundwana: on entering Cuttack it turns to the south-east, and afterwards to the east, and falls into the Bay of Bengal in 20° 48′ N. lat. The Subunreeka likewise rises in Chuta Nagpore, and flows in a south-easterly direction, with a very winding course, for 250 miles, and joins the Bay of Bengal, forming the southern boundary of the province of Bengal. These rivers abound with fish.

The rainy season does not begin so early as in Bengal, but continues from September to November with so much violence as to cause the different rivers to overflow their banks. In November the weather again becomes fine. From April to June the heat is very oppressive, and would be hardly supportable but for occasional thunder storms, accompanied by rain. At other times the climate is more temperate, but the thermometer seldom, if ever, sinks below 60°.

The manufacture of salt is carried on along nearly the whole of the coast; the produce is very white and pure, and yields a revenue of about eighteen lacs of rupees (180,000*l.*) per annum. The Mogulbundy produces rice and other grains, pulse, spices, dyeing stuffs, and sugar. Maize and wheat are the chief products in the hilly country farther inland. During the periodical rains, when the rivers are full, a good deal of teak and other-timber is floated down to the coast. The forests in which this timber is cut are very unhealthy, and for that reason can be visited only at certain seasons of the year.

The principal towns of the district are Cuttack, Balasore, and Juggernauth. [CUTTACK, BALASORE, JUGGERNAUTH.] The other towns, or rather large villages, deserving of mention, are Buddruck, Soroli, and Piply. Buddruck is thirty-eight miles S. S. W. from Balasore, in 21° 7′ N. lat. and 86° 26′ E. long. It is this village and its neighbourhood that furnish most of the people who are known in Calcutta as Balasore bearers. Soroli is about twenty-three miles south-west from Balasore; it contains two fine tanks and the ruins of a mud fort. Piply is twenty-seven miles south from the town of Cuttack, in 20° 5′ N. lat. and 85° 58′ E. long. The district contains a great number of small villages. The whole population, including the inhabitants of the three principal towns, was estimated in 1822 at 1,296,365. The revenue consists of the profits of the salt monopoly already mentioned; the land assessment, amounting to fourteen lacs of rupees (140,000*l.*), nearly all of which sum is collected in the Mogulbundy; customs-duties, pilgrim tax, and other minor sources, about one lac in addition. Making allowance for the expenses of collection, the annual revenue derived from the district is about thirty lacs of rupees, or 300,000*l.* A great part of the circulating medium is composed of cowries, supplies of which are obtained every year from the Maldive Islands in return for grain. A considerable amount of bullion is carried into Cuttack by pilgrims, but this for the most part finds its way to Calcutta.

The district of Cuttack, including Balasore and other dependencies, was ceded to the East India Company, in full sovereignty, by the rajah of Berar, in January, 1804; the fort and town of Cuttack were taken by the English army in the month of October preceding. The salt monopoly was partially introduced soon after the acquisition of the territory, but was first legally recognized by the government in 1814. The measures at first pursued operated rather to restrict the supply than to subject the article to taxation, and much distress was thereby occasioned to the people without producing any adequate addition to the government revenues. This circumstance, combined with the too rapid introduction of a new revenue system, and the consequent sales of land for arrears of rent, whereby in the course of eleven years a transfer had been effected of more than one-half of the settled lands in the Mogulbundy from the original possessors, excited so much exasperation, that a very serious revolt was attempted in 1817, and this was not fully quelled until two years after, causing a considerable sacrifice of lives. After this insurrection was quelled, arrangements were made for supplying the district with salt by an extended system of local sales, at fixed prices, below those of the auction sales at Calcutta, and by this means a much larger quantity has been sold for consumption within the district, the revenue has been improved, and the people have been relieved from what was felt as a severe oppression.

(Rennell's *Memoir; Reports of Committee of Commons on the affairs of India*, 1832; *Revenue and Judicial Selections*, printed by the East India Company.)

CUTTACK, the capital of the district, is situated in 20° 27′ N. lat., and 86° 5′ E. long. The town is built on a tongue of land between two branches of the Mahanuddy river. During the rainy season Cuttack is completely insulated, and the town itself would be subject to periodical inundations but for large and solid embankments faced with cut stone, which effectually keep out the water. The necessity and at the same time the efficacy of these embankments were proved during the heavy rains of 1817, when the waters rose in one night eighteen feet. The river, during the rains, is a mile and a half broad, and from thirty to forty feet deep at this part, but during the dry season it is a narrow stream with a depth of only three feet.

The Sanscrit word Catak, from which the name of the town is derived, signifies a royal residence. While the province of Orissa preserved its independence, Cuttack was the residence of the Gajapati, or superior rajah, at whose court the military chiefs of Orissa performed feudal service. The Mogulbundy already described, formed the fisc or domain of the Gajapati, while the holdings of the military chiefs were situated round and along the frontier of the kingdom, and it was the duty of their possessors to defend the country from the irruptions of neighbouring powers in the same manner as the lords of the marches in Europe were in former days required to repel invaders.

The town contains a very well-built street with houses of stone two and three stories high, a large market-place, and several mosques; in one of these is exhibited a stone brought from Mecca, and bearing an impression of the foot of Mohammed. In 1822 the town contained altogether 6500 houses and 40,000 inhabitants. The fortress of Barabuttee, which was built in the fourteenth century, stands about a mile north-west from the town. Cuttack is 251 miles from Calcutta, 482 miles from Nagpore, 651 from Hyderabad, 779 from Madras, and 902 miles from Delhi, all travelling distances. (Rennell's *Memoirs; Col. Briggs on the Land Tax in India.*)

CUTTING, in gardening, is a portion of a plant from which a new individual is propagated when placed in the earth. Every body knows that a stick of willow stuck into the ground will put forth roots, and become a new plant; such an instance is a rude exemplification of the manner of multiplying plants by cuttings. In the empirical rules to be observed in this operation, the reader had better consult some book on gardening; we shall confine our observations to the theory of the operation.

Every bud which a plant contains is a distinct seat of life, capable, under fitting circumstances, of growing, flowering, fruiting, seeding, independently of all other buds, and able, if separated from the mother plant, to form a new individual. The buds of a vine, and of a potato, are actually so employed under the name of *eyes;* a cutting is merely a small collection of eyes adhering to a mass of woody matter.

A cutting, when prepared for planting, is cut off close to a bud at the bottom, and down to another at the upper end; it is then placed in earth quite up to its topmost bud, the remainder being buried. The object of this is threefold: firstly, to expose only one bud to the stimulus of light, so that when the cutting begins to grow the leaves may not, from their number, require more food than the woody system can supply; secondly, to keep back the other eyes by the pressure of the earth upon them; and thirdly, to expose as great a surface of the cutting as possible to the influence of the moist earth and darkness, by means of which the production of roots will be facilitated.

In delicate operations, where cuttings are difficult to strike, several additional practices are had recourse to. The cuttings are covered with a bell glass, in order to keep the air that surrounds them saturated with moisture, so that when the buds begin to grow they may not exhaust the cutting of its vital fluid by their excessive evaporation. They are shaded with the same object in view; sun-light increases evaporation, and stimulates a growing part into action: the desire of the gardener is to guard against this till his cuttings have formed abundant roots to feed by. When cuttings are very difficult to strike, their lower end is often made to rest upon the bottom of the garden-pot in which they are to grow; this removes their wounded end from too much moisture, and prevents their being gorged with crude sap before they are able to digest it, an evil quite as great as that of being exhausted by too rapid a digestion. The same or a similar purpose is answered by putting the cuttings in the first instance into pure silex (silver sand), from which they are removed as soon as roots are emitted; such sand permits only a slow transmission of water through it, and is in fact incapable of supersaturation if proper means are taken to drain it; and hence it renders it impossible that water should be conveyed too quickly into the open vessels of the cutting.

In many cases a single leaf, or a portion of one, is left attached to the upper eye of the cutting; this is for the sake of keeping up a slow circulation in the system, and of drawing into the vessels of the wood a gentle current of moisture, so that the cutting may never be too much exhausted.

When cuttings will not strike because they are too young, the cause is to be sought in the young tissue being too absorbent, and taking up moisture faster than it can digest it, the result of which is a repletion of the vessels, disease, and death. On the other hand, cuttings the wood of which is too old will not strike from an opposite cause; their vessels are so small and rigid, that when the young leaves are ready to expand, and the new roots to develop, the supply of food moves too sluggishly through the cutting from point to point, and hence the new parts wither if formed, or will not form at all. The exact age at which a cutting roots most readily is a matter of experiment, and not capable of being reduced to any theoretical rule.

It is highly probable that if these points are well considered, all plants, of whatever nature, provided they have well-formed buds, are capable of striking from cuttings; and it is notorious, that while some gardeners can only succeed with the commonest things, others, by the success that attends their operations, possess what would seem a magical power over plants, if we did not know that natural magic consists in nothing more than the right application of right knowledge at the right time.

CUTTLE-FISH. [CEPHALOPODA, vol. VI., p. 425; SEPIADÆ.]

CUVIE'R, GEORGES, was born August 23, 1769, at Montbéliard, now in the department of Doubs, but which at that time was a county belonging to the dukes of Würtemberg. His father, a half-pay officer of a Swiss regiment in the French service, had married late in life a young and accomplished woman, who took especial care of Cuvier's early education. He was sent to study first at Tübingen, and he afterwards entered the Academia Carolina, then newly established at Stuttgard by Prince Charles of Würtemberg for the purpose of training up young men for public and diplomatic offices. Cuvier, however, bestowed most of his time on natural history; he collected specimens, and drew and coloured insects, birds, and plants during his hours of recreation. The limited circumstances of his family obliged him to remove from Stuttgard before he obtained any public employment; and at twenty-one years of age he accepted the situation of tutor to the only son of Count d'Hericy in Normandy. The family residence being near the sea, the study of marine animals became a part of Cuvier's occupation. He compared the living species with the fossil remains found in the neighbourhood; and the dissection of a species of cuttle-fish led him to study the anatomy of the mollusca, and to reduce to order this hitherto neglected branch of zoology. While he was thus employed, a society was formed at Valmont, in his neighbourhood, for the encouragement of agriculture. L'Abbé Teissier, a venerable and learned old man, the author of the articles on agriculture in the 'Encyclopédie Méthodique,' had taken refuge at Valmont from the revolution, disguising his obnoxious character of Abbé under the garb and profession of a surgeon. At a meeting of the new society he expressed his opinions on his favourite subject in a manner which forcibly reminded young Cuvier of the articles which he had read in the Encyclopédie. At the end of the sitting Cuvier addressed the stranger by the name of l'Abbé Teissier: the abbé was alarmed, but Cuvier soon removed his apprehensions, and an intimacy was formed between them. When the reign of terror had ceased, Teissier wrote to Jussieu and other friends at Paris in terms of high commendation of his new acquaintance. The result was, that Cuvier was requested to forward some of his papers to the Society of Natural History, and shortly after, in 1795, being then 26 years of age, he went to Paris, and in the same year was appointed assistant to Mertrud in the superintendence of the Jardin des Plantes, which locality became from that time his home, and the scene of his labours and of his fame. Here he began the creation of that now splendid collection of comparative anatomy, and in December of the same year he opened his first course on that branch of science. In 1796 the National Institute was formed, and Cuvier was one of its first members. In 1798 he published his 'Tableau élémentaire de l'Histoire Naturelle des Animaux,' and afterwards his 'Mémoire sur les Ossemens Fossiles des Quadrupedes' and 'Mémoire sur les Ossemens Fossiles qui se trouvent dans les Gypses de Montmartre.' He continued to illustrate the subject of fossil remains by subsequent memoirs. In the year 1800 he was named professor of natural philosophy at the Collége de France, continuing at the same time his lectures on comparative anatomy at the Jardin des Plantes. In that year were published the first two volumes of his 'Leçons d'Anatomie Comparée,' which met with the greatest success. The three following volumes appeared in 1805. In 1802 the first consul Bonaparte appointed Cuvier one of the six inspectors-general for establishing lycea, or public schools, which were supported by government in thirty towns of France, and which are now called Royal Colleges. Cuvier established those of Marseilles, Nice, and Bordeaux. He was about the same time appointed perpetual secretary to the Institute for the Department of Natural Sciences, with a salary of 6000 francs. In 1803 he married the widow of M. Duvancel, a former fermier général: four children whom he had by this marriage all died before him. In 1808 he was commissioned by Napoleon to write a report on the progress of the natural sciences from the year 1789. The luminous and interesting treatise which he produced on this occasion was formally presented to Napoleon in the council of state. Cuvier declares the true object of science to be, 'to lead the mind of man towards its noble destination—a knowledge of truth—to spread sound and wholesome ideas among the lowest classes of the people, to draw human beings from the empire of prejudices and passions, to make reason the arbitrator and supreme guide of public opinion.' His next appointment was that of counsellor for life of the new Imperial University, in which capacity he had frequent personal intercourse with Napoleon. In 1809-10 he was charged with the organization of the new academies, the name designed to be given to the old universities of the Italian states which were annexed to the empire. He organized those of Piedmont, Genoa, and Tuscany. His reports of those missions exhibit the mild and enlightened spirit which he brought to the task. Speaking of the universities of Tuscany, he deprecates a too hasty and rash interference with institutions which had been founded and sustained by so many great men, and in which he found much to praise and to retain. In 1811 he was sent on a similar mission to Holland and the Hanseatic towns: his report especially concerning Holland is very interesting, as the subject of public instruction in that country is not generally known. He paid particular attention not only to the higher branches of education, but also to popular or elementary instruction; his principle was, that instruction would lead to civilization, and civilization to morality, and therefore that primary or elementary instruction should give to the people every means of fully exercising their industry without disgusting them with their condition; that secondary instruction, such as in the lycea, should expand the mind, without rendering it false or presumptuous; and that special or scientific instruction should give to France magistrates, physicians, advocates, generals, clergymen, professors, and other men of learning. His words were: 'Give schools before political rights; make citizens comprehend the duties that the state of society imposes on them; teach them what are political rights before you offer them for their enjoyment: then all amelioration will be made without causing a shock; then each new idea, thrown upon good ground, will have time to germinate, to grow, and to ripen, without convulsing the social body. Imitate nature, which, in the development of beings, acts by gradation, and gives time to every member to grow to perfection. The infant remains nine months in its mother's womb; man's physical perfection only takes place between twenty and thirty, and his moral completion from thirty to forty. Institutions must have ages to produce all their fruits; witness christianity, the effects of which are not yet accomplished, notwithstanding eighteen centuries of existence.' (Laurillard, *Eloge de M. le Baron Cuvier*.)

In 1813 Cuvier was sent to Rome, then annexed to the French empire, to organize the universities there. Although his being a Protestant rendered this mission the more delicate, yet his enlightened tolerance and benignity of manner gained him the general esteem and approbation in the capital of the Catholic world. Soon after Napoleon appointed him maître des requêtes to the council of state; and in 1814, just before his abdication, he named him councillor of state, an appointment which was confirmed by Louis XVIII., who soon after appointed him chancellor of the university, an office which he held till his death. In both these capacities he found himself at times in a very trying position, arising from the intolerance and bigotry of certain individuals of influence about court.

In 1817 he published a second edition of the 'Recherches sur les Ossemens Fossiles,' in 5 vols., 8vo., and also his 'Règne Animal,' in 4 vols., in which the whole subject-matter of zoology is arranged according to the principle of organization. It begins with man, of whom he recognizes only one genus and one species, diversified by varieties called races. In 1818 he made a journey to England, where he was received with appropriate honour. In the same year he was elected a member of the French Academy. In 1819 he was appointed president of the committee of the interior in the council of state, an office which, fortunately for him, was beyond the sphere of political intrigues, and only required order, impartiality, and an exact knowledge of the laws and principles of the administration. In the same year Louis XVIII., as a personal mark of his regard, created him a baron. He was appointed also temporary grand master of the University, an office however which he willingly resigned for that of grand master of the Faculties of Protestant Theology in 1822. He himself stipulated that he should receive no salary for this latter office. He was made at the same time one of the vice-presidents of the Bible Society. Through his care fifty new Protestant cures were created in France. He also established new professorships of history, living languages, and natural history, in the minor schools of the kingdom. In 1825 he republished, separately, the preliminary discourse to the 'Recherches sur les Ossemens Fossiles,' which is generally known by the title of 'Discours sur les Revolutions de la Surface du Globe,' and has been translated into most European languages under the title of 'Theory of the Earth.' This work is not a system of mere speculative theory, but a series of deductions from actual facts, authenticated by his own researches into the fossil remains, classed according to the strata in which they were found. Cuvier draws the following conclusions: 1st. That in the strata called primitive there are no remains of life or organized existence. 2nd. That all organized existences were not created at the same time, but at different times, probably very remote from each other; vegetables before animals, the mollusca and fishes before reptiles, and the latter before the mammalia. The transition limestone exhibits the remains of the lowest forms of existence; the chalk and clay conceal the remains of fishes, reptiles, and quadrupeds, the beings of a former order of things which have now disappeared. 3rd. That among fossil remains no vestige appears of man or his works, no bones of monkeys are found, no specimen of the whole tribe of quadrumanous animals. 4th. That the fossil remains in the more recent strata are those which approach nearest to the present type of the corresponding living species. 5th. That the stratified layers which form the crust of the globe are divisible into two classes, one formed by fresh water and the other formed in the waters of the sea; a fact which leads to the conclusion that several parts of the globe have been alternately covered by the sea and by fresh water. From these and other facts, Cuvier concludes that the actual order of things on the surface of our globe did not commence at a very remote time: he agrees with Deluc and Dolomieu, that the surface of the earth was subject to a great and sudden revolution not longer than five or six thousand years ago, and that this catastrophe caused the disappearance of countries formerly the abode of man and of species of animals now unknown to us. But he also believes that the countries now inhabited had been at some former period, long before the creation of man, inhabited by land animals, which were destroyed by some previous convulsion, and that this globe has undergone two or three such visitations, which destroyed as many orders of animals, of which we find the remains in the various strata. At the close of his work on fossil remains he thus modestly expresses himself: 'I have no doubt, that in a few years, the work which I now terminate, and to which I have devoted so much labour, will be but a trifling sketch, a first glance thrown over the immense creations of antient times.'

In 1826 Charles X. bestowed on Cuvier the decoration of grand officer of the legion of honour; and the king of Würtemberg, his former sovereign, made him commander of his order of the crown. In 1827 Cuvier, as a member of the cabinet of the interior, was intrusted with the superintendence of all affairs concerning the different religions professed in France, except the Catholic. In the same year he had the misfortune to lose his only remaining child, a daughter, amiable and accomplished, and on the eve of her marriage; a loss from which he never entirely recovered, although a sense of his public duties made him stifle his grief. In 1828 appeared the first volume of his 'Histoire Naturelle des Poissons;' a splendid work, of which he lived to see eight volumes published, and which has been since continued, and is to be completed in twenty volumes It contains more than 5000 species of fishes, described from real specimens and classed, with observations on their anatomy, and critical researches on their nomenclature, antient as well as modern.

In 1830 Cuvier opened a course in the Collége de France on the history and progress of science, and especially of the natural sciences, in all ages. In the same year he paid a second visit to England, and it was during his absence from Paris that the revolution of July took place. On his return he was graciously received by the new king Louis Philippe, who in 1832 made him a peer of France. On the 8th of May of that year, he opened the third and concluding part of his course of lectures on the history of science, by summing up all that he had previously said; he then pointed out what remained for him to say respecting this earth and its changes, and announced his intention of unfolding his own manner of viewing the present state of creation. This discourse, delivered in a calm solemn manner, produced a deep impression on his hearers, which was increased when he added the concluding words: 'These will be the objects of our future investigations, if time, health, and strength, shall be given to me to continue and finish them with you.' That was his last lecture. The following day he felt ill, and soon after paralysis manifested itself. He saw the approach of death with resignation, and on the 13th he expired, at the age of sixty-three, universally regretted. He was buried in the cemetery of Père la Chaise; his funeral was attended by deputations from the Council of State, the several academies, by members of the two Chambers, &c.

The career of this great and good man, passed quietly but most usefully in the pursuits of science, and in instructing and benefiting mankind, during forty years the most eventful in the history of France and of Europe, forms a striking contrast with that of the conquerors and politicians who agitated the world during the same period. His works, of which we have mentioned a few of the most important, are very numerous, and even a mere catalogue of them would exceed our limits. The reader will find a full list of them in chronological order in the very interesting *Memoir of Baron Cuvier*, by Mrs. R. Lee, to which, as well as to a well written article on the *Life and Labours of Cuvier* in No. XXVIII. of the *Foreign Quarterly Review*, December, 1834, we are indebted for most of the materials of this notice. Numerous eloges of Cuvier have also appeared in France, by MM. Duvernoy, Pariset, Laurillard, &c.

Cuvier himself wroto numerous eloges, among others, of Bruguières, Daubenton, Lemonnier, Priestley, Adanson, Saussure, Bonnet, Fourcroy, Pallas, Rumford, Werner, Sir Joseph Banks, Délambre, Berthollet, Lacepède, Fabbroni, Ramond, Sir Humphry Davy, &c. These eloges, which are really interesting biographies, have been published in 3 vols., 8vo. He also contributed to the 'Dictionnaire des Sciences Medicales,' the 'Biographie Universelle,' and to the 'Dictionnaire des Sciences Naturelles.' The article 'Nature,' in the last, is deserving of especial attention. There is a little work of Cuvier, a small 12mo., which although out of the sphere of his general studies, deserves mention. It consists of a discourse on the distribution of the annual prize established by the philanthropist M. de Montyon under the name of 'prix de vertu,' to be given to those who have excelled by their active virtues in doing good to their fellow-creatures. Louise Scheppler, the villager of the Vosges, and disciple of the venerable Oberlin, was one of those who received the prize.

CUXHAVEN, a large and important harbour on the left bank of the Elbe, at its entrance into the German Ocean. It is situated in 53° 53′ N. lat. and 8° 44′ E. long. in the bailiwick of Ritzebüttel, which lies along the northern shores of the Hanoverian duchy of Bremen, and belongs to the free city of Hamburg. It affords a secure shelter against this dangerous sea in the winter months, or to ships waiting for fair winds. It contains about 800 inhabitants, chiefly pilots and fishermen; has a lighthouse, excellent bathing establishments, and arrangements for the performance of quarantine. There is also a regular communication with England by the packets, which formerly took their departure from Cuxhaven. The chief magistracy is always vested in a senator of Hamburg.

CUZCO, a town in South America, in the Republic of Peru, 260 miles from the Pacific, 13° 42′ S. lat., and 71° 4′ W. long. Before the arrival of the Spaniards it was the capital of the extensive empire of the Incas, and is said to have been built by the founder of the empire, Manco Capac, in the tenth or eleventh century of our æra. In the year 1534, when it was taken by Francis Pizarro, the Spaniards were astonished at the magnificent buildings which it contained, especially the Temple of the Sun. Of this temple there remain at present only some walls of singular construction, upon which stands the magnificent convent of Santo Domingo.

The town is built at the foot of some hills in the middle of a wide valley, which has an undulating surface. This valley extends eastwards to a mountain stream, the Quillabamba, and in the lower part is well cultivated, the fields having the advantage of irrigation. The houses of Cuzco are built of stone, covered with red tiles. Many of them still retain their original walls. The great size of the stones used in their construction, the variety of their shapes, and the excellent workmanship which they display, give to the city an interesting air of antiquity. The cathedral, the convents of S. Augustin and of La Merced, are very large buildings, inferior in architecture to few in the old world.

Upon a lofty hill, a little north of the city, are the ruins of a great fortress, many parts of the wall of which are even now in perfect preservation. They consist of stones of extraordinary size, and of polygonal shapes, placed one upon another without cement, but fitted with such nicety as not to admit the insertion of a knife between them. This stupendous work was erected by the Incas for the protection of their capital.

The population exceeds 40,000, of whom a great part are Indians, who are distinguished by their industry; they manufacture cotton and woollen goods, and tan leather. Their embroideries and carved furniture are much valued. The town formerly contained several institutions for education, as a university, two colleges, &c.; but we do not know what changes have taken place in this respect since the expulsion of the Spaniards.

The great high road of the Incas extended from this town northward as far as Quito, and southwards probably to the southern extremity of the valley of the Desaguadero to the neighbourhood of Oruro, or from the equator to 20° south lat. (Ulloa; *Memoirs of General Miller.*)

CYANIC ACID, a compound of cyanogen and oxygen. When a mixture of ferrocyanide of potassium and binoxide of manganese is heated to redness, and the residue is boiled in alcohol of specific gravity 0·86, tabular crystals are formed as the solution cools, which are cyanate of potash; this acid forms insoluble salts with solutions of lead, silver, &c., and when these are diffused through water and sulphuretted hydrogen is made to act upon them, metallic sulphurets are precipitated, and cyanic acid remains in solution; this is a sour fluid, the smell of which resembles that of vinegar; it decomposes with great facility. It is composed o

$$\left.\begin{array}{lr}\textbf{Two equiv. of Carbon} & 12\\ \textbf{One \quad „ \quad Azote} & 14\end{array}\right\} = \text{One equiv. Cyanogen } 26$$

One „ Oxygen 8

Equivalent 34

There is another acid, constituted of similar proportions of cyanogen and oxygen, which is isomeric with this acid; but which, on account of the explosive nature of some of its salts, is called *fulminic acid*. [FULMINIC ACID.]

CYANOGEN, or bicarburet of azote, is a gaseous compound sometimes termed *Prussine* or *Prussine gas*. This gas was discovered by Gay Lussac in 1815; it is prepared by heating bicyanide of mercury in a retort by means of a spirit lamp; the cyanogen comes over in the gaseous state, and metallic mercury is distilled. This gas is colourless, and has a peculiar and pungent odour; under a pressure of 3·6 atmospheres, and at a temperature of 45°, it is reduced to the state of a limpid fluid, but which resumes the gaseous state when the pressure is removed. It is inflammable and burns with a purple flame; but a taper immersed in it is extinguished. It is not readily decomposed by heat. At the temperature of 60° water absorbs 4·5 times its bulk, and alcohol 23 times. The acid property of reddening litmus paper is exhibited by the aqueous solution; but this is probably dependent upon the formation of acids by the mutual decomposition of the cyanogen and water. The name of cyanogen is derived from κύανος, *blue*, and γένος, a termination common to many other chemical terms, as oxygen, hydrogen, &c. It is an essential ingredient of Prussian blue.

This gas is composed of 100 cubic inches of azotic gas, weighing 30·1 grains, and holding 25·1 = 55·9 gr. of carbon in solution; its specific gravity is therefore to that of atmospheric air as 1·803 to 1. It is constituted of

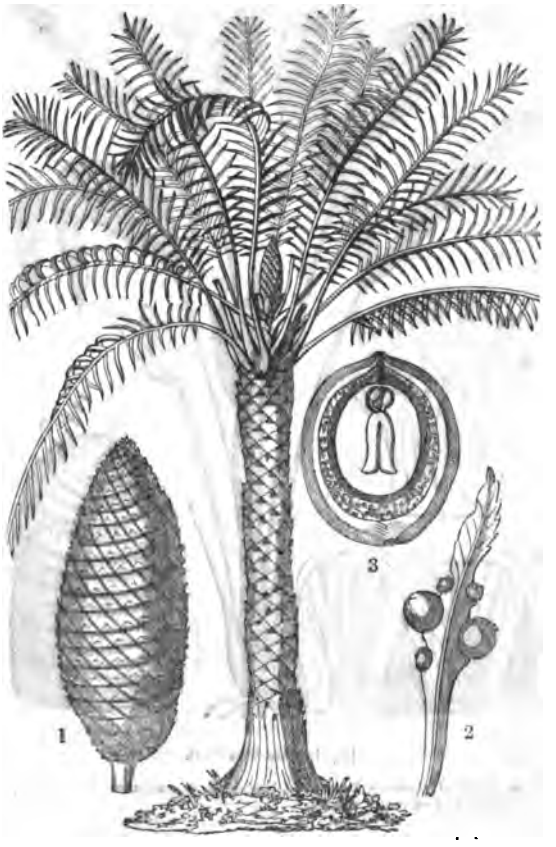
Two equivalents of carbon 12
One „ azote 14

Equivalent 26

When one volume of this gas is mixed and detonated with two of oxygen over mercury, there are produced two volumes of carbonic acid gas and one volume of azotic gas. Cyanogen combines with several metals to form single and double cyanides or cyanurets. One of the most useful and remarkable of the simple cyanides is the well-known pigment Prussian-blue, which is composed of 9 equivalents of cyanogen and 7 equivalents of iron. A double and well-known cyanide is the ferrocyanide of potassium; it is a crystalline salt of a fine yellow colour, prepared by heating animal matter and potash in an iron vessel; the residue is a coaly matter which is partially soluble in water, and by evaporation gives the crystals in question. These are composed of one equivalent of cyanide of iron 54, two of cyanide of potassium 132, and three of water 27 = 213. This salt, when added to a solution of sulphate of iron with certain precautions, produces percyanide of iron or Prussian blue.

Cyanogen combines with various elementary bodies to form peculiar compounds; thus with hydrogen it forms prussic or hydrocyanic acid; it unites also with chlorine and sulphur to form chlorocyanic and sulphocyanic acids.

CYCADA′CEÆ, one of the natural orders of Gymnospermous plants. It is essentially characterized by its trunk growing in a cylindrical unbranched manner in consequence of the development of one terminal bud only, and by its diœcious flowers, of which the males at least grow in cones, composed of peltate scales. In one genus, Zamia



[Cycas circinalis.]

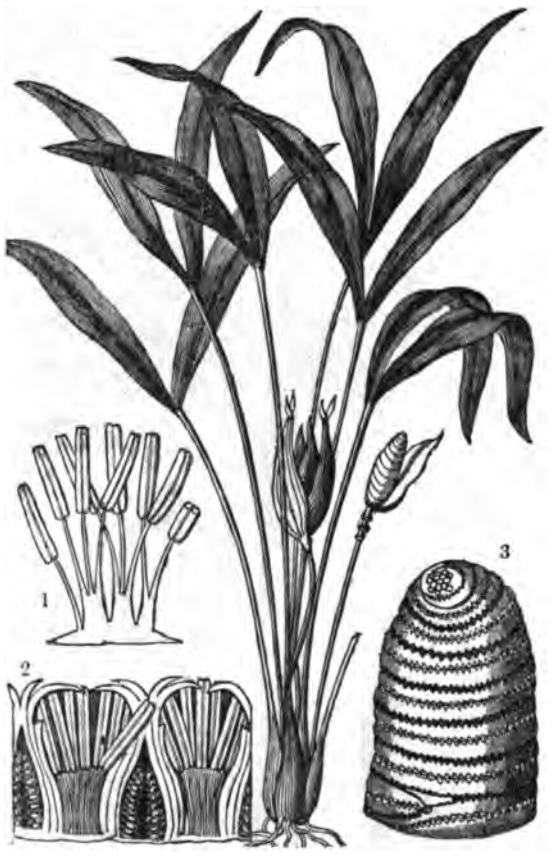
1, a male cone; 2, a female spike; 3, a section of a ripe fruit.

the female flowers also are disposed in the same manner; in the other, Cycas, they are placed upon the toothings of abortive leaves, occupying the centre of the terminal bud. The leaves of these plants are pinnated, and have a certain resemblance to those both of ferns and palms; their wood is arranged both in concentric circles, which in Cycas are numerous, and in a confused manner among the central pith; so that a Cycadaceous stem partakes in structure of the peculiarities of both Exogens and Endogens. In the manner in which their leaves unrol, and in their terminal single bud, Cycadaceæ resemble Ferns, with which they may moreover be compared on account of their fruit proceeding from leaves; with Coniferæ they accord in the cone-like arrangement of their parts of fructification and their naked ovules; and with Palms in the secretion of a large quantity of fæcula in their stem, in their mode of growth, and in the arrangement of a part of their woody system. Cycadaceæ therefore, belonging as they do to Gymnosperms, possess nearly equal affinity with Palms or Endogens, and Tree-ferns, or Acrogens.

A few plants inhabiting India, New Holland, the Cape of Good Hope, and tropical America, constitute the whole of this order, all the species of which contain a large quantity of fæcula in their trunk. Cycas circinalis yields a coarse sort of sago in the East Indies, and arrow-root of the finest quality is manufactured from Zamia furfuracea in the West Indies.

CY'CLADES. [Archipelago, Grecian.]

CYCLANTHA'CEÆ, a highly curious but little known natural order of plants, allied to Pandanaceæ, from which their habit and fructification distinctly divide them. They have plaited, slit, stalked leaves, and a spadiceous inflorescence like Araceæ; the flowers are arranged in spiral bands upon the spadix, one band being alternately male and the other female. The whole order consists of a very small number of tropical American plants. (See Lindley's *Natural System of Botany*, p. 362.)



[Cyclanthus bipartitus.

1, a panel of stamens from a male ring; 2, a section of a spadix; 3, the upper portion of an entire spadix.

CYCLAS. [Veneridæ.]

CYCLE. This term, which means nothing but circle (κύκλος), has an arbitrary use in chronology Certain of the cycles, or recurring methods of denoting time, which are in common use, are called cycles, to the exclusion of the rest. The principal of these, if not the only ones, are the Metonic cycle [Meton, Calippus], the solar cycle, and the cycle of Indiction. But the natural cycles, such as the revolutions of the sun and moon, are not called cycles; nor even some of the artificial ones, such as the Julian *period*. It would be useless to retain this artificial and confused distinction. Under the distinctive words Meton, Indiction, &c., the reader will find the origin of each method of reckoning; while in the article Period of Revolution he will see a table of the lengths and commencements of all the cycles, natural and artificial, whether called cycle, period, year, day, or month.

CY'CLICA, a section of coleopterous insects. According to Latreille, this group forms a subsection of the section Tetramera; the groups Tetramera, as well as Pentamera, however, we imagine are somewhat artificial. See Coleoptera.

The section Cyclica contains the Linnæan genera *Hispa*, *Cassida*, and *Chrysomela*, the species of which may be distinguished by the following characters:—Tarsi four-jointed, furnished beneath with a velvet-like substance; the penultimate joint bilobed; antennæ of moderate length, generally filiform, or increasing in thickness towards the apex; body usually of a rounded or oval form, the thorax being, at the base of the same width as the elytra.

These insects are usually of brilliant metallic colouring: various shades of green appear to predominate. Their larvæ have a soft body, and are furnished with six legs, attached two to each of the three first segments, or those next the head. They feed upon the leaves of plants.

To this group belong the following families:—*Cassidiadæ*, *Chrysomelidæ*, and *Galerucidæ**. The principal genera belonging to the family Cassidiadæ are, *Alurnus*, *Hispa*, *Chalepus*, and *Cassida*. To these genera we shall at present confine our remarks, commencing with the genus *Cassida*, the technical characters of which are:—Body oval or rounded, depressed; thorax generally somewhat semicircular, with the anterior portion produced so as to conceal the head; mandibles with three notches on the inner edge; external lobe of the maxilla as long as the inner one.

The Cassidæ are usually of a somewhat flattened form, and are remarkable for their having the external margins of the elytra projecting beyond the body; the outer margins of the thorax are also produced, and conceal the head. Those parts which extend beyond the animal itself are generally semitransparent and flattened, whilst the parts which immediately cover the insect are more or less convex. When the insect is at rest, the legs, which are rather short and compressed, are retracted, and the external margins of the elytra and thorax are applied closely to the plant on which it lives. The larvæ of the Cassidæ are of a depressed form, and usually armed on the upper parts with numerous little spines; these are longest on the sides of the body and at the tail. The use of these little spines appears to be for the purpose of holding the excrement of the animal, which is always deposited upon its back, and probably serves as a means of defence, by concealing it from its enemies.

Cassida viridis, an insect not uncommon in this country, is about a quarter of an inch in length, and of a bright green colour above; the body beneath is black. This species lives both in the larva and imago states upon thistles.

Mr. Stephens, in his 'Catalogue of British Insects,' enumerates nineteen species of this genus.

The insects belonging to the other three genera of the Cassidiadæ have the body of a more elongated form than those just described, and the head is exposed, the margins of the thorax and elytra not being produced. They are all included in the genus *Hispa* of Linnæus.

CYCLOBRANCHIANS. (Cuv.) [Cyclobranchiata Cervicobranchiata.]

CYCLOBRANCHIA'TA. M. De Blainville's third order of the second section of his subclass *Paracephalophora monoica*.

Family character.—Organs of respiration branchial, in form of foliated branches, placed together symmetrically near the vent, which is situated in the mesial line of the posterior part of the body. Skin naked, and more or less tuberculous. (De Blainville.)

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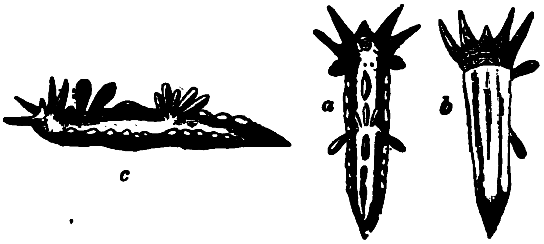
* The characters of these families are given under their proper heads

Genera Doris.*

Body oval, more or less depressed; the borders of the mantle going beyond the foot and head on all sides. Four *tentacula*, two of which are superior and contractile within a cavity, and two inferior under the border of the mantle. *Mouth* at the extremity of a small fleshy tube, without teeth, but with a lingual mass beset with denticles of some size. *Branchiæ* ramified, or in form of projecting foliated branches, disposed in a circle more or less complete in front of the vent. Organs of generation terminating on the anterior part of the right side in a common tubercle.

α.

Species which have the anterior border of the mantle divided into many strap-like portions symmetrically disposed. (Genus *Polycera*, Cuv.) Example, *Doris cornuta*.



[Doris cornuta.]

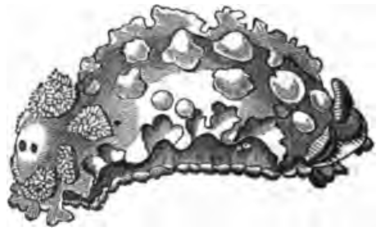
a, seen from above; *b*, seen from below; *c*, side view

β.

Species the anterior border of whose mantle is undivided.

*

Body prismatic.
Example, *Doris lacera*.



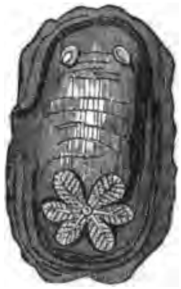
[Doris lacera.]

**

Body very convex (bombé) above.
Example, *Doris verrucosa*.

***

Body extremely depressed.
Example, *Doris Solea*.

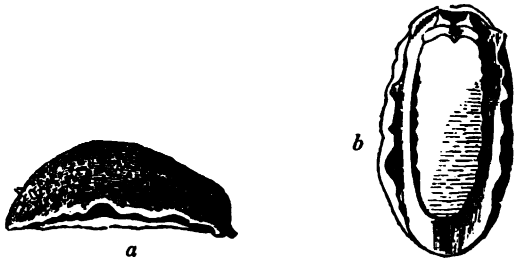


[Doris Solea.]

Habits, &c.—There are many species spread abroad in almost all seas, where they live upon rocks. The student should refer to Cuvier's monograph in the *Annales du Museum*, vol. iv.; and to De Blainville's in the *Dictionnaire des Sciences Naturelles*.

Onchidoris.

Body oval, tumefied (bombé) above. *Foot* oval, thick, overpassed throughout its circumference by the borders of the mantle. Four *tentacula* as in *Doris*, besides the labial appendages. *Organs of respiration* formed by very small ramifications, disposed circularly, and contained in a cavity situated at the posterior and mesial part of the back. *Vent* mesial at the inferior and posterior part of the border of the mantle. Orifices of the *organs of generation* very distant, and united by an external furrow occupying the entire length of the right side. Example, *Onchidoris Leachii*.



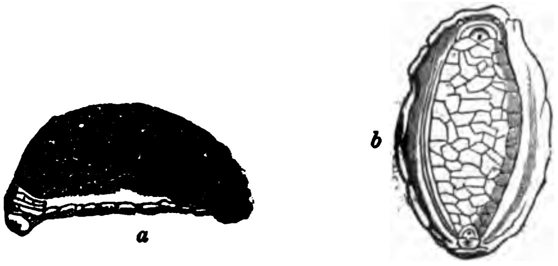
[Onchidoris Leachii.]

a, side view; *b*, seen from below.

M. De Blainville established this genus for a mollusk in the British Museum, the locality of which was unknown.

Peronia.

Body suboval, tumefied above. *Foot* oval, thick, overpassed throughout its circumference by the borders of the mantle Two inferior *tentacula* only, depressed, and but little contractile, and two labial appendages. *Respiratory organ* nearly retiform or pulmonary, in a cavity situated at the posterior region of the back, and opening externally by a rounded mesial orifice, pierced at the inferior and posterior part of the borders of the mantle. *Vent* mesial, situated in front of the pulmonary orifice. Orifices of the organs of generation very distant; that of the ovary entirely at the posterior extremity of the right side, continued by a furrow to the root of the labial appendage of that side: orifice of the exciting organ very large, nearly mesial at the anterior part of the root of the tentacle of the same side. Example, *Peronia Mauritiana*.



[Peronia Mauritiana.]

a, side view; *b*, seen from below.

M. De Blainville observes, that this genus contains the marine *Onchidia* of Cuvier, and that he knows of four or five species, all from the southern hemisphere.

N. B. The *Cyclobranches*, Cyclobranchians of Cuvier, form the eighth order of Gastropods of that zoologist, and contain the genera *Patella*, Linn., and *Chiton*, Linn. CERVICOBRANCHIATA, vol. vi., p. 440 et seq.; CHITONS, vol. vii., p. 94 et seq.

CYCLOID (κυκλοειδής, like a circle), a name very incorrectly given to the curve which is traced out by any point of a circle rolling on a straight line. Thus while the wheel of a carriage revolves, each nail on the circumference describes a succession of cycloids. We might also here describe the various curves made by the points of circles which roll inside or outside of other circles, &c. &c. But as the cycloid stands apart from all the rest, both in simplicity and historical notoriety, we shall here confine ourselves to this one curve alone, and refer the rest to the head TROCHOIDAL CURVES.

If we suppose a circle to roll on a straight line, it is obvious that the centre will advance in every moment through a length equal to the portion of the circumference which is brought in contact with the line on which the circle rolls. That is,

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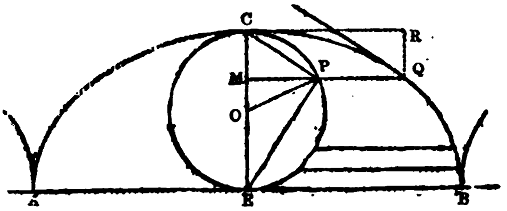
* The term Doris was originally applied by Linnæus to an animal of this genus. Müller and Gmelin afterwards extended it to all the *Nudibranchiata* or Mollusks with naked branchiæ. Cuvier and De Blainville have restrained it as above.



Supposing C, the point now highest on the circle, to be the one whose path is to be traced, then, by the time the mere rotation would have brought this point to P, the whole system will have been carried forward through a length PQ equal to the arc CP. Hence follows a very simple mode of conceiving the form of a cycloid · at every point P imagine a line PQ parallel to AB and equal to the arc CP; the extremities of all these lines will be in the cycloid. The arc AC, through which the point on the circle rises from the line AB to its highest position, is similar and equal to the arc CB through which it descends. In the diagram we see small parts of the preceding and succeeding cycloids.

The principal properties of the cycloid are as follows:—

1. PQ is equal in length to the *arc* CP.

2. The tangent at Q is parallel to the *chord* CP.

3. The arc CQ is twice the chord CP, and the whole arc ACB is four times CE, the diameter of the generating circle.

4. Complete the rectangle CQR; the area CQR is equal to the circular area CPM, and the whole area ACB is three times that of the generating circle.

5. The curvature at Q is the same as that in a circle whose radius is twice EP, and the involute and evolute (see these terms) of a cycloid are both cycloids of the same magnitude.

6. If the figure be reversed, so that C is the lowest point of the cycloid, and A and B the highest points; then, no friction being supposed, and the cycloid being of resisting matter, a small weight placed at Q will take the same time to slide to C, wherever the point Q may be. Hence all the arcs of the cycloid are said to be *synchronous*.

7. On the same supposition as in the preceding, a weight will slide from B to Q in a shorter time than in any other curve which can be drawn between B and Q. Hence the cycloid is called the *brachystochron*.

Let θ be the angle COP (in theoretical units) [ANGLE], CM $= x$, MQ $= y$, OP $= a$, then we have the following equations:—

$$x = a\,(1 - \cos\theta)$$
$$y = a\,(\theta + \sin\theta)$$

from which the properties of the curve may be deduced.

If, instead of measuring PQ from P, we had carried it forward from M, then Q would have described a curve known by the name of the *companion to the cycloid*, but which is in truth a *curve of sines*. [SINES, CURVE OF.]

The history of the cycloid is remarkable from the contests which it produced, and the manner in which the names of Galileo, Descartes, Mersenne, Pascal, Roberval, Wallis, and others, appear in connexion with it. But there would be little use in giving an abstract of history on points of no material use, and the interest of which depends on the light in which a detailed account, and nothing less, would place the state of science of the seventeenth century. Gallileo was certainly the first who attempted the investigation of the properties of the cycloid, as appears from a letter to Torricelli, written in 1639. (See Montucla, *Hist. des Math.*, vol. ii. p. 52, &c.)

CYCLO'LITHES. [MADRIPHYLLIÆA.]

CYCLOPÆ'DIA. [DICTIONARY.]

CYCLOPS. (Zoology.) [BRANCHIOPODA, vol. v. p. 340 et seq.]

CYCLO'STOMA. [HELICIDÆ.]

CYDER. [CIDER.]

CYDNUS. [ANATOLIA; CILICIA.]

CYDO'NIA VULGA'RIS, or QUINCE, of the fruit of which there are two varieties, apple-quince and pear. The seeds are the part used in medicine, on account of the mucilage which they yield. The seeds are more numerous in the small hard than in the large fleshy fruits. They generally occur in large irregularly-shaped masses, as they easily adhere to each other, owing to the mucus which invests them. When moistened in the mouth or in water, they give out a large quantity of mucilage, which is white, and not coagulable by boracic acid. One part of these seeds will render 40 to 50 parts of water so mucilaginous, that it will possess the thickness of a syrup. They should be set to digest in cold water, otherwise the mucilage acquires the odour of hydrocyanic acid. Indeed the actual presence of, or tendency to form, hydrocyanic acid, may be demonstrated by distillation (Stockmann.) Many seeds yield a yellow-coloured mucilage. If allowed to remain in a fluid state the solution soon spoils, but by careful evaporation the mucilage may be brought to a dry state; or, as proposed by Zier, the mucilage may be precipitated from its watery solution by alcohol. Ten ounces of seeds yield two ounces of dried mucilage, two grains of which, with distilled water, produce one ounce of mucilage of proper consistence for use. In whatever way obtained, the mucilage possesses demulcent qualities, and may be employed either internally, or as a lotion, which is especially applicable to the faces of those who suffer from the cold winds of winter and spring.

CYGNUS (the swan), one of the old constellations of Aratus, who refers it to the fable of Leda, as does Higinus; but the latter gives another fable of the same kind. The bright star (Deneb), *α* Cygni, may be seen on the meridian at eight o'clock in the beginning of October; the bright stars in Aquila, Lyra, and Cygnus form a remarkable triangle.

The principal stars are as follows:—

Character. Not in Bayer ( ).	No. in Catalogue of		Magnitude.	Character. Not in Bayer ( ).	No. in Catalogue of		Magnitude.
	Flamsteed and Piazzi.	Astron. Society.			Flamsteed and Piazzi.	Astron. Society.	
κ	1	2254	4	ω^1	45	2415	5
α	2	2267	5	ω^2	46	2420	5
	3	2271	6	α	50	2444	2
β^1	6	2281	3½	ϵ	53	2455	3
	9	2296	6	λ	54	2458	4
ι^2	10	2284	6		57	2477	6
ϕ	12	2307	5	ν	58	2489	4
θ	13	2303	4	ξ	62	2505	4
	15	2316	6	f^2	63	2509	6
χ	17	2323	5	ζ	64	2512	3
δ	18	2321	3½	τ	65	2519	4
	22	2346	6	υ	66	2524	5
b^2	28	2376	5	σ	67	2523	4
o^2	31	2387	5	g	71	2553	6
	32	2394	5½	ρ	73	2561	4
	33	2391	6	μ	78	2582	5
γ	37	2401	3	π^1	80	2580	4
(h)	39	2402	6	π^2	81	2593	5
(i)	41	2411	4		(258)	2440	6

CYGNUS. [SWAN.]

CYLINDER, in mathematics (κύλινδρος), a name given generally to the surface formed by a straight line which moves parallel to itself, whatever may be the guiding curve but frequently confined to the common definition, which supposes the straight line to be of finite length, and to move round the circumference of a circle, keeping always at right angles to its plane. We shall extend this a little and treat of the cylinder which has an oval for its base and the moving line at right angles to the plane of the base whence the cylinder is called a *right* cylinder.

The cylinder may be considered as a cone, of which the apex is at an infinite distance; and many of the general notions in the article CONE may be applied to it.

The content of a cylinder (in cubic units) is the number of square units in the base multiplied by the number of linear units in the altitude. Thus the cylinder being circular, the base having a radius of 10 feet, and the altitude being 7 feet, the number of square feet in the base is 100 × 355 ÷ 113, or 314·59, which, multiplied by 7, gives 2202·13, the number of cubic feet in the cylinder. To find the number of square units in the surface, multiply the number of linear units in the circumference of the base by that in the altitude. Thus in the preceding case the number of feet in the circumference of the base is 20 × 355 ÷ 113, or 62·918, which, multiplied by 7, gives 440·426, the number of square feet in the cylindrical part of the surface, exclusive of its two terminating planes. [Prism, Subcontrary.]

CYMATIUM. [Column.]

CYMBA. [Volutidæ.]

CYMBALS (κύμβαλον), metallic musical instruments of percussion, which are traceable to the remotest ages of antiquity, and, with no great change in form, are still used by the moderns. They are always in pairs, are made of brass, and, according to Greek sculptures and medals, antiently took, as their name imports, a more cup-like shape than at present. Servius says that the cymbals were consecrated to Cybele—that is, were employed by her priests—because they represented the two celestial hemispheres which surround the earth. They are now nearly flat, about twelve inches in diameter, the central part sunk in, and at the back of the sunken portion is a strap, by which each instrument is held. The sound is produced by striking them more or less violently together, and in the open air they produce a very martial effect, but are entirely out of place in the theatre and concert-room. Into the latter, indeed, they have not yet often intruded, but in modern theatrical music they take a prominent part, the composer now making up by noise what he wants in genius and taste.

CYMBU'LIA. [Thecosomata.]

CYME, an irregular kind of panicle, having a corymbose appearance, and in which each branch is stopped in its growth after producing a single flower, when it is forced to form lateral branches, which are themselves stopped after forming one flower. The common Laurustinus or the Elder-bush offer examples of this sort of inflorescence.

CYMODOCEA. [Isopoda.]

CYMO'THOA. [Isopoda.]

CYNANTHUS. [Humming Birds.]

CY'NARA, a genus of Compositæ, in many respects like the thistle, but having an involucre composed of thick fleshy spiny scales, and a remarkably thick fleshy receptacle, covered over with numerous bristles. The two species most known are the Artichoke and the Cardoon.

C. Scolymus, the artichoke, so long cultivated in our gardens as a vegetable, came originally from the south of Europe, and though it has long been cultivated in the regions of the north, it does not resist the very severe cold of winter. Its perennial root is thick, fleshy, hard, branching, and gives rise to a cylindrical, glabrous, rather branching stem, from two to three feet high, to which are attached very large pinnatifid leaves, of a pale green above, whitish beneath, deeply serrated in lobes, and irregularly toothed. The heads stand singly at the top of the ramifications of the stem; they are as large as the doubled fist; their receptacle is very thick, fleshy, concave, furnished with simple bristles; the leaflets of the involucre are broad, thick, and terminated in a spiny point. All the florets are hermaphrodite and of a clear violet colour; the tube of the corolla is very long; its limb has five very narrow segments; the staminal tube is very prominent, of the same colour as the corolla. The pappus is sessile and feathery. The root of the artichoke is rather bitter, the stem still more so. It was formerly employed as a diuretic, but it has long been cultivated only as a kitchen garden plant. Everybody knows that the heads of the plant are gathered before the expansion of the flowers, and that the receptacles or the base of the involucral scales are eaten, either raw or after having been boiled in water. The artichoke when cooked is an agreeable food, not very nourishing perhaps, but easy to digest. The receptacles, or artichoke bottoms, may be preserved for winter use by drying them after having blanched them in boiling water.

C. Cardunculus, the Cardoon. The country of the cardoon is the same as that of the artichoke; it is found in the southern countries of Europe and in the north of Africa. Its thick and fleshy leaves cut into spiny lobes with very prominent ribs, its more slender stems terminated by heads of flowers three or four times smaller, with a thin receptacle, and the scales of the involucre armed with sharp spines, easily distinguish it from the artichoke. Some authors, however, have endeavoured to prove that the artichoke is only a variety of the cardoon. This opinion, however, does not appear well founded; for if it were so, among the great quantity of cardoons that are cultivated in gardens some plants would be found transformed into artichokes, which has never happened. In this species it is the rib, or the middle nerve of the leaves, which is eaten. When cooked it is tender, and its flavour greatly resembles that of the artichoke. It is in general a choice dish, and seldom seen except at the tables of persons in easy circumstances.

CYNAREÆ. [Compositæ.]

CYNAROCE'PHALÆ. [Compositæ.]

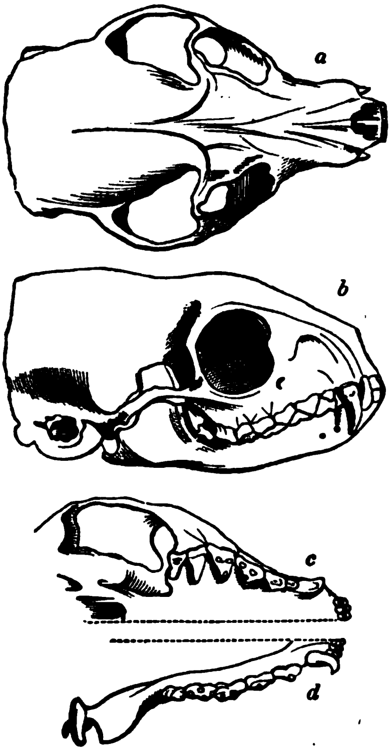
CYNA'RRHODON, a name given sometimes to the hep of the rose, which is a fruit composed of a succulent calyx-tube enclosing a number of hard dry hairy nuts.

CYNICS, the name of a sect of Greek philosophers who were produced by the school of Socrates, and were so called according to one interpretation of the word (κυνικοί, dog-like) from their snarling disposition, though it is possible that the name may have been derived from the gymnasium called Cynosarges, in which Antisthenes, the founder of this school, used to lecture. [Antisthenes.] Their doctrines were the exact opposite of those of the Cyrenaics, who were also an offshoot of the Socratic philosophy. [Cyrenaics.] They held that virtue was not only the highest but the only object at which men ought to aim, and that most of the sciences and arts, as they do not tend to make men virtuous, but sometimes on the contrary interfere with the attainment of it, are unprofitable and pernicious. The true philosopher, according to their notions, was he who could discard all the comforts and charities of life and triumph over his bodily wants, so as to be enabled to live only for virtue without any interruptions either to the contemplation or the practice of it. The result of these principles was great strictness of morals, and voluntary penances worthy of the fanaticism of an eastern dervise; and as long as these characteristics were coupled with ability in the professors and consistent philosophy in what they taught, the sect maintained its place by the side of other philosophical systems, and some members of it, for instance Antisthenes and Diogenes, deserved and obtained great celebrity. [Diogenes.] At length, however, the morality of the Cynics degenerated into the most shameless profligacy (see the case of *Crates* and *Hipparchia* in Diogen. Laërt., vi., § 97), and they became so disgusting from their impudence, dirty habits, and begging, that they ceased to be regarded with any respect, and the sect dwindled away into obscurity. Of their speculative opinions we know very little: indeed it does not appear that they had any theories except on the science of logic. The great merit of the Cynic philosophy was that it paved the way for the establishment of Stoicism, which succeeded and superseded it, just as the philosophy of Epicurus supplanted that of Aristippus. The connexion of this school with the philosophy of Socrates appears to have consisted in their developing the idea of science as applied to morality (to which object the labours of Socrates were mainly directed), but they did so to the exclusion of all those other principles which Socrates admitted as useful adjuncts, and his sneers at the austerity and affected negligence of Antisthenes may be taken as a proof of the low opinion which he entertained of this narrow application of his doctrines. (Diogen. Laërt., vi., § 8; ii., § 36.) The classical reader will find in Lucian's *Cynicus* an attempt to justify some of the peculiar views of this school, especially in regard to their neglect of the conveniences of life, though it is not to be supposed that Lucian was inclined to the Cynical philosophy, for he elsewhere ridicules it. (See the *Lapithæ* and the *Vitarum Auctio*.)

CYNICTIS (Zoology), a genus of *Carnivora* established by Mr. Ogilby for a mammiferous quadruped connecting the family of the *Civets* with that of the *Dogs*.

Generic character. Dental formula:—incisors, $\frac{6}{6}$; canines, $\frac{1-1}{1-1}$; molars, $\frac{6-6}{5-5}$. Of these last the three first are spurious, the fourth is the carnassier, and the rest are tuberculated. *Feet*, digitigrade; toes, 5 – 4, with long falcular claws adapted for digging. *Tail*, long, bushy.

'This system of dentition,' says Mr. Ogilby in his paper in the 1st volume of the 'Zoological Transactions,' 'is, in most respects, extremely similar to that which is common to the *Viverræ* in general, and particularly to the genus *Herpestes*, from which the *Cynictis* differs principally in the absence of the rudimentary false molar of the lower jaw, in having that of the upper jaw in contact with the canine, and in a few other circumstances of very minor importance when compared with the general character of the organization. From the *Ryzæna* or *Suricate*, on the other hand, the dental system of *Cynictis* differs in the presence of the superior rudimentary false molar, being thus directly intermediate, in point of dentition, between this genus and the Herpestes; and it is not a little singular that it should bear precisely the same relation to both these genera in the form and number of its toes. The *Herpestes* have rudimentary false molars both in the upper and under jaws, and five toes both before and behind; the *Cynictis* has rudimentary false molars only in the upper jaw, five toes on the fore and only four on the hind feet; the Ryzæna has no rudimentary false molars in either jaw, and four toes only, as well on the anterior as on the posterior extremities. These traits of zoological character strongly point out the true natural relations of all these animals, and demonstrate the relative positions which they occupy in the system of nature. With the single exception of the *Proteles*, there is no other known genus of the *Viverra* family which possesses the same number of toes and complete digitigrade extremities which form so prominent a character in the Cynictis[*]. Here however all analogy ceases between these two genera. It is true that we are at present ignorant of the adult characters of the dentition of the *Proteles;* when we become better acquainted with this important part of its organization, we may perhaps discover additional points of relation between it and the present genus; but in all its most striking external characters it is completely different, and seems to occupy an intermediate station between the *Dogs*, the *Civets*, and the *Hyænas*. In addition to these characters the *Cynictis* may be readily distinguished by its external form and appearance from all conterminous genera. It has a short head, contracted suddenly in front of the eyes, and forming a small naked muzzle, divided by a longitudinal furrow; the ears are short and elliptical, naked inside, and directed forwards; the body long and slender; the tail bushy, and two-thirds of the length of the body, and the whole external form and appearance not unlike that of a *Ferret* or *Ichneumon*. The temporal *fossæ* are separated from the orbits by a complete rim of bone.



[Skull of Cynictis]

a, seen from above; *b*, profile of the same; *c*, half of cranium seen from below, showing the position of the teeth in the upper jaw · *d*, half of the lower jaw seen from above (from Mr. Ogilby's figure)

Example. *Cynictis Steedmannii* (Ogilby), named after Mr. Steedman, to whom zoologists are indebted for a knowledge of the animal.

Description.—Length of the head from the muzzle to the root of the ear, 2½ inches; length of the ear. ¾ of an inch; breadth of the ear, 1¼ inch; length of the body from the muzzle to the root of the tail, 1 foot 6 inches; length of the tail, 1 foot; height at the shoulder, 7 inches; height at the croup, 7½ inches. Hair moderately fine in quality, much resembling that of a dog, smooth and close on the body, long and bushy on the tail. The general colour, as well as the whole external appearance, precisely that of a small *Fox*, bright red over the entire body, head, and extremities, deep and uniform on the back, but mixed with silvery grey on the cheeks, neck, sides, and tail, arising from a mixture of hairs tipt with grey, and dispersed through the fur of these parts. The breast, belly, and legs, unmixed red; and the tail, which precisely resembles the brush of a fox, covered with long bushy hairs of a sandy red colour at the roots, dark brown in the centre and grey at the points the last two inches at the tip of the tail uniform dirty white. Hairs of the body not annulated as in *Herpestes* and the *Suricate*, and altogether of a finer and more furry quality. External form and appearance comparable with those of the *Ferret* and *Egyptian Ichneumon*, but probably standing higher on the legs as being more completely digitigrade.

Locality.—Uytenhage, on the borders of Caffraria. (Ogilby.)

Mr. Ogilby thus concludes his observations on this interesting animal:—'In consulting the works of travellers through the colony of the Cape of Good Hope, I have been able to find but two notices which seem clearly to refer to this animal; one by Dr. Sparrman, the other by Mr. Barrow. The first of these authors in the English translation of his 'Travels,' vol. ii. p. 184, has the following passage. "Two other small animals, which probably likewise belong to the *Viverra* genus, I had only a hasty glimpse of in this colony. The one we saw and gave chase to between the two Fish Rivers made its escape from us, however, by running into a hole underground, and seemed to be somewhat less than a cat, though longer in proportion. The colour of it was a bright red." It is true that this passage records no observation by which we can with certainty refer the animal to which it alludes to, the *Cynictis Steedmannii*, but the size, colour, and habitat are so perfectly similar in both cases, as to render their identity extremely probable. In the following extract however from Barrow's Travels, vol. i. p. 185, the characters are fully reported. "Upon these parched plains" (those of Camdebo, on the eastern confines of the colony) "are also found several species of a small quadruped which burrows in the ground, and which is known to the colonists under the general name of *Meerkat*. They are mostly of the genus of animals to which zoologists have given the name of *Viverra*. An eagle making a stoop at one of these, close to where we were passing, missed his prey, and both fell a sacrifice, one to the gun, the other to the dogs. Both the bird and quadruped appeared to be undescribed species. . . . . The *Viverra* was wholly of a bright chestnut colour; the tail shaded with black hairs, bushy, straight, and white at the extremity; ears, short and round; on the fore-feet, five, and on the hind, four toes; the body and tail each one foot long." 'There can be no doubt,' continues Mr. Ogilby, 'of the animal to which this description refers, a description more minute and accurate than we generally find in the works of travellers. It agrees in every point with the species which forms the subject of the present memoir,

[Cynictis Steedmannii, from Mr. Ogilby's figure.][*]

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[*] N. B. Cryptoprocta, Benn., described subsequently in 'Zool. Trans.' has five toes and claws on each foot. [VIVERRIDÆ.]

[*] Mr. Gray informs us that this animal has been described by Cuvier as Herpestes penicillatus, and by Mr. Smith as Herpestes Levaillantii.

except, perhaps, in the reported dimensions of the tail and body; but this difference most probably arises from the age or sex of the specimens, or from the measures of Mr. Barrow being taken in a straight line, whilst mine followed the different curvature of the head, neck, and body. The name, *Meer-kat*, by which it appears this animal is known to the colonists, signifies a monkey, and is of very general acceptation in South Africa, being applied indifferently to the present species, the *Cape Herpestes*, *Ground Squirrels*, and various other small burrowing animals. Both the passages here quoted confirm the burrowing habits of the *Cynictis Steedmannii*, which I had already inferred from the form of the claws.'

CYNIPS QUERCUS. [GALLS.]

CYNOCE'PHALUS. [BABOON, vol. iii., p. 227.]

CYNOMORIA'CEÆ, an obscure order of Rhizanths, distinguished from Balanophoraceæ by their distinct stamens, and the imperfect perianth of the male flowers. The order is represented by Cynomorium coccineum, the Fungus melitensis of the old herbalists, a plant once in repute for its astringent properties, but now valued only for its rarity and the botanical interest that attaches to it. Dr. Walsh tells us that 'it grows most plentifully on a detached rock on the south-west side of the island of Gozo. It is there much celebrated for its medicinal properties: the time of the discovery of its virtues is not known, but, from some antient MSS., it appears to have been at a very remote period. It had been the usage of Malta to banish to Gozo all females of dishonest character, and here, according to tradition, they found a vegetable substance of an astringent quality, which proved very efficacious in removing the consequences of their irregular life. It was prepared in earthen pots, some of which have since been dug up in various places, marked with Phœnician characters indicating their use. The plant was also applied by them to the purposes of divination. It was laid between the breasts, and, from some accidental circumstances of position, &c., they augured good or bad fortune. This practice was reproved, and said to be finally abolished, by a Capuchin missionary. This curious vegetable was subsequently esteemed as a remedy in dysentery, and its curative powers were long held in very high repute. About the year 1740, the Knights of Malta set such a very high value on this fungus, that they interdicted the approach of any person to the place where it grew, and guarded the passage with the strictest jealousy. In April, when the fungus was ripe, it was carefully gathered by persons appointed for that especial duty, and the precious morsels were deposited in a government office, from whence some portions were sent as presents by the grand-master to different sovereigns, and the remainder distributed among the hospitals of the island. Even after the English took possession of Malta, and succeeded to the territorial rights of the order, and, amongst other things, to the possession of this rock, a *custode* was appointed to take care of it as heretofore, with a salary, which always makes an item in the public accounts of Malta. The fungus is thus continued to be guarded and regularly gathered, deposited in the state-office, and distributed among the hospitals; and when Dr. Hamilton, through the kindness of an official person in Gozo, was permitted to visit this rock, he was accompanied by the *custode*. The rock, as shown by the doctor's sketch, is difficult of approach: it is an isolated precipice, about 600 feet in height, detached from the neighbouring shore, and presenting very steep and inaccessible sides, in some places projecting considerably over the sea, so that the circumference of the base is less than that of the upper parts. It stands on the verge of a noble circular basin, formed by the surrounding cliffs, into which the sea enters by the chasms at each side of the fungus rock, the whole presenting the aspect of the crater of a volcano, raised from beneath, or extinguished by the irruption of the sea.'

CYNOSU'RA (*κυνὸς ὐρά*, the tail of the dog), a name given to the lesser Bear. According to Aratus and Hyginus, Cynosura was one of the nymphs of Mount Ida, who nursed Jupiter. But it is at least as probable that before the Greeks adapted their mythology to the constellations, they had from some oriental source the habit of figuring Ursa Minor as a dog, and that the tail of the dog was the pole star. [URSA MINOR.] Many persons may probably know this word only from the two lines of Milton's Allegro —

Where perhaps some beauty lies,
The Cynosure of neighbouring eyes

These lines have puzzled many, though the reference to the pole star and the property of the magnet gives the image a degree of fitness for poetry which the etymology of the word alone would hardly suggest.

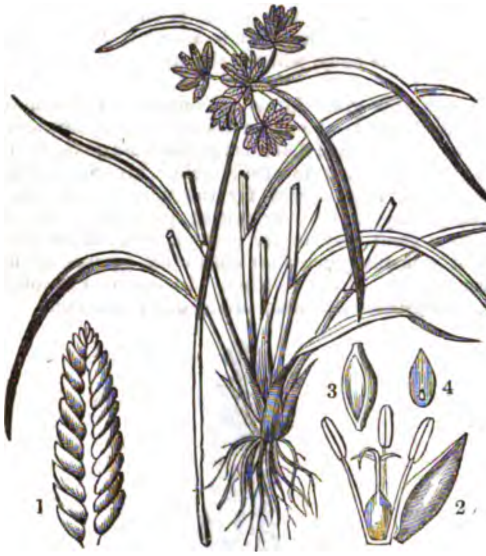
CYNOSU'RUS CRISTA'TUS, a well-known pasture grass, called by farmers crested dogstail or gold-seed, exceedingly abundant in all natural and artificial grass land. It grows with a slender smooth stem to the height of one or two feet, and is terminated by a somewhat cylindrical spike-like panicle of short clusters of flowers; each cluster consists of two flowered spikelets resting upon pinnate bracts. The glumes are two, about the length of the florets the paleæ 2, of which the lowest is sharp-pointed. The styles are feathery; the fruit is a small, yellow, smooth shining seed-like body, whence the common name of gold seed.

Although this grass forms so constantly a portion of all good pastures, it is chiefly on account of the fineness and closeness of its herbage that it is valuable, the quantity of hay that it produces being inconsiderable. Mr. Sinclair hence observes, that 'it is inferior for the purposes of hay, but admirably adapted for permanent pastures. The roots penetrate a great way under ground, from which circumstance it remains green after most other grasses are burnt by a continuance of dry weather. In irrigated meadows it arrives at a greater size than in any other situation.'

[Cynosurus cristatus.]

CY'NTHIA (Zoology), one of the subgenera into which Savigny has divided the *Ascidiæ*. The subgenus *Cynthia* consists of those ascidians whose body is sessile, and which have the branchial sac plaited longitudinally, and the reticulation continuous. Their external envelope or test is coriaceous. The structure comes nearest to that of *Boltenia*. [BOLTENIA.] Example, *Cynthia Momus*. This Ascidian does not attach itself to rocks, but makes shift to float about in the Gulf of Suez by attaching itself to fuci and other submarine plants. (See Savigny's *Mémoire sur les Animaux sans Vertèbres*, Paris, 1816; and Mr. W. S. Macleay's 'Anatomical Observations on the Natural Group of Tunicata,' *Linn. Trans.*, vol. xiv. p. 527.) N.B. M. Latreille has used the term *Cynthia* to distinguish a genus of coleopterous insects.

CYPER'ACEÆ, an extensive natural order of glumaceous Endogens, having much the appearance of grasses, with which they are sometimes popularly confounded. They differ in their stems being usually solid, not hollow, and angular, not round; in the sheaths of their leaves not opening on one side, but forming perfect tubes when the stem is pulled through them; in their male florets having no paleæ nor any covering to the stamens except a single bract, while the bisexual florets have nothing more than a few hypogynous bristles superadded; and finally in their embryo being enclosed in the albumen, and not lying at one side of it. There are other distinctions besides these, but what have been mentioned are the most remarkable. A large proportion of the order bears the name of sedges, and hence the sedge family or tribe is given to these plants as their English appellation. They are mostly inhabitants of marshy or swampy grounds, a few are met with on dry upland pastures, and a good many are Alpine plants. They occur in all parts of the world, and are generally abundant; but little or nothing has been discovered of their uses; their most common application is to the manufacture of what are called erroneously rush mats and rush bottoms for chairs. The plant used in this country for such purposes is not any kind of rush, but the cyperaceous species, Scirpus lacustris. It is not a little remarkable, that nearly as these plants are allied to grasses, they scarcely at all participate in the nutritious quality of that useful order; it is only among the coarse bad herbage of marshes that they are allowed to form a constituent of hay.

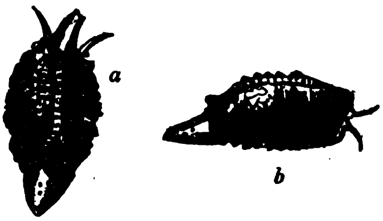


[Cyperus fuscus.]

1, a spikelet magnified; 2, a flower with its bract; 3, a fruit; 4, a section of a seed.

CYPRÆIDÆ. *Cowry Family*. *Cowries*, or sometimes, *Gowries*, *Porcellanen* of the Germans, *Porcelaines* (Porcelain shells) of the French. A family of marine gasteropodous mollusks, well known in commerce from one of the species (*C. Moneta*) being used in some parts of the East as a circulating medium. [COWRY.]

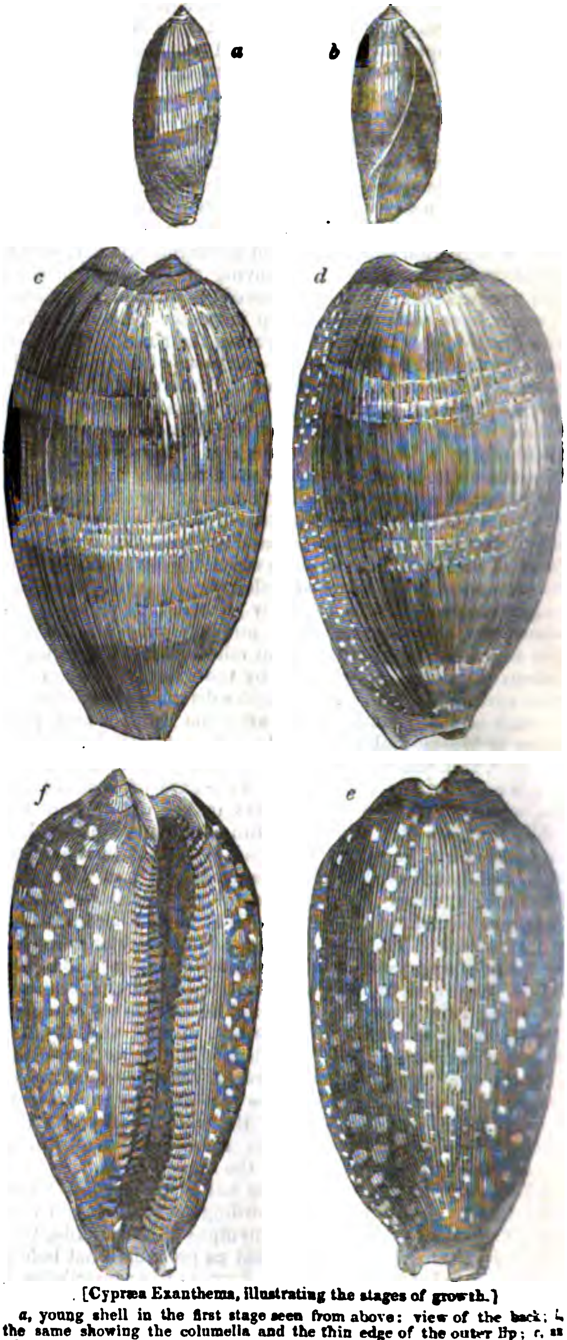
Family character. Animal unisexual, elongated; *head*, distinct, with two conical or subulate *tentacula* of some length, at the external base of which are situated the two sessile *eyes* on small projections; *mouth* vertical, at the bottom of a small cavity, and containing a lingual riband, or lamina, beset with tentacles and prolonged in the abdomen. *Branchial cavity* open, situated near the back of the neck; gills arranged in a longitudinal pectinated series on the inside of the columella on the left side of the mantle; siphon very short, and formed in the mesial line by the edges of the two lobes. *Mantle* bilobated, the lobes very large with extended aliform edges, capable of being reflected over the back of the shell so as to join on the mesial dorsal line. *Foot* oval, elongated, very large. *Vent* at the extremity of a tube behind the branchial cavity. *Male organ* situated more forward, and communicating with the orifice of the deferent canal by means of a furrow. *Adult shell* involute, highly enamelled, oval or oblong, more or less rounded or cylindrical with a small and imbedded spire; aperture longitudinal, nearly straight, toothed, or plaited, on each side, with a channel or groove at each end, inner lip flattened or sub-concave, outer lip involute. No *operculum*.



[Cypræa (Trivia) Pediculus.]

a, the animal seen from above; *b*, side view of the same.

Mr. Gray, whose arrangement we select, as being, in our opinion, the best which has hitherto appeared, thus notices the very great change of form that the young shell undergoes in its progress to perfection. 'The shell alters its appearance considerably, according to the age of the individual, and exhibits three very distinct stages. In the young or first stages, which are figured in 'Ency. Méthod.,' t. 349, f. *a. b.*, 'Mus. Gotwald,' viii. t. 53, *b. e.* 65, *a. f.* 66, *a. c.*; the shell is generally smooth, of a plain greyish colour, or with three longitudinal bands, and the upper part of the *inner lip* is smooth, convex, the lower part flat or concave; the *outer lip* thin. In the second stage the shell begins to assume more the character of the genus, as the outer lip begins to be inflected or rather thickened, and approaches nearer the perfect appearance of the species as the second coat of colour is deposited; but differs from it in the want of thickness of the shell and the spire being more distinct, and in the want of the dorsal line, which is usually distinct in the third or perfect state, where the last coat has been deposited*, and



[Cypræa Exanthema, illustrating the stages of growth.]

a, young shell in the first stage seen from above: view of the back; *b*, the same showing the columella and the thin edge of the outer lip; *c*, an advanced stage; view of back. The apex is already sinking, and the thickened lips are formed; *d*, still further advanced: the mantle has begun to secrete the enamelled spotted coat on the side, but the transverse stripes are still visible; *e*, the perfect shell; all traces of the transverse stripes lost under the enamelling of the thickened spotted coat; *f*, view of under side of the perfect shell.

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* By the mantle.

the aperture is more plaited on both sides. The colouring, or at least, the disposition of the colouring here, is a much more certain characteristic of species than either the general outline of form or size, the latter of which is exceedingly various. In this family I have often observed full-grown specimens of *C. Arabica* from one to three inches long; this peculiarity is attempted to be explained by Lamarck and others, who assert that when the animal has formed a complete shell, as it has not the faculty of enlarging its size, it is obliged to quit its shell and form a new one, in the same manner as the *Annulosa* cast their skins, and by that means the same animal forms many shells; but I believe there is not the slightest ground for this notion.'

Mr. Gray has recently observed, that sometimes, though rarely, the young shells of *Cypræa*, especially *C. Arabica*, have the inner edge of the outer lip thickened and furnished with a compressed sharp-edged series of teeth.

Geographical Distribution, Habits, &c.—Cypræidæ abound both in the old and new world, but their greatest development both in point of size and number of species takes place in warm climates. A very few species are inhabitants of the European seas. The family are littoral, and are generally found under stones or rolled corals.

Genera CYPRÆA (Cowry).

Generic character.—The young shell smooth, the adult with both lips toothed; the anterior and posterior canal distinct, recurved; the front end of the columella lip smooth, edged by a single large oblique fold, separated from the teeth by a deep groove. (Gray.)

*

Sub-genus. 1.

Cypræa.

The front of the columella broad, deeply impressed; *shell* mostly smooth.

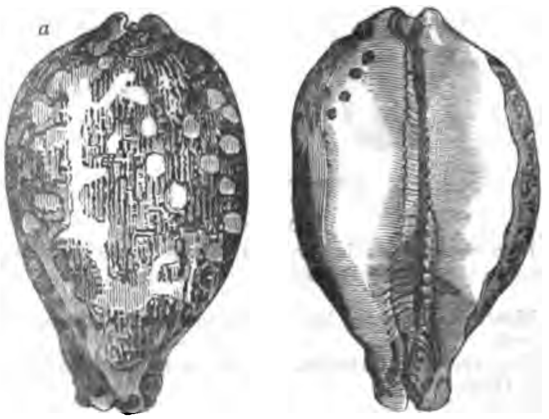
a.

Shell smooth; columella-pit transversely ridged; teeth of inner lip generally long. (Gray.)[*]

Under this division of the sub-genus Mr. Gray arranges twenty-seven species, including some of the rarest forms,—*Cypræa Aurora* (the Morning Dawn, or Orange Cowry), and *Cypræa Princeps*, for example,—together with *Cypræa Tigris* (the Tiger Cowry), and other common species.

Example.—*Cypræa Mappa*, the Map Cowry.

Description. Shell more or less ventricose, ovate, varied with deep brown or yellow lines, and spots. Dorsal line laciniated. Margin thick, spotted with black; teeth yellow. Locality, Indian Ocean.



[Cypræa Mappa.]
a, seen from above; *b*, seen from below.

There are many varieties, among which the rosy variety, the dark variety, from the Pearl Islands; the citron variety; and the dwarf rich-mouthed variety from the Mauritius, are the rarest or most beautiful. The young shell is of a fawn colour with obsolete spots and dashes.

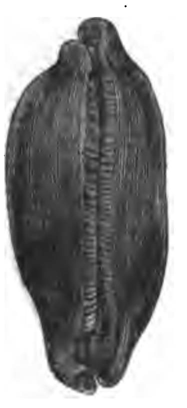
β.

Shell smooth; columella pit (nearly) smooth; teeth of inner lip short or indistinct.

Under this division of the sub-genus Mr. Gray arranges fifteen species.

Example.—*Cypræa Talpa*, mole cowry; Sardonyx Cowry of Gray.

Description.—Shell oblong ovate, subcylindrical, yellowish, with three darker bands; the subangular base and teeth brown or black; mouth pale. There is a variety (*Exustus*) shorter, darker, and with the teeth smaller and closer.



[Cypræa Talpa.]

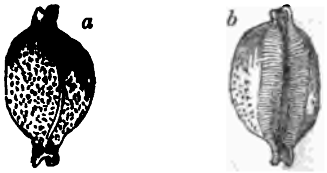
γ.

Shell with the back warty (rarely smooth), base ridged.

Under this section Mr. Gray enumerates three species.

Example.—*Cypræa Cicercula*, Vetch Cowry.

Description.—Shell subglobose, yellow, brown dotted, with a dorsal groove, and scattered tubercles over each extremity; base four-spotted, partly grooved.



[Cypræa Cicercula.]
a, seen from above; *b*, seen from below.

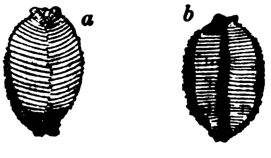
There is a larger variety which is more oblong, smooth, and is without the dorsal groove (*C. Globulus*).

δ.

Shell with transverse ribs.

Only two species are enumerated by Mr. Gray, and one of these, *C. rugosa*, Brod., is fossil.

Example.—*Cypræa Childreni, Children's Cowry*, Gray.



[Cypræa Childreni.]
a, seen from above; *b*, seen from below.

ε.

Shell with longitudinal and transverse ribs.

One species only, Cypræa Adamsonii Gray; Adamson's Cowry, very rare.

Description.—Shell ovate; pear-shaped, white, brown mottled. Locality, Pacific Ocean? (Gray).

[Cypræa Adamsonii.]

* *

Sub-genus 2.

Aricia.

Front of the columella flat, or nearly so; back of shell smooth.

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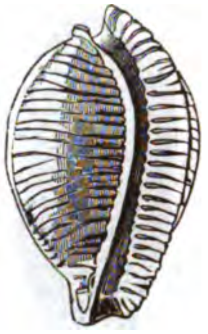
[*] The descriptions are throughout almost entirely Mr. Gray's, as well as the arrangement.

α.

Margin of the shell pitted on the upper edge. Fourteen species.

Example.—*Cypræa guttata*, Gmel. Blotched Cowry, Gray.

Description.—Brown, pale spotted, base and margin white, brown-ridged: a beautiful and rare species. Locality, Red Sea? (Gray).



[Cypræa (Aricia) guttata.]

β.

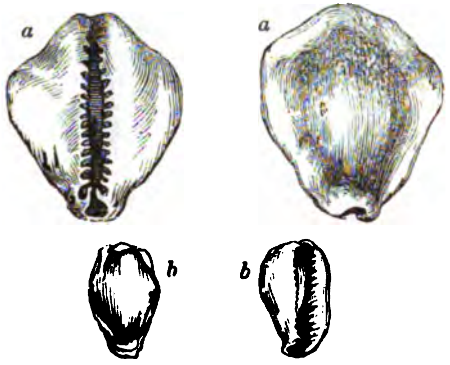
Margin entire; teeth of both lips extended more or less over the base. Thirty-seven species.

Example.—*Cypræa Moneta*, Linn. Money Cowry.

Description.—Shell yellow or white, with a yellow ring; margin and base tubercular; teeth of inner lip moderate.

Varieties.—*a.* Without a ring; *b.* with the margin and base less tubercular. [Cowry.]

Young.—Whitish with two dark bands. (*C. icterina*, Lam.)



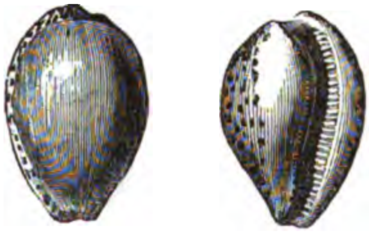
[Cypræa (Aricia) Moneta.]
a, adult; *b*, young.

γ.

Margin entire; teeth of inner lip very small, forming a slight ridge; front of columella lip slightly concave, produced, and toothed internally. Two species.

Example.—*Cypræa angustata*, Gray.

Description.—Shell whitish brown, minutely brown dotted; base white; margin closely black dotted, ends blackish. Worn plain brown, varying in darkness. Locality, New Holland.



[Cypræa (Aricia) angustata.]

Sub-genus 3.

Naria.

Front of the columella narrow dilated into a sharp-toothed ridge; shell smooth.

One species only, *Cypræa irrorata*, Gray.

Description.—Shell ovate, purplish, yellow dotted; bas white, flat; teeth large. Locality, South Seas. Most allied to *C. Felina*, variety 1.

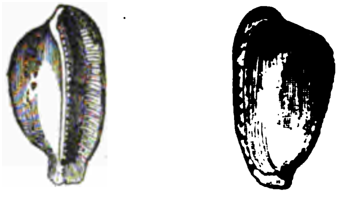
[Cypræa (Naria) irrorata.]

Luponia.

Shell like Cowry, but front end of the columella lip crossed by several irregular ridges, without any distinct marginal one, internally narrow, flat; shell pear-shaped, smooth, or cross-ribbed.

Five species. Example, *Luponia Algoensis*, Algoa Lupon, Gray.

Description.—Shell pale, brown dotted; base smooth; teeth of inner lip very small; margin black dotted. Variety with the teeth more or less obliterated. Locality, Cape of Good Hope.



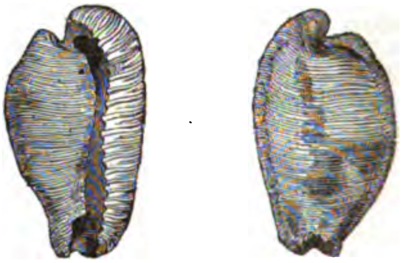
[Luponia Algoensis.]

Cypræovula.

Like Cowry, but front end of columella covered with regular cross-ribs, like rest of base, internally produced into an acute-toothed ridge. Shell pear-shaped, cross-ribbed.

One species, *Cypræovula Capensis*, Cape Cypræovula, Gray.

Description.—Pale brown; ribs very thin, continued, sharp. Locality, Cape of Good Hope: very rare.



[Cypræovula Capensis.]

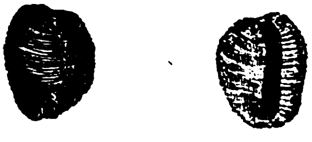
Trivia.

Like *Cypræovula*, but front of columella internally concave, ribbed. Shell subglobular, cross-ribbed.

α.

Mouth wide; outer lip slightly inflexed; shell equally ribbed.

Five species. Example, *Trivia carnea*, *Flesh-coloured Pig*, Gray.



[Trivia carnea.]

Description.—Shell oblong, thin, pellucid, pure rose-coloured, with very thin, distant, continued ribs; lips whitish. Varies with an indistinct dorsal groove.

Mr. Gray observes, that *Pig* is the common name of these shells on the coast, and that they are called *Porcelli* in Italy. He adds, that *Porcellain*, the common name for

Cowries, is taken from the fancied resemblance of these shells to pigs, and refers to Fabius Columna, &c.

β.

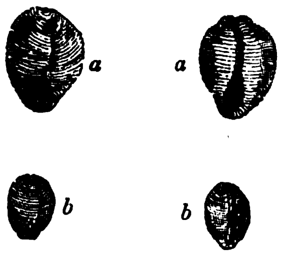
Mouth narrowish; outer lip wide; ribs of back subequal, linear.

Eighteen species. Example, *Trivia Europæa, European Pig*, Gray; *Cypræa Europæa*, Lam.

Description.—Shell ovate, subglobose, ash or flesh-coloured, with three black dots, and a whitish dorsal streak; ribs close, rather thick, whitish; base white; outer lip wide.

Variety.—Back spotless, with an indistinct dorsal groove. (*Cypræa Arctica*, Mont.)

Young white and smooth.



[Trivia Europæa.]
a, adult; *b*, young.

γ.

Mouth narrowish; the outer lip arched; the ribs enlarged or tubercular near the dorsal groove.

Seven species. Example, *Trivia Pediculus*, Louse Pig, Gray; *Cypræa Pediculus*, Linn.

Description.—Shell ovate, pale reddish, with six square, black, dorsal spots; ribs rather thick, subrugose, crowded; dorsal line narrow; base reddish. Locality, West Indies.

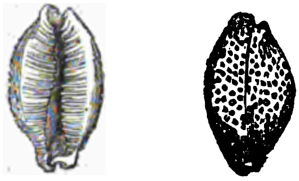
[Trivia Pediculus.]

δ.

Mouth narrow; ribs tubercular; dorsal line distinct; front of columella smooth.

Two species. Example, *Trivia pustulata, Pimpled Pig*, Gray; *Cypræa pustulata*, Lam., commonly called by collectors the Small-pox Cowry.

Description.—Purplish-brown; ribs studded with red-brown, black-edged warts. Locality, Pacific Ocean.



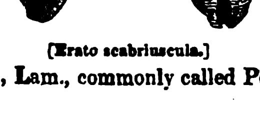
[Trivia pustulata.]

ERATO (Risso.)

Spire conical; apex sub-mamillary, blunt; shell, when young, smooth; the adult with both lips finely crenulated; the columella concave slightly radiatedly plaited or smooth, with two or three folds in front; the anterior canal straight, the hinder indistinct.

Seven species. Example, *Erato scabriuscula, Roughish Tear-shell*, Gray, *Marginella Cypræola*, Sow.

Description.—Shell ovate, turbinate, livid, purplish, minutely tubercular; spire conical; dorsal line impressed; mouth wide, whitish, inner lip largely plaited its whole length; teeth large, young, smooth; lip thin, toothless. Locality, South Pacific, St. Elena.



[Erato scabriuscula.]

OVULUM (Ovula, Lam., commonly called Poached Eggs.)

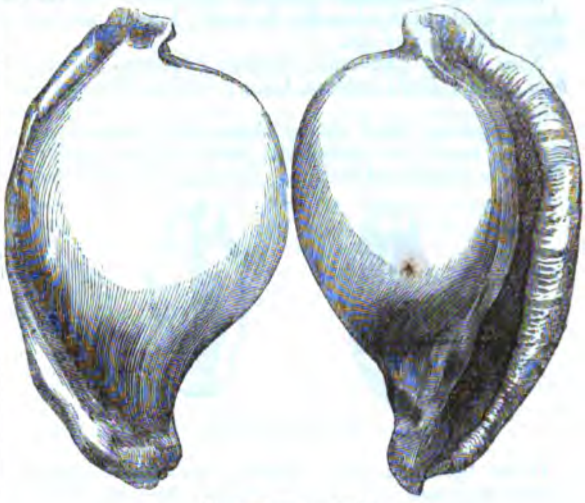
Generic Character.—The shell, when young, spirally striated; when adult, covered with a smooth enamelled coat; the inner lip toothless; the outer toothed or crenated; the anterior and posterior canal more or less elongated.

α.

The outer lip broad, inflexed, rounded, crenulated; extremities short; front of columella rounded.

Of this subdivision Mr. Gray enumerates two species. Example, *Ovulum ovum, Ovula oviformis*, Lam.; *Bulla ovum* Linn., *Common Poached Egg*.

Description.—White; back rounded; inside orange-brown.



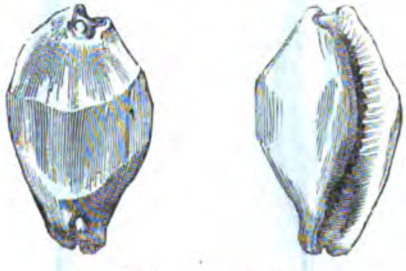
[Ovulum ovum, adult.]

β.

Outer lip inflexed, broad, toothed; ends short, curved; hinder end with a tooth on the inner side; front of the columella expanded beneath.

One species only, *Ovulum verrucosum, Ovula verrucosa*, Lam.; *Bulla verrucosa*, Linn.; *Two-warted Poached Egg*, Gray.

Description.—Shell ovate; back angular; extremity rosy, with a depressed wart above. Young closely striated; ends brown-edged. Locality, Indian Ocean.



[Ovulum verrucosum.]

γ.

Outer lip inflexed, rounded, narrow, toothed; rest like sect. β.

Four species. Example, *Ovulum Margarita*, Sow.; *Pearl Poached Egg*, Gray. Shell ovate, subglobose, white, pointed in front, ventricose; base convex; hinder tubercle rugose; front of columella concave; outer lip rounded. This with six brown dots artificially made is *Ovula punctata* of Duclos, Bull. Sci.; Guerin Mag. 27. Locality, Friendly Islands.

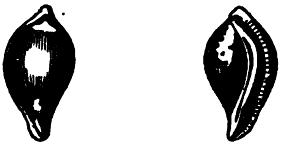
[Ovulum Margarita.]

δ.

Outer lip slightly inflexed, narrow, keeled externally, with edge shelving inwards; the rest like the former.

Seven species. Example, *Ovulum pyriforme* Sow., *Pear-shaped Poached Egg*, Gray.

Description.—Shell pear-shaped, yellowish-white, attenuated in front; front of columella concave; outer lip shelving inwards. Locality, New Holland.



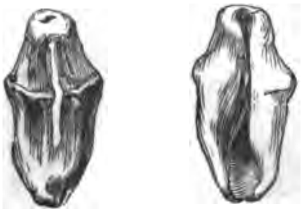
[Ovulum pyriforme.]

ε.

Outer lip thickened, inflexed, toothless; extremities short; front of the columella flattened; hinder part with a fold, obliterated by age.

Nine species. Example, *Ovulum gibbosum, Ovula gibbosa*, Lam.; *Bulla gibbosa*, Linn.; *Gibbous Poached Egg*, Gray.

Description.—Shell oblong, blunt, white; margin yellow, covering nearly the whole shell; back with an angular rib. Varies in length and breadth. Locality, Atlantic Ocean.

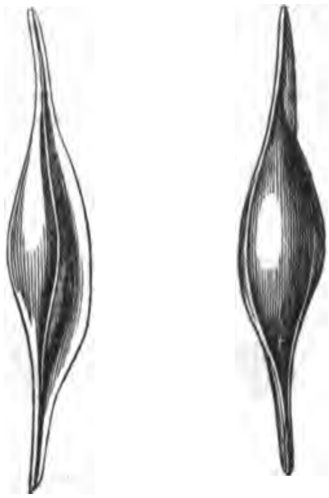


[Ovulum gibbosum.]

ζ.

Outer lip thickened, inflexed, toothless, extremities rather elongated; the hinder conical, straight; the rest like the former.

Four species. Example, *Ovulum longirostratum*, Sow.; *Goodhall's False Spindle*, Gray. Shell fusiform, white, thin; beak very long, curved; mouth linear rather expanded in front. Locality, Adriatic.



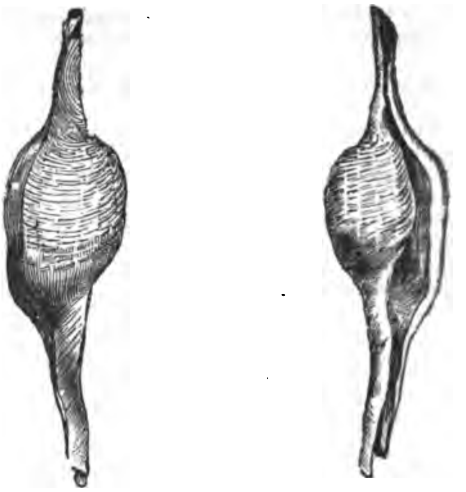
[Ovulum longirostratum.]

η.

Outer lip thickened, slightly inflexed, toothless; the front of the columella rounded, the extremities very long. (Volva, De Montf)

One species only, *Ovulum Volva, Ovula Volva*, Lam.; *Bulla volva*, Linn., Common Weaver's Shuttle.

Description.—Shell oval, flesh-coloured, striated; outer lip pink; the beaks long, flexuous. Locality, China.*



[Ovulum volva.]

Place in the Animal Series.—Lamarck places *Cypræa* between *Ovula* (*Ovulum*),—which is immediately preceded by *Marginella* and *Volvaria*,—and *Terebellum*, *Ovulum* being the first genus of his *Enroulées* (Involute Trachelipods). Cuvier arranges the genus between *Conus* and *Ovula*, (which last is immediately succeeded by *Terebellum*,) in his third family of pectinibranchiated gastropods or *Buccinoidea*. De Blainville's position for the Cowries is in his third family, *Angyostomata*, of his *Paracephalophora Dioica*, between *Peribolus* (which almost all agree to be a genus established on the young form of *Cypræa*) and *Ovula*, *Peribolus* being preceded by *Marginella*, and *Ovula*, the last genus of his first order, *Siphonobranchiata*, being succeeded by *Trochus*, the first genus of his first family *Goniostomata*, of his second order of *Paracephalophora Dioica*, viz., *Asiphonobranchiata*. Rang, in his Manual, places *Cypræa* (including *Peribolus*) between *Oliva* and *Ovula*. In Deshayes's Tables, the genus stands between *Ovula* and *Oliva*.

Mr. Gray (*Zool. Journal*, vol. i., p. 73) says, 'This family appears to be allied to the subfamily *Cassideæ*, amongst the *Buccinöideæ*, by means of the *Cassis Testiculus*, of which Lamarck observes, "ce casque a un peu l'aspect de certains Cypræa;" but the affinity is not slight, for in the shape and form of the aperture, which has a groove or canal at each end, both of the lips plaited, and the front part of the columella flattened, it accords with those *Cypræa*; but the outer lip is not inflected, nor is the back of the shell covered with a china-like coat, but with epidermis, and the canal in front of the aperture is recurved. The *Ovulæ* on the opposite side the family, have certainly great affinity to the *Bullideæ* (Bullidæ), as is pointed out by Linnæus, who places them all in that genus, but *Bulla* differs most essentially from them; in the animals by the position of their branchiæ and their being half hermaphrodite, and in the shell by the aperture being rounded and quite entire at each end, and the edges not being thickened, nor the back covered with a shelly coat, for the shell is here covered with the soldered reflected lobes of the mantle; the connexion is most apparent by means of *Ovula patula* and *Bulla Naucum*, in the latter of which there are some slight appearances of a curved canal at each end of the aperture, as in the character of the *Cypræideæ* (Cypræidæ), but it has not the enamelled back.

'This family has some analogy in their polished coats, first to the *Marginellæ*, which induced Montagu to call a species of that genus, *Cypræa Voluta*; and, indeed, such is the affinity between the young of this species, which has been called *Bulla diaphana*, that Dillwyn has considered it as the young of *Cypræa Europæa*; in which Montagu appears also to have coincided, until he observed a totally different construction in the animal: but I believe that *M. persicula* is the most analogical species of this genus; and secondly, to the *Olivæ*, which differ essentially in having an operculum, and all the characters of the *Buccinoideæ* (Buccinidæ).'

These observations were written before a more extended examination enabled Mr. Gray to propose the natural arrangement including the genus *Ovulum*, which we have given above from his monograph; but we have laid them before the reader because they contain many useful remarks.

Fossil Cypræidæ.

Fossil shells of this family do not appear to have been found below the Supracretaceous group. Mr. G. B. Sowerby speaking of the genus Cypræa (Genera) says, 'of these,' the fossils, 'we have several species in Britain, in the London clay and crag; many others are found on the Continent, as in the calcaire grossier in the environs of Paris; at Laugnan, near Bordeaux, and in Normandy; also in Italy and Piedmont; we have seen specimens of a very fine fossil species, nearly resembling *C. mus* from the Netherlands: they seem to be confined to the newer formations.' Lamarck enumerates eighteen fossil species of *Cypræa*, and two of *Ovulum*. Deshayes, in his Tables, makes the number of living *Ovula* eighteen, and the number of fossil (tertiary) species six. Three species, *O. Spelta*, *O. birostre*, and a new species he makes both fossil (tertiary) and living in the Mediterranean, the Indian Ocean, and the Mediterranean respectively. The number of living species of *Cypræa* he makes 138, and the number of fossil (tertiary) 19. He considers *Cypræa lurida* (Medit.), *rufa* (ibid.), *Annulus* (African Ocean), *Coccinella* (European Ocean), *a new species* (Sicily), and another *new species*, *Sphæriculata?* Lam., with an unknown habitat, as both living and fossil (tertiary).

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* The reader should also consult Mr. G. B. Sowerby's monograph of the genus Ovulum in his Species Conchyliorum.

Mr. Gray notes the following as fossil:—

Cypræa.

Cypræa Physis, Brocchi (*C. Pyrula*, Lam.), Plaisantin or Placentin; *C. leporina*, Lam.; *C. gibbosa*, Gray; *C. tumidula*, König, Bordeaux: and he observes, that *C. annularia*, Brogn., appears to be an allied species; *C. fragilis*, Gray; *C. Deshayesii*, Gray; *Ovula tuberculosa*, Duclos; *C. inflata*, Lam., Grignon, allied to *Ovulum; C. subrostrata*, Gray, Nehove; *C. fabagina*, Lam.; *C. diluviana*, Gray; *C. rugosa*, Brod., Turin.

Luponia.

L. elegans, Gray; *Cyp. elegans*, Defr.; *L. dactylosa*, Gray; *Cyp. dactylosa*, Lam.; *Cyp. Gervillii*, Sow.; *Cyp. Georgii*, Defr.

Trivia.

T. Barcinensis, Gray; *Cyp. Barcinensis*, König, Barcelona; *T. sphæriculata*, Cyp. Lam.? Italy; *T. acuticostata*, Gray, Italy; *T. pediculöides*, Gray, Italy; *T. Porcellus*, Gray, Crag? *T. Bronnii*, Gray, Italy; *T. solida*, Gray; *T. avellana*, Sow., M. C., Suffolk Crag, which, Mr. Gray observes, appears to be an allied species; *T. Duclosiana*, Gray.

Erato.

E. ventricosa, Gray, Italy.

Ovulum.

O. Lethesii (*Leathesii?*), Sow., M. C.

Mr. Gray makes the whole number of species of *Cypræidæ*, including the subgenera above indicated, and the fossil as well as the living species, 174. If *Cyp. nivosa*, Brod., is to be considered as a well-established species distinct from *Cyp. Dama*, as Mr. G. B. Sowerby (*Zool. Journ.*, vol. iv., p. 220) and others contend, the number will be 175, provided *C. Broderipii*, Gray, be not also a variety of *C. Dama*, as Mr. Gray says it perhaps may be. To these are to be added eight living species recorded by Mr. Gaskoin, and one by Mr. Reeve, in the *Zoological Proceedings for* 1835, as hitherto undescribed; and *C. umbilicata*, Sow., provided it be not a variety of *C. pantherina*, as Mr. Gray states it to be, but which Mr. Sowerby does not allow, considering it an established species more nearly allied to *C. pantherina* than *C. Tigris*.

M. Duclos has long promised a monograph of this family, but it has not yet appeared.

CYPRESS. [CUPRESSUS.]

CYPRIA'NUS, ST., THA'SCIUS CÆCILIUS, one of the most eloquent of the Latin fathers, was archbishop of Carthage towards the middle of the third century. The facts and dates relating to the early portion of his life are stated by different writers with a variation which occasions uncertainty. He was probably born about A.D. 200, at Carthage, where, before his conversion to Christianity, he acquired considerable affluence as a teacher of oratory, then so indispensable to success in all public affairs, from the ignorance of the great mass of the people, and the consequent facility and necessity of operating upon them by rhetorical artifice and arguments addressed to the passions—expedients which Cyprian, in the exercise of his episcopal office, appears to have duly appreciated, if we may judge by the florid style of his declamations, and his frequent recourse to the authority of celestial visions and miraculous events. His career as a Christian appears not to have exceeded ten or twelve years; for it was not until about the fiftieth year of his age that he was gained over to the church of Carthage by Cæcilius, a presbyter, whose name he henceforth adopted. On his conversion, he sold his mansion and estate for the benefit of the poor, and observed, in his mode of life, the most ascetic severity. It is stated, however, that, from some unexplained circumstance, he afterwards became repossessed of his property. Having held for two years the office of presbyter, to which he was elected on his joining the Christian community, he was importuned by the people to become their bishop, in opposition to several other presbyters who sought the promotion, and he is said to have been shut up in his house by the assembled populace, who barricaded all the outlets to prevent his escape, which in vain he attempted to make at an upper window. He was consequently installed archbishop of Carthage; but the persecution under the Emperor Decius having soon afterwards commenced, Cyprian fled, and so closely concealed himself during about a year and a half, that the place of his retreat appears never to have been known. This flight and long desertion of his flock occasioned much scandal against the church, and caused the clergy of Rome to address those of Carthage on the subject. (Cypr. *Epis.* 2.) The plea anxiously alleged by the archbishop and his apologist Pontius is an especial revelation from God in a vision. ('Deus secedere me jussit,' *Epis.* 9.) That this was a fiction is shown in *Epis.* 5, where one Tertullus is made responsible for the advice ('à Tertullo ratio reddetur'). When the persecution was abated, Cyprian, having suffered only proscription and the confiscation of his property, returned to Carthage, and being reinstated in his bishopric, he held several councils, at one of which 85 bishops attended to legislate concerning the rebaptizing of heretics, apostates, and deserters, who, after escaping the severity of Decius by renouncing their religious profession, desired to be re-admitted into the church. On the renewal of the persecution, about six years afterwards, by the Emperor Valerian, Cyprian was brought before the proconsul Paternus, with nine bishops of Numidia, who were condemned as profane disturbers of the peace, and sent to work in the mines Cyprian was banished to Curubis, about 40 miles from Carthage. By Galerius, the successor of Paternus, he was restored to his former dignities; but on his refusal to sacrifice to the pagan deities in obedience to the emperor's commands, he was seized by a band of soldiers, and was sentenced to be beheaded as an enemy to the gods, and a dangerous seducer of the people. He was led from the proconsular palace of Sextus to an adjoining field surrounded with trees, which were filled with thousands of spectators, in the midst of whom he submitted with much fortitude to his sentence. That the populace must have experienced a great reversion of sentiment towards their archbishop since they constrained his acceptance of office, is evident from this acquiescence in his death, and from the fact that, previous to this event, they loudly demanded in the theatres that he should be thrown to the lions. This change arose apparently from the harsh and ascetic austerity of Cyprian in denouncing not only idolatry and licentiousness, but the reasonable and natural gratification of the passions.

His writings are numerous and valuable, as containing much curious and important information concerning the doctrines and discipline of the primitive church: they consist of two kinds, epistles, and tracts or sermons. Of the former there are 83, many of which appear to have been written during the eighteen months of his concealment. The following few notices will show the kind of subjects to which these epistles relate. In the one to Donatus he relates, with much rhetorical embellishment, the circumstances of his own conversion, and shows the advantages of monastic seclusion and abstinence. In that to his priests and deacons he gives advice about escaping from persecution. The one to Cornelius contains passages of much importance to the apologists of the church of Rome, in which are mentioned, 'Petri cathedra atque ecclesia principalis unde unitas sacerdotalis exorta est.' The epistle to Fides contains the judgment of Cyprian and a council of bishops in favour of infant baptism. Another to Magnus on the same subject asserts that sprinkling is no less efficacious than dipping. One to Pomponius reproves the licentious abuses of monachism, and the prevalent custom of virgins living with the clergy, ostensibly for pious instruction, but really for indulgence in fornication. An epistle to Cæcilius is important as insisting upon the absolute indispensableness of mixing water with the eucharistic wine. In some antient MSS. three epistles are given besides the above-mentioned number, one of which, from Pope Cornelius to St. Cyprian, is replete with abuse and insolence.

The following are the principal tracts of Cyprian: *De Lapsis*, that is, concerning those who, from persecution, had lapsed into idolatry. The miraculous stories related in this discourse are such as in the present day would be regarded as pure falsehoods. (See Dr. Middleton's *Inquiry*, p. 112.) *On the unity of the church:* this is a treatise which both from the Roman and English hierarchy has received especial attention. It strongly denounces all schismatic separation, declaring that there is no crown, even for martyrdom, out of the pale of the true church.

The discourse *On Mortality* was written at the time of a dreadful plague, which for several years devastated the Roman empire. It shows the lamentable want of a due estimate of the value of life which distinguished the religious enthusiasm of that age. All here below is represented as a course of unmitigated misery and suffering, felicity being attainable only in heaven above; a Christian, says Cyprian, should therefore be thankful for any kind of death. The *Exhortation to Martyrdom* consists of twelve classes of scriptural passages exhibited to encourage and stimulate the faithful in submitting to tortures and death. The treatise *Against the Jews* is also a series of texts, quoted and verbally applied, as usual at that time, without any regard to the sense of the context. In the tract *On the Dress of Virgins* (De Habitu Virginum) many facts are mentioned which illustrate the social state of those times. A severe denunciation is directed against the passion among rich and youthful females for immodest attire, extravagant ornaments, the use of paint and cosmetics, and the dyeing of black hair a flaxen yellow in imitation of the Germans. The immoral habits of unmarried women appear to have furnished an especial subject for the sermons not only of Cyprian, but of all the primitive fathers. Besides a discourse on the Lord's Prayer, which has received high commendation, there are four which are considered to be wrongly ascribed to St. Cyprian; one is a turgid declamation in praise of martyrdom; the second is on Chastity; and the other two against Theatres, and against the heretic Novatian. The style of Cyprian much resembles that of his master and favourite author Tertullian. He treats the same subjects in the same manner, and though his language is more artificial, it is similar in harshness and occasional barbarisms. His eloquence is admired, however, by Jerome and even by Lactantius. In credulity he appears to have had but few equals, if indeed he believed all the miraculous stories he relates; for besides his own continual visions, he seriously appeals not only to the deeds of demoniacs or rather maniacs, and to the dreams of poor and ignorant women, but to the revelations of 'little boys full of the Holy Ghost.' (Epist. 9.) That St. Cyprian's visions happened generally to authorize some act of episcopal power unapproved by his clergy and people is indeed a fact which cannot but suggest a doubt of their reality.

There are several good editions of his works, among which may be mentioned that of the 'Opera Omnia,' Oxford, fol., 1682, and Amsterdam, 1700; but the editio optima is that of Paris, in fol., 1726. The following translation of the whole is in general accurate and faithful: 'The genuine Works of St. Cyprian, with his Life, as written by his Deacon Pontius, all done into English from the Oxford edition, and illustrated with notes, by Nathaniel Marshall, LL.B.,' fol., 1717. The whole works and life have also been translated into French, by Lombert, 1682. Translations of separate tracts are very numerous. That *On Mortality*, with others, is Englished by Elyot, 1534; by Brende, 1553; by Story, 1556; and by Lupset, 1560. *On the Lord's Prayer*, by Paynel, 1539. *On Virgins*, by Barksdale, 1675. *On the Unity of the Church*, by Bishop Fell, 4o., 1681; and by Horsburgh, 1815. (Watt's *Bibliothec.*) The life and martyrdom of Cyprian, by Pontius, his intimate friend, is still extant, and printed in several editions of the 'Opera Omnia;' but the style is too rhetorical for simple truth. The substance of this account is given in Lardner's *Credib.*, vol. iii. The *Lives of the Saints*, by the Rev. Alban Butler, (vol. ix., p. 172,) contains an elaborate biography of Cyprian. See also Dr. Adam Clarke's *Succession of Sacred Lit.*, vol. i., p. 177; Cave's *Hist. Lit.;* Le Clerc's *Biblioth.;* Tillemont and Bollandus.

CYPRICA'RDIA. [SUBMYTILACEA.]

CY'PRINA. [VENERIDÆ.]

CYPRI'NIDÆ, a family of fishes, of the section Malacopterygii Abdominales, the species of which are distinguished by their having the mouth small, formed by the intermaxillary bones, and generally devoid of teeth; the pharyngeans furnished with strong teeth, the branchiostegous rays few in number, and the scales generally of large size.

The principal genera belonging to this family are—*Cyprinus*, *Barbus*, *Gobio*, *Tinca*, *Cirrhinus*, *Abramis*, *Labeo*, *Catastomus*, *Leuciscus*, *Gonorhynchus*, *Cobitis*, *Anableps*, *Pœcilla*, *Lebias*, *Fundulus*, *Molinesia*, and *Cyprinodon*.

The genus *Cyprinus* (as now restricted) contains the common carp and allied species, which are distinguished from those of the other genera above enumerated, by their having one long dorsal fin, a small mouth devoid of teeth, the scales of large size, and the second rays of the dorsal and anal fins large, bony, and more or less serrated; branchiostegous rays three in number.

The common Carp (*Cyprinus Carpio*, Linn.) was introduced into this country at an early period (probably between the fourteenth and fifteenth centuries), but neither the date nor the country from which it was imported are precisely known. In Jenyns's 'Manual of British Vertebrate Animals' it is said to be originally from the middle of Europe, and since it thrives best in this part, such is probably the case. It now inhabits most parts of Europe, and in some places its growth is much attended to for the purposes of traffic. It frequents lakes, ponds, and rivers; in the last however it avoids those parts where the current is strong, preferring still water.

The food of the carp consists chiefly of vegetable substances, which are masticated by means of the flat teeth which are situated on the pharyngeans; the larvæ of insects and worms however also afford it nutriment. This fish is of an elongate form, and rather thick; the back is considerably elevated, and the greatest depth of the body, which is beneath the commencement of the dorsal fin, measures rather more than one-third of the entire length: the head is large, and the mouth small in proportion; the lips are furnished with two barbules on each side, situated near the corners of the mouth: the dorsal fin commences in a line with the end of the pectorals, and occupies a space nearly equal to one-third of the entire length; the first ray is short and bony; the second is also bony but long, and serrated on the hinder part; the third ray is the longest, and is flexible, as are likewise the remainder of the rays: the anal fin terminates in a line with the dorsal, and, like that, has the two foremost rays bony, and the second serrated; the pectoral fin has its origin immediately behind the free edge of the operculum; the caudal fin is forked, and the longest rays are double the length of those in the centre. The number of fin-rays are—dorsal, 22; pectoral, 17; ventral, 9; anal, 8; and caudal, 19. The lateral line is straight.

The general colour of the upper parts is a rich olive-brown, which is darkest on the head; the under parts are yellowish-white, and the fins are brown; the ventral and anal fins are tinged with red.

As regards the size and weight of the carp, we extract a few lines from Mr. Yarrell's valuable work. 'Though not so rapid in their growth as some fish,' says this author, 'carp have attained three pounds weight by their sixth year, and six pounds weight before their tenth year. The largest I can refer to are thus noticed in Daniel's Rural Sports:—"Mr. Ladbroke, from his park at Gatton, presented Lord Egremont with a brace that weighed thirty-five pounds, as specimens to ascertain whether the Surrey could not vie with the Sussex carp." In 1793, at the fishing of the large piece of water at Stourhead, where a thousand large brace of killing carp were taken, the largest was thirty inches long, upwards of twenty-two broad, and weighed eighteen pounds.

'At Weston Hall, Staffordshire, the seat of the earl of Bradford, the painting of a carp is preserved, which weighed nineteen and a half pounds. This fish was caught in a lake of twenty-six acres, called the White Sitch, the largest of three pieces of water which ornamented this fine estate.'

Carp are in season for the table from October to April.

The *Crucian Carp*, or *Prussian Carp* (*Cyprinus gibelio*, Bloch), is another species of this genus now naturalized in this country, and which is said to have been introduced from Germany.

This species is considerably less than the common carp; its usual weight is about half a pound; it has been known however to weigh upwards of two pounds.

The Crucian carp may at once be distinguished from the common carp by the absence of barbules on the lips. The greatest depth of the body is equal to one-third of the whole length, the tail included; the lateral line descends in a gentle curve from the upper angle of the operculum below the middle of the body, from whence it is straight; the tail is forked; the longest rays are about one-third longer than the shortest rays; the dorsal and anal fins have a strong bony ray, as in the common carp, but these rays are not so deeply serrated. The number of fin-rays are—dorsal, 18; pectoral, 14; ventral, 9; anal, 8; and caudal, 19.

The colour of the upper parts is olive brown; the belly is almost white; the cheeks and gill-covers are of a brilliant golden-yellow hue; the fins are for the most part of an orange-red colour.

This fish is found in some of the ponds in the neighbourhood of London, and in other parts of England, but is rather local.

The last species which we shall notice is the Gold Carp (*Cyprinus auratus*, Linn.). The gold and silver fish, as it is termed, has been long known in this country: it is a native of China, and, according to Pennant, was first introduced into England in 1691, but was not generally known till 1728. The gold carp is now completely naturalized, both here and in other parts of Europe, where it has been introduced, and breeds freely, especially in ponds in warm and sheltered situations. In many of the streams of Portugal it abounds, whence they are brought over to this country in the trading vessels for sale.

This fish is too well known to require description. It is subject to much variation not only in colour but in the fins, which are sometimes double, and not unfrequently have triple tails; in the latter case however it appears that the tail is thus developed at the expense of part or the whole of some other fin. When young, the gold carp is of a very dark colour, approaching to black; this dark colour is replaced by the golden-red hue more or less early according to the constitution of the individual.

CYPRI'NUS. [Cyprinidæ.]

CYPRIS. [Branchiopoda, vol. v., p. 341 et seq.; Crustacea, vol. viii., p. 198.]

CYPRUS (Κύπρος), called by the Turks Kibris, a large island in the Mediterranean, lying near the coasts of Syria and Asia Minor. Its length is 140 miles, from Cape St. Andrea at the north-east extremity, in 34° 41′ E. long., to Cape St. Epiphanias, the antient Acamas, at its west end, in 32° 18′. Its greatest breadth, which is in the west part, is about 50 miles from north to south; but it gradually narrows towards the east, being no more than five miles wide at the east end, which is 65 miles distant from Latakieh, the nearest point of the Syrian coast. The nearest point of the coast of Cilicia or Caramania, Cape Zephyrium, is about 42 miles north by west of the point of land in Cyprus which is near the antient Carpasia. A range of mountains runs through the island in the direction of its length, keeping closer to the north than to the south coast: the plains are consequently chiefly on the south side of the range. These mountains, called Olympus by the antients, are now known by several names; the highest summits are the Thrados, 24 miles north of Limasol, which is above 7000 feet; Mount Santa Croce, 18 miles north of Larnika, upon which is a church, said to have been founded by Helena, the mother of Constantine; and Buttavent, five miles from Cerini, near the north coast, with a monastery and an old castle upon it, from which there is a splendid view. (Mariti, *Travels in Cyprus*.) The most extensive plain, called Messarea, is in the south-east part of the island, and is watered by the river Pedæus, which is however nearly dry in summer, like all the other rivers of the island.

Strabo (Casaub. 682, &c.) gives the following enumeration of the towns of Cyprus in his time. On the north coast, east of Cape Acamas, were Arsinoe, Soli, with a harbour, founded by Phalerus and Acamas of Athens; Limenia, inland; then east of Cape Crommyon, Lapathus, built by the Lacedemonians; next Agidus, Aphrodisium, and Carpasia; east of the last was a mountain and cape called Olympus, with a temple of Venus upon it, which women were forbidden to enter. Facing the cape are two small islands, called Cleides, or the keys of Cyprus. (Herod. v. 108.) Turning thence towards the south was Salamis, at the mouth of the Pedæus, one of the principal cities of the island, said to have been built by Teucer, an emigrant from the island of Salamis. Proceeding southwards was another Arsinoe, with a port; next came Leucolla, near Cape Pedalium, a lofty table-land, called the Table of Venus. West of Pedalium was Citium, with a harbour that could be closed. Citium was a large town, and the birthplace of Zeno the Stoic. From Citium to Berytus in Syria the distance was 1500 stadia. West of Citium was Amathus. Inland was Palæa, and another mountain called Olympus. Sailing round Cape Curias to the west, was the town of Curium, with a port, built by the Argivi. Here the coast turns to the north-west looking towards Rhodes, and had the towns of Treta, Boosocra, and Old Paphos; then Cape Zephyrium; and next to it another Arsinoe, with a port and temple and sacred grove, and New Paphos, built by Agapenor, 60 stadia by land from Old Paphos. [Baffo.]

Most of the above towns, and others which Strabo has left out, have long since disappeared. The present towns of Cyprus are, 1. Leikosia, vulgarly called Nikosia, the capital of the island, and the residence of the Turkish governor, which is near the site of the antient Letra, or Leucotra. Its population is said to be above 12,000; it lies in the centre of the island, in a plain surrounded by mountains. Leikosia was the residence of the kings of Cyprus of the Lusignan dynasty, and was then much larger than at present: the Venetians destroyed part of it in order to strengthen the remainder. It is now three miles in circumference. The church of St. Sophia, a fine Gothic building, is converted into a mosque: the monuments of the Lusignans in it are sadly mutilated. There are also a fine bazaar, a khan or enclosed court, surrounded by apartments for travellers, and the palace of the governor, on the portal of which is still seen the Venetian lion in stone; and several other churches and mosques. The archbishop of Leikosia is metropolitan of the whole island. 2. Famagosta, on the south-east coast, a few miles south of old Salamis, and not far from the site of the antient Tamassus, once famous for its copper-mines, is a town strongly fortified by the Venetians, but now much depopulated and decayed. 3. Larnika, on the site of old Citium, near the south coast, is the most thriving bustling place in the island, being the residence of the European consuls and factors, and the seat of the chief trade. The port of Larnika is at Salines, about one mile and a half from it. A Greek bishop resides at Larnika, and there are also some Latin churches in the town. The houses are built chiefly of clay, and only one story high above the ground-floor, on account of the earthquakes to which the island is subject. The interior of the houses however is comfortable, the apartments are paved with white marble, and almost every house has a garden, of which the Cypriotes are very fond. The principal exports consist of cotton, wine, the best of which is produced near Limasol, salt, corn, opium, turpentine, silk, and fruit. A great part of the island is uncultivated, and is covered with thyme and other aromatic herbs. There are quarries of asbestos, talc, red jasper, agate, and rock-crystal. 4. Limisso, or Limasol, near the antient Amathus: the country here is very fertile in vine and other fruit-trees; carob trees are especially abundant. 5. Baffo, or New Paphos, already mentioned. 6. On the north coast is Cerini, the antient Cerinia, with a fort and a small harbour, from which there is some traffic with the opposite coast of Caramania. Besides these, there are a few Greek villages and several monasteries scattered about the island. The majority of the population are of the Greek Church; there are however some of the Latin communion, as well as Maronites, who also belong to the Western Church.

Cyprus appears to have been colonized by the Phœnicians at an early period. Ethiopians are also mentioned as forming part of the population, but it is difficult to say exactly who are designated under this name: probably some of the tribes south of Egypt who were taken to Cyprus as slaves after it came into the possession of the Egyptians. Greek colonies afterwards settled on the coast. According to Strabo it was divided among several petty tyrants, some say nine in number, who were at times at war with and sometimes allied to the neighbouring powers of Asia Minor and Greece. Amasis, king of Egypt, is said to have invaded Cyprus and taken Citium. The island became subject to the Persians (Herod. v. 108), and afterwards submitted to Alexander the Great, upon whose death it fell, with Egypt, to the share of Ptolemy, the son of Lagus. It continued under the Ptolemies, sometimes united with Egypt, and sometimes under a separate prince of the same dynasty. The last of these princes, brother to Ptolemy Auletes, king

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of Egypt, incurred the enmity of P. Clodius Pulcher, who, being taken prisoner by the Cilician pirates, sent to the king of Cyprus for money to pay his ransom. The king sent a sum which was too little. Clodius having recovered his liberty by other means, when he became tribune of the people obtained a decree to be passed for reducing Cyprus to a Roman province. (Strabo, 684, and Dion, xxxviii. 30.) M. Cato was sent to take possession of it. The king, on hearing of this design, put himself to death before Cato's arrival. Cato seized upon the treasury, which was well filled, and sent a large booty to Rome. Cyprus thus became a Roman province. On the division of the empire it fell to the lot of the Byzantine emperors, and after several vicissitudes became a separate principality under a branch of the Comneni. Richard of England took it in 1191, and sold it to the Templars, whose oppression drove the people to revolt. Richard resumed the sovereignty, and gave it to Guy of Lusignan, the expelled king of Jerusalem, in 1192. The Lusignans retained it for nearly three centuries, which was a flourishing period for Cyprus. John III. of Lusignan died in 1458, leaving the kingdom to Charlotte, his only legitimate child, who married her cousin Louis, Count of Geneva, second son of the duke of Savoy and of Anna of Cyprus. She was solemnly crowned at Leikosia in 1460, but was soon after expelled by her natural brother James, assisted by the Mameloukes of Egypt. James married Catharine Cornaro, the daughter of a Venetian merchant, who brought him a dowry of 100,000 golden ducats. On this occasion the Venetian senate adopted Catharine Cornaro as daughter of St. Mark, and the marriage was celebrated in 1471. In 1473 James died, and his wife soon after was delivered of a son, of whom the republic of Venice assumed the guardianship, and Venetian troops were sent to garrison the towns of the island. The child dying while an infant, the senate persuaded Catharine, in 1489, to abdicate the sovereignty in favour of the republic, and to retire to Asolo near Treviso, where she lived the rest of her days in a princely style on a liberal pension. Meantime Charlotte Lusignan had retired to Rome, where she died in 1487, bequeathing her claims to Charles Duke of Savoy, in consequence of which the sovereigns of that dynasty assume to this day the title of Kings of Cyprus and Jerusalem. The Venetians kept possession of Cyprus till 1470, when Selim II. sent a powerful force to invade the island. The Turks took Leikosia by storm, and massacred about 20,000 people. They then laid siege to Famagosta, which was long and gallantly defended by the proveditor-general, Marcantonio Bragadino. At last, in August, 1571, the Venetians were obliged to capitulate, on condition of being sent safely home. The pacha Mustapha signed the capitulation, but when Bragadino with the other Venetian officers repaired to his tent to deliver the keys, he had them all seized and put to death, except Bragadino, whom, after some days, he caused to be led naked to the square of Famagosta, where, in the pacha's presence, the executioner began to flay him alive. Bragadino expired in the midst of the torments, which he endured to the last with the greatest constancy. His skin was filled with straw and hung up to the yard-arm of the admiral's vessel, in which Mustapha returned to Constantinople. Venice raised a monument to the memory of Bragadino in the church of San Giovanni e Paolo, and his relatives after a time ransomed his skin, which was placed in the monument. From that time the Turks have remained in possession of Cyprus. A revolt broke out among the inhabitants in 1764, but was put down.

(Mariti, *Travels*; Paruta, *Historie Venetiane*; Botta, *Storia d'Italia*.)

CY'PSELUS. [CORINTH.]

CY'PSELUS. [HIRUNDINIDÆ.]

CYR, ST., a village near Versailles, in France, celebrated for its royal abbey, an institution founded by Louis XIV., at the desire of Madame de Maintenon, for the education of young ladies of noble birth. Previous to the foundation of this establishment, St. Cyr was composed only of some peasants' cottages, with the château of the lord of the village. The institution was for two hundred and fifty young ladies who could show a noble descent of four generations on the father's side: they were received between the ages of seven and twelve years, and maintained, instructed, and furnished with everything till they reached the age of twenty. The girls were instructed by about forty ladies, and waited upon by about the same number of attendants, denominated 'sœurs converses.' The ladies to whom the instruction of the pupils was confided were subject to a monastic rule, but our authority differs as to whether it was that of St. Benedict (Vaysse de Villiers) or St. Augustin (Prudhomme); the dress of the pupils was plain, without being monastic, and they did not use the monastic style of address, 'mother' and 'sister,' but 'madame,' with the name of the individual spoken to, as usual in society. On quitting the establishment they received a dowry of a thousand crowns. The buildings of the abbey were designed by Jules Hardouin Mansard, the favoured architect of Louis XIV., and consisted of twelve principal piles of building, forming five courts, with extensive gardens attached. The buildings were commenced in 1685 and completed in a year; 2500 workmen were engaged in the work. Louis XIV. was in the habit of visiting Madame de Maintenon in a pavilion in the garden; and in the buildings of the institution the young ladies used to perform the 'Esther' of Racine, whose 'Athalie' was also written for them, though only performed by them twice, and that without dresses, and not in their theatre. Madame de Maintenon passed the close of her life at St. Cyr, and dying there A.D. 1719, was buried in the choir of the church, where a long epitaph, in French and Latin, was inscribed to her praise.

This establishment was suppressed at the Revolution, and the buildings were at first devoted to the purpose of a military hospital, subsidiary to the Hôtel Royal of Paris. In 1814 Napoleon transferred hither the military school of Fontainebleau, and the restored government of the Bourbons sanctioned the change. The gardens have been converted partly into parades for the pupils and partly into a kitchen-garden. The establishment includes a governor of the rank of general, a lieutenant-governor of the rank of colonel, twenty-four professors, and a variety of other officers. The pupils amount to 350, part of whom are maintained by the government and part are at their own charge. They enter between the ages of sixteen and twenty, and about 140 leave the institution every year; some stay two years, and others three. (Dulaure, *Histoire des Environs de Paris*; Prudhomme, *Dictionnaire Universel de la France*. Vaysse de Villiers.)

CYRE'NA. [VENERIDÆ.]

CYRENA'ICA, a region of North Africa, comprehending the country between the Great Syrtis and the Gulf of Platea, now Bomba. The western limits between Cyrenaica and the Carthaginian dominions were fixed at the Philænorum Aræ at the bottom of the Great Syrtis, and its east limits towards Egypt seem to have been about the Catabathmus Magnus. Cyrene, Teuchira, and Hesperis were the earliest Greek colonies. Barca was a colony of Cyrene, mixed with Libyan aborigines. Afterwards, under the Ptolemies, Teuchira took the name of Arsinoe, Hesperis was called Berenice, and the port of Barca became the city of Ptolemais, and drew to it most of the inhabitants of Barca itself. The port of Cyrene, called Apollonia, became also an important town. From these five cities, Cyrene, Apollonia, Ptolemais now Ptolometa, Arsinoe, and Berenice, the country was sometimes called Pentapolis. The interior was peopled by Libyan tribes. There were also other towns mentioned as having existed in this country in the Roman period, such as Darnis, Hadriana, Neapolis, Thintis, &c.; but their site is not well ascertained, except Darnis, which is believed to have been where Derna is now. This interesting region remained for many centuries unexplored by European travellers, until an Italian, Dr. Della Cella, in the service of the pacha of Tripoli, visited it in 1817. 'Viaggio da Tripoli di Barberia alle Frontiere Occidentali dell' Egitto,' Genoa, 1819. The narrative is in a series of letters to a friend, and is written in a simple unpretending style. Dr. Della Cella's observations were made in haste, and without much opportunity for taking an accurate survey of the country. In 1821-2, Captain Beechey, R.N., and H. W. Beechey, explored the coast of the Pentapolis, as well as the ruins of Cyrene: 'Expedition to explore the North Coast of Africa from Tripoli eastward, comprehending an Account of the greater Syrtis and Cyrenaica, and of the antient Cities composing the Pentapolis,' 4to. London, 1828, with maps and plates, a most interesting work. Lastly, this country was visited by M. Pacho, a young and enterprising French traveller, whose melancholy death happened just before the publication of his work: 'Rélation d'un Voyage dans la Marmarique, la Cy renaique et les Oases d'Audjelah and de Maradeh, accompagnées de Cartes Géographiques et Topographiques et de Planches representant les Monumens,' 4to., with Atlas, fol., Paris, 1827-9. In describing this country, we shall follow he route of MM. Beecheys, who went from Tripoli round by the shores of the Great Syrtis to Bengazi. Pacho, coming rom Egypt, entered Cyrenaica on the opposite side by Derna, and his information is most valuable and novel on hat part of the country known in antient times by the name of Marmarica, and which extends from Alexandria to Derna. He also visited the great Oases of Augila and Maradeh, which lie in the Libyan desert, south of Cyrenaica.

As the traveller approaches Bengazi from the south he ees the country improve, and leaving behind the sandy racts of the Syrtis, which continue to spread inland in an astern direction, he enters a new region of hills and plains it for cultivation, and covered with vegetation. The coast tretches to the north-east, forming a curvilinear peninsula which advances into the Mediterranean, between the Great Syrtis to the west and the Gulf of Bomba to the east. The chord of this curve from Bengazi to Bomba is about 50 miles, but the sweep of the coast is above 200. A idge of mountains from 800 to 1100 feet high begins to he south-east of Bengazi, and extends to the north-east n a diagonal direction to the shore, being distant from Bengazi about fourteen miles, from Teuchira five, from Ptolometa about two, and then comes close to the sea at Ras Sem, continuing along the coast to Apollonia, and as ar as Derna. Farther inland is another range, nearly 000 feet above the sea, which forms the plateau on which Cyrene stood, and which declines gradually towards he east, and blends with the lower one near Cape Bujebara. t then joins the mountains of Akabah el Soloum, the Caabathmus Magnus of the antients, which run through Marmarica in a south-east direction to the Oasis of Siwah. To the south and south-west the mountains of Cyrene slope gradually to the level of the Libyan desert and of the sandy ract which borders the Great Syrtis. According to Pacho, he greatest breadth of the hilly region from north to south s between seventy and eighty miles. Towards the north both the higher and lower ridges are frequently broken by deep wadys or chasms, through which the winter torrents rush to the sea. In these chasms or valleys grow a vast number of pine trees, generally small, though some are large enough for top-masts of a man-of-war. The argest of these chasms is near Cape Ras Sem, with a perennial stream running through it, which is supplied from the fountain of Cyrene. Clusters of date trees are seen near Bengazi and Derna. The road from Bengazi to Tocra or Teuchira and Ptolemeta, lies through a very fertile and beautiful country, though a comparatively small part of it s cultivated. It is a plain, thickly covered with wood and flowering shrubs, stretching from the sea to the foot of the mountains, and narrowing every mile as we proceed towards Ptolemeta, where the high land comes very close to the sea. The whole length of the plain from Bengazi to Ptolemeta is fifty-seven geographical miles. The sides of the mountains also are thickly clothed with wood, chiefly pine of various kinds, and numerous shrubs, among which the juniper abounds. Ravines whose sides are covered with wood and verdure cross the road very frequently in their course from the mountains to the sea, most of which must be impassable in the rainy seasons, as there is nothing like a bridge over any of them. Open spaces, some of considerable extent, also occur occasionally in the woods; they were probably once cultivated, but are now thickly covered with grasses of various kinds, among which oats grow spontaneously, as well as a species of wild artichoke, which is eaten raw by the Arabs. Several towers of very solid construction are scattered along this road.

Of the five towns of the Pentapolis, Bengazi is generally believed to occupy the site of the antient Hesperis, afterwards called Berenice, of which there are hardly any remains above ground. [Bengazi.] In the neighbourhood of Bengazi there are some curious chasms or pits sunk in the rock sixty or seventy feet below the plain, with excellent soil at the bottom, covered with trees and rich vegetation, and which seem to answer to the description of Scylax of the gardens of the Hesperides. The next town on the coast is Tocra, the antient Teuchira, afterwards called Arsinoe, which, although totally deserted, is still completely inclosed, except on the sea or north side, by walls of uncommon solidity and thickness, strengthened at intervals by quadrangular towers, twenty-six in number, and is entered by tw strong-built gateways placed opposite to each other on the east and west sides of the walls. The circuit of Teuchira is about one mile and a half. It is situated in a plain about four miles from the foot of the mountains. The interior of Teuchira has been utterly destroyed, and the few remains, among which are those of a handsome Christian church, are not distinct enough to give an idea of the former buildings. The line of some of the streets however is distinctly traced. We know very little about the history of Teuchira, or of the epoch of its final destruction. The walls were repaired by Justinian, in doing which blocks of stone and marble have been introduced, many of them bearing Greek inscriptions, which evidently formed part of much older buildings. A number of quarries with excavated tombs are seen outside of the city walls. There is no appearance of a port at Teuchira, and the position of the coast is such as not to afford shelter to vessels. Ptolemeta or Dolmeta is also ruined: several of the buildings however are partly standing, such as a lofty gateway, an amphitheatre, two theatres, a palace or large building, the inner court of which retains its tesselated pavement; several columns are still erect, and a number of others are thrown down in heaps. Though the walls of Ptolemeta have been thrown down, their line can be traced in many places, but nowhere do they rise more than one foot above the ground. Ptolemais was originally the port of Barca, which latter is mentioned as one of the five cities of the Pentapolis, though it was inhabited by a mixed Greek and Libyan race. Ptolemais and Barca have been confounded by some geographers, but Ptolemy distinguishes them, and Scylax says that Barca was 100 stadia from the sea. Under the Ptolemies of Egypt, the port of Barca assumed the name of Ptolemais; and in the vicissitudes of the country, the Greek population of Barca withdrew to Ptolemais, which flourished through its maritime trade. Pomponius Mela mentions Ptolemais, and not Barca, among the cities of Pentapolis. Barce or Barca was however still inhabited under the Arabs, who gave its name to the whole country of the Pentapolis; but the town sank at last into total desolation and oblivion, and even its site is not now ascertained, though probabilities are for its being in the plain of Merdje on the first ridge of hills south of Ptolemeta, and on the road to Cyrene. (Barca; and also Beechey's *Narrative* and Quotations.) Ptolemeta lies in a delightful position at the foot of the hills, and on a slope stretching to the sea between two romantic wadys or ravines. Its extent, as far as it can be traced, was about one square mile: but the whole space is now overgrown with wild vegetation, with patches of corn here and there among the ruins. The Arabs sow the corn and leave it to the winter rains, and they return at harvest time to cut and carry it off. There are several large cisterns in good preservation, which were restored by Justinian, and now afford a supply of good water.

The road from Ptolemeta to Cyrene leads up a romantic valley, the sides of which are thickly clothed with pines, olive trees, and various kinds of laurel, interspersed with clusters of luxuriant honeysuckles, myrtle, arbutus, juniper, and a variety of wild roses, and then opens into the plain of Merdje, a large and fertile tract about five miles in breadth, on the summit of the first range of mountains, with pools and small lakes formed by the waters from the upper ridge. The Arabs encamp here, and partly sow the ground with corn, and use the rest as pastures. From the plain of Merdje the path follows the track of the antient road in a north-east direction leading through a succession of hills and fine vallies to Ghrenna, the Arab name for Cyrene. On approaching Ghrenna the country becomes more clear of wood, the valleys produce fine crops of barley, and the hills afford excellent pasture for cattle. A plant, three feet high, perhaps the silphium of the antients, and resembling in shape the hemlock, grows here in great abundance. The position of Cyrene is one of the finest that can be imagined, being on the edge of the upper range of hills about 800 feet above the lower range. Below the town the hill slopes down towards the north, forming several natural terraces one below the other, and terminating with a fine sweep of table-land, which forms the summit of the lower range, and which is covered with wood, with scattered tracts of corn and verdant pastures. Ravines whose sides are overgrown with trees, intersect the country in various directions, and form the channels of mountain streams. This table-land extends east and west as far as the eye can reach, and to the north after stretching about five miles, it descends abruptly to the sea. The slope of the lower ridge, which runs along the coast of Cyrenaica, is here thickly covered with wood. Its height is about 1000 feet, so that Cyrene is about 1800 feet above the sea, of which it commands an extensive view. The ledges or terraces of the upper ridge afforded room for roads or drives sweeping along the sides of the mountain, and the tracks of the chariot wheels are still impressed upon the rock. The remains of Cyrene occupy a vast extent of ground, but they have been sadly disfigured by the hand of man. Innumerable tombs, either built of stone or excavated in the rock, encircle the town, and are ranged on each side of the avenues leading to it. In some of these excavations paintings have been found in good preservation, representing funeral games, hunting parties, several sketches of private life, and allegorical subjects. The costumes are beautifully rendered, and the colours very brilliant. Within the precincts of the antient town are the remains of a bath built of brick, of which some parts of the vaulted work are still left, some towers or forts, a very large hypogeum picturesquely situated on the extremity of the only grove that is found on the plateau, several large temples of the Doric order, two small excavated temples of the Roman period with Christian emblems, two theatres, an amphitheatre, an aqueduct, but all sadly damaged; in fact, the whole of the existing remains are at present little more than one mass of ruins, and the tombs afford the most perfect examples of Grecian art now remaining in Cyrene. A quantity of prostrate columns, statues, capitals, rilievi, and inscriptions, are scattered about the ground, but the statues are mutilated, and many of them want their heads, which the Arabs have cut off. There are two copious springs, from one of which, supposed to be the fountain of Apollo, the water flows into a subterraneous channel, and then issues out on the other side of the mountain.

The country around Cyrene must have been in the time of its splendour a complete garden, and it is easy to conceive how the people of such a country became so much addicted to luxury and pleasure as they are reported to have been. Even now in its wild state 'the rich ochrish red soil, watered by rivulets gushing on every side, brings forth a rich vegetation which pierces the mossy rocks, clothes the hills, extends in rich pastures, or develops itself in forests of dark juniper, green thaya, and pale olive trees. The modern name of the Cyrenaica, "Jebel Akhdar," *i. e.*, "the green mountain," expressively indicates its rich and smiling aspect.' (Pacho, *Voyages dans la Marmarique et la Cyrènaique.*)

Cyrene appears to have gradually declined under the Romans as the maritime towns of the Pentapolis rose in importance. It afterwards suffered greatly, and was in a great measure ruined during the dreadful insurrections of the Jews under the reigns of Trajan and Hadrian; the province was depopulated when Hadrian colonized it afresh, at which time it is probable that many of the buildings of Cyrene were restored, for there is a variety of Greek and Roman style observable in them as well as in the sculptures. The Jews were at one time very numerous in Cyrenaica; they had settled in it in the time of the Ptolemies, and chiefly resided at Berenice, where they formed a distinct community governed by two archons.

In the fourth century, Synesius, bishop of Ptolemais, one of the most eloquent of the early fathers, deplored the ruin and depopulation of Cyrene, hastened by the oppressions of the Byzantine governors. It was in his time that Cyrene was destroyed by an invasion of some barbarous hordes of the interior of Libya, whose women were armed as well as the men, who destroyed all before them, and only spared the male children to recruit their ranks. (Synesii *Opera*, p. 300.) Those of the inhabitants of Cyrene who escaped took refuge at Ptolemais. The barbarians besieged Ptolemais, in which Synesius had remained faithful to his flock, and they were repulsed. In the early part of the seventh century the Persians under Khosroo Purvéez, after overrunning Egypt, invaded the Pentapolis and depopulated the country. The Saracens afterwards completed the work of the Persians, and the towns of the Pentapolis have remained in ruins ever since. Now the nomade Arabs wander about the whole region, which is nominally subject to the Beys of Bengazi and of Derna, who are dependants of the pacha of Tripoli. Apollonia, afterwards Sozysa, and now called Mersa Soosa, was the port of Cyrene, from which it is about twelve miles distant. The antient road leading to it still remains. Apollonia lies at the bottom of an open bay, protected however by two small islands in front of the town. The town is ruined, but the greater part of the wall is standing, and there are remains of two Christian churches, the columns of which are of fine marble, of a basilica, a fort, &c. MM. Beecheys have given plans of Ptolèmeta, Teuchira, Apollonia, and Cyrene, as well as of the modern towns of Bengazi and Derna. Pacho's Atlas gives many views and plans of the different monuments of Cyrene, Ptolemeta, &c.

CYRENA'ICS, a school of philosophers among the Greeks, who derived their name from the birth-place of their founder Aristippus. Like the Cynics, their doctrines were a partial development of those of Socrates; but the view which they took of their predecessor's philosophy was quite different from the Cynical [CYNICS.] The only particular in which the two sects agreed with the original system and with one another was that they all three made virtue consist in knowledge; in other words they were all three attempts to awaken and develop the idea of science; but while the Cynics considered all sublunary enjoyment and most branches of knowledge as impediments to the knowledge, and consequently, according to Socrates, to the practice, of virtue, the Cyrenaics, on the other hand, were not contented with the mere knowledge of the good as a general term, but sought for it in the separate particulars, and deemed him to have performed his proper functions most consistently with his nature who had succeeded in amassing the greatest number of particular good things. In regard to the idea of science, they did not look upon it as a speculative conception, but as a merely empirical result, as the aggregation of successive experiences; in other words, not as an intuition but as a combination of perceptions; and while Plato, and in some measure the Cynics also, placed the *summum bonum* in the attainment, by means of dialectics, of the abstract idea of the good, the Cyrenaics placed it in the collection of the greatest number of agreeable perceptions, and the true philosopher, according to them, was one who actively, methodically, and successfully carried on the pursuit of pleasure. Consequently, as agreeable perceptions; were continually to be sought as good and the contrary to be avoided as bad in themselves, perception of sensible objects became the criterion of all knowledge and the object of all action, and therefore truth both theoretical and practical. (Sextus Empir. *adv. Mathematicos*, vii., § 191–200.) The chief successors of Aristippus were Theodorus, Hegesias, and Anniceris. Theodorus perceived the necessity for some principle, in addition to the mere collection of agreeable sensations; for without some effort of the understanding to determine which of many gratifications was to be preferred, it would be impossible, he thought, to obtain the maximum of gratification; and he therefore set the understanding over the senses as a regulating and restraining faculty. He is said to have been banished from Athens for denying the existence of the gods. (Diog. Laërt., ii., § 97.) Hegesias, following in the steps of Theodorus, insisted still more than he did upon the inadequacy of the senses as the criteria of the desirable, and at last even went so far as to assert that nothing was in itself either agreeable or the contrary, and that life and everything in life should be a matter of indifference to the wise man. In this assertion of the principle of indifference he made an approach to the doctrines of Epicurus and the Stoics in the point in which those two opposite systems met. Cicero tells us (*Tuscul. Disput.*, i., c. 34) that his book called *ἀποκαρτερῶν* caused so many suicides that he was forbidden by one of the Ptolemies to lecture on the worthlessness of life. In the philosophy of Anniceris and his followers the original principles of the Cyrenaics were quite lost, and though he also, in a popular way, recommended the pursuit of the agreeable, he denied that it depended in any way upon mere sensible impressions, for that the wise man might be happy in spite of all annoyances; that friendship was to be sought, not for the sake of any immediate advantage to be derived from it, but on account of the good-will which it generated; and that for a friend's sake a man should encounter even annoyances and troubles. (Diog. Laërt. ii., § 96, 97.) These are the doctrines of a mere popular morality, and can hardly be ascribed to one school more than to any other. It will be remarked by every one that the original tenets of this school were very similar to those of Epicurus; indeed, with the exception of the atomic sys tem which he borrowed from Democritus and Leucippus, the two systems differed only in this; the Cyrenaics placed the great object of man in the positive and active pursuit of the agreeable, while Epicurus made it consist in a perfect rest of mind and in freedom from pain; for he considered the agreeable as something merely negative, as the pleasing harmony produced by exemption from all passion and appetite. The philosophy of Epicurus may therefore be considered as the successor, in one point of view, of the system of Aristippus.

CYRE'NE (Κυρήνη), a city of Libya, near the coast, to the east of the Great Syrtis, was founded B. C. 631, by a colony from Thera (Herod. iv. 155), an island in the Ægean sea. Thera was a Lacedæmonian colony (Herod. iv. 148), and when Isocrates (Philip. § 254) speaks of the people of Cyrene as a colony from Lacedæmon, it is either on account of the origin of Thera itself, or because, as is reported by Pausanias (iii. 14), Anchionis and a considerable number of Lacedæmonians accompanied Battus, the leader of the colony, to the coast of Libya. Battus, according to Herodotus (iv. 155), was the son of Polymnestus, one of the principal citizens of Thera, and received this surname on account of an impediment in his speech; Callimachus, who appears to have been one of his descendants (Strabo, pp. 837, 838, *b. a.*) gives (*Hymn to Apollo*, v. 76) Aristoteles as the original name of Battus, and this is confirmed by the Scholiast on Pindar (*Pyth.* iv. 104). The immediate occasion on which the colony was planted is variously stated by different writers: it was probably the result of some political commotion in which the vanquished party was forced to quit the island. At any rate it appears that the Delphic oracle was consulted, and that its suggestion was taken. Battus and his comrades sailed for the coast of Libya, but they had not proceeded far before they were alarmed at the dangers of the navigation, and resolved to put back to Thera. On approaching the island they were pelted by the inhabitants on the shore, and being unable to land, they had no alternative but to set sail again. They at last reached the coast of Libya and settled in an island called Platea, where they remained two years; afterwards they removed to Aziris, where they remained six years, and at length settled in the place which they called Cyrene, a name said to be derived from a fountain Cyre flowing near. The following is a list of the kings of Cyrene, with the length of their reigns, as far as can be ascertained:—

Battus I. (reigned 40 years), died about B. C. 591; Arcesilaus I. (16 years), B. C. 575; Battus II., surnamed the Happy (21 years), B. C. 554; in this reign the colony was greatly increased by emigrants from Greece; Arcesilaus II. (4 years), put to death B. C. 550; Battus III., surnamed the Lame (about 21 years), B. C. 529; in this reign, Demonax, of Mantinea, introduced laws which greatly modified the constitution and diminished the royal power; Arcesilaus III. (about 13 years), B. C. 516; this king submitted to the Persians (Herod. iii. 13), but afterwards recovered the kingship and exercised his power so tyrannically that he was assassinated in Barca. Of Battus IV. and Arcesilaus IV. we have no certain information. About B.C. 450 the government appears to have changed to a republic, but the particulars of the constitution are unknown. (Aristoteles, *Politic.* vi. 4). The subsequent history of Cyrene seems to have been a series of changes and internal troubles till after the time of Alexander, when it became subject to Egypt in the reign of the first Ptolemy, and so it continued till Ptolemy Physcon, whose bastard son Apion, being in possession of the chief power, gave it into the hands of the Romans about B.C. 97. Strabo says (837 *c.*) that in his time the kingdom of Cyrene, with Crete, formed a Roman province.

[Coin of Cyrene.]

British Museum. Actual Size. Gold. Weight, 68 grains.

Cyrene produced many celebrated persons: Aristippus, his daughter Areta, and her son Aristippus, Anniceris, Eratosthenes, and Carneades, besides Callimachus, the poet. Aristippus the Elder was the founder of that sect of Socratic philosophers which was called Cyrenaic, from his birthplace. (Strabo, pp. 837 *d.* 838 *a.*)

Cyrene was famous for a fine breed of horses. The Cyrenæan doctors had a high reputation; they were considered in Greece at one time to be inferior only to the doctors of Croton (Herod. iii. 131). (Herodotus, iv. 154–167; Strabo, pp. 56 *d.*, 836, 837, 838).

CYRIL, ST., of Jerusalem, was born in that city about A. D. 315; and received among the clergy there an education for the church. In 345 he was ordained priest and catechist by Maximus, the Patriarch, or, which in fact is the same thing, archbishop of Jerusalem. On the death of that prelate, A. D. 350, Cyril was chosen to succeed him: and the commencement of his episcopate is said to have been signalized by a wonderful luminous appearance in the heavens, called the Apparition of the Cross. It is spoken of in the Chronicle of Alexandria, by Socrates (lib. ii. c. 28), by Philostorgius (lib. iii. c. 26), and by several other ecclesiastical historians. The letter immediately written by St. Cyril to the emperor Constantius describing this miraculous phenomenon, is quoted in proof of the fact by Sozomen, Glycas, Theophanes, John of Nicæa, Eutychius, and many subsequent writers. Dr. Cave, in his Life of St. Cyril, inserts it entire. It is stated that on the nones (7th) of May, A. D. 351, at nine in the morning, a great mass of light, far brighter than the sun, was observed over Golgotha, and extending to Mount Olivet (two English miles); that it assumed the form of a cross, and was seen during several hours by all the inhabitants of Jerusalem. The expression of a wish, with which the letter of Cyril concludes, that Constantius might glorify the consubstantial Trinity (τὴν ὁμοούσιον τριάδα) tends to invalidate the evidence of the fact as an especial miracle, since it shows that Cyril, a zealous Trinitarian controversialist, sought to influence the creed of the emperor, which strongly favoured the Arian tenets: and it is well known to have been a general maxim among the primitive fathers that a pious and orthodox end fully justifies a recourse to any means, however inconsistent with veracity. The zeal with which St. Cyril enforced and defended the doctrine of the consubstantiality of the Son, with the jealousy about precedence, and the ambitious encroachment of jurisdiction, which characterize the episcopal history of that age, occasioned Acacius, the Arian bishop of Cæsarea, to commence a course of persecution against him which terminated in his deposition by a council, A. D. 357. On this he retired to Tarsus until 359, when, by a council of Seleucia, he was re-established in his see, but, through the party of Acacius, he was immediately deposed a second time by a council of Constantinople A. D. 360. On the accession of Julian, who, to increase the broils of the church, recalled all the exiled bishops, Cyril returned to his bishopric, from which, under the emperor Valens, he was expelled a third time by Eudoxus, the Arian bishop of Constantinople, A. D. 367. Finally, under Theodosius, who favoured the Trinitarian sect, he was again restored by a council of Constantinople in 381; and notwithstanding the ambitious and schismatic contests of the bishops and clergy, he remained in his see until his death, A. D. 386. An incident noticed by all the biographers of St. Cyril, is the celebrated attempt of the emperor Julian to rebuild the temple of the Jews at Jerusalem, ostensibly for the purpose of promoting their religion, but really with the sinister view of falsifying the prophecies respecting its irreparable destruction. It is said that notwithstanding the enthusiastic expectations of the Jews, and the prodigious preparations and actual commencement of the work, St. Cyril's reliance on the infallibility of the scriptures induced him to persevere in predicting the failure of the project; and that, accordingly, a series of earthquakes, storms of lightning, and subterraneous eruptions of fire and smoke, destroyed all the materials and a multitude of workmen, the garments of those who escaped being impressed with shining phosphoric crosses, which, even by washing, could not be effaced. The particulars of this miraculous fulfilment of Cyril's prediction are related by St. Gregory Nazian. (*Orat.* 4 *advers. Julian*); by Theodoret, Socrates, St. Chrysostom, Philostorgius, Sozomen, and St. Ambrose. See also bishop Warburton's *Dissert.* on the subject, p. 88.

The extant writings of St. Cyril are in the Greek language and consist of eighteen books of catecheses, or sermons, delivered during Lent to the catechumens, called before baptism Illuminati (φωτιζόμενοι)· five similar discourses delivered during Easter week to the neophytes, after baptism called mystagogic (μυσταγωγικά), being explanatory of the mysteries of the Christian sacraments: a treatise on words, and the letter to Constantius: besides which, several homilies and epistles are sometimes improperly included. Rivetus, in his 'Criticus Sacer' (lib. iii. c. 8, 9, 10, de Cyrilli Catechesibus), considers the five Mystagogics, and letter to Constantius, as supposititious, but by Vossius, Cave, Mill, Whittaker, and bishop Bull, they are acknowledged as genuine. The books of Catecheses are crowded with quotations from scripture, and the style is dull and tiresomely prolix; but the facts they contain relating to the doctrines and discipline of the Eastern church in the fourth century are extremely interesting to the student of Christian antiquities. In the first Catechesis are described the effects of baptism. The fourth gives an exposition of all the Christian doctrines, and treats of numerous questions concerning the body, soul, virginity, marriage, &c. The subsequent discourses exhibit and enjoin a belief in the miraculous virtues of the relics of saints, which are represented as worthy of all veneration; in the efficacy of prayers and sacrifices for the dead; in the powers of exorcism, consecrated unction, oil, and water. Christians are exhorted to cross themselves on every occasion and action throughout the day. The enthusiastic adoration of the cross displayed by St. Cyril was probably owing to his officiating in the church of the Holy Cross, in Jerusalem, where, after 'the Invention of the Cross,' it was deposited in a silver case, and shown by the archbishop to thousands of pilgrims, who each took a little chip of it, without occasioning any diminution of its bulk; hence one of his proofs of the truth of the gospel history of the Crucifixion is the fact of the world being full of chips of the cross. A description of this cross is given by Dom Touttée, at the end of his edition of Cyril's works.

The doctrine of the uninterrupted and perpetual virginity of Mary is taught by Cyril. The state of virginity in general is extolled as equal to that of angels; with an assurance that, in the day of judgment, the noblest crowns will be carried off by the virgins. The resurrection is proved and illustrated by the story of the Phœnix, and it is remarkable that this fiction is regarded as a reality not only by St. Cyril, St. Clement, and other Christian bishops, but by many of the most learned and philosophic Gentiles. That Cyril's superstitious credulity and love of the marvellous was remarkably great, is very apparent: for instance, in describing the Descent into Hell, he declares that the doorkeepers of that place, on seeing Jesus, all ran away in a fright; and in his sixth Catechesis on Heresies, he says that Simon Magus, having, by the power of his magic, mounted up into the air in a fiery chariot drawn by a pair of dragons, St. Peter and St. Paul, by their prayers, dissolved the enchantment, and Simon consequently fell to the ground and broke his bones. In the five Mystagogics are described the ceremonies which precede baptism; the anointing with oil the forehead, face, ears, and nose; the forms of exorcism, the holy chrism, confirmation, the eucharist, liturgy, and communion. The dogma of transubstantiation is most explicitly enforced: we are said to be made concorporeal and consanguineal with Christ, by his body and blood being distributed through our bodies. Very minute directions are given for the mode of receiving the eucharistic bread and wine: thus, put your left hand under your right elbow, making with your hollowed right hand a throne for the reception of the body of Christ, and closing your fingers lest a crumb be lost, which would be a greater misfortune than the loss of a limb, &c., then, having drunk of the cup of the blood, moisten the tip of your finger from your lips, and by touching, consecrate your eyes, ears, nose, &c.

For a list of editions of Cyril see Watt's *Biblioth. Brit.*; Mille's ed. of the *Opera Omnia*, Græce et Latine, fol., 1703, contains notes, three indices, and the various readings; but the editio optima is that by Augustus Touttée, a Maurist monk; Gr. et Lat. fol., 1720; (*Lives of Saints*, by the Rev. Alban Butler, vol. iii.; Dr. Adam Clarke's *Succession Sac. Lit.*, vol. i.; Lardner, vol. iv.; Grodecius, *Vita St. Cyrilli; Lives of Saints*, vol. i. 4to. 1729.)

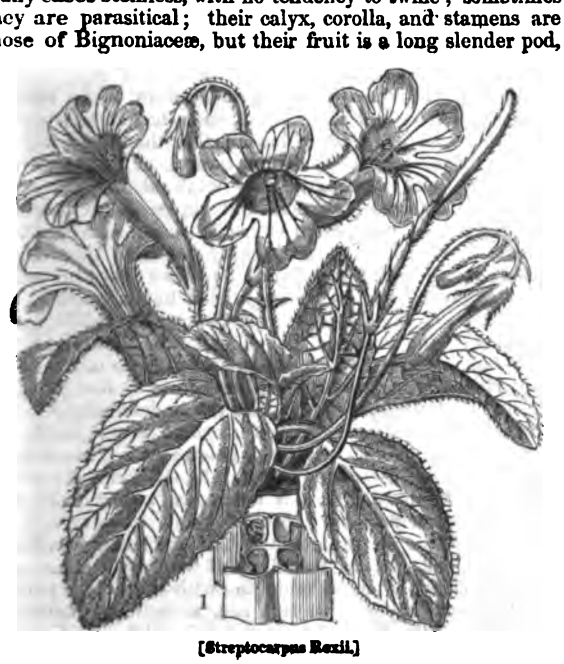
CYRIL, ST. (CYRILLUS), of Alexandria, was educated under his uncle Theophilus, the contentious bishop of Alexandria, by whom St. Chrysostom was persecuted and deposed. On the death of Theophilus, A.D. 412, Cyril was so successful in the struggle which, on such occasions, always occurred at that time among the aspiring clergy, that in three days after his uncle's decease he was elected patriarch, that is archbishop of Alexandria. His episcopal power was first displayed in shutting up and plundering the churches of the puritan sect founded by Novatian, who is said to have been consecrated a bishop by three episcopal friends whom he invited and made drunk for the purpose. (Pluquet, *Dict. des Heres.*) Cyril next exhibited his zeal against heretics by heading a furious mob of fanatics, who drove out all the numerous Jewish population from Alexandria, where, since the time of Alexander, its founder, they had enjoyed many privileges, and were politically important as contributors to the public revenue. This arrogant proceeding therefore highly excited the anger of Orestes, the governor of the city, and made him henceforth the implacable opponent of the bishop, who, in the name of the Holy Trinity and Gospels, in vain implored a reconciliation. In consequence of the enmity thus created, and of Cyril's resentment of the checks opposed to his ambitious encroachments on the jurisdiction of the civil power, a murderous attack was made on the governor in his chariot by a band of 500 monks; and one who severely wounded him having suffered death on the rack, Cyril, in his church, pronounced a pompous eulogy over his body as that of a glorious martyr. (Soc., l. vii., c. 14.) By the philosopher Eunapius (*Vita Ædesii*) these monks are described as swine in human form. The tragic story of Hypatia, the daughter of the mathematician Theon of Alexandria, furnishes further evidence of the revengeful disposition of St. Cyril. This lady, whose wonderful abilities enabled her to preside over the Alexandrine school of Platonic philosophy, was the especial object of the bishop's envy and malice; not only because she far excelled him in the depth and extent of her knowledge, which drew to her lectures the greatest philosophers and statesmen, and a crowd of students from Greece and Asia; but because, from her intimacy with the governor and the great respect and admiration he manifested towards her, Cyril and his clergy suspected her influence in promoting the governor's unfavourable opinion of them. The consequent murder of Hypatia is circumstantially related by several ecclesiastical historians. (Socrates, l. vii., c. 13 and 15; Nicephorus, l. xiv., c. 16; Damascius, in *Vita Isidori*; Hesychius and Suidas, in Ὑπατία; Photius, *Annot. ad Socrat.*, l. vii., c. 15.) In these accounts it is stated that Cyril having vowed the destruction of this accomplished woman, a party of infuriated wretches, whom Nicephorus (*ubi supra*) expressly declares to have been Cyril's clergy, led on by Peter, a preacher, seized her in the street, and having dragged her into a church, completely stripped her, tore her to pieces, carried the mangled fragments of her body through the streets, and finally burnt them to ashes, A.D. 415. (See Toland's *Hypatia, or the History of a most beautiful, virtuous, learned, and accomplished Lady, who was torn to pieces by the Clergy of Alexandria, to gratify the cruelty of their Archbishop, undeservedly styled St. Cyril*, 8vo., 1730.)

The titles of 'Doctor of the Incarnation' and 'Champion of the Virgin' have been given to this bishop on account of his long and tumultuous dispute with Nestorius, bishop of Constantinople, who denied the mystery of the hypostatic union, and contended that the Divinity cannot be born of a woman—that the divine nature was not incarnate in, but only attendant on, Jesus as a man, and therefore that Mary was not entitled to the appellation then commonly used of 'Mother of God.' (Pluquet.) The condemnation and deposition of Nestorius having been decreed by Pope Celestine, Cyril was appointed his vicegerent to execute the sentence, for which he assembled and presided at a council of 60 bishops at Ephesus. But John, the patriarch of Antioch, having, a few days afterwards, held a council of 41 bishops, who supported Nestorius and excommunicated Cyril, the two parties appealed to the Emperor Theodosius, who forthwith committed both Cyril and Nestorius to prison, where they remained for some time under rigorous treatment. Cyril, by the influence of Celestine, was at length liberated and restored, A.D. 431, to the see of Alexandria, which he retained until his death, A.D. 444.

His works are numerous, and chiefly on subjects connected with the Arian controversy, the incarnation, consubstantiality of the Son, and similar difficult points which are involved in additional obscurity by an intricate perplexity of style and the use of barbarous Greek. The following are some of the principal treatises:—'Thesaurus on the Trinity,' intended as a complete refutation of Arianism. In 'Dialogues on the Incarnation,' in 'Five books against Nestorius,' and in an ample 'Commentary on St. John's Gospel,' the same subject is continued. Ten books against Julian contain replies to that emperor's three books against the Gospels, which, if Cyril's quotations are faithful, were as weak and absurd as the answers. Seventeen books 'On Worship in Spirit and Truth,' show that all the Mosaical institutions were an allegory of the Gospel; 'a proof,' says Dr. Adam Clarke, 'how Scripture may be tortured to say *any* thing.' Thirteen books on the Pentateuch and the Prophets are written with a similar view. Thirty paschal Homilies, announcing, as customary at Alexandria, the time of Easter, are 'dull, dry, barren, and perfectly uninteresting.' (Dr. A. Clarke.) Sixty-one Epistles nearly all relate to the Nestorian controversy. Cyril's Synodical Letter contains 12 solemn curses against Nestorius, who as solemnly replied with 12 curses against Cyril. In a treatise against the Anthropomorphites, or those Egyptian monks who taught that as man is made in the express image of his Maker, God has the form and substance of a human body, Cyril reproves them for their gluttony and idleness, and answers with great metaphysical skill a series of very perplexing queries, such as whether God can cause what *has* happened, *not* to have happened; whether he can cause a prostitute to have been always a virgin; how angels who are spirits had carnal knowledge of women, &c. Cyril throughout his works enforces the adoration of Mary as the mother of God, and explicitly teaches the doctrine of transubstantiation, declaring that by taking the Lord's body we become concorporeal with God, being blended together like two portions of melted wax. 'The history of none among the Christian fathers,' says Dr. Adam Clarke, 'is more disgraceful to the Christian character than that of St. Cyril, of Alexandria—a man immoderately ambitious, violent, and headstrong; a breeder of disturbances; haughty, imperious, and as unfit for a bishop as a violent, bigoted, unskilful theologian could possibly be—but resolved that if the meek inherit the earth, the violent should have possession of the sees.' The editio optima of the 'Opera Omnia' of Cyril is that in 7 tom. fol., Greek and Lat., Paris, 1638. Spanheim's edition of Julian's works contains Cyril's work against Julian. (Clarke's *Succession Sac. Lit.*, vol. ii., p. 137; Socrates, *ubi supra;* Tillemont, tom. xiv., p. 272; Butler, *Lives of Saints;* Ceillier, tom. xiii., p. 241; Rivetus, *Critic. Sac.*)

CYRILLUS, the author of a Greek Glossary, which some have attributed to the bishop of the same name. It is printed in the appendix to the London edition of H. Stephen's Greek Lexicon, 1826.

CYRTANDRA'CEÆ, a small natural order of irregular-flowered monopetalous Exogens, scarcely distinct from Bignoniaceæ by any positive characters, although they have a very peculiar habit. They are herbaceous plants, and in many cases stemless, with no tendency to twine; sometimes they are parasitical; their calyx, corolla, and stamens are those of Bignoniaceæ, but their fruit is a long slender pod, containing a multitude of seeds, that are often terminated by long delicate tails, and are destitute of albumen. The pod is two-celled, and each cell has its placentæ doubled back from the axis so as to form two plates at right angles with the dissepiment. The species inhabit the East Indies chiefly, a few only being met with in other warm parts of the world. They are all beautiful in their flowers, but they are of no known use.



[Streptocarpus Rexii.]

1, a section across the ripe pod, showing the double placentæ.

CYRUS I. (Κῦρος), founder of the Persian monarchy, began to reign about B.C. 559. Even in the time of Herodotus the history of Cyrus was so obscured by legendary tales that the truth could not be separated from the fiction. His original name appears to have been Agradatos (Strabo, p. 729 *d.*): the word Cyrus is said to have signified the sun and this name was probably assumed by him when he became king. (Heeren, *Ideen.*) Cyrus was the son of Cambyses, a Persian, and Mandane, daughter of Astyages, king of Media, and hence was called by the oracle a mule. (Herod. i. 91.) In consequence of Astyages dreaming a dream which portended that the offspring of his daughter would take the throne of the Medes, he ordered Cyrus to be destroyed as soon as he was born. Harpagus, a person of rank in the king's household, was charged with the commission, but being reluctant to execute it, he gave the child to the king's herdsman to put to death. The herdsman's wife, who just at this time was delivered of a stillborn male child, persuaded her husband to preserve the life of the royal infant, and their own dead child was accordingly exposed instead of Cyrus, whom they brought up under their own roof. Among his boyish playmates Cyrus exhibited all the royal symptoms of an inclination to command and be obeyed. In their games the youths made him king, and the severity with which he enforced his orders on one of these occasions led to his being brought before Astyages, who recognized in his features a likeness to himself, and found that the time of the exposure of his grandson and the age of Cyrus agreed. The circumstances of his preservation were disclosed, and he was sent to his real parents. Astyages was less enraged against the herdsman than against Harpagus, on whom he wreaked his vengeance by the murder of his son: the youth's mangled limbs were dressed and served up at supper when Harpagus was present, and the head, hands, and feet were afterwards shown to the father in a basket, with insulting expressions. Harpagus said nothing, but meditated revenge; and it was not long before he succeeded in rousing Cyrus against Astyages. Cyrus induced the Persians to revolt against the Medes, and dethroned Astyages B.C. 560. He next attacked and took Sardis, and made Crœsus prisoner B.C. 546. [CRŒSUS.] He besieged and took the city of Babylon B.C. 538, which he entered by diverting the course of the Euphrates and leading his army into the city by the dry bed of the river (i. 190, 191). At last he carried his arms against the Massagetæ, and was defeated and slain by Tomyris, their queen (B.C. 529), who had his head cut off and put into a leathern bag full of human blood, saying, 'Though I am alive and have conquered you, you have undone me by taking my son; but I will, as I threatened, satiate you with blood.' He had reigned twenty-nine years (i. 214). This is the account given by Herodotus, which, with a few variations, is copied by Justin. Xenophon's work on the education of Cyrus is rather an historical romance than a history, and therefore his narrative is less to be depended on than that of Herodotus, from which it differs materially. Both Xenophon and Ctesias (*Persica*, c. 8) [CTESIAS], make Cyrus die quietly a natural death. (See the last chapter of Cicero *De Senectute.*) The account of Ctesias as to his death is conformable with the story in Arrian (*Anab.* vi. 29) of the body of Cyrus being interred at Pasargadæ. [ALEXANDER III., p. 301.) The fame of Cyrus appears to have lasted to the downfall of the Persian empire; he was regarded by his countrymen as their great national hero; and his fame is still preserved in the annals of modern Persia. The Persians gave him the title of father (iii. 89), while they called his son, Cambyses, a tyrant. The capture of Babylon by Cyrus is the point at which sacred history first touches on profane. (Clinton, *Fast. Hel.* p. 301.) Cyrus left two sons, Cambyses, who succeeded him on the throne, and Smerdis, who was murdered by the command of Cambyses. (Herod. iii. 30.)

CYRUS II. was the son of Darius II. and Parysatis. Artaxerxes, the eldest son of Darius, succeeded him as king: but Cyrus disputed the right of succession, and founded his own claim on the fact that he was the first-born after the accession of his father. Cyrus was the favourite of his mother, Parysatis, and was indebted to her intercession with Artaxerxes for the preservation of his life after he had been charged with a conspiracy against the king. He was sent back to his government in the western provinces of Asia Minor, but did not relinquish his designs on Artaxerxes. Indignant at the disgrace he had suffered by being sentenced to death, he resolved, if possible, to dethrone his brother. The great difficulty was to raise a sufficient force without exciting his brother's suspicions. Clearchus, a Lacedæmonian general, undertook to raise a body of Greek troops for the purpose of making war on some Thracian tribes. Aristippus in Thessalia, and Proxenus in Bœotia, raised troops for similar purposes and with a similar object. Artaxerxes had originally been apprized of the designs of Cyrus by Tissaphernes, but the cities which were in the government of Tissaphernes now all revolted to Cyrus, with the exception of Miletus. A war thus arising between Tissaphernes and Cyrus, gave Cyrus a pretext for openly collecting his forces, and even for soliciting the aid of the king, to whom he made heavy complaints of the conduct of Tissaphernes. Artaxerxes was thus blinded to the real aims of Cyrus, who explained his intentions to no Greek but Clearchus, lest they should be deterred from joining him by the boldness of the attempt. When his forces were all collected, he set out from Sardis, the seat of the Persian authority in Western Asia (B. C. 401), without the soldiers knowing any thing more of the objects of the expedition than that he was going to march against the Pisidians, who had infested his province. Tissaphernes however, with his characteristic cunning, saw that the preparations were much too great to be really intended against the Pisidians, and accordingly he went with all expedition to inform the king. Artaxerxes no sooner heard of the armament of Cyrus than he began to make preparations for opposing him. Cyrus in the mean time was continuing his march through the southern provinces of Asia Minor, passing through Celænæ, Peltæ, Thymbrium, Tyræum, Iconium, and Dana, till he arrived at the foot of the Taurus, which he crossed and arrived at Tarsus. Here the Greeks refused to march any farther: they suspected that they were going against the king, and declared that they were hired for no such purpose. The tumult was partially appeased by the influence of Clearchus, who persuaded them to send deputies to Cyrus to inquire what was the real object of the expedition. Cyrus, by an artful evasion, which however was partly seen through by the soldiers, pretended that he had an enemy, Abrocomas, on the banks of the Euphrates, at the distance of a few days' march, and that he was advancing against him. A promise of half as much pay again as they had received before, induced them to proceed; but it was not till some time after that it was openly stated that they were going against the king. At last, on arriving at the plain of Cynaxa, in the province of Babylon, Cyrus found Artaxerxes ready to oppose him with an immense army. Clearchus advised Cyrus not to expose his own person, but he rejected the counsel. As soon as the enemy approached, the Greeks attacked them with such vigour that the disorderly and ill assorted army of the king forthwith took to flight. While Artaxerxes was preparing to attack in the flank, Cyrus advanced against him with a large body of horse, and with his own hand killed Artagerses, the captain of the king's guards, and routed the whole troop. Just at this moment, spying the king himself, and crying out, 'I see him,' he rushed forward and engaged with him in close combat. He killed his brother's horse and wounded the king himself. The king mounted another horse, but Cyrus attacked him again, and gave him another wound, and was in the act of giving him a third, when he himself was slain. The select guards and friends of Cyrus, not choosing to survive their master, killed themselves on his body. With the life of Cyrus ended the cause in which he died, and the Greeks effected their retreat under the command of Xenophon and others. [ANABASIS.] The whole expedition occupied fifteen months.

The character of Cyrus is highly eulogized by Xenophon (*Anab.* i. c. 9). In his childhood and youth he excelled all his companions in those pursuits which belonged to their rank: he was fond of war and hunting. His justice was conspicuous in all his conduct both public and private, and he never suffered the evil-doer to go unpunished. To those who deserved reward for services he was unbounded in his munificence, and his friends received frequent tokens of his kind remembrance. On the whole it was the opinion of Xenophon that no individual had ever secured the affections of a greater number of men whether Greeks or others. According to a passage in Xenophon quoted by Cicero (*De Senectute*, c. 17), Cyrus was fond of agricultural and horticultural labours, and worked with his own hands. (Xenophon, *Anabasis* i.: Plutarch, *Artaxerxes;* Diodorus Siculus, xiv.)

CY'RUS, the name of several, Asiatic rivers, and apparently the same name as that of the Persian conqueror The Cyrus, now the Kur, flows from the Caucasus into the Caspian Sea (Strab. Casaub., p. 501), and another river of the same name flowed past Pasargadæ. (Strab. 729.)

CYSTI'NGIA (Zoology), a sub-genus of the natural group of *Tunicata*, established by Mr. W. S. Mac Leay, who observes that it comes nearer to *Boltenia* than to any other hitherto described, and that they may prove eventually to be only two subgenera, of which we want the intervening links to enable us to form an accurate notion of the genus to which they belong. The characters, however, adds Mr. Mac Leay, both internal and external, are so different from those given as generic by Savigny to *Boltenia*, that it is impossible to assign it to this group, which indeed has nothing in common with it but externally a pedicle, and internally composite tentacula.

Subgeneric Characters.—External. *Body* with a subcoriaceous test, affixed by the summit to a very short pedicle, which is in the same line with the two orifices. The *Branchial orifice* quadrifid and lateral, the *anal* irregular and terminal; both being so little prominent as not to alter the form of the body. *Anatomical.—Branchial pouch* membranaceous, indistinctly reticulated, and divided into longitudinal folds. The *tentacula* of the branchial orifice composite. *Intestinal canal* lateral. *Stomach* very large, extending almost the whole length of the body *Ovaries* two, composed of globular ova disposed in free racemes on each side of the body, with the branchial pouch and stomach between them. (W. S. Mac Leay.) Example, *Cystingia Griffithsii*.

Description.—Envelope semipellucid, yellowish. *Mantle* very thin, and provided near the branchial and anal orifices with a reticulation of circular muscles nearly at right angles to each other. *Tentacula* about 10 or 12, compressed and laminated like those of the genus *Boltenia*. *Branchial* pouch having its net-work exceedingly lax, meshes irregular and indistinct, but apparently simple, the nervures being nearly of the same size. The longitudinal folds of the branchiæ, or rather (owing to the singular position of them in this genus) their transverse folds, about 14 or 15 in number. Length of the body, half an inch. (W. S. Mac Leay.) Locality, Winter Island. Mr. Mac Leay, who has named the species after William Nelson Griffiths, Esq. who found only one specimen during the third voyage under Captain (now Sir Edward) Parry, gives the following details of its organization.

'The body of this animal, so different in many respects from all other *Tethyæ*, is pyriform, and attached to a pedicle so short as scarcely to curve down farther than the branchial orifice. This pedicle is rather conical at its base, subcylindrical, and apparently very weak at its extremity. From this apparent weakness and imperfect formation of the pedicle, in conjunction with the circumstance of one side of the conical part in the only specimen that I have seen being incrusted with sand, I suspect that the animal can scarcely be said to be suspended by its pedicle, but rather reposes on the conical part of it; by which means the folds of the branchial pouch will take a vertical, and the stomach a horizontal position, and thus be more in correspondence with the ordinary position of the stomach in the simple *Ascidiæ*, which is very rarely descending. The envelope of *Cystingia Griffithsii* is exceedingly smooth, and so pellucid as to appear almost gelatinous. The original colour I cannot ascertain; but if it be the same as that of the specimen in spirits, it is cinereous, rather yellowish. The external orifices have scabrous veins, are very minute, and scarcely at all prominent. The branchial orifice is quadrifid, and placed exactly half-way down the side. The anal orifice is on the same line with it and the pedicle, but is placed opposite to this last, so as to be terminal, having its external surface apparently without rays; in both respects being totally different from the anal orifice of *Boltenia*.'

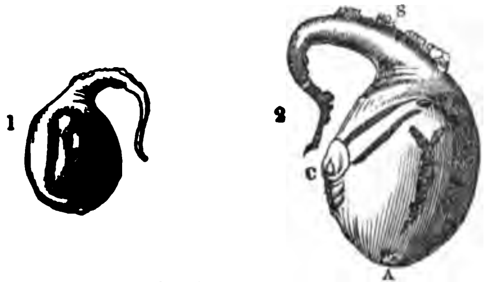
Respiratory System.—'The entrance of the branchial cavity is provided with a circular range of 10 or 12 unequal tentacula, which are composite or divided into laciniæ at the extremity, which laciniæ are again so minutely divided as to be almost plumate. The branchial pouch has about 14 folds, and its net-work is very indistinct and lax, the ransverse nervures being perhaps the most visible, particularly towards the branchial orifice. The folds of the branchiæ are most easily seen on the inside of the branchial pouch.'

Circulating System.—'The heart is situated horizontally between the lower part of the tunic and the stomach. It s large, ovoidal, and appears to be composed of several obes, and is indeed of a structure different from that of uch *Ascididæ* as are known.'

'The *dorsal sulcus* is remarkably distinct, and proceeds rom the immediate vicinity of the heart, or rather along he back of it to that of the branchial orifice. It may be een through the external envelope of the body, when this s viewed on the left side, and forms an arch inclosing a esser and more pointed arch, which last appears to be nothing else than one of the folds of the branchial pouch. At the point where this last arch touches the dorsal sulcus, here is in our specimen an orifice opening internally, and pparently communicating by a tube with a beautifully diaphanous longitudinal pouch, which contains nothing but wo blackish nodules, one of which is longer than the other.' The imperfection of the only specimen which Mr. Mac Leay had for examination prevented him from accurately scertaining the nature and use of this part of the organization, which, he says, appears to have nothing similar to t in any of the other *Tunicata* hitherto observed.

Digestive System.—'The *Pharynx* is situated rather igher than the branchial orifice; and the *œsophagus*, which is about half the length of the stomach, after descending to the highest part of the branchial vein, descends, nd gives rise to a simple but enormous stomach, with very light transverse striæ, and having a longitudinal division, marked somewhat deeply, and which runs almost the whole ength of the body in a line between the base of the pedicle nd the anal orifice. The intestine is exceedingly short, nd apparently descending in a line with the stomach; the ectum is cylindrical, and anus simple. Such at least is he description of the digestive apparatus of this animal, if we give the name of pharynx to that end of the intestinal anal which opens into the branchial cavity, and the name f *anus* to that end of it which is free; and there is no oubt that such a description makes it an animal totally ifferent from *Boltenia*, and in fact from all other species f *Tethyæ*, not only with respect to the singular form of the ntestinal canal, but inasmuch as the branchial vein is thus laced, in relation to the pharynx, directly opposite to its osition in all other animals of this group. I therefore am nduced in some measure to suppose that there is a montrous formation in the intestinal canal of the only speimen which I have had the means of examining; a supposition which must of course for the present throw doubt n any generic character which might be drawn from the bove description of the intestinal canal. If indeed we ould imagine that, were it not for some monstrosity of tructure, the intestinal canal would communicate with the ranchial cavity by that end which, from its being free, I ave been obliged to consider the anus, then the whole of he internal organs of nutrition would have a situation nalogous to that of those of *Boltenia*. For instance, there would then be a short œsophagus opening near the anal rifice of the envelope, an ascending stomach, a long curved ntestine, and descending rectum, while the branchial vein nd heart would take their usual situation in respect to the harynx and stomach. We know moreover, from those memoirs of Savigny, to which I have in the course of this aper had occasion to refer, that the digestive organs of the *Tunicata* are subject to analogous derangements, of which e has figured two remarkable examples in *Cynthia Momus* and *Phallusia turcica*. It appears indeed to be a onsequence of the low rank of these animals in the scale f being, and of their simple organization, that the organs pparently most essential to their existence may undergo he greatest inversions without affecting their life; for the monstrous *Cynthia Momus* described by Savigny, as well s the *Cystingia* now under consideration, had its ovaries ull of eggs.'

Mr. Mac Leay observes that Pallas, in the *Nova Acta Petropolitana*, has described, under the name of *Ascidia globularis*, a species of this family, which he found during his Siberian journey plentiful on the shallow sandy shores of the Arctic Ocean. The description of Pallas, as Mr. Mac Leay remarks, is vague, and principally differs from the species now under consideration in the size and position of the apertures. It is therefore, Mr. Mac Leay adds, just possible that the species which Pallas describes as being of the size of a large cherry, and attached by a very short peduncle to the fine sand of those shores, the particles of which being agglutinated to its surface, make the animal appear rough, may be identical with *Cystingia Griffithsii*, which would be rather interesting in a geographical point of view; but if both the apertures of Pallas's species be truly terminal, and the position of the peduncle be truly indicated in the figure, it is not only a different species, but probably a very different genus.



[Cystingia Griffithsii.]

1, nat. size, seen on the right side; 2, magnified, seen on the left side; A, anal orifice; C, branchial orifice; S, grains of sand externally encrusting the thick end of the pedicle.

For an illustration of the interesting anatomical details, we must refer to *Linn. Trans.*, vol. xiv., tab. 19, whence the figures and description are taken.

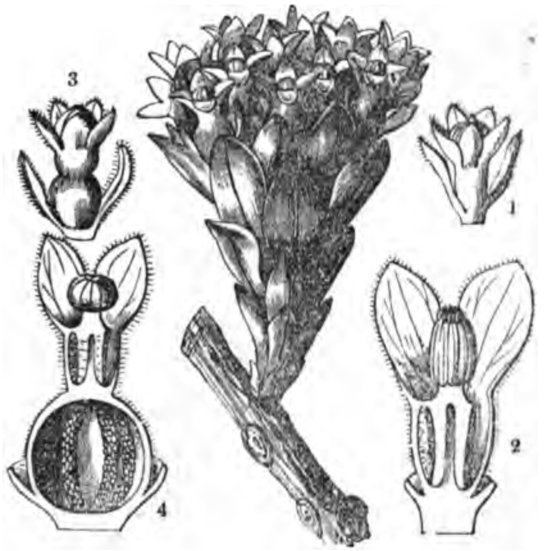
Mr. Griffiths's specimen was taken in Fox's Channel, and two specimens were obtained by the late expedition under Captain Sir John Ross, near Felix Harbour; but as these were abandoned with the rest of the collection, it is probable, as Captain James Ross observes, that the individual from which Mr. Mac Leay's description and drawings were taken is the only specimen ever brought to England.

CYTHE'RA. [CERIGO.]

CYTHERÆA. [VENERIDÆ.]

CYTHERI'NA. [BRANCHIOPODA, vol. v., p. 341.]

CYTINA'CEÆ, a small natural order of Rhizanths, the type of which is Cytinus Hypocistis, a parasite found growing on the roots of certain kinds of Cistus in the south of France. Its stems are a few inches high, thick, succulent, reddish or yellowish, and covered by straight fleshy imbricated scales which are only abortive leaves. The flowers are nearly sessile, erect, arranged at the summit of the stem, yellowish and velvety on the outside. The fruit is baccate, inferior, leathery, divisible into eight polyspermous lobes. The inspissated 'uice is used in French phar-



[Cytinus Hypocistis.]

1, a male flower; 2, a section of the same, very much magnified; 3, a female flower; 4, a section of the last.

macy as a styptic, but it is not admitted with us. Along with this genus are associated the curious genus Hydnora, Cape of Good Hope, which looks like a great star of the Lycoperdon, Apodenthus, a minute parasite upon the branches of trees, and two other less known genera.

CY'TISUS, a genus of hardy papilionaceous shrubs, natives almost exclusively of Europe and the temperate parts of Asia, bearing ternate leaves, and with one exception, *C. purpureus*, yellow flowers. The species are common ornaments of our gardens; the most remarkable are the two kinds of Laburnum, *C. Laburnum* and *C. Alpinus*: these two plants form small well-known trees, which in spring are loaded with their numerous bunches of yellow flowers. They have a handsome hard olive-green wood, well adapted for the purposes of the turner; both are natives of the Alps of Europe, and are much alike; but *C. Alpinus* has the broader and more shining leaves of the two, and is much the handsomer plant. It is not a little singular, that the seeds of these species, in an order of plants usually wholesome, are decidedly and dangerously poisonous, owing to the presence of the deleterious alkaline principle called Cytisine.

The Cytisus of Virgil was the Medicago arborea of botanists.

CY'TISUS SCOPA'RIUS, or **BROOM**, a shrub extremely common on uncultivated ground, heaths, &c., of most parts of Britain. The young tops or twigs when bruised, have an unpleasant odour, and a disagreeable nauseous taste. The seeds are emetic, and probably contain cytisine, an alkaloid found in the seeds of the Cytisus Laburnum, which possesses emetic, and, in large doses, poisonous properties.

Broom-tops boiled in water form a decoction which acts both on the bowels and kidneys. It is unquestionably a valuable diuretic, and many obstinate cases of dropsies have yielded to the use of this indigenous remedy which had resisted other means. Its diuretic properties may be increased by the addition of juniper berries and dandelion, to form the decoction, as now directed in the Pharmacopœia, and by adding to each dose, acetate, tartrate, or bitartrate of potash.

CY'ZICUS (Κύζικος), an antient town of Asia Minor, built on an island in the Propontis near the coast of Mysia, which was joined to the main land by two bridges. An isthmus has gradually formed itself, and the island is become a peninsula. It is said to have been a Milesian colony, formed in the eighth century B.C. Strabo (Casaub. 675.) speaks of Cyzicus as worthy of being numbered among the first cities of Asia for its size, beauty, and splendour, and for the goodness of its laws. It became early allied to Rome, and remained faithful in its alliance. It withstood all the power of Mithridates who besieged it, and the brave resistance of the citizens gave time to L. Lucullus to come up with his army and drive him back into Pontus. The Romans, grateful for the fidelity of Cyzicus, not only respected its liberties, but gave it an increase of territory, which extended, according to Strabo, to the east, as far as the lake Dascylitis, and to the west, beyond the Æsepus into Troas as far as Adrasteia. To the south, it reached Miletopolis. The town of Cyzicus was built partly on the sea-coast, and partly on a hill; its site has been described by Pococke and Sestini; there are some remains, and among others, an amphitheatre. On the same island, west of Cyzicus, was another Greek colony called Artace.

[Coin of Cyzicus.]

British Museum. Actual size. Bronze. Weight, 229 grains.

CZAR, or **TZAR**, the Russian title of the monarch of Russia. Some have supposed it to be derived from Cæsar or Kaisar, but the Russians distinguish between Czar and Kesar, which last they use for emperor. The sovereign of Russia styles himself also Autocrat of all the Russias. It is only since the time of Peter the Great that the title of emperor has been given to him by the senate, and afterwards by the other courts of Europe. Before Peter's time, the sovereign of Russia was styled grand duke in European diplomacy. The consort of the czar is styled czarina.

CZASLAU, a circle in the eastern part of the kingdom of Bohemia, bounded by the circles of Chrudim, Kaurzim, and Tabor, and the margraviate of Moravia. Its area is about 1260 square miles, and it contains nine towns, Czaslau, Deutsch-Brod (4450 inhabitants), Kuttenberg (8000), Kank, Humpoletz, Chotiberg (2000), Przemislau (1400), Pollna (1800), and Golz-Jenikau, 38 market towns, and 840 villages. The population is about 234,260: in 1817 it was 187,120. The surface is undulating, with numerous levels, except on the side next Moravia, where it is mountainous. In the northernmost parts it is intersected by the Elbe, which is here increased by the Dobrava; and from west to east it is traversed by the Sazova. Much corn and flax are raised; it yields timber, silver, iron, saltpetre, garnets, and other precious stones, &c.; and has woollen, cotton, paper, &c. manufactories.

CZASLAU, the chief town, lies in a fertile plain, in 49° 52′ N. lat. and 15° 25′ E. long. It is an antient town, has a collegiate church, embellished with the loftiest steeple in Bohemia, a public school, manufactures of saltpetre, linens, &c. and it contains about 3400 inhabitants. The monument in memory of J. C. von Troeznow, more commonly called Ziska, the celebrated leader of the Hussites, who died in 1424, was once in the church, but all vestige of it has been removed.

CZEGLE'D, a large market-town in the county of Pesth in Hungary, and circle of Ketskemét, is the property of the established or Roman Catholic church. It lies in 47° 10′ N. lat. and 19° 48′ E. long., has a Roman Catholic and Protestant church, several handsome buildings, and contains about 13,050 inhabitants, 8500 of whom are Protestants and 4400 Roman Catholics. The country around it is well cultivated, and produces much grain and a great quantity of common red wine. The breweries are considerable.

CZERNIGOF, or **TSHERNIGOF**, formerly part of the Ukraine, is at present one of the three governments of that part of the south of Russia in Europe which is called Little Russia. It lies between 50° 20′ and 53° 20′ N. lat. and 30° 10′ and 34° 40′ E. long. It is bounded by the governments of Mohilef, Smolensk, Orel, Kursk, Pultava, Kief, and Minsk, and contains an area, according to Neumann, of about 27,000 square miles, which, however, Wichmann reduces as low as 20,920 and Arsenief to 19,9[illegible] The general character of the surface is a level, occasionally interrupted by hills, and rising into high land as it approaches the elevated banks of its south-west boundary the Dnieper. With the exception of some sandy tracts, the subsoil is sand or clay, which is well covered with rich loam, and presents a succession of luxuriant arable and pasture lands. On the banks of the Dnieper, the chalk, slate, and clay alternate, but slate predominates. Most of the streams which water Czernigof empty themselves into the Dnieper, particularly the Desna, a navigable river, which enters the country in the north-east from Orel, and traverses it nearly in its whole length in a south-westerly direction. The waters of the Desna are increased by those of the Snof, Ostre, Seim, and Sudost; the Sofda also flows through the northernmost, and the Trubesh through the southernmost districts. Czern[illegible] abounds in small streams, and in natural sheets of water, none however large enough to be called lakes; it has mineral springs, but they have not been brought into use. The climate is dry, mild, and salubrious; but the land has of late years suffered from the inroads of locusts. Agriculture and grazing constitute the principal pursuit of the inhabitants; corn of all kinds, particularly rye, barley, and oats, are grown, and the yearly produce is estimated at three millions of quarters, of which upwards of two millions are consumed in the country itself. Hemp in large quantities, flax, tobacco, peas and beans, linseed, and hops are also raised. Vegetables, melons, and the commoner sorts of fruit are plentiful, but the grape does not ripen sufficiently for wine. There is here a peculiarly fine species of the cherry, called Tsherasun, from which brandy and sugar are obtained. The woods and forests yield an abundance of excellent timber, charcoal, potash, and tar. Horses and cattle are reared in great numbers; the horse is of the small, active, and hardy breed of the Ukraine, and well adapted for the use of light cavalry, and there are fine studs kept, particularly by Count Rasumofsky. The ox is of a fine race, and fattens readily; this animal here performs the labour of the plough exclusively. Large herds of sheep and swine are kept. Much honey and wax are made. Of minerals, Czernigof possesses iron, alum, saltpetre, porcelain earth, potter's-clay, chalk, and slate.

According to the census of 1796, the twelve circles of which Czernigof was then composed, contained a population of 1,013,600 souls; its present amount is estimated at 1,410,000. The average increase during the three years 1825, 1826, and 1827, was 49,121 in each year. There are scarcely any serfs in this government. The Greek is the predominant form of faith, and ecclesiastical affairs are directed by the archbishop or eparch of Czernigof and Neshin, who has 1016 parishes under his jurisdiction.

The inhabitants mostly make their own clothing and utensils. There has, however, been an improvement in this respect; in 1808 the whole country could not produce above fifteen manufactories, but in 1830 the number had increased to seventy-seven, which gave employment to 3095 operatives. The fondness of the people for ardent spirits has occasioned the establishment of a great number of distilleries. There is some internal trade, which mostly centres at Neshin, where four large fairs are held in the course of the year. The exports, consisting principally of horses, cattle, swine, tallow, wool, skins, bristles, grain and meal, honey and wax, potash, hemp and hempseed, and brandy, are considerable.

Czernigof is one of the privileged governments, the antient prerogatives of the nobility having been confirmed to them in 1802, and the Cossack inhabitants enjoying the privilege of distilling brandy in any spot they please, without its being deemed an infringement on the crown monopoly. The governor-general of Little Russia is at the head of the local administration of Czernigof, as well as Pultava and Kief, and the revenues of the government are said to produce about 200,000*l.* sterling per annum.

The country is divided into the fourteen circles of Czernigof, Gorodnia (capital Gorodnick on the Gorodna, three churches, and about 1300 inhabitants), Sosniza (capital of the same name, at the confluence of the Ubeda and Desna, 1200 inhabitants), Koselez (capital Koselez, on the Oster, 2,100 inhabitants), Neshin (capital Neshin, on the Oster, fifteen churches, and upwards of 10,000 inhabitants who carry on a large trade), Borsna (capital Borsna, on the river Borsna, about 1000 inhabitants), Konotop (capital Konotop, on the Yesatsha, about 1000 inhabitants), Gluchof (capital Gluchof, on the Irsmen, twelve churches, and about 9000 inhabitants), Novgorod-Seversk (capital Novgorod-Seversk, on the Desna, 8000 inhabitants), Starodub (capital Starodub, on the Babinga, about 4300 inhabitants), Novomiasto (capital Novomesto, on the Iput, about 1100 inhabitants), Mglin (capital Mglin, on the Sudenka, four churches and about 2500 inhabitants), Souragia, and Krolevertz.

CZERNIGOF, the capital of the government, is situated on the elevated banks of the Desna, in 51° 27′ N. lat. and 31° 15′ E. long. It is surrounded by a rampart of earth which is now converted into walks. It was built in the year 1024, and is accounted the oldest town in European Russia. In its centre stands a high hill with a castle on its summit; it has several churches, among which is the cathedral, a well-built edifice, in which the remains of St. Theodosius are deposited. There are also four monasteries, a gymnasium, an ecclesiastical seminary, with a printing establishment attached to it, an Imperial orphan asylum, a riding-school, a mechanics' school for 400 pupils, and several establishments for the indigent. Usevoloisky states the population to be about 7000, but others carry it as high as 10,000; the inhabitants are chiefly employed in retail trade and mechanical pursuits, and manufacture small quantities of woollens, linens, leather, and soap. Four markets are held here in the course of the year. It is the residence of the archbishop of the diocese or eparchate.

CZERNOVITZ or CZERNOVICS; one of the counties or circles of the kingdom of Austrian Galicia; it formerly constituted what was called 'the Buckowine,' being that portion of Moldavia which the Porte ceded to Austria in the year 1777. This country, though now incorporated with Galicia, has retained its old legislative institutions. The Moldau borders it on the south and east, and Transylvania on the south-west. Its surface, which comprises an area of about 3090 square miles, is intersected in all parts by well-wooded branches of the great Carpathian range. The intervals between the lines of mountains are broad and productive valleys, fertilized by the Pruth, Sereth Moldau, Czeremosh, Suczava, Golden Bistriza, &c., and yield rich crops of corn, flax and hemp, potatoes, and fruit. Grazing is also carried on upon an extensive scale. The forests abound in beeches, pines, and firs, which afford valuable timber, but the oak is of very partial growth. The Buckowine is rich in minerals, particularly salt, which the works at Karzike alone produce in sufficient quantity to supply its whole consumption. The gold-dust of the Bistriza does not at present yield enough to defray the cost of collecting; but silver, lead, copper, and iron, are obtained from the mines near Kirlibaba (about 560 marks of silver, and 50 tons of lead), Posczoryta about 1000 cwt. of copper, and Jacobeny about 1200 tons of iron. There are three glass-works, and several potash manufactories and brandy distilleries, in this county. The Buckowine was in a very wild and barbarous state when it was first annexed to the crown of Austria, but has been rapidly advancing in civilization and prosperity ever since. The inhabitants differ both in descent and religion from their Galician neighbours; they are chiefly of Wallachian extraction, and profess the Greek religion. A vast number of Armenians, Jews, Hungarians, and Germans, besides about 8000 Philippones from the Crimea, who sought refuge here in Joseph II.'s time, and settled in and around Dragowesna, have intermixed with them. The whole population in 1817 amounted to 201,319, and consisted of 41,864 familes; in 1825 it was 261,162; and at the present day it is about 280,000. Of municipal towns there are 3; market-towns 3; and villages 274. The three municipal towns are Czernovitz, the capital; Suczava, with 4 churches, a synagogue, and about 5200 inhabitants; and Sereth, with 3 churches, and about 3100 inhabitants.

CZERNOVITZ, the capital of the Buckowine, and of the present circle of Czernovitz, is situated on a hill close to the right bank of the Pruth, in 48° 25′ N. lat., and 25° 39′ E. long. In the centre of the town is a spacious square, with the main street passing directly across it. Although there are many handsome private houses and public edifices, such as the Greek cathedral, the Roman Catholic collegiate church, the hospital and government buildings, &c., Czernovitz itself is an indifferently constructed town, and the remote quarters are composed of narrow rows of low wretched hovels. The number of houses is about 900, and of inhabitants about 7300, including above 1200 Jews. Czernovitz is the residence of a Greek bishop, and seat of a Greek consistory; it has a philosophical academy, conducted by a director and seven professors, a gymnasium, a head district school, an ecclesiastical seminary, courts of justice, &c. Mechanical pursuits, and a considerable trade in native and other productions with Moldavia, Wallachia, and various quarters of Germany, contribute greatly to the prosperity of the town.

CZIRKNITZ (ZIRKNITZ), a market-town in the circle of Adelsberg, duchy of Carinthia, in Illyria. It lies on the Brohitza, contains 240 houses, and about 1,300 inhabitants, who are occupied in fishery, and in salt and tile-making: 45° 38′ N. lat., 14° 25′ E. long.

Near it is the singular lake of the same name, inclosed within limestone mountains of very grotesque outlines. The lake in dry seasons is from 12 to 15 miles in circumference, and when quite full about 24 miles; its entire area is then about 63 square miles. Its form however is made very irregular by numerous bays, capes, and islands. At the foot of the Javoring, which rises on its southern bank, the peninsula of Dervoseck stretches far into the lake; on the west is the island of Vorneck, on which is the village of Ottock, the inhabitants of which cultivate millet and vegetables. While passing over the more shallow parts, the rocky bottom of the lake presents a very dark appearance, occasioned by numerous funnel-shaped cavities of various dimensions. All these cavities have peculiar and for the most part significant names; such as Kottu (the kettle), Betscheck (the tub), Reitie (large corn sieve), Rescheto (coarse sieve), Sittarza (fine meal sieve), Vadonos (water carrier), &c. Its depth, compared with other lakes, is inconsiderable: the Cave of Rescheto, the deepest part of the whole lake, is at the lake's mean height only 56 feet; Vadonos 50, Velka Bubnarza 45, Kottu 38; the others are from 29 to 6 feet deep. The lake is remarkable for great variation in the height of its water which is owing to the nature of the limestone rocks. The bottom of the lake, especially of the funnels, is full of clefts and fissures, through which the water passes at forty different openings into subterranean caverns and channels, and reappears under the form of the Bistriza and Baronniza in the valley of Laibach. During the dry season, which generally occurs in autumn, the bottom of the lake is covered with luxuriant herbage, which is made into hay. Only a very small portion of the lake however is susceptible of cultivation; millet and buck-wheat are sown, which ripen in six weeks; but as the waters of the lake frequently do not subside for three, or even more years, the sowing and harvest are of course very irregular. In January, 1834, the waters left the lake, and did not return till March, 1835. During the interval grain and vegetables were sown and gathered, and cattle grazed on the bottom of the lake—an occurrence which, for the long cessation of the waters, is said to be unprecedented.

The lake abounds in fish, chiefly pike and the *Cyprinus tinca*, Lin.: they are caught in pits, at the rising of the lake, with drag and small hand-nets, and are sent alive to Laibach and other places, or dried. The lake is also frequented by numerous aquatic fowl, which, like the fishery, form an important means of subsistence to the inhabitants. In the environs of the lake, which are exceedingly picturesque, are nine villages, twenty churches, and two castles.

CZORTKOV, a county in the kingdom of Austrian Galicia, having Russia for its eastern boundary, and Moldavi and the Buckowine for its southern. Its area is about 134 square miles; and its population, which was 149,488 in 1817, is at present upwards of 176,000. With the exception of a tract between the Pruth and Dniester, once part of the Buckowine, its surface is a uniform level, fertilized by the waters of the Sered, Striva, Dzurym, Dupa, and other rivers, and highly productive, particularly in most kinds of grain, tobacco, aniseed, and maize: there is abundance of timber; but the breeding of cattle is neglected. Wax and honey are made in great quantities. Manufacturing industry is limited to coarse woollens. Zaleszczyky, an ill-built place, but beautifully situated on the Dniester (in 48° 53′ N. lat., and 25° 45′ E. long.), is the chief town; it has a chapter-house, collegiate church, Protestant place of worship, monastery and head school: the population is about 5500, including about 3150 Jews. The second town is Czortkov, on the right bank of the Sered, with a castle, and government tobacco manufactory, a monastery, and about 2300 inhabitants; and the third town is Husiatyn, on the Podhorze, with an old castle, and about 1540 inhabitants, two-thirds of whom are Jews. Besides these, the circle contains 19 market-towns, and 242 villages.

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D.

D, which occupies the fourth place in the Hebrew alphabet and those derived from it, is the medial letter of the order of dentals or palato-dentals. It readily interchanges with those of the same organ. The German language and the English offer an abundance of examples.

1. *D* in German corresponds to *th* in English, as *dein*, thine; *denk-en*, think; *du*, thou; *dieb*, thief; *donner*, thunder; *dorn*, thorn; *durch*, through; *tod*, death; *bruder*, brother; *erde*, earth; *leder*, leather, &c. And on the other hand, *th* in German, which however is not pronounced as among us, corresponds to *d* in English, as *thau*, dew; *thal*, dale; *thaler*, dollar; *thu-n*, do; *that*, deed; *theil*, dole and deal; *roth*, red; *noth*, need; *muth*, mood.

2. *T* in German to *d* in English, as *tag*, day; *taub*, deaf; *taube*, dove; *tief*, deep; *traum*, dream; *tod*, death; *brot*, bread; *breit*, broad; *wort*, word; *bart*, beard.

3. *D* in Latin to *z* or *ss*, or *s* final in German, and *t* in English, as *decem*, *zehen* or *zehn*, ten; *digitus*, *zehe*, toe; *duo*, *zwey*, two; *dingua* (the same as *lingua*), *zunge*, tongue; *dens* (*dent*), *zahn*, tooth; *cor* (*cord-is*), *herz*, heart; *duc-ere*, *zieh-en*, tug; *doma-re*, *zahm-en*, tame; *sud-or*, *schweiss*, sweat; *pes* (*ped-is*), *fuss*, foot; *ed-ere*, *ess-en*, eat; *clud-ere*, *schliess-en*, shut; *od-it*, *hass-en*, hate; *quod*, *was*, what; *id*, *es*, it; *grandis*, *gross*, great.

4. *D* is interchangeable with *l*, and this most freely. Compare the Greek forms Οδυσσευς, Πολυδευκης, δαψιλης, δακρυ-ω, δε-ω, with the Latin *Ulixes*, *Pollux*, *lapsilis*, *lacruma*, *liga-re*. In the Greek language itself compare δειδω with δειλος. δαλος with δᾳς (δᾳδ-ος); and in the Latin, *sella*, *scala*, *mala*, *ralla*, with the verbs *sede-o*, *scand-o*, *mand-o*. *rad-o*. *Vesidia* and *Digentia*, two small streams of antient Italy, are now called respectively *Versiglia* and *Licenza*. So the Italians say either *edera* or *ellera* for ivy; and the Latin *cauda*, a tail, is in Italian *coda*, in Spanish *cola*. But one of the most remarkable instances of this change exists in the words *eleven* and *twelve*, in both of which the *l* has grown out of a *d* in *decem*. In the same way, while the Greek has δεκα for ten, the Lithuanian prefers *lika;* and of two Sanscrit dialects, one has *dasan*, the other *lasan*, for the same numeral. The people of *Madrid* call themselves *Madrilenos*.

5. *D* attaches itself to the letter *n*. Thus we find Gr. τειν-ω, and Lat. *tend-o*, stretch; Lat. *canis*, Eng. *hound;* Lat. *sonus*, Eng. *sound;* Lat. and Gr. root μεν or *men*, Eng. *mind;* Ger. *abend*, Eng. *even* or *even-ing;* Ger. *donner*, Eng. *thunder;* Ger. *niemand*, Eng. *no-man*. And our English term *husband*, is a corruption of *house-man* (Lat. dominus). This *d* is particularly apt to insert itself after an *n* when an *r* follows. Thus from the Latin *ciner-is*, *gener*, *tener*, come the French *cendre*, *gendre*, *tendre*. And the latter language has the futures *viendrai*, *tiendrai*, where analogy would have led to *venir-ai*, *tenir-ai*.

6. *Di* before a vowel is changed into a *g* or *j*, as *Dianus* or *Janus*, the god of light (dies) in Roman mythology; *Diana* or *Jana*, the goddess of light. So *Diespiter* and *Jupiter* are the same name. The Latin *hodie* is in Italian *ogge*. Sometimes a *z* is preferred to a *g*, especially in the Greek, Italian, and German languages. In the Greek, for example, ζα is used for δια; hence ζαω, *vivo*, and διαιτα, are connected, and the same town on the African coast is called indifferently *Hippo Zarytus* or *H. Diarrhutos*.

7. *Du* before a vowel is changed into *b* or *v*. [See B.] With this principle is connected the change of *d* into *v*, in the words *suavis*, *suadeo* and ἁδυς, *clavis* and *claudo*, and the river *Suevus* or *Oder*

8. Instances occur where *d* is interchanged with both the other medials; with *b*, as in Latin *barba*, *verbum*, English *beard*, *word;* with *g*, as in the Greek Δημητηρ from γη μητηρ, πηδος, 'the beech,' as well as φηγος, and in the two names of the African city, Καρχηδων and *Carthago*. One may often hear in the mouths of children *dood* for *good*, and *do* for *go*.

9. *D* when flanked by vowels often disappears in the transition of words from Latin into French. Compare *Melodunum*, *Ludovicus*, *vadum*, *vādis*, *medius*, *fides*, *nudus*, *cauda*, *assidere*, *videre*, with *Melun*, *Louis*, *gué*, *vas*, *mi*, *foi*, *nu*, *queue*, *asseoir*, *voir*.

For the forms of the letter D see ALPHABET.

D as a Roman numeral signifies five hundred. It is more correctly written IↃ. [NUMERALS.]

D (in Music), the second note or degree of the diatonic scale, answering to the *re* of the Italians and French.

DABCHICK. [DIVERS.]

DA CAPO (from the head, or beginning), an Italian musical term, signifying that the first part, or strain, is to be repeated, and to conclude at the sign of the pause (𝄐), or at the word *fine*. The phrases in use are, *Da Capo al fine*, and *Da Capo al segno; i.e.*, 'From the beginning (or over again) to the *fine*,' or 'to the sign.' This term is abbreviated by the letters D. C.

DACCA JELALPORE (Dhaka), one of the districts into which the province of Bengal is divided; it lies between 23° and 25° N. lat., and between 90° and 91° E. long., and is bounded by the district of Mymunsingh on the north, by Tiperah on the east, by Tiperah and Backergunge on the south, and by Rajeshahy and Jessore on the west. The limits of this district were much more extensive before the year 1800 than they are at present, reaching as far south as the sea, and as far north as the Garrow mountains. It then contained an area of more than 15,000 square miles, but it is now reduced to somewhat less than 6000 square miles. The surface of this district is uniformly low and level, and being intersected by the Ganges and Brahmapootra, a great part of the lands are periodically covered with water by the overflowing of those rivers during the rainy season. At these times the villages which are built on artificial embankments have the appearance of small islands. The deposits left by these inundations fertilize the soil. The lands are only partially cultivated: towards the north and west are very extensive tracts of jungle in which are great numbers of wild elephants which cause much damage to the neighbouring farmers, and prevent the extension of cultivation. Towards the south and the east nearly seven-eighths of the land are under cultivation, producing rice, betel-nut, hemp, cotton, and sugar. The abundance of the rice harvests has caused the district to be called the granary of Bengal.

Dacca is principally known in Europe for its manufactures of cotton goods. The striped and figured muslins of Dacca were long celebrated throughout the world. The beauty and delicacy of these fabrics were once unrivalled, but of late years the weavers of Paisley and Manchester have so successfully competed with those of Dacca, that a large proportion of the families in that district, who have for many generations employed themselves in their production, have been compelled to adopt other pursuits. Another reason for this change may be found in the altered condition of the former lords of the country, among whom the curious fabrics of Dacca were held in the highest estimation, and who are now unable to gratify their taste for expense.

The ruins of antient mosques and Hindoo temples are spread all over the country; and in many places are seen the remains of fortresses constructed to oppose the invasion of the Mughs, but they are all now dilapidated and the cannon rendered useless. The settled estates are mostly parcelled out into small talooks, or Zamindaries, and these are divided and sub-divided into very insignificant farms. The principal towns are Dacca, Rajnaghur, Narraingunge, Furreedpore, and Soonergong. Rajnaghur stands on the east side of the Puddah, the grand outlet of the Ganges, in 23° 22′ N. lat., and 90° 25′ E. long., 23 miles south by west from Dacca; Narraingunge stands on the west side of a branch of the Brahmaputra, about 8 miles south-east from Dacca, in 23° 37′ N. lat., and 90° 35′ E. long. This town contains a population of more than 15,000 souls, and is one of the greatest inland places of trade in Bengal. Salt, tobacco, indigo, and grain, are the principal objects of the trade. Numerous indigo factories are established on the banks of the river where the soil is favourable for the growth of the indigo plant. On the opposite, or east side of the river, is a Mohammedan mosque, to which great numbers of devotees resort from the neighbouring towns to see what is described as the foot-mark of the prophet of Mecca. Similar foot-marks are shown in several other places in India, and impart a peculiar sanctity to the buildings in which they are placed. Furreedpore is situated on the south side of the Puddah, or great Ganges, five miles from its banks, and 40 miles from Dacca: it is the residence of the principal civil and judicial officers for the district. Soonergong stands on one of the branches of the Brahmapootra, in 23° 39′ N. lat., and 90° 43′ E. long., about 13 miles south-east from Dacca. This is said to have been in antient times a large city, and the seat of government before the building of the town of Dacca; it is now little more than a village; it was long celebrated for its manufacture of beautiful cloths, some of which are still made in the village.

The entire population of the district was stated in 1801 to be 938,712; one-half were Hindus and the rest Mohammedans. The condition of slavery is recognized, and slaves are sold and conveyed by deeds of sale, which are registered in the courts of justice in the same way as other conveyances of chattels are registered.

DACCA, the capital of the district just described, is situated on a branch of the Ganges, called the Booree Gunga (old Ganges), about 100 miles above the mouth of the river, in 23° 47′ N. lat., and 90° 17′ E. long. Dacca is comparatively a modern town. In 1608 the seat of government was removed to it by Islam Khan, then governor of Bengal; in compliment to the emperor, the name of the place was then changed from Dacca to Jehangire Nuggur. It is related that in 1689 rice was sold in the market of Dacca at the rate of 640 pounds for one rupee, and that to commemorate this fact the western gate was built up by order of the viceroy, Shaister Khan, and an inscription placed on it forbidding the re-opening of the gate until the price of this main article of food should be again equally low. Dacca was formerly a much more extensive place than it is now, and in the reign of Aurengzebe exhibited a considerable degree of splendour. The former limits of the city contain the ruins of many magnificent buildings, such as bridges, mosques, and palaces, but the places where these occur are for the most part overrun with jungle. Including the suburbs the town occupies a space six miles long, on the bank of the river, but it is not wide in proportion. The streets are narrow and crooked, and the houses, for the most part, are mean buildings. The native population in 1801 was estimated at about 200,000 souls, rather more than one-half of whom were Mohammedans and the rest Hindus. There are several Portuguese, Greek, and Armenian merchants settled in the place. In 1823 a society was formed for the support of Christian, Persian, and other native schools for males and females in the city of Dacca and its vicinity. This society took under its charge six schools, and in three years increased the number to twenty-five, which were attended by 1414 scholars. After a few years the funds of the society fell short, in consequence of their support being withdrawn by the wealthy natives. Under these circumstances a donation was made to the society by the government, but by no means equal to its wants, and the schools have in consequence greatly fallen off in numbers and efficiency.

DACE. [LEUCISCUS.]

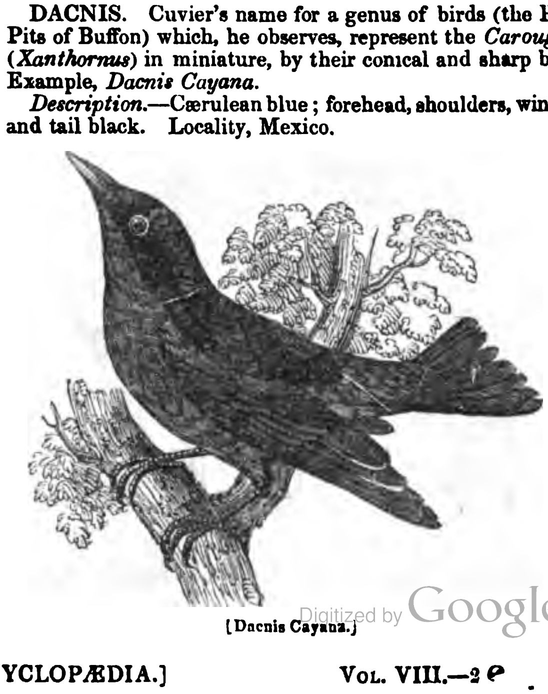
DA′CELO. [KINGFISHERS.]

DA′CIA, the antient name of a country north of the Danube and south of Sarmatia, bounded on the east by the Pontus Euxinus, and on the west by the Tibiscus, now the Theiss. It was divided into Dacia Ripensis, Dacia Alpensis, and Dacia Mediterranea. The antient Dacia comprehended the modern Transylvania, Wallachia, Moldavia, and Bessarabia. The Daci were antiently called Davi, according to Strabo (p. 304, *c.*), and hence, he adds, the name Davus was commonly applied to a slave in Attica, many of the Athenian slaves being imported from the countries about the Danube. This appears from the plays of Terence, which were translated from the Greek, or at least founded on a Greek model. The change of the name has been explained in another place. [C, 2nd column.] The country was inhabited by the Daci and the Getæ: the Daci occupied the part towards Germany and the source of the Danube; the Getæ occupied the part towards the east and the Pontus. (Strabo, p. 304, *c.*) Both the Getæ and Daci spoke the same language. (Strabo, p. 305, *a.*) The Getæ were better known to the Greeks in consequence of their frequent migrations to the banks of the Danube. The Latin name Daci included the Getæ. The principal river of Dacia is the Tibiscus, which, with its tributary the Marisus, falls into the Danube. There are several small rivers besides, the Aluta (the Alt), the Aravus, and others, which also fall into the Danube. The first expedition of the Emperor Trajan was against the Daci, headed by their king Decebalus, and the war, which lasted nearly five years, ended in their submission A.D. 105 (Dion Cassius, lxviii.) to the Roman power. One of their chief towns, Sarmizegethusa, was afterwards called Ulpia Trajani, in memory of the victory which was gained. In A.D. 250 Dacia was overrun and conquered by the Goths, to whom it was afterwards resigned by the Emperor Aurelian. Domitian celebrated his pretended exploits against the Dacians by assuming the title Dacicus. (Juvenal, *Sat.* vi., 204.)

DACIE′R, ANDRE′, was born at Castres in 1651, studied at Saumur under Tanneguy le Fèvre, whose daughter Anne he married in 1683. Both husband and wife became eminent among the classical scholars of the seventeenth century. They were employed with others to comment upon and edit a series of the antient authors for the dauphin, which form the collection 'Ad usum Delphini.' Madame Dacier's commentaries are considered as superior to those of her husband. She edited Callimachus, Florus, Aurelius Victor, Eutropius, and the history which goes by the name of Dictys Cretensis, all of which have been repeatedly reprinted, with her notes. She published French translations of the Amphitryon, Rudens, and Lepidicus of Plautus, with a good preface, of the comedies of Terence, of the Plutus and the Clouds of Aristophanes, and of Anacreon and Sappho. She also translated the Iliad and the Odyssey, with a preface and notes. This led to a controversy between her and La Motte, who had spoken slightingly of Homer. Madame Dacier wrote, in 1714, 'Considérations sur les Causes de la Corruption du Goût,' in which she defended the cause of Homer with great vivacity, as she did also against Father Hardouin, who had written an 'Apology of Homer,' which was more a censure than an apology. The warmth however with which both the Daciers resented anything that was said against the antient writers was carried to the extreme, and had at times something ludicrous in it. But Madame Dacier's enthusiasm was real, and unaccompanied by pedantry or conceit. Neither did her learned lucubrations make her neglect her domestic duties as a wife and a mother; and she was generous and charitable towards the poor. She died in 1720, and her husband in 1722. The latter, besides his editions of the classics, translated also into French the works of Hippocrates, the Œdipus and Electra of Sophocles, the Poetica of Aristotle, and the lives of Plutarch, which last translation is inferior to Amyot's; he also translated Horace, but neither the translation nor the notes are much esteemed. The 'Bibliothèque des Anciens Philosophes,' 9 vols. 12mo., was published under Dacier's name, but he only furnished some of Plato's dialogues and the Manual of Epictetus. Dacier was member of the Academy of Inscriptions, secretary to the French Academy, and keeper of the Cabinet of the Louvre, and he had a pension of 2000 francs from Louis XIV.

DACNIS. Cuvier's name for a genus of birds (the Pit-Pits of Buffon) which, he observes, represent the *Carouges* (*Xanthornus*) in miniature, by their conical and sharp bill. Example, *Dacnis Cayana.*

Description.—Cærulean blue; forehead, shoulders, wings, and tail black. Locality, Mexico.



[Dacnis Cayana.]

This pretty little bird is the *Elototoil* of the Mexicans. Hernandez says that it lives about the trees of the Tetzcocan mountains; that it is eatable; that it does not sing, and that therefore it is not kept in the houses of the inhabitants.

DACTYL is the name of a metrical foot consisting of a long and two short syllables, as the Latin word *littora;* or of an accented syllable followed by two unaccented, as *gallery.*

DACTY'LICS. To this term belong all those metres which consist of a repetition of dactyls or equivalent feet. The long syllable may be the first in the line, as it is in the heroic verse of Homer; or it may be preceded by one or two short syllables. Thus the modern anapestic verse is strictly a dactylic metre, as—

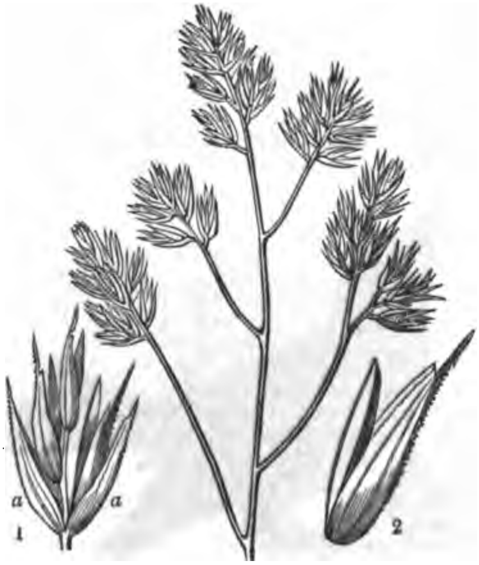
> 'If he ha'd any fau'lts, he has le'ft us in dou'bt.'

Of the dactylic metres the most common are the hexameter, which, as its name implies, consists of six feet [Hexameter], and the pentameter, of five feet.

The dactylic metre often alternates with trochaic measures. Such is the case in the sapphic and alcaic stanzas.

DA'CTYLIS GLOMERA'TA, or Cocksfoot grass, is an extremely common plant in fields and waste places, growing and flowering during a great part of the summer. It has, in its wild state, a coarse bluish rough herbage, and a flower-stem about three feet high, divided at the point into a loose panicle, each of whose divisions bears a cluster of flowers at its end. The glumes are two, sharp-pointed, keeled, and rather unequal; they enclose from three to six florets, each of which consists of two rough-ribbed paleæ, the lower and outer of which is the broader, and tipped with a short bristle. In its uncultivated state this is a coarse hard grass; nevertheless, it is readily eaten by cattle, horses, and sheep: it strikes its roots to a considerable depth in the soil, and on this account is capable of enduring the drought of dry sandy exposed land. Hence, in such situations, where scarcely any other pasture can be procured, as in the naked brecks (or undulating downs) of Norfolk, it is of great value.

Mr. Sinclair assures us that Cocksfoot forms a part of the herbage of pastures most celebrated for fattening and keeping the largest quantity of stock in Devonshire, Lincolnshire, and the vale of Aylesbury; and he states that in the most skilfully managed of these pastures the foliage of the Cocksfoot was only to be distinguished by an experienced eye from the various species of fine pasture grasses with which it is combined. We would not however recommend any one laying down artificial grass to employ Cocksfoot, where other grasses can be made to succeed; for we have invariably found it overgrowing the sorts with which it was mixed, and forming coarse tufts, which neither feeding nor mowing have been able to keep down.



[Dactylis glomerata.]

1, a spikelet much magnified; *a, a,* the glumes; 2, a floret with the paleæ.

DACTYLO'CERUS. [Phrosine.]

DACTYLO'LOGY. The simple art of communicating ideas by spelling words with the fingers is called dactylology. The positions which the fingers are made to assume correspond to the alphabetic characters of a language, and the series of alphabetic signs is perhaps better known under the name of the manual alphabet. The chief, and the most useful application of dactylology is in the instruction of the deaf and dumb. In the various institutions for this class of persons, dactylology is almost universally employed. The letters may be formed by the two hands, or with only one hand: a two-handed alphabet is used in the English institutions; on the continent of Europe, and in America, the one-handed alphabet is employed. Both these alphabets are represented in vol. ii., p. 500, of the 'Penny Magazine.' By reference to these engravings, it will be seen that either of them may be learned by an hour's practice; they are often taught to the deaf and dumb, in conjunction with the written alphabet, in a few days.

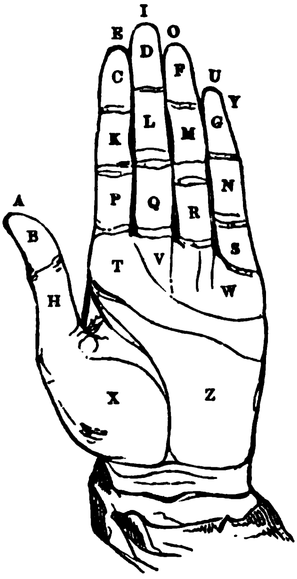
Dactylology must not be confounded with the natural language of the deaf and dumb, which is purely a language of mimic signs. We mention this because some persons have misunderstood the office and overrated the value of finger-talking; imagining that all deaf and dumb persons naturally understand language, and converse with their fingers, and that, by acquiring the manual alphabet, they can communicate with them. Such persons should bear in mind that the deaf are shut out from all spoken languages; that before they can use or understand a written or spoken language, they must learn it; and that such an acquirement is made, under their disadvantages, by a very slow process. To the uninstructed deaf, dactylology is useful as a means of communication between them and their teacher; at first, in such select language as the pupil understands, or as may be readily explained by mimic signs or other auxiliaries. As the pupil advances in the knowledge of words and their collocations, this mode of communication becomes more satisfactory, and at length he can use it to converse on all ordinary subjects with the accuracy of writing and with much greater rapidity.

Degérando has clearly and fully explained the use and value of this very simple art. (*De l'Education des Sourds-Muets,* Paris, 1827.) He says dactylology is to alphabetic writing what that is to speech. Formed upon writing as its model, it represents it precisely as writing represents words. But in this connexion between dactylology and writing, the reciprocal utility of the two orders of proceeding is at the same time the reverse of what we have remarked in the connexion between writing and speech. In fact, the office of dactylology consists in giving to writing that moveableness which speech enjoys, and which the first loses in the fixedness of depicted characters. Dactylology is writing set free from its material dress, and from those conditions necessary for the employment of the pen or pencil; it carries with itself these instruments; it is thus ready in all familiar conversations; it affords help at all times and in all places. It is thus that dactylology is little more than a toy for those who already possess, in speech, a means of communication more easy and more appropriate to all circumstances. It is thus also that it becomes an essential resource to those who are deprived of speech, to whom it renders a portion of those advantages, supplying for them writing, and giving it in some manner a new extension. However, dactylology is far from affording all the advantages of speech, while it loses a portion of those which are peculiar to the privilege of writing. On the one hand it is much less rapid than speech; it is unfurnished with that expression which belongs to the human voice—of that infinite diversity which the soul finds within for pourtraying all the sentiments which affect it; it has nothing of that harmony, that secret charm, that power of imitation of which speech is so capable; its employment, besides, obliges the suspension of all business and all action. On the other hand, it has none of that durability which renders writing so favourable to the operations of reflection; it is not able to exhibit its signs but after a successive manner; it cannot preserve in composing, as writing does, those vast pictures which the inventive faculty embraces simultaneously, and subsequently surveys, in every sense, with perfect liberty. Dactylology shares in some of the inconveniences of speech, and in some of those of writing; it is as fugitive as the first, it is as complicated in its forms as the second. (Vol. i., pp. 259, 60.)

The manual alphabet has been employed as a medium of intercourse between the deaf and dumb, and blind persons; it is also commonly used by the former when they have to converse in the dark. As the art addresses itself to the sense of touch, as well as to that of sight, it is easy to touch another person's hands, who is acquainted with the hand-alphabet, in such parts or positions as to enable him to read the words or sentences thus conveyed. Bulwer, one of the earliest writers on the instruction of the deaf (vol. vi., p. 19), was fully aware of the advantage of manual alphabets in their instruction; and it seems strange that he did not invent one, or ascertain and make known the merits of one, of which he thus writes:—

'A pregnant example, of the officious nature of the touch, in supplying the defect or temporall incapacity of other senses, we have in one Master Babington, of Burntwood, in the county of Essex, an ingenious gentleman, who, through some sicknesse, becoming deaf, doth, notwithstanding, feele words, and, as if he had an eye in his finger, sees signes in the dark; whose wife discourseth very perfectly with him by a strange way of arthrologie, or alphabet contrived on the joynts of his fingers; who, taking him by the hand in the night, can so discourse with him very exactly; for he feeling the joynts which she toucheth for letters, by them collected into words, very readily conceives what she would suggest to him.' (*Chirologia, or the Natural Language of the Hand*, p. 106.)

Perhaps the first manual alphabet which was published in England was that of Dalgarno, the most intelligent author on the subject of the instruction of the deaf and dumb next to Bulwer; he published it in 1680. As few copies of his work are now to be met with, we shall give his hand-alphabet, and accompany it by as much of his own explanation as seems necessary for understanding his views on dactylology. 'After much search and many changes, I have at last fixt upon a finger or hand-alphabet according to my mind; for I think it cannot be considerably mended, either by myself or any other (without making tinker's work), for the purposes for which I have intended it; that is, a distinct placing of and easy pointing to the single letters; with the like distinct and easy abbreviation of double and triple consonants.'

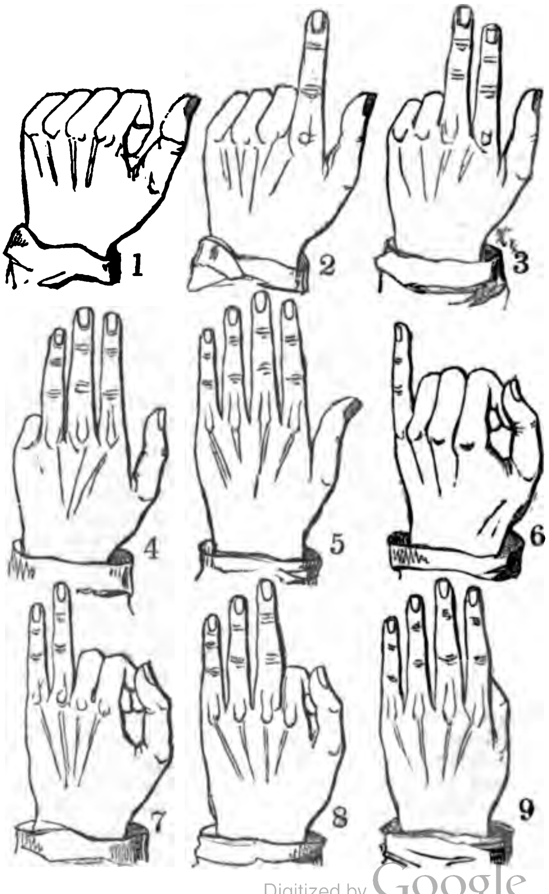


'The scheme (I think) is so distinct and plain in itself, that it needs not much explication, at least for the single letters, which are as distinct by their places as the middle and two extremes of a right line can make them. The rules of practice are two. 1. *Touch the places of the vowels with a cross touch with any finger of the right hand.* 2. *Poynt to the consonants with the thumb of the right hand.* This is all that I think to be needful for explaining the scheme, so far as concerns the single letters.'

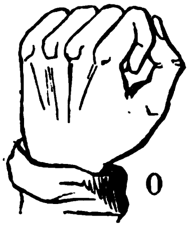
This was probably the finger-alphabet from which our present two-handed one was derived; some similarities may be traced in them, particularly in the places for the vowels. The one-handed alphabet was invented in Spain, and appears to have been first published in Bonet's work. [BONET.]

A dactylology of syllables has been sometimes employed in the instruction of the deaf and dumb. This was one of the means adopted by Pereire, who lived in the middle of the eighteenth century, and who was more successful in imparting a knowledge of language to his pupils than any teacher who has since cultivated this difficult art. But his modes of teaching were a mystery which he always refused to divulge, and they were lost at his death. In our own days, M. Recoing has employed syllabic dactylology in conjunction with stenography, and by these means, combined with others more commonly pursued, he conducted the instruction of his own deaf and dumb son with that success which enabled him to convey to his son the words of a speaker as rapidly as they were uttered. M. Recoing published two works on this subject at Paris, in the years 1823 and 1829. A system of alphabetic and syllabic dactylology was also published by Dr. Deleau, the younger, in 1830.

There remains to be noticed another application of finger-language, which, in the instruction of the deaf and dumb, is next in importance to alphabetic signs; it is in the designation of numbers, and in the employment of the fingers in the first rules of arithmetic. The ten fingers are the most ready and natural abacus, as they are doubtless the most antient. That they should early come into use for exhibiting numbers, especially where speech was wanting, may be readily supposed. The only system of manual notation which deserves that name is the one which we shall now describe. It is used in several of the American and English institutions for the deaf and dumb; we consider it perfect, and we believe it has never before appeared in any English publication. Mr. David Seixas, of Philadelphia, improved the Abbé Sicard's signs for numbers, and his plan was used in the institution for the deaf and dumb in that city. The following system was invented by Mr. O. Stansbury, a former superintendent of the New York Institution; it has received a few, perhaps unimportant, modifications, and by it any amount of numbers may be expressed. One hand only, the left, is used, and the pupil's right hand is thus left at liberty to record his calculations upon his slate. The nine digits are represented one after another by elevating the fingers of the hand successively, thus:—



The cipher is represented by the closed hand.



The thumb represents *one*, the other fingers being closed, the index-finger is added for *two*, the middle-finger is raised for *three*, the ring-finger is added for *four*, and the open hand represents *five;* the little finger alone is raised for *six*, the ring-finger is added for *seven*, the middle-finger for *eight*, and the fore-finger is raised to the others for *nine*. Thus far for units. To indicate tens, the position of the hand is changed from perpendicular to horizontal; the thumb is pointed forwards for ten, the thumb and fore-finger for twenty, and so on to ninety. Hundreds are pointed downwards; thus the thumb, fore-finger, and middle-finger pointed downwards represent 300. If 572 be the number to be designated, three positions of the hand are required; the five fingers are pointed downwards for 500, the little-finger and ring-finger are pointed forwards for 70, and the thumb and fore-finger are held upright for two. During these changes the hand is kept in front of the body. To represent thousands, the left hand is placed across the body towards the right shoulder, and the signs which were used in front for units, in this situation, represent thousands; keeping the hand in the same situation and pointing forwards or downwards, tens of thousands or hundreds of thousands are exhibited. By changing the situation of the hand to the left shoulder, and by exhibiting the various positions of the fingers before described, millions, tens of millions, and hundreds of millions are expressed. The same positions, upright, forwards, and downwards, exhibited in other situations, may be applied to the expression of notations to any extent. Though rather complex in description, the whole is most easy and comprehensive in operation. The superiority of this system of manual notation for teaching arithmetic to the deaf and dumb, or for making signals of numbers where silence is necessary, compared with the clumsy resources of figuring the digits in the air, of repetitions of tens by the ten fingers, or even of arbitrary signs, will be at once acknowledged.

DACTYLO'PORA. [Polyparia Membranacea.]

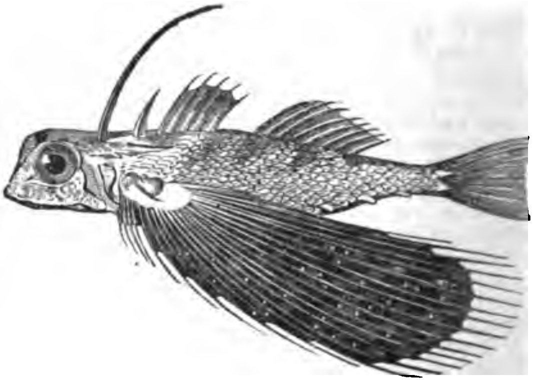
DACTYLO'PTERUS (Lacépède), a genus of fishes of the order Acanthopterygii and family Loricati. Generic characters:—head flattened, large and long, and rising suddenly from the muzzle, which is very short; inferior angle of the pre-operculum furnished with an elongated strong spine; operculum without spines; mouth small; jaws furnished with masses of minute conical teeth; branchiostegous rays six in number; some of the anterior rays of the dorsal fin free; subpectoral rays numerous, very long, and connected by a membrane; ventral fins with four rays; body covered with hard carinated scales.

The fishes of this genus are classed with the gurnards; they may however be readily distinguished from the typical or true gurnards* by the immense size of the pectoral fins.

In the true gurnards we observe three detached rays situated under the pectoral fins, but springing from the same base: in our present genus these rays are very numerous, immensely long, and connected by a membrane. By means of these large fins, the length of which is almost equal to that of the body of the animal, these fishes are enabled to sustain themselves in the air for several seconds, which they often do to escape from their enemies when pursued; but in quitting the waters to avoid their pursuers in that element, they not unfrequently fall a prey to the frigate-birds and albatrosses.

This genus contains but two species, one of which has been long known: it inhabits the Mediterranean, and is the Trigla volitans of Linnæus, commonly called the flying-gurnard and flying-fish.† The other species inhabits the Indian Seas, and is the Dactylopterus orientalis of Cuvier.

The flying-gurnard (*Dactylopterus volitans*) varies from one foot to fifteen inches in length, and is of a brown colour above, with spots of a deeper tint: the sides of the body are red, and the under parts are of a pale rose-colour. The large pectoral fins are of a blackish tint, mottled and spotted with blue; the ventral and anal fins are of a rose-colour; the anterior dorsal is gray, with clouded markings of a deeper hue; the posterior dorsal is transparent, and its rays are of a pale colour, spotted with brown.


[Dactylopterus orientalis.]

DADO, a term for the die or plane face of a pedestal. The dado employed in the interiors of buildings is a continuous pedestal, with a plinth and base moulding and a cornice or dado moulding surmounting the die. This continuous pedestal, with its moulding, is constructed of wood, and is usually about the height of a chair-back. Its present use is to protect the stucco-work or paper of the walls, but originally it was used as an architectural decoration to a room. The construction requires care in joining the deals of the dado, which are ploughed and tongued and keyed transversely at their backs, in order to prevent any joint from appearing in the die or plane surface. Some dados are pannelled.

DÆDA'LION. [Falconidæ.]

DAFFODIL, the English name of Narcissus Pseudo-Narcissus and its allies, to which some recent botanists have given the generic name of Ajax.

DAGHESTAN, a country situated on the western shores of the Caspian Sea, extending from the mouth of the river Terek, 43° 50′ N. lat., to the peninsula of Absheran on the south, 40° 30′ N. lat. Though forming a part of the Russian government of Georgia, the different tribes which inhabit the valleys on the eastern declivities of Mount Caucasus are governed by independent petty sovereigns, but those which possess the low and hilly country towards the sea are dependent on the Russian governor. The term Daghestan means the mountainous country, from the Turkish word Dagh, a mountain [Georgia and Derbend.]

DAGHO, DAGOE, or DAGEN, an island at the entrance of the gulf of Finland, about 41 miles long, and varying from 27 to 37 miles in breadth; in 58° 4′ to 59° N. lat., and from 22° 20′ to 23° 8′ E. long. It is comprehended in the Russian province of Reval, circle of Habsel, and is divided by a small channel from the island of Oesel. Its area is about 304 square miles: it contains three parishes. The inhabitants, about 10,000 in number, are Esthonians: they are employed in husbandry, grazing, fisheries, and carry on a little trade in the port of Tewenhaven, which lies on the eastern side of the island. The coasts abounding in shallows and sandbanks, a lighthouse has been erected near the village of Dagerort, in 58° 50′ N. lat., and 22° 40′ E. long. The Swedes, to whom the Danes ceded Dagho in 1645, ceded it in their turn to Russia under the treaty of Nystadt, in 1791.

DAGOBE'RT I., son of Clotarius II., succeeded him in 628 in the Frankish monarchy. He gave his brother Caribert a part of Aquitania, with the city of Toulouse, but Caribert dying in 630, Dagobert reunited the whole monarchy under his sceptre, and caused Chilperic, Caribert's eldest son, to be put to death. Boggis, another son of Caribert, was the head of the line of the dukes of Aquitaine, and of the counts of Armagnac. Dagobert sustained wars against the Saxons from England, the Vascones of the Pyrenees, the Sclavonians, and the Bretons, and he obliged Judicaël, the prince of Britanny, to give him satisfaction for the incursions which he had made into his territories. When the Bulgarians were flying from before the Huns, they took refuge in Austrasia, where Dagobert granted them an asylum; but soon after, fearing that these guests might become too powerful for him, he gave orders to have them all massacred in one night, when 10,000 families were put to the sword. Dagobert was cruel and debauched, like all the rest of the Merovingian kings; and yet in the old ballads and chronicles he is called 'le bon Roi Dagobert.' He published the laws of the Franks; he encouraged commerce, and opened negotiations for that purpose with the Byzantine emperors; and he made Paris his permanent residence. The wealth and splendour of his court are extolled by the chroniclers. Eligius, or Eloi, a skilful goldsmith of the time, became his treasurer and confidential minister, and was also made bishop of Noyon. Dagobert died in 638, in his thirty-sixth year, and left two sons, Siegbert II., who succeeded him in Austrasia, and Clovis II., who became king of Burgundy and Neustria.

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* Those belonging to the genus Trigla as now restricted by Cuvier and others.

† There are other flying-fishes with which our present species must not be confounded. The common flying-fish belongs to the genus Exocetus.

DAGOBERT II., son of Siegbert II., king of Austrasia, was shut up in a convent after his father's death, in 656, by Grimoald, maire of the palace, who gave the crown to his own son. Dagobert was sent to Scotland, and the report of his death was spread in France. In Scotland he married Mathilda, a Scotch princess, and after many years returned, and was acknowledged king of Austrasia. He was murdered in 679 by Ebroïn, maire of the palace of Thierri III., king of Burgundy and Neustria. Pepin d'Heristel succeeded Dagobert in Austrasia, not as king, but with the title of duke.

DAGOBERT III. succeeded his father Childebert III. as king of the Franks in 711. Pepin d'Heristel continued to enjoy the whole authority, as he had done under the preceding reigns, owing to which circumstance the nominal kings have been styled in history Rois Fainéans. Pepin died in 714, and Rainfroy succeeded as maire of the palace. In 715 Dagobert died, leaving a child called Thierri, who was afterwards called Thierri IV., and was set up as a nominal king by Charles Martel, the natural son of Pepin d'Heristel. (Henschenius, *Historical Dissertation on the three Dagoberts*, 4to., 1653.)

DA'GYSA. [SALPA.]

DA'HLIA, a small genus of Composite flowers, of which three species only are known, all natives of Mexico. Of these, two, D. coccinea and D. Cervantesii, were formerly cultivated in this country, but not sporting into varieties, and being much less beautiful than D. variabilis, they are not now seen in gardens. D. variabilis itself is, in its wild state, a bushy herbaceous plant, seven or eight feet high, with single purple or lilac flowers, and is by no means remarkable for its beauty. In cultivation however it is so readily improved in size and form, and sports into such endless varieties in stature, leaves, and flowers, that it has become the most extensively cultivated florist's plant of the present day. Its innumerable sorts are the glory of our gardens in the autumn, and are quite unrivalled at that season of the year: they are however destroyed by the earliest frosts. Each season produces its favourite varieties, and these are in their turn eclipsed by others of a newer or a choicer form. For those which are the most in vogue at the present day the nurserymen's lists should be consulted; their fleeting reputation renders them undeserving of notice in a permanent work.

As some attempts have been made of late years to substitute the name of Georgina for that of Dahlia, we may take this opportunity of stating that the name Dahlia originated with the Spanish botanist Cavanilles in 1791; that the name was applied by Thunberg to a different genus in 1792, without however superseding the former; that the name Georgina was not heard of till 1803, and that consequently, as priority of publication settles all such matters, there is no pretence for abolishing Dahlia and substituting Georgina.

DAHOMY, a celebrated and for some time powerful negro kingdom of western Africa, lying inland from the part of the coast of Guinea called the Slave Coast. It is bounded on the west by Ashantee, from which it is divided by the river Volta. Its southern boundary is about sixty or seventy miles from the sea, and it is supposed to extend about 150 or 200 miles farther into the interior, which would bring it near the range of the Kong Mountains. Its capital, Abomey, is placed in lat. 7° 59′ N., and in about long. 3° 20′ E.

Even the name of Dahomy may almost be said to have been unknown in Europe till some time after the beginning of the last century. Dauma, which is no doubt the same kingdom, is indeed mentioned by Leo Africanus, along with several others, of which he merely says that they lie south of Nigritia; and that name is found placed where Dahomy lies in several maps published towards the end of the sixteenth century, the earliest being probably one in the Geography of Sanutus, published at Venice in 1588. It occurs so placed even in the Maps of Sir Jonas Moore's Mathematics, published under the care of Dr. Halley in 1681; but in another map published by Halley in 1700 it is omitted, and it does not again appear for a considerable time. The most recent accounts indeed now represented the whole of that part of Africa as occupied by other states. Bosman, who has minutely described this part of the African coast from personal observation, in a series of letters written in 1700 and 1701, makes no mention of Dahomy. The Dahomans for the first time made their appearance on the coast where the European establishments were in the reign of their king Trudo Andati, or, as other accounts call him, Guadja Trudo, who is said to have succeeded to the throne in 1708. This prince, who appears to have been a person of remarkable talent, as well as of inordinate ambition and warlike ferocity, having determined upon securing to himself a share of the European commerce, in forcing his way to the coast captured in 1724 the chief town of the kingdom of Ardra, the most powerful state that lay between him and the sea. Here he found a Mr. Bulstrode Lamb, who resided in the place as factor for the English African Company. Lamb was detained in captivity for nearly three years; but was treated with extraordinary kindness and consideration by the black monarch, who till now had never set his eye upon either a white man or the sea. We believe the earliest account of Dahomy that exists is a very curious letter written by Lamb, after he had been for some months in captivity, to his superior, Mr. Tucker, governor of the English fort at Whidah (the Juida of the French, and Fida of the Dutch). It is dated from Abomey, in November, 1724; but did not appear in print till it was published at the end of a 'New Voyage to Guinea,' by William Smith, Esq., which appeared at London in 1745. Smith had been on the Slave Coast in the beginning of March, 1727, when he found that only a few days before his arrival the king of Dahomy had effected the conquest of the state of Whidah, lying along the coast, and had laid in ruins the English, French, and Portuguese forts situated at its capital, Sabi, or, as the French call it, Xavier. The captains of these forts and all the European residents were now prisoners in the Dahoman camp. However, they were all soon after released, as Lamb had been a short time before. We have the continuation of the narrative in the 'Full Account of some part of Guinea,' published at London, in 1734, by Captain William Snelgrave, who arrived at this part of the African coast only a few weeks after Smith, and while the king of Dahomy and his troops still occupied the territory. The narrative of Snelgrave, who visited the Dahoman camp, is exceedingly curious. In 1729 he made a second voyage to the same coast. In the interval the king of Dahomy and the governors of the French and English forts had again come into collision; and just before Snelgrave's arrival, Mr. Testefole, the English governor, who had imprudently endeavoured to excite the people of Whidah to an insurrection against their Dahoman masters, had been seized by the latter and put to death. Snelgrave has, from the information of others, brought down his account to the end of March, 1732, at which time a new quarrel had ended in the destruction of the Dutch, English, French, and Portuguese forts at the town of Jaquin, the only other part of the Slave Coast where there were any European establishments. The residents, however, although taken prisoners in the first instance, were all eventually allowed to take their departure. It is asserted, nevertheless, that Guadja Trudo in his advanced years became more blood-thirsty than ever, and that a morbid suspiciousness by degrees took possession of him, and destroyed the better qualities of his former character He died this same year, and was succeeded by his son, Bossa Ahadee. A work entitled 'Memoirs of the Reign of Bossa Ahadee, with an Account of a Journey to Abomey in 1772,' was published in 1789, by Mr. Robert Norris of

Liverpool, a person who had been engaged for eighteen years in the African trade. It is accompanied by a map of the kingdom of Dahomy, and is reprinted, with many corrections and additions by the author, in 'The History of Dahomy, compiled from authentic memoirs, by Archibald Dalzel, Esq., governor of Cape Coast Castle,' 4to., London, 1793. This last-mentioned work brings down the history of Dahomy, through the reigns of Ahadee, a destestable tyrant, the scourge of his own subjects and the torment of all his neighbours, for forty years; of his son, Adahoonzou II., by whom he was succeeded in 1774, and who continued his oppression and his ferocious wars; and of the first years of that of Adahoonzou's son and successor Wheenoohew, who mounted the throne in 1789. The materials for the two last reigns were contributed by Lionel Abson, Esq., the British governor at Whidah, who had then been twenty-seven years in the country. The continuation of the history of Dahomy for some years further is given in a little work entitled 'A Voyage to Africa, with some account of the Manners and Customs of the Dahomian People,' by John M'Leod, M.D., 12mo., London, 1820. Mr. M'Leod visited this part of Africa in 1803. At that time Dahomy still seems to have been a powerful state, and to have exercised sovereignty over all that part of the coast of Guinea. The reigning king was a younger son of Wheenoohew, the elder having been set aside because one of his toes overlapped another. It appears, however, from the accounts of Clapperton and the Landers, that Dahomy has now been reduced to subjection by the neighbouring state of Yarriba; and it is probable that Yarriba in its turn very soon will be, if it has not already been, absorbed by the extending empire of the Fellatahs.

The region in which the kingdom of Dahomy is situated is a vast plain rising by a very gentle ascent from the sea. No river worth notice falls into the sea between the Volta and the Brass river, or Niger. The soil is a rich reddish clay, on which scarcely a stone is to be found of the bigness of a walnut. All who have visited the coast, especially before the devastations of the Dahomans, describe it as a scene of matchless beauty and luxuriance. An ample account of its vegetable productions, comprising maize and other farinaceous crops; yams, potatoes, pine-apples, melons, oranges, limes, guavas, and other tropical fruits; a singular fruit said to possess the property of communicating a sweet taste to the strongest acids and bitters; indigo, cotton, sugar, tobacco, palm oil, spices, &c., may be found in the introduction to Mr. Dalzel's book, to which may be added some notices in Mr. M'Leod's volume. The country abounds with tigers, leopards, hyænas, elephants, buffaloes, deer, sheep, goats, hogs, both wild and tame, and several varieties of poultry. It is also infested by boa snakes of immense size, and other kinds of serpents. The government of Dahomy is, or at least formerly was, as absolute a despotism as has anywhere existed; and authority is maintained by the shedding of blood at a rate which has been approached nowhere but in Africa. The customs or festivities held at the court of the monarch on occasion of the annual receipt of duties or tribute, are of the same ferociously sanguinary character with those that take place at Ashantee. Their regular season appears to be in April or May, but instances are mentioned of their lasting for three months, and in these cases they seem to begin earlier in the year. The chief ornament of the royal residence is human skulls, of which, when a number was wanted to pave a court or decorate a ceiling, it was not an unusual process to have some scores of persons massacred for the purpose. The principal trade formerly carried on with Dahomy and the subject states on the coast was in slaves; and since the abandonment of that trade on the part of the principal European powers, which used to resort to this part of Africa, the commercial intercourse which these kingdoms hold with other parts of the world has become quite insignificant. The only money of the Dahomans consists of cowry shells, of which a thousand are stated to represent half-a-crown English. Their language is the same with that of the people of Whidah and the other nations of the coast.

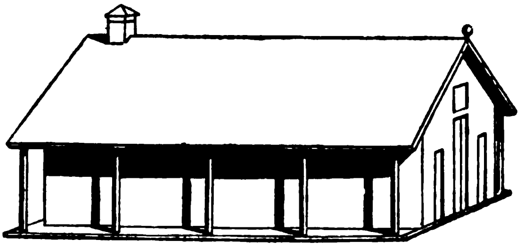
DAILLE', JEAN, was born at Chatelleraut in 1594, of a Protestant family. In 1612 he undertook the education of the two grandsons of Duplessis Mornay, the friend of Henry IV., and he travelled with them in several countries of Europe. At Venice he became acquainted with the famous Fra Paolo Sarpi. On his return to France he became pastor at Charenton in 1626. He published many works on divinity, both in Latin and French, and especially on controversial subjects. He was one of the most learned and most powerful advocates of the Protestant doctrines in his time. His principal productions are:—1, 'Traité de l'emploi des S. S. Pères pour le jugement des différends de la religion,' Geneva, 1632, which was also published in Latin, with the title 'De usu Patrum:' it is one of Daillé's best works, and much esteemed, especially by the Presbyterians; 2, 'De la croyance des Pères sur le fait des images; 3, 'Adversus Latinorum traditionem de religiosi cultus objecto;' 4, 'De cultibus religiosis Latinorum.' These three last works attempt to prove, that in the early or primitive Christian church there was no religious worship paid to the host, nor to relics, cross, images, &c. 5, 'De confirmatione et extrema unctione;' 6, 'De sacramentali sive auriculari Latinorum Confessione,' Geneva, 1661. This last work puts forth the strongest arguments against the practice of auricular or private confession. [CONFESSION.] 7, 'De scriptis quæ sub Dionysii Areopagitæ et Sancti Ignatii Antiocheni nominibus circumferuntur,' Geneva, 1666. Daillé looks upon the works attributed to Dionysius and Ignatius, of Antioch, as apocryphal. This, which is a work of much historical and critical learning, is dedicated to Samuel Bochart. 8, 'De pœnis et satisfactionibus humanis.' He also wrote an apology of the reformed churches and numerous sermons, which have been collected in several volumes, and also 'Dernières heures de Duplessis Mornay,' Leyden, 1647. Daillé died at Paris in 1670. His son, Adrien Daillé, left France at the revocation of the Edict de Nantes, and retired to Zürich, where he wrote his father's life.

DAIRY, the name usually given to the place where the milk of cows is kept and converted into butter or cheese. The occupation is called *dairying;* and land which is chiefly appropriated to feed cows for this purpose is called a *dairy-farm.*

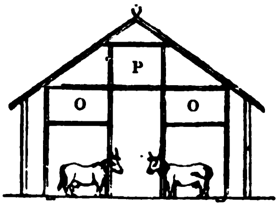
A dairy-house should be situated on a dry spot somewhat elevated, on the side of a gentle declivity, and on a porous soil. It should be on the west or north-west side of a hill if possible, or at least sheltered from the north, east, and south, by high trees. In some countries where there are natural caverns with an opening to the west, and springs of water at hand, the best and coolest dairies are thus prepared by nature. Artificial excavations in the sides of freestone rocks are sometimes formed for the purpose of keeping milk, and more frequently wine. Where no such natural advantages exist, the requisite coolness in summer, and equal temperature in winter, which are essential in a good dairy, may be obtained by sinking the floor of the dairy some feet under ground, and forming an arched roof of stone or brick. In cold climates flues around the dairy are a great advantage in winter; and an ice-house in warm summers is equally useful. But these are only adapted to those dairies which are kept more as a luxury than as an object of profit. In mountainous countries, such as Switzerland, where the summers are hot in the valleys, and the tops of the mountains or high valleys between them are covered with fine pastures, the whole establishment of the dairy is removed to a higher and cooler atmosphere, where the best butter and cheese are made. Coolness is also produced by the evaporation of water, an abundant supply of which is essential to every dairy. It is also a great advantage if a pure stream can be made to pass through the dairy, with a current of air to carry off any effluvia, and keep the air continually renewed.

As the milk suffers more or less from being agitated, or too much cooled, before it is set for the cream to rise, the cow-house or milking-place should be as near as possible to the dairy, or rather it should be under the same roof. The milk may then be brought immediately from the cows, without being exposed to the outer air. The dairy-house should consist of three distinct apartments below, with lofts and cheese-chambers above. The principal place is the dairy, properly so called, sunk two or three feet below the level of the ground, with a stone or brick bench or table round three sides of it to hold the milk pans. This table should be a little below the level of the outer soil. Air-holes covered with wire should be made in the walls a little above, and on opposite sides of the dairy; and they should have shutters sliding over them to open or shut according to the weather. The floor should be of stone or paving tiles, sloping gently towards a drain to carry off the water. Great care should be taken that no water stagnates in this drain, which must be kept as clean as the floor of the dairy, and not communicate with any sink, but run out into the open air: a declivity from the dairy is essential for this purpose. If this cannot be obtained, it must run into an open tank, and the water be regularly pumped out. The windows of the dairy should be latticed. Glazed windows may be added for the winter, but they should always be open except in very hot or very cold weather. There may be shutters to close entirely, but this is not essential. If the windows are made like venetian blinds, the light will be excluded without excluding the air. The utmost purity must be maintained in the air of a dairy; nothing should enter it that can produce the slightest smell. No cheese or rennet should be kept in it; and particularly no meat, dressed or undressed. Even the dairy-maid should avoid remaining longer in it than is necessary, and should at all times be extremely clean in her person.

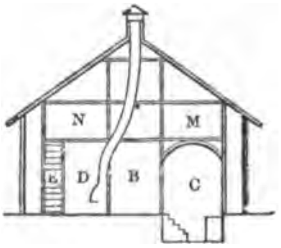
The next important place is a kind of wash-house, in which there is a chimney where a large copper kettle hangs on a crane to heat water in, or milk when cheese is made. In countries where wood is scarce, and pit-coal is the common fuel, a copper may be set in brick-work with a grate under it, as is usual in England. In this place all the utensils of the dairy are kept, and scalded with boiling water every day. It should have an outer door, which may be to the south, and benches outside on which the pails and other utensils may be set to dry and be exposed to the air. Between the two last apartments may be another communicating with both, and forming a kind of vestibule, where the churning may take place; and over them a cheese-room and lofts, or any other useful chambers. A verandah round the dairy is very convenient, or on three sides at least. It shades from the sun, and adds to the warmth in winter; and the utensils may be dried and aired under it even in rainy weather. Gentlemen's dairies are often built expensively, and highly ornamented; but they seldom unite all the conveniences essential to a good dairy, because the architects who plan them are seldom practical farmers. They are generally too far from the cow-houses, which might be joined to them without detracting from the neatness of the structure. A dairy-house placed near a mansion, and at a distance from the farm buildings, is quite out of its place. In Switzerland and in Holland, the cow-house and dairy often have a very neat appearance within a short distance from the principal residence. The plan in both countries is very similar; the style of the roof is the chief difference. It is taken from the common dairy-farms in Holland, where the farmer and his family live under the same roof with his cows. In the Netherlands, especially in North Holland and Friesland, a cow-house is as clean as any dwelling-house, and the family often assemble and take their meals in it. The following description of a cow-house and dairy under one roof combines all that is useful, with considerable neatness internally and externally:—It is a building about sixty feet long by thirty wide, with a verandah running round three sides of it. The dwelling is not here attached, as it usually is in common dairies, and the building is not surrounded by a farm-yard: these are the only circumstances in which it differs from that of a common peasant. The dairy-room is sunk below the level of the soil, and is paved with brick. The sides are covered with Dutch tiles, and the arched roof with hard cement. The cow-house, like all in Holland, has a broad passage in the middle, and the cows stand with their heads towards this passage, which is paved with clinkers or bricks set on edge. Their tails are towards the wall, along which runs a broad gutter sunk six or eight inches below the level of the place on which the cows stand. This gutter slopes towards a sink covered with an iron grate, which communicates by a broad arched drain with a vaulted tank into which all the liquid flows. The gutter is washed clean twice a day before the cows are milked. The cows stand or lie on a sloping brick floor, and have but a small quantity of litter allowed them, which is removed every day and carried to the dung-heap or to the pig-styes to be more fully converted into dung. Whenever the litter is removed, the bricks are swept clean; and in summer they are washed with water. In Holland the cows' tails are kept up by a cord tied to the end of them, which passes over a pulley with a weight at the other end, as we see practised with horses that have been nicked: thus they cannot hit themselves, or the person who milks them. The manner in which the cows are fastened is worthy of notice:—Two slight pillars of strong wood are placed perpendicularly about two feet distance from each other, so that the cow can readily pass her head between them. On each of these is an iron ring, which runs freely up and down, and has a hook in its circumference: two small chains pass from these hooks to a leather strap, which buckles round the neck of the cow. Thus the cow can rise, and lie down, and move forward to take her food, which is placed in a low manger before the two pillars; but she cannot strike her neighbour with her horns. The mangers or troughs are of wood, or of bricks cemented together, and are kept as clean as all the rest of the cow-house. In



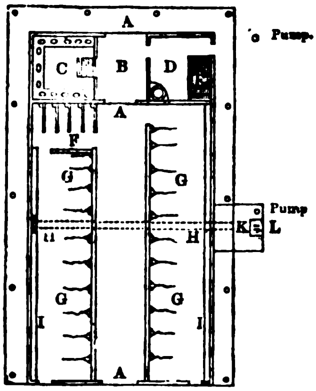
Side view.



Section of the Cow-house.



Section of the Dairy.



Ground Plan.

A, A, A, passage through the cow-house and dairy ten feet wide, paved with bricks set on edge or Dutch clinkers. The food is brought in this passage in a small cart and distributed to the cows.

B, part of the above passage closed in with doors and forming a vestibule to the dairy; C, dairy-room, in which only milk, cream, and butter, are kept. It is sunk three feet under the level of the cow-house, and covered with a brick arch; it has one latticed window, and several ventilators, on a level with the place on which the milk vessels are set.

D, the room where the utensils are scalded, and where cheese is made; in one corner is a fireplace, with a large kettle or a copper set.

E, a stairs to go up to the cheese-room M, and loft N.

F, calf-pens, in which the calves are tied up to fatten, so that they cannot turn to lick themselves; a small trough with pounded chalk and salt in each pen.

G, the place for the cows, without partitions; each cow is tied to two posts by two small chains and two iron rings, which run on the posts. The chains are fastened to a broad leather strap, which is buckled round the neck o each cow. H, H, two sinks, with iron gratings over them, to catch the urine from the gutters I, I, which run all the length of the cow-house on each side K, the urine tank, vaulted over with a door, L, to clean it out, and a pump to pump up the liquid manure. O, O, in the section, are places where the green food or roots are deposited for the day's consumption. P, a hay-loft.

Switzerland the cow-houses are similar, but there is also a rack, the back of which towards the passage shuts up with a board on hinges. The Dutch mode supplies more light and air to the middle passage; and as the food is given frequently and in small quantities there is very little waste. The preceding cuts will give a tolerable idea of the whole arrangement. The food is brought in carts, which are driven at once between the cows. What is not wanted immediately is stored above, whence it is readily thrown down before the cows. Thus much trouble is saved, and one man can feed and attend to a great many cows. From November till May the cows never leave the cow-house. In summer when they are out, if they are in adjacent pastures, they are driven home to be milked, but if the pastures are far off, which is sometimes the case, they are milked there, and the milk is brought home in boats; but this is not thought so good for the butter, which is then always churned from the whole milk, without letting the cream rise. The finest and best flavoured butter is always made from the cream as fresh as possible; and to make it rise well, the milk should be set as soon as it is milked, and agitated as little as possible. The greatest quantity is seldom obtained when the quality is the finest. When great attention is paid to the quality, the milk is skimmed about six hours after it is set; and the cream taken off is churned by itself. The next skimming makes inferior butter. These particulars are mentioned to show the necessity there is of having the dairy as near as possible to the cow-house.

The utensils of the dairy, such as pails, churns, vats, &c., are usually made of white wood, and are easily kept clean by scalding and scouring. Leaden troughs are used in large dairies; and if they are kept very clean by careful scouring, they answer the purpose better than wood. They may be so constructed that the milk may be let off gently before the cream, which is collected by itself. This saves all the trouble of skimming. Brass pans have the advantage of being readily warmed on a chafing dish in winter. In Devonshire tin or brass pans are frequently used instead of earthenware. Although there is some danger in the use of brass utensils, very little attention will obviate it. It only requires that they should be kept bright, in which case the smallest speck of oxide or verdigris would be perceptible. In Holland the milk is invariably carried in brass vessels. Cast-iron pans have been invented, which are tinned inside. They are economical; but there is nothing better or neater than well-glazed white crockery ware, of the common oval form. Some recommend unglazed pans for summer, but they are difficult to keep sweet, as the milk insinuates itself into the pores, and is apt to become sour there.

The most common use of cows is to supply butter and cheese [Butter and Cheese], and sometimes to fatten calves [Calf] for the butcher; but the most profitable dairy is that which supplies large towns with milk. In these dairies the system is different. The cows are mostly kept in stalls, and fed with food brought to them. Some dairymen near London possess several hundred cows, and the arrangement of their establishments is worthy of notice. The cows are bought chiefly in the north, before or after they have calved. They are seldom allowed to go to the bull, but are kept as long as they can be made to give milk by good feeding. When they are dry, they are often already sufficiently fat for sale, or at all events they soon fatten, and are sold to the butcher. A succession of cows is thus kept up, new ones arriving as others are sold off. The women who purchase the milk from the dairyman and carry it about for sale, come for it to the dairy and milk the cows twice a day; and as they well know that the last drop of milk is the richest, the cows are sure to be milked quite dry, an essential thing in a dairy. An accurate account is kept of the quantity which each woman takes, which is paid for weekly. When there is more milk than there is a demand for, it is set, and the cream is sold separately, or made into butter; but this is seldom done to any extent. The cows are fed on every kind of food that can increase the milk: brewers' grains and distillers' wash are preferred, when they can be obtained. The grains are kept in large pits, pressed close and covered with earth, under which circumstances they will remain fresh a long time. Turnips and beet-root are used in large quantities; but hay is given sparingly. The cows are generally placed in pairs, with a partition between every two pair. Each cow is fastened to the corner of the stall, where she has a small trough with water before her: thus they cannot gore each other with their horns. The great dairies about London are kept very clean; but the liquid manure, which would be so valuable for the market-gardens, is lost, and runs off by the sewers. In Belgium the urine would be contracted for at the rate of 2*l.* per cow per annum, which would produce 1200*l.* a year in a dairy of 600 cows, and would pay a good interest for the money expended in constructing large vaulted cisterns under each cow-house.

The dairy farms of England are chiefly in Gloucestershire, Devonshire, and Cheshire. They require a smaller capital than arable farms of the same extent; the chief outlay is the purchase of cows. The rent of good grass land is generally higher than if it were converted to arable land; and the risk from seasons, and from a variation in the price of the produce, is much less in a dairy farm than in one where corn is chiefly cultivated. Hence the rents are better paid, and there are fewer failures among the tenants; but the profits of a dairy farm, without any arable land, are not considerable; a decent livelihood for the farmer and his family is all that can be expected. There is no chance of profit in a dairy of which the farmer or his wife are not the immediate managers. The attention required to minute particulars can only be expected in those whose profit depends upon it. The dairies of men of fortune may be arranged on the best and most convenient plan, and be indispensable articles of luxury; but the produce consumed has always cost much more than it could be purchased for. A proper attention to keeping correct accounts of every expense will convince any one of this truth. In a dairy farm the great difficulty is to feed the cows in winter. It is usually so arranged, that the cows shall be dry at the time when food is most scarce, and they are then kept on inferior hay, or straw, if it can be procured. It is a great improvement in a dairy farm if it has as much arable land attached to it as will employ one plough, especially if the soil be light; but the mode of cultivating this farm must vary from that of other farms, since the food raised for the cows must be a principal object. Corn is a secondary object; and the cultivation of roots and grasses must occupy a great portion of the farm. When the grasses degenerate, a crop or two of corn is taken, and the rotation is chiefly roots, corn, and grass cut for hay, until it wears out. If the roots are well manured, the land keeps in excellent heart. The old pastures are kept for summer feeding. Where there is no arable land near a dairy farm, it deserves mature consideration whether it will be advantageous or not to allow some of the pasture to be ploughed up. It is often a dangerous experiment where the soil is naturally heavy, which is the case with most dairy farms in England. Arable land laid down to grass for the purpose of the dairy seldom produces fine-flavoured butter, or good cheese; but clover-hay is excellent for young stock, or to fatten off the old cows. Lucern is reckoned to make cows give very good milk; nothing however can equal a rich old pasture, as all dairymen agree.

In hiring a dairy farm, it is an object of great importance that the buildings be situated near the centre of the land, and that they be well constructed and convenient. The nature of the feed must be ascertained by experience. It is often impossible to say by mere inspection whether a pasture will make good butter or cheese, especially the latter. But those which have no great reputation may often be highly improved by draining, and also by weeding, a thing too much neglected in pastures.

DAIS or DEIS, a word which occurs very frequently in old English authors; as in Chaucer, Prologue to the Canterbury Tales, v. 372.

> Wel semed eche of hem a fayre burgeis,
> To sitten in a gilde halle, on the *deis*.

Tyrwhitt apprehends that it originally signified the wooden floor (Fr. *d'ais*, Lat. *de assibus*) which was laid at the upper end of the hall, as we still see it in college-halls and in most, if not all, of those of the city companies of London, and those belonging to the inns of court. The part of the room being floored with planks was called the *deis*, the rest being either the bare ground, or, at best, paved with stone; and being raised above the level of the other parts, it was called *the high deis*. In royal halls there were more *deises* than one. Christine of Pisa (Hist. Cha. V., P. iii., c. 33) says that at a dinner which Charles V of France gave to the emperor Charles IV. in 1377, there were *five deis*.

As the principal table was always placed *upon a deis* began, by a natural abuse of words, to be called itself a deis, and people were said to sit *at the deis* instead of *at the table upon the deis*. So in 'Matthew Paris,' *Vit. Ab.*, p. 1070, 'Priore prandente ad magnam mensam, quam *deis* vocamus?'

Menage, whose authority has led later antiquaries to interpret *deis* a canopy, has evidently confounded *deis* with *ders*.

(Ducange, *Glossary;* Tyrwhitt's *Notes on Chaucer's Canterb. Tales*, 4to., Oxford, 1798, vol. ii., p. 403.)

DAISY, or DAY'S EYE, the little perennial plant called Bellis perennis by botanists. Like most composite flowers, it has proved productive of varieties when domesticated; but they have almost disappeared, except from old-fashioned or cottage gardens. And yet the varieties are in some cases very pretty, and well suited for an edging to borders. The double-red, the striped, and the hen-and-chickens are the prettiest sorts. The latter is a curious permanent vegetable monster, and derives its singular name from each of the flower-heads being surrounded by a quantity of smaller heads half covered by the mother-head, as a brood of chickens is by the wings of the hen. This circumstance arises from the leaves or leaflets of the involucre generating buds from their axils, instead of remaining sterile, as such leaves usually are.

DALAGO'A BAY is situated on the eastern coast of Southern Africa, where the twenty-sixth parallel and the thirty-third meridian intersect one another. It is a large bight, extending about twenty miles east and west, from Cape Ingack to the entrance of the English River; twenty-two miles to the southward of this line it affords good anchorage for the largest vessels, and will probably some time be an important place, as there does not exist between it and False Bay, near Cape Town, any port in which a vessel drawing more than eight feet of water can enter, though this line of coast is upwards of 1000 miles in length. Three rivers enter the bay; the Manice or King George's River, the English River, and the Mapoota, and they are all navigable for a considerable distance. The English River is properly an æstuary, into which three other rivers discharge themselves, at the distance of eight miles from the bay. On this æstuary, about two miles from the sea, is built a Portuguese fort, the most southern possessed by that nation in Africa; but it is a miserable place, consisting of three or four houses: its garrison is composed of three officers and about fifty Mozambique black soldiers, with a governor. The fort contains only a few rusty cannons.

The country near the shores of the bay is low, marshy, and unhealthy; but at no great distance from it the ground rises, is healthy, well peopled, and comparatively well cultivated. It is inhabited by three or four tribes, independent on each other. (London, *Geographical Journal*, iii.; and Threlfall, in Bannister's *Humane Policy, or Justice to the Aborigines, &c.*)

DALAI LAMA. In the article BUDDHA it is noticed, as an essential point in the faith of the Buddhists, that on the death of the founder of their sect, his soul became immediately re-embodied in the person of another religious chief of the Buddhist community, and that in this manner the same Buddha continued to reappear among his followers in a succession of spiritual rulers, who have by some writers very appropriately been called Buddhist patriarchs. From the time when the last of these patriarchs quitted India and took his abode in China (*i. e.*, towards the close of the fifth century of our æra), we hear of more than one spiritual chief, subordinate to the patriarch, appearing at the same time in the several countries in which Buddhism has become the prevailing religion. Chinese historians make mention of them under the honorific appellations of Preceptor of the Kingdom, Prince of the Faith. It seems at an early age to have become a matter of policy with the secular sovereigns of Buddhist countries to attach these religious chiefs to their interests; and thus was laid the foundation of an hierarchical system, which subsequently developed itself to an extent without a parallel in history. For eight centuries the Princes of the Faith continued in comparative obscurity at the courts of Buddhist sovereigns; and it was not till the thirteenth century that the chief residing at Putala, in Tibet, was by the victories of the Mogols, under Genkis khan and his successors, raised to the rank of supreme pontiff of the sect. A separate province in Tibet was assigned to him as his own territory; and besides his spiritual dignity he became, to a limited extent, a temporal monarch. The Tartars, who in the fourteenth century put an end to the Mogol power in Tibet, paid even greater deference to the Buddhist pontiff. Eight subordinate chiefs, or rather as many inferior incarnations, were appointed to act as his council; and titles expressive of his transcendent power and authority in spiritual matters were conferred upon him. The word Lama, which properly signifies a priest, became from that time an illustrious appellation. The title Dalaï Lama, *i. e.*, 'The Priest who resembles the ocean (in greatness of mind),' has been applied to the pontiff since the beginning of the sixteenth century. Occasions for jealousy and contention between the pontiff and the other spiritual chiefs, who resided in various parts of Chinese Tartary, could not be long wanting; and we find that the Tartar princes, among whom the possession of Tibet and the neighbouring countries was at different times contested, availed themselves of these dissensions for the advancement of their own interests. With all their professed veneration for the spiritual character of the Dalaï Lama, we hear of more than one instance of his being deprived of his dignity and even of his life. Such the condition of the Tibetan hierarchs seems to have remained till within recent times. The predecessor of the Lama, to whom Turner was sent as ambassador from the Bengal government, had been invited to visit the emperor of China, and died soon after his arrival at Pekin (in 1780), under circumstances which justified the suspicion of his having been poisoned. [LAMAS.] (A. Rémusat, *Mélanges Asiatiques*, vol. i. p. 129—145.)

DALECARLIA, properly **DALARNE** (the valley country), a province of Sweden, extends from 60° 55′ to 62° 12 N. lat., and from 12° 30′ to 16° ′40 E. long. Its surface is 12,225 square miles, or more than twice the area of Yorkshire. On the north it borders on Heriedalen, on the east on Gertrikland, on the south on Westmanland, Nerike, and Vermland, and on the west on Norway.

The mountain-ridge, which divides the sources of the two rivers Dalelf from Lake Fämund in Norway, rises to between 3000 and 4000 feet above the sea. It is a southern offset of the Kölen (pronounced Tioelen) range, and from it there branch off three ridges of considerable elevation. The most northern separates the river Ljusnaelf from the Oester Dalelf; the middle, the Oester Dalelf from the Wäster Dalelf; and the southern runs between the Wäster Dalelf and the Klarelf. These ranges subside into hills before they reach the meridian of the Lake of Silian. The country about this lake presents a pleasant intermixture of hills, valleys, and plains, and may be compared to the lower parts of Switzerland for scenery. But the whole country still preserves a considerable elevation, the surface of Lake Silian being about 560 feet above the sea. The eastern districts are also uneven, but the heights are rather round-backed hills than mountains, and are usually covered with wood. Numerous lakes of different size lie between them. It is only on the borders of Gestrikland that plains of any extent occur.

Like the other parts of Sweden, Dalecarlia abounds with rivers and lakes. The principal river is the Dalelf, which originates in two powerful branches on the mountain-range forming the western boundary. The Oester Dalelf runs south-east, and after traversing the Lake Silian unites with the Wäster Dalelf, which originates a little farther south, and in the beginning is called Fuluelf. It runs south-south-east, but near Apelbo it turns suddenly to the east, and continues in that direction to its junction with the Oesterelf. The united river Dalelf runs south-east to Avestad, and hence north-east to its entrance into the Gulf of Bothnia. About six or seven miles from its mouth it forms the cataract of Elfcarleby, the rival of the famous cataract of Schaffhausen in height and beauty. The Lake Silian is from twenty-seven to twenty-eight miles long, and fifteen broad, where widest. It contains several fine islands, on one of which is a church. The Lake Runn is about ten miles long, and five wide.

The winter in this province is long and severe, the summer short and hot. Wheat does not succeed, but rye and barley are raised, though both frequently suffer from the early night-frost in autumn. The agricultural produce does not meet the demands of the scanty population, and the tender bark of pines is mixed with the bread, and also used as fodder for cattle and hogs. The cultivation of potatoes is rapidly increasing.

The usual domestic animals are reared, but hogs are rather scarce. Game is abundant, especially different kinds of woodcocks, blackbirds, geese, ducks, and swans. Wolves and bears frequent the numerous and extensive forests. Fish abounds in all the lakes, except those near Falun.

The forests consist of birch, ash, aspen, pines, and fir, but they seldom grow up to timber trees. The fruits of some kinds of *rubus* are gathered for domestic use.

Near Falun are found copper, silver, gold, and brimstone. To the north of Elfedalen, on the Oester Dalelf, are quarries of beautiful porphyry, in which a small number of workmen are employed: the porphyry is made into vases, candlesticks, &c. of great elegance.

The population amounts to about 140,000, or a little more than 11 to each square mile. Except in the neighbourhood of Falun, to which place they are attracted by the mines, the population is dispersed over the country in villages, some of which are of considerable size. The Dalecarlians are distinguished by their stature, courage, spirit of independence, and frankness of character. The part which they took under Gustavus Vasa, in liberating their country from the tyranny of Christian II., is always fresh in their memory, and makes them feel proud of their name.

Dalecarlia forms one administrative province, or Län, called Falun Län, or Kopparbergs Län. The governor resides at Noor. Falun and Avestand are the most considerable places. [FALUN.] Nothing is exported but the produce of the mines and game, especially birds. (Thomson; Schubert's *Reise durch Schweden*; Harrison; Forsell, *Statistik öfver Swerige*.)

D'ALEMBERT. [ALEMBERT, D'.]

DALGARNO, GEORGE. The following short notice of this original but neglected author is in Anthony-à-Wood's *Athenæ Oxonienses*, vol. ii., p. 506. 'The reader may be pleased to know, that one George Dalgarno, a Scot, wrote a book entitled "Ars Signorum, Vulgo Character Universalis et Lingua Philosophica," London, 1661. This book before it went to press the author communicated to Dr. Wilkins, who, from thence taking a hint of greater matter, carried it on, and brought it up to that which you see extant. This Dalgarno was born at Old Aberdeen, and bred in the university of New Aberdeen; taught a private grammar-school with good success for about thirty years together in the parishes of St. Michael and St. Mary Magdalen in Oxford; wrote also "Didascalocophus, or the Deaf and Dumb Man's Tutor;" and dying of a fever on the 28th August, 1687, aged sixty, or more, was buried in the north body of the church of St. Mary Magdalen.' According to the above account, Dalgarno was born in or before the year 1627, and he must have been residing at Oxford in the year 1657; whether previous to that time, it does not appear, but it may not be erroneous to conclude that he went to Oxford to avail himself of the advantages of that seat of learning. Perhaps he lived there in the twofold capacity of student and teacher: Anthony Wood's work professes only to give a history of all the writers and bishops who have had their education in the famous university of Oxford, &c. From the works which Dalgarno left behind him, it may be concluded that he was a man of original talent, and of great acquirements; his speculations concerning a universal language, a favourite subject with the learned men of his time, undoubtedly preceded those of bishop Wilkins, at that time dean of Ripon, and he received the testimony of Dr. Seth Ward, the bishop of Salisbury, Dr. John Wallis, and others, that he had discovered a secret 'which by the learned men of former ages had been reckoned among the desiderata of learning.' We have carefully sought for some acknowledgment of the merits of Dalgarno in the 'Essay towards a Real Character' of bishop Wilkins, but the name of this obscure man is not once mentioned, though assistance from others is noticed, among whom the name of Dr. Ward appears. Wilkins's work was published in 1668. Its appearance had been delayed for two years in consequence of the whole impression, when nearly printed, with the exception of two copies, having been destroyed in the great fire of London. Allowing for this delay, Dalgarno's work had the priority by several years, and Dr. Wilkins had the advantage of seeing it 'before it went to press.' This treatise, 'Ars Signorum,' &c., exhibits a classification of ideas, and a series of arbitrary signs or characters adapted to the classification, so as to represent each idea by a specific character, without reference to any language of words. All those persons who are acquainted with the Essay of Wilkins will see the germ of it in this design of Dalgarno's. The Didascalocophus develops views on the instruction of the deaf and dumb, both comprehensive and practical. It is a truly philosophical guide, by which the writer shows how capable the deaf and dumb are of understanding and applying a written language, and of their capacity to speak and to understand the speech of other persons. He shows that the art of teaching this class of persons requires the exercise of common sense, perseverance, and ordinary patience, under a teacher, fertile in expedients, and one who is able to turn even disadvantages and difficulties to a good account. How rational is the following: 'When your scholar is got over this difficulty of knowing and writing his letters, then imitate the way of the nursery. Let *utile* and *jucundum*, variety and necessity, invite and spur him on; specially if he be young, or of a lache (trifling) temper. You must not be too grammatical in teaching, till you find his capacity will bear it; he must not be dealt with as schoolboys, who are often punished for not learning what is above their capacity. It is enough for him to understand the word or sentence proposed, without parsing every word or syllable; for this is all the use of language that not only children, but even people of age that are illiterate have.' (*Didascalocophus*, p. 53.) Much might be extracted from this little treatise to show how correct were Dalgarno's ideas on general instruction, as well as how accurately he had employed his thoughts on the teaching of the deaf. His style is quaint and pedantic, and rather abounds with long and technological words, which serve to exhibit the learning of the author more than to increase the perspicuity of his work. But this must be excused; it was the garb which learning assumed in his day. In the article DACTYLOLOGY a representation of Dalgarno's hand-alphabet is given. It is a gratification to find that his works are likely to be preserved, as they have been privately reprinted by Lord Cockburn and Mr. Thomas Maitland, and presented to the Maitland Club of Glasgow. Mr. Dugald Stewart has on more than one occasion paid a tribute of respect to Dalgarno: he mentions him in a note annexed to the first volume of the 'Philosophy of the Human Mind,' as the author of a very ingenious tract, entitled 'Ars Signorum;' and in his account of James Mitchell, a boy born blind, and deaf and dumb, he says, 'I feel myself called on to lay hold of the only opportunity that may occur to me, of rescuing from oblivion the name of a Scottish writer whose merits have been strangely overlooked both by his contemporaries and by his successors. The person I allude to is George Dalgarno, who, more than a hundred and thirty years ago, was led by his own sagacity to adopt, *à priori*, the same general conclusions concerning the education of the dumb, of which the experimental discovery, and the happy application have, in our times, reflected such merited lustre on the name of Sicard.'

DALKEITH. [EDINBURGH, SHIRE OF.]

DALMATIA, the Kingdom of, the most southern possession of the crown of Austria, consists of a narrow maritime tract and numerous islands, forming part of the eastern boundary of the Adriatic, and lying between 4 and 45° N. lat. and 14° and 19° E. long. The Generalat of Carlstadt, in Hungary, bounds it on the north; the Turkish sandshak of Iskenderia on the east; and the Adriatic on the south and west. It is not a compact territory, inasmuch as the circle of Ragusa is disjoined from the rest of Dalmatia by two tongues of land, the Klek on the west, and the Suttorina on the east, which are Turkish. The area, inclusive of the islands, and according to the most recent estimate, is about 5098 square miles: Blumenbach, however, states it to be 5743. Dalmatia is divided into four circles, Zara and Spalatro, which constitute Old Dalmatia, and Ragusa (the territory of the former republic of that name) and Cattaro, which form New Dalmatia. The whole surface of Dalmatia is a series of mountain-ranges, some of which extend even into the Adriatic, and form islands with their loftier summits. With the exception of the Vellebich on the Hungarian border, which belongs to the Julian Alps, all these ranges are continuations of the Dinaric Alps. The loftiest summits among them are the Dinara, which is 5670 feet high, and gives its name to the main chain, the Promina, north of Dernis, 36 the Svilaya, east of Dernis, 4750; Mount Mosor, 42 Mount Marian, on the peninsula next Spalatro, and the Biokovo, near Macarsca, which is 5520 feet. To the south of those lie the ranges of Ragusa and Cattaro, among which is the Dubovicza, the most southern mountain in the Austrian dominions. The Montenegrin heights encircle the gulf of Cattaro. The general character of the Dalmatian mountains is bleak and bare: they are full of fissures, ravines, and chasms, and in many places altogether without soil. Limestone is the prevailing rock. The numerous islands which line the coast have originated in the breaking up, by some violent action, of masses of clay and sandstone, while the limestone masses, being of firmer composition, have been left standing. The whole line of coast is barren and naked, except along the narrow tract between the Adriatic and the base of the mountains; forests and underwood lie interspersed at their feet; the background is formed by a continued line of dreary precipitous heights, seldom less than 2500 feet in elevation. The coast is indented in numerous points, and affords abundance of excellent harbours. The interior of the country is furrowed by glens and valleys, many of which are stony and sterile; even the plain extending from Novegradi to the Kerka is covered with stones. On the whole, there is no part of the Austrian empire which has so wild and desolate an aspect as Dalmatia.

Few countries are so poorly supplied with water, many parts being destitute of water fit even for the use of cattle: the islands in particular suffer greatly. The Dalmatian rivers run mostly from east to west into the Adriatic. Among the larger streams are the Zermanya (antiently the Tedanius), which enters from the Hungarian Military Frontiers, and, after a course of about 27 miles, falls into the bight of Morlach, near Novigrad; the Kerka (antiently the Titius), which rises above Knin, issues from a grotto, forms several cascades and five magnificent falls, particularly that by Scardona, in its course of about 51 miles, and, after receiving the Cicola, flows into the Adriatic near Sebenico. The Cettinu (Tilurus or Nestus), which springs from the foot of the Yerebiza, near Vrilo, has two falls in its course of about 60 miles, one of which is from 90 to 100 feet in height, and occurs near Velika-Gubowicja: the banks of this river are extremely wild, and generally precipitous, until it reaches a fine valley near Amissa, where it enters the Adriatic. The Narenta (Naro of the antients), the broadest river in Dalmatia, enters it from Turkey, and, after watering it for about ten miles, parts into two channels at Fort Ovus, and reaches the canal of Narenta through ten arms. Its waters are saltish until it receives the Norin at Torre di Norin. Among the smaller rivers are the Sinkotina and Ombla.

The islands along the Dalmatian coast form several fine channels, which are sheltered from the stormy waves of the Adriatic: they are here called canals, and take their names from the adjacent islands; such are the canals of Morlak, Quarnerola, Zara, and Pasman, Mezzo, Spalatro, Lissa, Curzola, Narenta, &c.

Dalmatia is full of lakes, all of which become more or less dry in hot weather, except the Vrana, to the south-east of Zara, which is separated from the Adriatic by a narrow tongue of land, contains an area of about 8570 acres, and has brackish water. The lakes of Novigrad, Yezero (the dry bed of which is at times cultivated), Narin, Kadin, Trocklian, Prelosaz, &c. become dry at certain seasons from the want of natural springs. None of the numerous mineral springs have yet been turned to account, except the warm sulphureous springs at Spalatro and Salona.

No part of the Austrian dominions is so hot as Dalmatia. In the lowlands the date-bearing palm, the American aloe, and the Cactus opuntia thrive in many districts in the open air. The almond blossoms in January. Among the mountains, where the snow sometimes continues till May and even June, the climate is much bleaker. Near the coasts of Zara, about the canal of the Narenta, and elsewhere on the Adriatic, the exhalations which arise from extensive swamps render the climate very unhealthy. Winter is characterized by six weeks of uninterrupted rain.

The arid character of the soil renders Dalmatia on the whole unsuited to agriculture. But there are parts of the country, such as the districts around Dernis, Muk, and Sign, which might be cultivated with success, but for the indolence and ignorance of the people. The want of water and sheltering woods is another obstacle to cultivation. Turkey and Hungary supply the constant deficiency in the crops of grain, which do not furnish more than six or at most eight months' consumption. The whole amount of arable land does not exceed 191.190 Paduan campi. Barley and oats are the corn mostly grown. Figs may be termed almost the staple produce of the country: the export is about 845,000 pounds weight yearly. The oil is of superior quality, and used by the natives instead of butter; yet above 21,000 barrels are annually exported. Much wine of a strong quality is made; the deeper the colour, the more powerful the liquor: the Vino Nero, a red wine, is nearly black, and the white wine as deep in colour as Malaga: the Marzenin del Teodo is the best. About 8,000,000 gallons (the whole produce being about 9,120,000) per annum are exported to Fiume, Trieste, and Venice. Almonds, dates, dried currants, citrons, pomegranates, oranges, and other fruits are exported. The country abounds in timber, but being in the interior, it is almost inaccessible: the forests in the neighbourhood of the coast have been exhausted. The coast fisheries employ about 8000 hands: the staple kinds of fish are the sardinia and the tunny, both of which are exported in a dried or salted state. The rivers too are well supplied, particularly with the salmon-trout, which attains an enormous size. Altogether, the value of this branch of trade is estimated at 300,000*l.* a year and upwards. At some spots the coral fishery is productive, especially near Sebenico. The Morlaks convert the fat of the frog into an oil, which they employ for various purposes. Honey and wax are produced in some quantities.

The rearing of cattle is on a limited scale: the breeds are inferior and small: the whole stock of oxen, cows, sheep, and goats is not estimated at more than about 800,000, of which 53,000 only are oxen. The number of draught and saddle-horses is about 22,500, and of mules about 3906. Pains are taking, by the introduction of Merinos, to improve the breed of sheep, the native race being of diminutive size, and the fleece short and coarse. The stock of goats and swine is limited; but poultry, except geese and ducks, plentiful. There has in fact been a great diminution in the number of horses, cattle, and sheep during the last thirty years; for it appears by the returns of 1808 to have amounted at that time to 1,271,218, of which there were 1,105,078 sheep alone.

Of wild animals, Dalmatia possesses the Ciaghlo, or wild dog, wolf, fox, and hare, but it has no deer: swans, pelicans, falcons, vultures, owls, turkeys, and other wild fowl are abundant.

Dalmatia is rich in minerals, particularly limestone, gypsum, coal, pitch, asphaltum, and sea salt. No precious metals have been discovered, although Pliny (iii.) reports that the Dalmatian mines yielded as much as 50 pounds weight of gold per diem in Nero's time. These mines, however, cannot have been within the limits of the present territory of Dalmatia.

The majority of the inhabitants are descendants of the Sclavonian hordes, who invaded these parts in the seventh century and drove out the old inhabitants. The language of the country is the Herzogovine dialect of the Sclavonian, but Italian is the prevalent tongue among the well-educated classes, and is used in the public offices and courts. The remainder of the population is composed of Italians (about 40,000), who are spread throughout the maritime towns and sea-coast; Bosnian Greeks (about 10,000) and Servian Morlaks (about 80,000), both of whom took refuge here from persecution in the fourteenth century. The Morlaks or *Moroflachi*, *i. e.* Servians, who dwell next the sea (*Moro*), inhabit the mountain-districts of the Zara and Ragusa and some of the islands: the wild Montenegrin is of this race. The population of Dalmatia, which had been on the increase in the early part of the present century, inasmuch as the numbers rose from 256,863 in 1808 to 305,671 in 1815, and 324,075 in 1822 fell to 323,112 in 1825, and according to Blumenbach, cannot now be estimated at more than 320,000. In general the Dalmatian is of good stature, muscular, robust, hardy in his habits, and frugal in his diet he lives much in the open air and under tents. The poorest man drinks his wine, and eats his salad, fig, and melon: he is hospitable and talkative, but cunning, and addicted to lying and theft. There are some Germans and about 500 Jews settled in the country, the latter of whom are the descendants of Spanish colonists, who were expelled from Spain about the year 1502. Some few Greeks are settled in Dalmatia, as well as several tribes of gipsies, in number about 1800, who chiefly haunt the neighbourhood of Verlika and Sign.

The Roman Catholic, which is the established religion, is professed by at least four-fifths of the people. The ecclesiastical establishment consists of the archbishop of Zara and the 5 bishops of Spalatro, Ragusa, Sebenico, Lesina with Lissa, and Brazza and Cattara: they have under them 378 cures of souls, 60 monasteries, and 9 nunneries. The inhabitants, who profess the Greek faith, are in church-matters subordinate to a bishop resident at Sebenico and the vicar-general at Cattaro, under whom are 11 monasteries and 119 benefices.

Dalmatia is divided into the following circles:—

	Area.	Number of Inhabitants.	Districts.	Towns.
	Sq. M.			
Zara . . .	2121	114,000	7	Zara, cap. of Dalmatia, 7900 inhabitants; Sebenico, 4000; Scordona, 1200.
Spalatro or Spalato .	2656	133,000	10	Spalatro, cap., 7300; Trau or Troghie, 2900; Macarsca, 1300.
Ragusa . .	588	41,000	6	Ragusa, cap., 5000; Curzola, 6200.
Cattaro . .	378	32,000	3	Cattaro, cap., 2600.
	5743	320,000	26	

The circle of *Zara* comprises the Quarneric, Dalmatian, and Culadic islands; that of *Spalatro*, the islands of Zirona Grande, Bua, Solta, Lissa, Brazza, and Lesina; and that of *Ragusa*, the islands of Calamotta, Meleda, Lagosta, Curzola, and Pelagosa Maggiore.

Dalmatia contains 9 municipal towns, 14 market-towns, and 988 villages, and about 63,500 houses. The will of the sovereign is the law of the land, and there is no representative body or provincial states as in the native dominions of Austria; but certain districts and towns have been allowed to retain the rights and privileges which they possessed when under the dominion of the republic of Venice. Poglizza alone, a mountain district of about 16,000 or 17,000 souls, including several Hungarian and Bosnian nobles, in the circle of Spalatro, is so far independent that it elects its Gran Conte, or governor, and its local elders and magistrates, in the general assembly of the people called Zdor, which is held every year in the plains of Gatta. Every male is a soldier, and the district pays a tribute in lieu of taxes. The general administration of affairs in Dalmatia is vested in the Gubernium or government-board established at Zara, which receives its instructions from the Chancery and minister of the Home Department in Vienna. Each circle is divided into districts; each district into 'Haupt-gemeinden,' or head communities; and each of the latter consists of 'Unter-gemeinden,' or subordinate communities. At the head of each circle, in civil matters, is a 'Pretoria;' of each head community, a 'Podesta,' or 'Sandako;' and of each subordinate community, a 'Capo-villa,' or 'Casnazzo.'

The revenues of Dalmatia arise from the imperial domains, which yield about 10,000*l.* per annum; the regalia, which include the monopoly of salt, about 25,000*l.*; the direct taxes, about 39,000*l.*; and the indirect taxes, about 21,000*l.*: altogether about 95,000*l.* a year. Von Lichtenstern estimates the expenditure, exclusive of the military establishments, at about 72,900*l.* per annum. Dalmatia furnishes four battalions of Sharpshooters for the imperial service.

The manufacturing industry of this country is very small, and scarcely adequate to supply its common wants: it is confined to the townspeople, and its main branches are shipbuilding and the distillery of spirits, among which the liqueur called Maraschino-Rosoglio has obtained European celebrity. Here and there a little flax and cotton are spun, and small quantities of woollen cloth, coverlids, house linen, tape, and coarse cottons, twine, cordage, and nettings, soap, vinegar, leather, and hats are made. For every other article of necessity or comfort Dalmatia is dependent on other countries. 'There is clay,' says Blumenbach, 'but no potter; quartz, but no glass-work; timber, but no carpenter; lime, but no kiln; coals, but no mine; iron, but no furnace; skins, but no leather-maker; and rags, but no paper-mill. To this hour the hand-mill is universally used.' What must be the state of a country of which even a native can thus write!

Favoured as Dalmatia is by its situation and numerous ports, its commerce is comparatively small. The principal countries with which it trades are the maritime provinces of Austria, Italy, and Turkey. To the first two countries it exports wine, olives, oils, brandy, figs, salt, pitch, bark, salted fish, hides, wool, wax, honey, fruit, &c., and to Turkey the same products, besides foreign produce and manufactures. It has also some transit trade. Its returns from Turkey consist of horned and fatted cattle, cheese, wools and hides, corn, wood for fuel, drugs, &c. Dalmatia is not included with the other Austrian possessions under its onerous system of customs-imports, and its trade is therefore almost unshackled. The Dalmatians are well known in the Adriatic and Mediterranean as excellent mariners, and possess between 2900 and 3000 vessels of their own, varying in burthen from 40 to 500 tons: their best ships are constructed along the coast of Cattaro.

The Austrians found the country in a wretched state of ignorance, for the Venetians had done nothing whatever for its intellectual improvement. But the present government has commenced the good work by making pecuniary grants for the establishment of schools for the lower orders, and for encouraging the clergy to give instruction to their flocks. A normal seminary and school for girls have been opened at Zara; national schools of a superior class have been established at Spalatro, Macarsca, Ragusa, Cattaro, Sebenico, and Lesina, independently of the schools attached to the convents. And for the more affluent classes, gymnasia have been instituted in Zara, Spalatro, and Ragusa, and a lyceum or species of university at Zara, in which town there are likewise an ecclesiastical seminary, an obstetrical school, and a college for educating 37 pupils at the public expense. The benevolent institutions are as yet confined to the hospitals and foundling asylums at Zara, Sebenico, Spalatro, Lesina, and Cattaro, and the infirmary at Ragusa.

Dalmatia derives its name from the Dalmatine, a small district between Sebenico and Scordona. Its territory in former days was much more extensive than at present. The Dalmatians long resisted the Romans, but Augustus brought them under the Roman dominion. (Strab., p. 315.) After the fall of the western empire, the country became a prey to the Goths and Avari successively, and the latter maintained possession of it until the beginning of the seventh century, when they were driven out by swarms of Sclavonians. This people erected it into an independent sovereignty, which endured until overthrown by Ladislaus, king of Hungary, in the early part of the eleventh century: this monarch annexed the whole of it, the maritime towns only excepted, to the dominion of the Magyárs. These towns, among which was Zara, the most important of them, had long been under the special protection of Venice, which availed itself of the connexion to extend its sway over other parts of the country, and bring the greater part of Dalmatia under subjection. That portion which lay on the right bank of the Zermanya, and which Hungary retained, lost the name of Dalmatia altogether; and the same occurred with regard to the portion which forms part of Bosnia, and fell into the hands of the Turks, by whom it was erected into the sandshak of Hersek. The Austrians acquired the Venetian part of Dalmatia in 1798 under the treaty of Campo Formio. (Blumenbach; *Austrian Encyclopædia;* Von Lichtenstern; Hassel; Stein; Roprer, &c.)

DALRYMPLE FAMILY. The surname of this family is derived from the lands of Dalrymple, in the shire of Ayr, of which, in remote times, the chief of the house was proprietor. The family appears to have been of importance very early, for in the reign of King Robert III., Duncan Dalrumpill had a charter of the office of Toscheodorach (principal executive officer of the crown) in Nithsdale; and in 1462 James de Dalrymple was clericus regis.

The lands of Stair, whence the viscounty and earldom are derived, came into the family by William de Dalrymple, who became possessed of them in the middle of the fifteenth century by his marriage with his relation, Agnes Kennedy, heiress of the estate. The son of these parties married a daughter of Sir John Chalmers, of Gadgirth, in the same shire, whose first ancestor had held the high office of chamberlain of Scotland; and in lineal descent from him was James de Dalrymple of Stair, who married Janet, daughter of Kennedy of Knockdaw, and by her had

JAMES DALRYMPLE, first viscount Stair. He was born in May, 1619, at Dummurchie, in the parish of Barr, county of Ayr, and lost his father before he had attained his fifth year. At that tender age he was left under the guardianship of his mother, who survived her husband upwards of thirty years His early education was acquired at the school of Mauchlin, whence, at the age of fourteen years, he was removed to the college of Glasgow, where, applying himself closely to his studies, he gained the approbation of his teachers, and qualified himself for taking the degree of A.M. in 1637. He left college the following year, and at the breaking out of the civil war obtained a captain's commission in the earl of Glencairn's regiment.

About this time the chair of philosophy in the university of Glasgow became vacant, and having, by the advice of some of the professors, become a candidate, he was in 1641, being then twenty-two years old, appointed to the place after a comparative trial. It was then the practice for every regent to swear at taking office to demit on his marriage. This Dalrymple did, and having in 1643 married Margaret Ross, co-heiress of the estate of Balneil in Wigton, he resigned the chair, but was soon afterwards re-appointed. In this place he sedulously pursued his studies, and particularly the study of the civil law, with the view to the profession of the law, in which a knowledge of the Roman jurisprudence was then of great moment. In 1647 he resigned his chair, came to Edinburgh, and after the usual trials, was admitted an advocate on the 17th February, 1648. The following year he was appointed secretary to the commissioners sent by the Scottish parliament to treat with Charles II., then an exile in Holland, for his return to his native dominions. He held the same office in the more successful mission of 1650, and was on that occasion particularly noted for his 'abilities, sincerity, and moderation.' In 1654 we find him on a committee of four, deputed by the Faculty of Advocates to wait upon the judges for the purpose of getting the antient form out of the Outer House restored; and he was indeed well known both at the bar and in the country.

During the Protectorate he was recommended to Cromwell by General Monk, as a fit person to be one of the judges of the court of session. In his letter, dated from Edinburgh, 23rd June, 1657, Monk says, 'I make bold to mention to your highness one Mr. James Dalrymple, as a person fit to be a judge, being a very honest man, a good lawyer, and one of considerable estate. There is scarce any Scotsman, or Englishman who hath been much in Scotland, but knows him, of whom your highness may enquire farther concerning him.' The general wrote again to the Protector on the subject a few days after, and on the 1st July, 1657, Dalrymple took his seat on the bench.

At the Restoration he went to London with the earl of Cassilis to pay his respects to the king. On that occasion the honour of knighthood was conferred upon him; and by letter, dated Whitehall, 14th February, 1661, he was also nominated one of the lords of session. He was soon afterwards much annoyed however by the declaration enacted in 1663, and continuing to refuse signing it, his place was declared vacant 19th January, 1664. He thereupon set out with his eldest son on a tour to the continent; and having waited on the king at London on his return, his majesty allowed him to qualify his subscription to the Declaration, and restored him to his seat. As a farther proof of the royal favour, he was created a baronet on the 2nd June of the above year, 1664; and on the resignation of Sir John Gilmour, he was appointed president of the court of session 7th January, 1671.

On the 28th February, 1672, his eldest son, *John*, was admitted an advocate before the court: on the 25th June, 1675, his next son, *James*, was admitted; and his third son, *Hew*, on the 23rd February, 1677. A short time before this last date, the town-council of Edinburgh, 'having taken into consideration the many great and signal services done to the city by Sir James Dalrymple, president of the court of session,' resolved that his house-rent should be paid by the town during his life, as also that of all his successors in office.

Dalrymple continued president till the year 1681, when, on account of his conduct on occasion of the Test Act, he was superseded, and found it necessary to retire into Holland.

In 1681 he published his 'Institutions of the Law of Scotland,' the work of a great and philosophic mind, but one deeply imbued with the principles of the Roman jurisprudence: it gave consistency to the body of Scots law; and till our own day has guided the determinations of the Scottish lawyers. From his retirement at Leyden he transmitted to the Edinburgh press his 'Decisions of the Court of Session from 1661 to 1681;' the first volume appearing in 1684, and the second in 1687. And in 1686 he published at Leyden his 'Philosophia Nova Experimentalis.' He also busied himself about this time on a work relating to the mutual obligations of the sovereign and his people, but it was never published.

On the accession of King James II., Dalrymple's eldest son was appointed lord advocate of Scotland in the room of Sir George Mackenzie; and in this place he had influence enough to procure a pardon for his father, who, on the testimony of Spence, the secretary of Argyle, had been prosecuted and outlawed for his alleged concern in the Rye-house Plot. Sir John held the situation of lord advocate for about twelve months, when he was appointed successor to Foulis of Colinton, both as lord justice clerk and as an ordinary lord of session. His father, on coming over to this country with the Prince of Orange, with whom he had been much in favour while in Holland, was reinstated in the presidency of that court; and on the 21st April, 1690, raised to the peerage by the style and title of viscount Stair. The same year Sir John was re-appointed lord-advocate; and the next year advanced to be one of the principal secretaries of state, in which latter place he continued till the year 1695, when he was driven from office upon the parliamentary inquiry into the equally impolitic and barbarous massacre of Glenco, as to which he bore so much blame.

Stair died in the end of the same year, on the 23rd November, 1695, shortly after the publication of his work entitled 'A Vindication of the Divine Perfections,' and was buried in the high church of Edinburgh. He was succeeded in his title and estate by his eldest son, who, on the 8th April, 1703, was advanced to be earl of Stair. This person died suddenly on the 8th January, 1707, after a warm debate that day on the 22nd article of the treaty of Union which relates to the number and privileges of Scots peers. By his wife, daughter and heiress of Sir John Dundas, of Newliston, in the shire of Edinburgh, he left a younger son, who was

John Dalrymple, second earl of Stair. He was born at Edinburgh on the 20th July, 1673, and in early youth had the misfortune to kill his elder brother by the accidental discharge of a pistol. For some years afterwards he was under the tuition of a clergyman in the shire of Ayr, whence he was at length restored to his father's house.

In 1692, when but a youth of nineteen, he entered as a volunteer under the earl of Angus, commander of the Cameronian regiment, at the battle of Steinkirk. His parents however appear to have been desirous of his adopting the profession of the law, and for that purpose sent him to Leyden; but on his return in 1701 from his travels, he accepted a commission as lieutenant-colonel of the Scots regiment of Foot Guards. The year following he served as aide-de-camp to the duke of Marlborough at the taking of Venlo and Liege and the attack on Peer; and in the course of the year 1706 he successively obtained the command of the Cameronian regiment and the Scots Greys. On his father's death in the beginning of 1707 he succeeded to the earldom of Stair; and was soon afterwards chosen one of the representative peers of Scotland in the united parliament. In the subsequent victories of Oudenarde, Malplaquet, and Ramillies, he held high command and obtained great distinction; but on the accession of the new ministry in 1711, when the career of Marlborough was stopped, he sold out of the Scots Greys, and retired from the army.

When George I. succeeded to the throne the earl of Stair was appointed a lord of the bedchamber and a privy councillor, and, in the absence of the duke of Argyll, was constituted commander-in-chief of the forces in Scotland. The next year he was sent on a diplomatic mission to France; and it would seem that the embassy was distinguished by much skill and address, and at the same time by remarkable splendour and magnificence. He was recalled in 1720, and for the next twenty-two years lived in retirement at his seat at Newliston, where, it is said, he planted various groups of trees in a manner designed to represent the arrangement of the British troops at one of the victories he had been engaged in. He also turned his attention to agriculture, and was the first in Scotland to plant turnips and cabbages in the open fields.

On the dissolution of the Walpole administration in 1742 he was recalled to public life, and served in a military capacity on different important occasions till his death, which happened at Queensberry-house, Edinburgh, on the 9th May, 1747. He left a widow, but no children.

His next brother, *William Dalrymple*, of Glenmure, who was a colonel in the army, married Penelope, countess of Dumfries, and their issue succeeded to the earldom. His youngest brother, *George Dalrymple*, of Dalmahoy, passed advocate, and on baron Smith's advancement to the chair, was made a puisne baron of Exchequer, in which situation he continued till his death in July, 1745. More lately, there was on the bench of the same court, a member of another branch of the same family, Sir *John Dalrymple*, of Cranstoun, Bart., who was appointed in 1776 one of the barons of the Exchequer, and so continued till the year 1807, when he resigned. He was the author of 'Memoirs of Great Britain,' 'Tracts on Feudal Law,' and other publications. He was descended from *James*, second son of the first viscount Stair, who was author of 'Collections concerning Scottish History preceding the Death of David I.,' and who was created a baronet on the 28th April, 1698, the day previous to his younger brother, *Hew Dalrymple*, of North Berwick, being raised to the like dignity.

This Sir Hew Dalrymple was some time one of the commissaries of Edinburgh, having been appointed to that place on the resignation of his brother James, when the latter was made one of the principal clerks of session. He had also been some time Dean of the Faculty of Advocates; and was now, on the occasion of his being created a baronet, promoted at once from the outer bar (like the predecessor of his father, Sir George Lockhart, and in more recent times Mr. Blair, the only instances in the history of the court) to the presidency of the Court of Session, which had remained vacant since his father's death in 1695. President Sir Hew Dalrymple collected the decisions of the court from his appointment till the 21st June, 1720, and continued in the chair till his death, which took place on the 1st February, 1737, in the eighty-fifth year of his age. Lord Woodhouselee says of him in his Life of Kames,—'If he inherited not the distinguished talents of his father the viscount of Stair, and his elder brother the secretary he was free from that turbulent ambition and crafty policy which marked the characters of both; and, with a sufficient knowledge of the laws, was a man of unimpeached integrity, and of great private worth and amiable manners.'

He had a younger son of the same name with himself, *Hugh Dalrymple*, who passed advocate on the 18th November, 1710, and in December, 1726, was made a lord of session under the titular designation of Lord Drummore. He was also, some time afterwards, appointed a lord of justiciary on Erskine of Dun's resignation, and died in the possession of both offices in June, 1755, with the character of an acute and learned lawyer and a very honourable man. By his wife, Anne Horn, heiress of the estates of Horn and Westhall, in the county of Aberdeen, he left a large family, one of whom was *David Dalrymple*, of Westhall, who passed advocate in the beginning of 1743, in the twenty-third year of his age, and in 1746 was chosen procurator (or advocate) to the Church of Scotland. In 1748 he was also constituted sheriff depute of the shire of Aberdeen, and he continued in both offices till July, 1777, when he was made a lord of session under the title of Lord Westhall. His elder brother assumed his maternal surname of Horn, and marrying Mary, daughter and heiress of Sir James Elphinstone, of Logie, assumed the additional surname of Elphinstone, and had by his wife a son, who, on the 16th June, 1828, was created a baronet by the style and title of Sir *Robert Dalrymple Horn Elphinstone*, Bart., of Horn and Logie Elphinstone. A younger branch of the same family had, a few years before, been raised to the like dignity in the person of Sir *Hugh Whiteford Dalrymple*, of Highmark, in the county of Wigton, who was created a baronet on the 6th May, 1815.

The youngest son of the first Viscount Stair was Sir *David Dalrymple*, of Hailes, Bart., so created on the 8th May, 1700. He passed advocate on the 3rd November, 1688, and in 1709 was appointed lord-advocate of Scotland in the room of Sir James Stewart, who was however reinstated in the office in the year 1711. On Stewart's death, Sir David was again appointed lord-advocate, and continued till May, 1720, when he was succeeded by Robert Dundas, of Arniston, who also succeeded him on his decease, the following year, in his place of Dean of the Faculty of Advocates. His eldest son was Sir *James Dalrymple*, of Hailes, Bart., some time auditor of exchequer; and by his wife, Lady Christian Hamilton, daughter of the sixth earl of Haddington, the father of a numerous family.

The eldest of these was the celebrated judge and antiquary,

Sir **David Dalrymple**, better known by his titular designation of Lord Hailes. He was born at Edinburgh on the 28th October, 1726, and after acquiring the rudiments of his education in his native place, was sent to Eton, where, with a competent degree of learning, he imbibed that classical taste, and partiality for the manners and customs of England, which distinguished the subsequent periods of his life. From Eton he returned to Edinburgh, whence, after passing through the usual course at the university there, he was sent to Utrecht to study the civil law; and on his return, in 1746, he prepared for the bar, and passed advocate on the 24th February, 1748. After eighteen years of professional life, he was raised to the bench of the Court of Session; and ten years afterwards he was also, on the resignation of Lord Coalston, to whose only daughter he was married in October, 1763, appointed a lord of justiciary. As a judge, his accuracy, diligence, and dignity, were eminently conspicuous; but it is on the broader basis of literary merit that his great fame rests.

The earliest of his publications appears to have been sacred poems, being a collection of translations and paraphrases from scripture, by various authors, Edinb., 1751. His next was the 'Wisdom of Solomon, and the Book of Ecclesiastus,' 1755. The same year he wrote in 'The World' Nos. 140 and 147, and the next year No. 204, in which year also he published 'Select Discourses,' by John Smith, of Cambridge, with a preface and learned notes. The year following, 1757, he republished, with notes, 'A Discourse of the unnatural and vile Conspiracy attempted upon the King by the Earl of Gowry.' In the month of October, 1761, two vessels being wrecked on the shore between Dunbar and North Berwick, and pillaged by the country people, Sir David published a Sermon, from Acts xxviii., 2—'The barbarous people showed us no little kindness.' In 1762 he published, from the press of Foulis, of Glasgow, 'Memorials and Letters relating to the history of Britain in the reign of James I., of England,' with a preface and notes. From the same press, in 1765, he published the works of the ever memorable Mr. John Hailes, of Eton, in 3 vols.; and the same year at Edinburgh the first specimen of a book entitled 'Ane compendious booke of Godly and Spiritual Songs.' The year following he published 'Memorials and Letters relating to the history of Britain in the reign of Charles I.,' from the originals collected by Woodrow; an 'Account of the Preservation of Charles II. after the battle of Worcester,' drawn up by himself; and the 'Secret Correspondence between Sir Robert Cecil and James VI.' The next year he published a catalogue of the lords of session from the institution of the court, with historical notes; and the following year, 'The private correspondence of Bishop Atterbury and his friends in 1725.' In 1769 he published, first, 'An Examination of some of the arguments for the high antiquity of the Regiam Majestatem, and an inquiry into the authenticity of the Leges Malcolmi;' 'Historical Memoirs concerning the provincial councils of the Scottish clergy, from the earliest account to the æra of the Reformation'; and third, 'Canons of the Church of Scotland, drawn up in the provincial councils held at Perth in the years 1242 and 1269.' And in 1770 he published some antient Scottish poems from MSS., with a number of curious notes and a glossary. His next performance was the additional case of Elizabeth claiming the title of Countess of Sutherland: a singularly able paper, which was subscribed by Alexander Wedderburn, afterwards Lord Chancellor of England, and Sir Adam Ferguson, but well known to be the work of Lord Hailes. In 1773, Sir David published 'Remarks on the history of Scotland;' and in 1776, 'Letters from Hubert Languet to Sir Philip Sydney.' This last year also he published his 'Annals of Scotland, from the time of Malcolm Canmore to King Robert I.'; 'Tables of the succession of the Scots Kings' during the same period; and in 1779, his 'Annals of Scotland, from the aceession of Bruce to the accession of the House of Stuart.' In the above year, 1776, he published another work of great erudition; namely, 'An account of the Martyrs of Smyrna and Lyons in the second century, with notes. This was intended as the first vol. of 'Remains of Christian Antiquity;' the second vol. of that work appeared in 1778; and the third in 1780. The next year his published 'Octavius,' a dialogue by Marcus Minucius Felix, with notes and illustrations; and the year following, the treatise, by Lactantius, of the manner in which the persecutors died, illustrated in like manner by various notes. In 1783 appeared his disquisitions concerning the antiquity of the Christian Church; and in 1786, an inquiry into the secondary causes which Mr. Gibbon has assigned for the rapid growth of Christianity. After this followed some biographical sketches, in separate works, and at different times, but all intended as a specimen of a Biographia Scotica. In 1788 he published from MSS. the opinions of Sarah, duchess of Marlborough; and in 1790, a translation of the address of Q. Septim. Tertullus to Scapula Tertullus, proconsul of Africa, with notes, to illustrate the state of the church in early times.

This was the last work which Lord Hailes lived to publish. On the 29th November, 1792, he expired, in the sixty-sixth year of his age, the baronetcy, for want of male issue, descending to his nephew, *James*, eldest son of *John Dalrymple*, Esq., some time lord provost of Edinburgh, who was brother of Sir David, and also brother of

ALEXANDER DALRYMPLE, the hydrographer. He was born at New Hailes, the seat of his father, Sir James Dalrymple, Bart., on the 24th July, 1737, and was the seventh son of a family of sixteen children, all of whom he survived. His scholastic education was very limited, partly from the troubles of the times, and partly from the early death of his father; and when scarce sixteen years of age, he went abroad as a writer in the East India Company's service. Owing to his deficiency in the ordinary branches of learning, he was, on his arrival in India, placed under the storekeeper; but at length, through the kindness of friends, he was removed to the secretary's office, Lord Pigot himself giving him some lessons in writing, and Mr. Orme, the historian, instruction in accounts.

In the records of the secretary's office he found certain papers on the subject of a commerce with the Eastern Archipelago; and so interested in the subject did he become, that contrary to Lord Pigot's advice, he refused the secretaryship, and determined on a voyage among the eastern islands. He now also made himself master of the Spanish language by his own efforts, as he had a short time before done in regard to the French. In the course of the voyage he concluded a commercial treaty with the sultan of Sooloo; but not long afterwards the political affairs of that place were altogether changed, and no beneficial effects resulted from the enterprise. He subsequently returned to Sooloo, and re-established a friendly understanding between the inhabitants and the company; but unfavourable circumstances again intervened to prevent the results which were anticipated, and his exertions in England, whither he afterwards came on the same matter, were equally unfortunate. He appears indeed to have been peculiarly exposed to the influence of an adverse fortune: for besides the instances already given, he had, when in England in 1776, been promised by the earl of Egmont, on the urgent recommendation of Lord Howe, to be appointed hydrographer to the admiralty, with a salary of 500*l.* a year, and afterwards of being employed on an expedition of discovery to the South seas, and on a mission to observe the transit of Venus; but from various causes he received none of these appointments. At length in 1769, the Court of Directors voted him 5000*l.* for his past services, equivalent to the emoluments of secretary at Madras, which he had relinquished in 1759 to proceed on the eastern voyage.

From the time of his return to England, in 1765, he employed himself in collecting materials for a full exposition of the importance of the Eastern islands and South seas; and the Court of Directors, satisfied of the important information he possessed, employed him to draw up several charts of the eastern seas, which were published under their authority.

On Lord Pigot's appointment to be governor of Fort St. George, in 1775, Dalrymple was reinstated in the service of the East India Company, and went out to Madras as a member of council and one of the committee of circuit; but in 1777 he was recalled, with others, under a resolution of the general court, to have their conduct inquired into, though nothing appears to have been done thereupon. Two years afterwards he was appointed hydrographer to the East India Company; and in 1795, when the admiralty at last established the like office, it was given to Dalrymple. This place he retained till 1808. In May of that year the admiralty insisted on his resignation on the ground of superannuation, and it certainly appears that he exhibited symptoms of decayed faculties and an irritable habit. He refused to resign however, upon which they dismissed him from the place; and on the 19th of the following month he died, it is said from vexation, in the seventy-first year of his age.

He left a large library, and rich particularly in works on navigation and geography, a few of which were purchased by the admiralty, and the remainder were sold by auction. His own works amount to about sixty in number; many of them undoubtedly valuable, but some also of a merely personal and transitory character. A list of them is appended to a memoir of the author, furnished by himself, in the 'European Magazine' for November and December, 1802.

DAMAGES (old French *damage*, Latin *damna*), in law, signifies the compensation that is given by the jury (or assessed by the court) to the plaintiff or demandant for the wrong the defendant has done to him. The word is taken in the law in two several significations; the one properly and generally, the other strictly and relatively. Properly, as it is in cases where damages are founded upon the statute 2 Henry IV. and 8 Henry VI. c. 9, where costs are included within this word damages; for damage, in its proper and general signification, is said (though improperly) to come from *à demendo*, when a thing by diminution is made worse; and in this sense costs of suit are damages to the plaintiff, for by them his substance is diminished. But when the plaintiff declares the wrong done to him, to the damage of such a sum, this is to be taken relatively for the wrong which is passed before the writ brought, and cannot extend to costs of suit, which are future and of another nature. (Cowel's *Interpreter.*)

At common law damages were recoverable in personal and mixed actions, but not in real actions, because, says Sir Ed. Coke, in his commentary on the statute of Gloucester, 6 Edward I. c. i., 'the court could not give the demandant that which he demanded not, and the demandant in real actions demanded no damages, neither by writ nor count.' Till the right to the land was determined, the party could not be said to suffer wrong; but after the recovery, damages might be laid in a personal action; but by the above statute damages and costs are made recoverable in certain real actions, as in 'Dower,' 'Entry sur disseisin,' &c. But such actions were, strictly speaking, mixed, though they were usually denominated real. Though all real actions have been recently abolished, the right to land being now triable in all cases by ejectment, it was necessary to refer to them to explain the nature of damages. In ordinary cases, where the title to land is in dispute, the damages are merely nominal, the actual damage sustained by the detention of the property being recovered in an action of trespass for the mesne profits, except only in ejectment by a landlord against a tenant, where damages in the nature of mesne profits may be given by statute 1 George IV. c. 87, § 2. In all actions which sound in damages (*i. e.*, where compensation for wrong is sought), as assumpsit, &c., the amount of the damages is determined by the jury, though they cannot give more than the amount laid in the declaration. In actions of debt the plaintiff seeks to recover a specific sum, and not a compensation in damages; the damages therefore for the detention of the debt are generally merely nominal, except in those cases where, by the recent alterations in the law, the jury is empowered to give damages in the nature of interest. [DETINUE.]

Where the parties have stipulated for a liquidated sum to be paid as damages, the jury are bound to give the full amount of that sum; but where they have stipulated merely for a penalty to be paid [PENALTY], the jury may give less, or if the parties do not proceed for the penalty, they may give more. There are several cases in which double and treble damages are given by statute. If the damages given be excessive, the court will sometimes grant a new trial, but not so if they be too small; at least it is very unusual to do so, except in actions on mere money demands or on inquisitions. (Co., *Litt.;* Tidd., *Pract.*)

DAMASCE'NUS, JOANNES, was born at Damascus towards the end of the seventh or the beginning of the eighth century of our æra. His father, Sergius, a wealthy Christian of Syria, was councillor to the caliph, and at his death John succeeded him in the same office. His father had given him for preceptor a monk named Cosmas, whom he had redeemed from slavery. About A.D. 728 he wrote several tracts in defence of image worship against the Iconoclasts, who were then favoured by the Emperor

Leo the Isaurian. A legendary story is told of Leo having forged a treasonable letter from John to himself, which he contrived should come into the hands of the caliph, who sentenced John to have his right hand cut off, when the severed hand was restored to the arm by a miracle. About that time however John withdrew from the caliph's court to the monastery of St. Saba, near Jerusalem, where he passed the remainder of his life in ascetic practices and study. His numerous philosophical and theological works place him among the most distinguished writers of the Eastern church in the eighth century. His principal work is an exposition of 'the orthodox faith,' or Christian doctrines, in four books, which unites the two systems of scholastic and dogmatic theology, the former being by ratiocination, according to the Aristotelian or scholastic method, and the second by the authority of the Scriptures and the fathers. This work attained great reputation in the Greek church, and the author was styled Chrysorrhoas, or 'Golden-flowing,' on account of his eloquence. He promoted the study of Aristotle, and wrote various popular tracts, in which he collected and illustrated that philosopher's principles. He wrote also letters and treatises against heretics, especially against the Manichæans and Nestorians. His principal works have been published by Lequien, 'Opera J. Damasceni,' Paris and Venice, 1748, 2 vols. fol.

DAMASCE'NUS, NICOLA'US, a philosopher and historian of the age of Augustus, and the friend of Herod the Great, tetrarch of Judæa, is mentioned by Josephus, Athenæus, Eusebius, and others. He wrote various works in Greek, and among them one on universal history, in 144 books, of which we have some fragments, 'N. Damasceni Historiarum Excerpta et Fragmenta quæ supersunt,' 8vo., Leipzig, 1804; and again in Paris, 1805, edited by D. Coray.

DAMASCUS, a city of Syria, and the capital of an important Pashalik of Asiatic Turkey, is situated in a fertile plain at the east base of the Antilibanus ridge, about 180 miles south by west of Aleppo, in 33° 27′ N. lat., and 36° 25′ E. long. It is one of the most antient towns in the world, being mentioned as existing in the time of Abraham. (*Genesis* xiv. and xv.) Its antient name was Damesk, but the present natives call it Scham, which is also the name of Syria, and sometimes Scham Shereef, *i. e.*, 'the noble.' It is one of the very few places which have maintained a flourishing existence in all ages. Though often taken and devastated, it has always risen again, and has always been mentioned as one of the most delightful situations in the world. It appears to have been in the time of David or of Solomon (1 *Kings* xi., 24) the capital of an independent kingdom, which afterwards, under the name of the kingdom of Syria, was engaged in wars with the Jews. It was subsequently annexed to the empire of Assyria, afterwards to that of Persia; it then fell into the hands of the Macedonians, the Romans, and lastly of the Arabians, A.D. 634, when it was taken by the lieutenants of the caliph Abu-bekr after the defeat of the forces of the emperor Heraclius in its neighbourhood. It became for a time the residence of the caliphs, and after other vicissitudes was taken by the Turks under Sultan Selim. In the late war between the Porte and Mehemet Ali, pasha of Egypt, Damascus was taken by the troops of the latter, to whom it was formally ceded by the sultan by the peace of 1833. The Pashalik of Damascus extends from north to south, from Hamah on the Orontes down to the deserts of Arabia Petræa, south-east of the Dead Sea, a length of about four degrees of latitude; and it comprehends the country of Haouran, and the other districts on the east side of the Jordan and the Dead Sea, besides the greater part of Judæa west of the Jordan, including Jerusalem and Nablous. To the east it is bounded by deserts, which divide it from the valley of the Euphrates, to the north by the Pashalik of Aleppo, and to the west by the Pashalik of Acre.

The view of Damascus from the neighbouring mountain of Saleyeh, an offset of the Antilibanus to the north-west of the city, is very impressive; it comprises the town, with its numerous domes and minarets, the extensive woods, orchards, and gardens with which it is surrounded, clothed in perpetual verdure of various hues, and beyond it the vast level plain stretching to the east farther than the eye can reach, and bounded to the south-east by the distant mountains of Haouran. The river Barrady and other streams descending from the mountains furnish the city and the plain of Damascus with a constant supply of water, which is distributed into numerous canals for irrigation, and is the main cause of the extraordinary fertility of the country. The town is about six miles in circumference, is surrounded by old brick walls falling to ruin in several places, and is said to contain, according to Buckingham and Richardson, about 150,000 inhabitants; but according to others above 200,000, of whom 12,000 are Christians, and about as many Jews. The rest are Mohammedan Syrians, Arabs, and Turks. The native Mohammedans have long had the reputation of being the most fanatical and intolerant in Turkey; but Dr. Richardson's account of them, and the reception which he and the rest of Lord Belmore's party met with, does not confirm this bad report of the Damascenes. (Richardson's *Travels along the Mediterranean and parts adjacent, in company with the Earl of Belmore, in* 1816-18.)

Seetzen, who visited Damascus in 1806, gave also rather a favourable account of the inhabitants. There is a Franciscan convent long established in the city, and the Greek patriarch of the church of Antioch usually resides there. When Dr. Richardson visited Damascus, Lord and Lady Belmore lodged at the French consul's, who appeared to live in perfect comfort and security in the midst of this fanatical population. A frightful insurrection however took place some years after, ostensibly on the news of an English consul coming to reside in the city, but the real source of the tumult appears to have been a long-brooding discontent at the weak and oppressive rule of the Porte and its pashas. Since that time, the pasha of Egypt and his son Ibrahim have enforced strict order and rational tolerance in Damascus, and the English consul-general and English merchants, in their Frank costume, live in and walk about the town in perfect safety. (Dr. Hogg, *Visit to Jerusalem, Alexandria, and Damascus*, 2 vols. 8vo., 1835; Michaud et Poujoulat, *Correspondance d'Orient*, 1833-35.) M. Poujoulat himself, who was much alarmed on entering the gates at hearing some fellow proposing to burn him as a Frank, yet honestly says, 'I could cite evidence greatly in favour of the Damascene Mussulmans. A Greek Catholic, who has had commercial relations with them for years, told me that he never had occasion to complain of them. I myself have frequently met Mussulmans in Christian houses, who treated me with great kindness. I cannot speak of the lower orders and the population of the suburbs, who probably resemble the same classes in most great cities.' The same writer gives the following statistical list:—'They reckon at Damascus 129 tanners' shops, 22 establishments for printing stuffs, 73 dyers of stuffs, 120 dyers of silk, 34 houses of silk-winders, 748 merchants of damask cloth, 211 grocers, 68 tobacco manufacturers, 72 saddlers, 11 tent merchants, 47 copper-smiths, 50 ironmongers, 54 farriers, 70 fur merchants, 93 lacemen, 24 corn-merchants, 148 bakers, 58 millers, 122 coffeehouses, 32 confectioners, 59 public baths, 129 butchers, 71 tailors, 43 shops for pipes, 6 watchmakers, 200 haberdashers' stores, 4 glass-manufactories, 19 armourers, 4 soap factories, 143 weavers, and more than 400 public cooks. The manufacture of Damascus blades, once so famous, has declined long since: but good sabres are still made. Saddles and bridles, both rich and highly finished; fine cabinet-work, inlaid with ivory and mother-of-pearl, and rich jewellery, are among the articles of Damascene industry. 'The shopkeepers of Damascus,' says Dr. Richardson, 'are generally clean and well-dressed, very comfortable in their appearance, and extremely civil to strangers. The bazaars are better lighted, and have a more elegant appearance than those of Cairo or Constantinople. Every class of commodities has its own street or bazaar: in one they sell nothing but shoes, another is occupied by the goldsmiths,' &c. The town is well supplied with ice; and ice-water, mixed with the juice of figs or currants, is sold and drank in profusion. The best coffeehouses of Damascus are situated in the skirts of the town, on the edge of that branch of the river Barrady which supplies the gardens; they are built of wood, and are cool and well shaded from the sun, which is their chief attraction. The streets are narrow, and many of them have a gloomy dilapidated appearance, being lined by dead brick walls, with small mean-looking doors here and there, which open into the courts of the respective houses, which are not seen from the streets. Many of these houses are splendid in their interior, the courts being paved with marble and refreshed by fountains, with arcades and divans around. There are no carriages at Damascus, and but few carts, camels, horses, mules, and donkeys constituting the means of carriage or conveyance. The great khan is a sumptuous building, the masonry being formed of alternate layers of black and white marble, like the Florence cathedral. The spacious square court within has a handsome fountain in the middle, and is surrounded by a fine arcade of pointed arches, enriched with mouldings. On the ground-floor are the entrances to chambers and magazines, and a staircase and gallery lead to another series of apartments above. The principal mosque is also a fine building: it was originally a Christian temple of the Corinthian order, said to have been built by the Emperor Heraclius. There is also an extensive citadel.

Beiroot is considered as the port of Damascus. The exports from Damascus are chiefly raw silk, galls, madder, gums, opium, and dried fruit; but Damascus is also a great place of depôt and market of goods both from India and from Europe. The great Hadji caravan goes every year from Damascus to Mecca. Other caravans proceed to Aleppo, to Hit on the Euphrates, and thence to Bagdad. From Damascus to Hit is about eleven caravan days.

[Coin of Damascus. Imperial Greek.]

British Museum. Actual size. Copper. Weight, 217¼ grains.

DAMASK, a description of woven cloths composed both of flax and of silk, which are believed to have been originally brought from Damascus. Linen damask is used for table-cloths and napkins. Until the last half century the cloths of this kind used in England were imported from Germany, but the manufacture has since that time been successfully carried on both in Scotland and in Ireland. Damask cloths are of thick texture but fine in quality, and the weaving of them puts into requisition all the skill of the weaver for the production of the elaborate patterns which they bear. Some of these patterns require upwards of 1200 changes of the draw-loom for their completion, the method of performing which could not be explained without going into the detail of the art of weaving. The weaving of silk damask was introduced into England by the Flemish weavers, who fled hither from the persecutions of the duke of Alva in 1567. For a long time silk damask dresses were used on all occasions of ceremony by ladies of rank and by wealthy commoners, but they were never commonly worn. They were wrought with a great variety of colours, and if the patterns did not exhibit much taste they were sufficiently showy: from the quantity of silk which they contained they were also very costly. The damask employed at the present day for curtains and the like articles of household furniture is made of a mixture of silk with flax, cotton, or wool; the warp is of the more costly material.

DA'MASUS I., the son of a presbyter, was elected bishop of Rome after the death of Liberius, A.D. 366. A party among the clergy elected the deacon Ursinus in opposition to Damasus, and the people, who had then a share in the elections, being equally divided, the two parties fought in the streets and in the churches for several days. Ammianus Marcellinus (xxvii. 3), who gives an account of these disorders, states that 137 bodies of the slain were found in one day in the basilica of Sicininus alone. The same author draws a sad picture of the corruption of the clergy of Rome in that age, of their cupidity and luxury, which he contrasts with the modest bearing of some of the provincial clergy. In the Theodosian Code (b. xx.) there is an imperial constitution, which was issued about that time for the better discipline of the clergy, in which they are forbidden receiving legacies from widows and minors, frequenting the houses of matrons, cohabiting with women under the pretence of religion, &c. Damasus being acknowledged by the bishops of Italy, was confirmed by the Emperor Valentinian, who sent Ursinus into exile. The party of the latter however kept up disturbances in Italy for several years. Ursinus himself returned to Italy. A Jew having brought a charge of adultery against Damasus, the affair was tried by a council of bishops at Rome in 378, and Damasus was acquitted. The Emperor Gratian being appealed to, sent the Jew into exile, as well as Ursinus and several of his party.

Damasus held several councils for the purpose of condemning heretics, and especially the Arians, the Apollinarians, and the Luciferians. He also was requested by the Eastern churches to decide disputes which had arisen among them, particularly on the subject of the election of Flavianus to the see of Antioch. Among the eastern bishops who repaired to Rome on that occasion was Epiphanius, bishop of Cyprus, accompanied by St. Jerome, who had acquired, during his residence in Syria and Palestine, a great reputation for theological learning. Jerome became intimate with Damasus, and is said to have acted as his secretary. It was not until the death of Damasus, A.D. 384, that Jerome finally returned to the East, where he died.

There are a few letters of Damasus which have been preserved by Theodoretus and St. Jerome. Other letters and verses, as well as a liber pontificalis, which have been published under his name, are now considered apocryphal. The church of S. Lorenzo in Damaso at Rome has derived its name from him, as he is believed to have been the founder of a church on the spot where the present structure stands, and where he was buried. Damasus was one of the most learned and influential among the earlier bishops of Rome. He was succeeded by Syricius.

DAMASUS II., Poppo, bishop of Brixen, was elected pope A.D. 1048, in the room of Benedict IX., who had been deposed by the council of Sutri for his misconduct. He died, twenty-three days after his election, at Palestrina, and was succeeded by Leo IX.

DAMAUN, a district of Afghanistan, formerly subject to the sovereign of Cabul, and now divided among many small uncivilized tribes, who are frequently engaged in quarrels with each other. Damaun extends along the west bank of the Indus between 31° and 33° N. lat., and includes the tract of country comprehended between the Salt range, the Soliman range, the Indus, and Sungur in Upper Sinde. This district consists almost wholly of plains, and great part of the soil is sandy and sterile, the natural unproductiveness being suffered to remain without any attempt to remedy it, on account of the insecure condition of the inhabitants. The land in the immediate vicinity of the villages is, however, cultivated and rendered productive. The only trees to be found in the district are some dates which have been planted in these spots. The country is very thinly populated. Dera-Ishmael-Khan, the capital of the district, stands on the west bank of the Indus, in 31° 50′ N. lat., and 70° 33′ E. long., and is enclosed by a wall of unburnt bricks about a mile and a half in circumference. The greater part of the inhabitants are Baloochees; the remainder are composed of Hindus, Afghans, and Juts. The country people of Damaun are chiefly Juts and Baloochees; they are dark-complexioned, and a meagre ill-formed race. The banks of the river are covered in many parts with thick jungle, which is the resort of numerous wild animals. The climate is subject to great changes. In the winter, frost is very common in the night and morning, when the thermometer is often some degrees below the freezing point. The summer is insupportably hot both by day and by night, and it is said that the inhabitants are obliged to wet their clothes and thus produce an artificial coolness in order to procure any sleep.

DAMIE'NS, ROBERT FRANÇOIS, was born in 1715, in a village of Artois, where his father had a small farm. He enlisted in the army, which he left at the peace, and went to Paris, where he engaged as a menial, first in the College of the Jesuits, and afterwards in several families: he was repeatedly turned out of his situation on account of misconduct. While he was unemployed he used to attend the great hall of the Palace of Justice, which was then the rendezvous of those who were styled Jansenists. At that time France was distracted by the long quarrel concerning the bull Unigenitus. [CLEMENT XI.] The parliament of Paris disapproved of the bull, although it had been forced by the court to register it. Several of the parish clergy expressed a similar opinion, and were on that account suspended from their functions by their bishops, who were in general favourable to the prerogatives of the court of Rome. The clergymen thus laid under interdict appealed to the parliament, which returned a decision favourable to them. Upon this the court and the bishops attacked the parliament, several of whose members were imprisoned by lettres de cachet. The supposed miracles of the Abbé Paris, brother of a councillor of parliament, and a sturdy opposer of the bull, excited the minds of the people, and created a sect of fanatics, called 'convulsionnaires,' or 'shakers.' The archbishop of Paris refused the sacraments, not only to the shakers, but to all those suspected of Jansenism, that is to say, opposed to the bull. The parliament issued arrêts to oblige the local clergy to administer the sacraments. The king cashiered these arrêts. The outcry now became general against the archbishop, the ministers, and the king; France was threatened with a schism and a war of religion. Louis XV. had then for his mistress Madame de Pompadour, who was generally disliked on account of her haughtiness and prodigality. All these complaints seem to have made a deep though confused impression on the excitable but ignorant mind of Damiens. Gautier, a servant of one of the councillors of parliament, acknowledged that he had heard him speak very violently in defence of the parliament, and against the archbishop of Paris. It would seem that Damiens was particularly irritated at the archbishop refusing the sacraments to so many people, and that he fancied that by killing or at least wounding the king he would effect a change in the system of the government, and put down the archbishop and his party. However this may be, Damiens went to Versailles; and on the 5th of January, 1757, about five in the afternoon, as Louis was stepping into his carriage, Damiens, who had made his way unobserved among the attendants, stabbed him on the right side with a knife. The wound was slight, and the king, after a few days, recovered. It is worthy of remark, that the knife had two blades, of which Damiens used the shorter, which seems to confirm what he stated on his interrogatory, that he did not intend to kill the king, but only to frighten him and give him a warning. He did not attempt to run away, but was secured, examined, and put to the torture. He was afterwards removed to Paris, and committed for trial before the grande chambre of the parliament, to which the king wrote, or was made to write by his ministers, a letter, in which he demanded 'a signal vengeance.' Damiens was condemned as a regicide to be broken alive by four horses. The sentence was executed on the 28th of March, 1757, on the Place de Grève. Before being put to death, he was tortured for one hour and a half on the place of execution with red-hot pincers, molten lead, and other cruel contrivances. All the windows and roofs of the houses around were filled with spectators, men and women, among whom were many ladies of rank. It was altogether one of the most disgraceful exhibitions that ever took place in a civilized country.

Damiens acknowledged no accomplices, and it does not appear that he had any. His crime was the act of a weak and disordered mind. His trial was published by Le Breton, with a notice of his life, 4to. 1757. (See also *Histoire du Parlement de Paris*, 8vo. 1769.)

DAMIETTA or **DAMIAT**, a town of Lower Egypt, on the right or east bank of one of the principal branches of the Nile, and about six miles above its mouth, the antient Phatniticum Ostium. Old Damietta, or Thamiatis as it was called under the Byzantine emperors, stood about four miles farther north, and near the sea, which however has now receded from it: its scanty remains are seen near the village of Esbé, about two miles from the shore. Thamiatis was a small town in the time of Stephanus Byzantinus, but it increased gradually from the decay of Pelusium, and drew to itself the trade of the latter. It was taken by the Saracens, who surrounded it with strong walls and made it one of the most commercial and wealthy towns of Egypt. Roger, king of Sicily, took it, but it was retaken by Salaheddin; it was taken again by the crusaders under John of Brienne, but they lost it soon after. In 1249 Louis IX. landed with a large armament, and took Thamiatis almost without resistance; but having advanced inland, he was defeated and taken prisoner at Mansoura. The sultans of Egypt, in order to prevent further attacks in that quarter, choked up the mouth of the Nile by sinking large barges filled with stones, and thus formed a dangerous bar, which prevents large vessels from entering the river. They also razed Thamiatis to the ground, and removed the inhabitants farther inland. From these occurrences arose New Damietta.

The town of Damietta is larger than Rosetta: its population amounts to about 20,000, although several travellers have reckoned it much higher. It has some fine mosques, several bazars, and baths adorned with marble; many of the houses have pavilions or belvederes on the terraces for enjoying the cool breeze. It carries on a considerable trade both with Europe and the Levant. The merchant-ships remain at anchor outside of the bar, and load and unload by means of djermes or boats. Rice is one of the chief articles of exportation. At Damietta and in the neighbourhood are manufactures of fine cotton cloth, towels, &c. The country around is a complete garden, irrigated by numerous canals, and planted with all kinds of fruit-trees, such as orange, lemon, fig, tamarind, pomegranate, &c. The great marshy lake Menzaleh begins two or three miles east of Damietta, and extends about 40 miles in length to near antient Pelusium. It communicates with the sea by several mouths, and with the Damietta branch of the Nile by canals. The fishery of lake Menzaleh is very abundant; various kinds of water-fowl are also caught upon it.

Damietta is the head town of a prefectship or province, which extends eastwards along the banks of lake Menzaleh as far as El Arish on the borders of the Syrian desert.

DAMP, CHOKE. [MINING.]

DAMPIER, WILLIAM, was born in 1652, of a Somersetshire family; he went early to sea, served in the war against the Dutch, and afterwards became overseer of a plantation in Jamaica. He thence went to the Bay of Campeachy with other log-wood cutters, and remained there several years. He kept a journal of his adventures and observations on that coast, which was afterwards published: 'Voyages to the Bay of Campeachy,' London, 1729, with a 'Treatise on Winds and Tides:' Dampier, besides being a bold seaman, had also studied navigation as a science. In 1679 he joined a party of buccaneers, with whom he crossed the Isthmus of Darien, and having embarked in canoes and other small craft on the Pacific ocean, they captured several Spanish vessels, in which they cruised along the coast of Spanish America, waging a war of extermination both by sea and land against the subjects of Spain. [BUCCANEERS.] In 1684 Dampier sailed again from Virginia with another expedition, which doubled Cape Horn and cruised along the coasts of Chile, Peru, and Mexico, making depredations upon the Spaniards. From the coast of Mexico they steered for the East Indies, touched at New Holland, and after several adventures in the Indian Seas, Dampier went on shore at Bencoolen, from whence he found his way back to England in 1691, when he published his 'Voyage round the World,' a most interesting account, and which attracted considerable attention. His abilities becoming known, he was appointed commander of a sloop of war in the king's service, and was sent on a voyage of discovery to the South Seas. Dampier explored the west and north-west coasts of New Holland, surveyed Shark's Bay, and gave his name to a small archipelago east of North-West Cape. He also explored the coasts of New Guinea, New Britain and New Ireland, and gave his name to the straits which separate the two former; on his homeward voyage he was wrecked on the Isle of Ascension. He at last returned to England in 1701, when he published the account of this voyage. In 1707 he published a 'Vindication of his Voyage to the South Seas in the ship St. George,' with which he had sailed from Virginia in his former marauding expedition. Dampier went to sea again till 17 but the particulars of the latter part of his life are little known. He ranks among the most enterprising navigators of England. He was acquainted with botany, and was possessed of considerable information and general knowledge. His style of narrative is vivid, and bears the marks of truth. His voyages were published together in 3 vols. 8vo. London, 1697—1709.

DAMSON, or **DAMASCENE** (from Damascus), a race of plums cultivated in this country for the sake of their hardiness and prolific habits. They are a mere form of the domestic plum, from which there are no certain characters to distinguish them, except the abundance of their late oval fruit, and the property they possess of propagation by suckers. All the varieties are used for kitchen purposes principally, and are generally confined to the gardens of cottages or farm-houses, where the quantity of produce is more valued than its quality. Much the finest variety of this sort of plum is that called the Shropshire damson, which is extensively multiplied in the nurseries by grafting.

DANCING. [BALLET.]

DANCOURT, FLORENT CARTON, a popular French dramatist and actor of the times of Louis XIV., was born in 1661, and studied at Paris under the Jesuit Larue. His preceptor, observing that his talents were far from ordinary, wished him to devote himself to the religious profession, but Dancourt preferred the law, and acquired some reputation as an advocate. He shortly however fell in love with the daughter of the comedian, La Thorilière, an attachment which induced him to quit his legal studies and appear on the stage. Having married Mlle. La Thorilière, he became one of the king's comedians, and even one of his greatest favourites. An anecdote is told of his being saved from falling by Louis, who caught his shoulder; and in the days when this story was current, a king who under any circumstances put forth his hand towards a subject was reckoned full as condescending as one of the gods of antiquity who came down to aid some favourite hero. After remaining thirty-eight years in the service of the king, he retired to his estate at Berri, where he passed the remainder of his life in devotional exercises, and wrote some psalms and a sacred tragedy, which is not extant. He died in 1726, having superintended the erection of his own tomb, leaving two daughters, who were both actresses, and both married into families of distinction.

The works of this author occupy six volumes: they were most of them successful at the time they were written. The greater number of them are farces, the scene of which lies mostly in low life. There is a drollery about them and a smartness in the dialogue which will always render them amusing, but the interest they possessed at the time of their appearance is now lost. Dancourt being an unlearned man, sought for subjects among incidents which he himself witnessed, and which were often well known to the public. An author whose chief excellence lies in happily delineating events of a local interest may be sure of popularity, but equally sure that his popularity will be but transient.

DANDELION, a corruption of the French name 'dent de lion,' or lion's tooth, a common weed, with a tapering milky perennial root, resembling that of succory: like the latter, it is sometimes cut into pieces, roasted, and employed to adulterate coffee. Its leaves have also been forced in the winter as salad; but its excessive bitterness prevents its being much employed in this way. It is the Leontodon Taraxacum of botanists.

DA'NDOLO, ENRICO, a patrician of Venice, who was elected doge in 1192 at a very advanced age. In the year 1201 the French crusaders applied to the Venetian senate for assistance in their expedition to Palestine. Dandolo warmly supported their petition, lent them money and provisions and ships, and stipulated in return that they should assist him in conquering the town of Zara for the republic. Dandolo, though aged and nearly blind, embarked in the admiral's ship. The crusaders took Zara, and afterwards, being invited by Alexius, son of Isaac Angelus, who had been driven from the throne of Constantinople, the Venetians and crusaders, forgetting the Holy Land, sailed for Constantinople, attacked it and took it by storm, A.D. 1204. Old Dandolo, then nearly 90 years of age, was the soul of this expedition; he was one of the first to land, on the first attack in 1203, and to take possession of part of the ramparts, on which he planted the standard of St. Mark. For other particulars of this expedition and its results, see Baldwin I., Emperor of Constantinople. Dandolo refused the imperial crown, which the crusaders had offered to him, but accepted the title of Despot of Romania. He died shortly after, in 1205, and was buried in the church of Santa Sophia. Dandolo is one of those who contributed most to the establishment of the maritime power of Venice. There have been other senators and doges of the same name.

DANEGELD, sometimes called simply the **GELD**, was tax originally imposed in order to purchase peace with the Danes; and means Danish payment. Henry says (*Hist. of Brit.*, edit. 8vo., Lond., 1805, vol. iii., p. 366,) that when the invasions of the Danes were frequent and formidable, it became a custom sometimes to bribe them with a sum of money to desist from their depredations and leave the country; and at other times to keep a considerable body of troops in constant pay to defend the coasts against these dangerous enemies. The ordinary revenues of the crown were quite inadequate to the expense of these expedients; and therefore it was found necessary, with the consent of the wittenagemot, to impose a tax first of one Saxon shilling, and afterwards of two or more shillings, on every hide of land in the kingdom. As there were 243,600 hides of land in England, this tax, at one shilling on each hide, raised 12,180 Saxon pounds, equal in quantity of silver to about 36,540*l.* sterling, and in efficacy to more than 360,000*l.* of our money at present. According to the Saxon Chronicle (edit. Gibs., p. 116), this tax was first imposed A.D. 991. It was soon after raised to two and at last to seven shillings on every hide of land, and continued to be levied long after the original occasion of imposing it had ceased.

Whilst the invasions of the Danes were almost annual, our kings derived little profit from this tax, which was all expended in bribing or fighting these invaders; but after the accession of the Danish princes to the throne of England, it became one of the chief branches of the royal revenue. This tax was raised so high, and collected with so much severity by King Canute, A.D. 1018, that it amounted to the prodigious sum of 71,000*l.*, beside 11,000*l* paid by the city of London. (*Chron. Sax.*, ut supr., p. 151.)

Edward the Confessor, who succeeded Hardicnut in 1042, and put a stop to all future payments from the English to the Danes, as well tributary as stipendiary, continued nevertheless to collect danegeld from the subject until the year 1051, when, as Ingulphus and other authors say, he absolutely repealed it. It was revived at an early period of William the Conqueror's reign, and, according to Webb, in his 'Short Account of Danegeld,' 4to., Lond., 1756, p. 2, continued to be collected as low as 21 Hen. II., if not later. In the Domesday Survey, danegeld occurs but once by its own name, tom. i., fol. 336 b., under Stamford, in Lincolnshire. It is mentioned as one of the *Jura regalia* in the Laws of Henry I., chap. 10. Stephen, at his coronation, took an oath that he would remit this tax. (Compare Spelman's and Du Cange's *Glossaries*, v. 'Danigeldum.')

DANES is the general appellation given to the Scandinavian tribes which in the ninth and tenth centuries became so formidable by their predatory expeditions, and invaded and occupied a great part of Britain and France. The early history of the Scandinavian nations is involved in great obscurity, though Danish and Swedish chroniclers gravely deduce their genealogy from Japhet and his son Gog, and relate their early migration from Asia. But coming to more historical times, there is a poem on the exploits of the Danes in the third and fourth centuries, which refers to their wars among themselves, and in which the Danes, properly so called, or Western Danes, appear as the inhabitants of Jutia, who are also called Scyldingi; while the Sveones (perhaps the same as the Suiones), mentioned by Tacitus (*German.*) as living near the shores of the Baltic, are called also Eastern Danes, or inhabitants of part of the country now called Sweden. Next to these are mentioned the Geata, or Goths; and in the islands of the Baltic, the Sæ Geata, or Sea Goths, called also Scylfingi. We find also mention of the Northern Danes, probably the Norwegians. (*De Danorum Rebus gestis Seculis III. et IV. Poema Danicum dialecto Anglo-Saxonica ex bibliotheca Cottoniana Musæi Britannici*, edited by G. J. Thorkelin, 4to. 1815.) The common language of all these people was the Norse or Dönsk Tunga, which is still spoken in Iceland, and of which the Anglo-Saxon was a dialect. (P. Vidalini, *De Appellatione Linguæ Septentrionalis*, 1775.)

Scandinavian migrations had taken place to North Britain in very remote times; and it appears probable that some of the tribes which inhabited Caledonia in the Roman period had come originally from that quarter. The Jutes and Angli, who, with the Saxons, conquered Britain, came from Jutia, the country of the Western Danes. But after the Saxon conquest, the connexion between the migrated tribes and the Danes who had remained in Scandinavia became obliterated, until the end of the eighth century, when the Danes began to make war upon their old kinsmen with all the fierceness of inveterate enemies. Their predatory descents on the coast of Britain became formidable during the reign of Egbert; and under his successors the Danes obtained possession of great part of the island, until Alfred the Great defeated them, and obliged the Danish chieftains to submit. [Alfred.] The eastern part of England retained long after the name of Danelagh, or Danish Law, and the population was in great measure of Danish stock, especially to the north of the Humber. After the death of Alfred fresh incursions took place, until at the beginning of the eleventh century Canute, or Knut, having established himself as sovereign of all the Scandinavian nations, added Britain also by conquest to his sceptre. [Canute.] After Canute's death his successors Harold and Hardicnut held the sway of Britain for a few years longer, after which the line of the Saxon kings was restored in the person of Edward the Confessor. The Norman conquest, which followed close upon the death of the latter, put an end to the Danish invasions on the coasts of Britain. But the Normans themselves were originally of Danish stock in the general sense of the name, having settled in North France under Rollo the Ganger in Alfred's time; and those Norman pilgrims and knights who conquered the kingdoms of Sicily and Apulia in the eleventh century were likewise their progeny.

DANIEL, one of the four greater prophets (Isaiah, Jeremiah, Ezekiel, Daniel). From the first chapter of the book of this prophet we learn that he was of the tribe of Judah; that, when a child, he was carried captive to Babylon by Nebuchadnezzar, in the third year of the reign of Jehoiakim, king of Judah, 606 B.C., and that he was one of the 'children (ver. 4) in whom was no blemish, but well-favoured, and skilful in all wisdom, and cunning in knowledge, and understanding science,' who were chosen by the master of the king of Babylon's eunuchs to be taught 'the learning and the tongue of the Chaldeans,' and to stand before the king. It appears to have been required of these children to have countenances fair and fat in flesh—qualities in which Daniel, otherwise Belteshazzar, and his three companions, Shadrach, Meshach, and Abednego excelled, by adopting a diet of pulse and water instead of the king's meat and wine supplied to them for this purpose (10, 15). 'Daniel had understanding in all visions and dreams; and in all matters of wisdom and understanding the king found him and his three companions ten times better than all the magicians and astrologers that were in all his realm' 17, 20). In reward for the interpretation of a dream related in ch. 2, 'King Nebuchadnezzar not only gave Daniel many valuable gifts, and made him ruler over the whole province of Babylon, and chief of the governors over all the wise men of Babylon, but he fell upon his face and worshipped him, and commanded an oblation and sweet odours to be offered unto him' (46, 48). Daniel's Chaldæan name of Belteshazzar was that of a Babylonian deity, the god of Nebuchadnezzar; and the prophet is repeatedly said to have possessed the spirit of the holy gods, and to have been made master of the magicians, astrologers, Chaldæans, and soothsayers (iv., 8, 9; v., 11). For interpreting the mysterious writing on the wall, king Belshazzar clothed him in scarlet, put a chain of gold about his neck, and made him third ruler in the kingdom. Daniel also prospered in the reign of the Median monarch Darius (probably the Cyaxares of the Greek historians), who appointed him the first of three presidents over 120 princes, whom he set over the whole kingdom (vi., 2). Having escaped unhurt from the lions' den into which he was thrown by Darius, he continued to prosper in the reign of Cyrus the Persian (28). He did not return to Judæa on the termination of the captivity, but remained with the large portion of his countrymen who continued at Babylon, where he is generally supposed to have died. Some, however, state that he died at Susa, on the Eulæus. He was contemporary with Ezekiel (xiv. 14, 20, and xxviii. 3). Among the Rabbis it is generally maintained that Daniel was not a true prophet; that he did not dwell in the Holy Land, out of which they say the spirit of prophecy does not reside; that he spent his life, not as the other Jewish prophets, in solitude, poverty, and abstinence, but amid the grandeur, pomp, and luxury of a royal palace; that he was a eunuch (2 Kings, xx. 18), one of a class who are excluded from the congregation of the Lord (Deut. xxiii. 1). Some place his writings among the mere Hagiographia, as having less authority than the canonical books. They account for the fact of his not being mentioned when his three companions were cast into the furnace, by saying that he was absent from Babylon on an expedition to Egypt, for the purpose of stealing hogs (Calmet's *Dict. of the Bible*); and they object to his prophecies that they all relate to dreams and visions, which they consider the most imperfect modes of revelation. However, it is said by Josephus (*Ant. Jud.* l. x. c. 12), that Daniel was a great and true prophet, who was favoured with communications from Jehovah: he says also that Daniel built a famous palace at Susa or Ecbatana. Dr. Adam Clarke and others think that Zoroaster was Daniel. The twelve chapters of the canonical book of Daniel are partly in the Hebrew and partly in the Chaldaic language. The uncanonical or apocryphal books attributed to this prophet, consisting of the stories of Susannah and Bel and the Dragon, and the Song of the Three Children, are extant only in the Greek of Theodotian, which is adopted in all the Greek churches of the east, the version of the Septuagint being lost. The following are the principal prophetical subjects of the canonical book of Daniel. Chapter 2 contains the account of Nebuchadnezzar's dream of the great image of gold, silver, brass, iron, and clay, with Daniel's interpretation. The stone which became a great mountain is considered as prophetic of the Messiah. Chapter 4 relates the same monarch's dream of the great tree, representing himself, as interpreted by Daniel, and which was speedily fulfilled. In chapter 5 is recounted Daniel's interpretation of the writing on the wall at the feast of Belshazzar. Chapter 7 contains the prophet's description and interpretation of his own dream of the four great beasts. The commentators state that the four kingdoms of the earth designed by these four beasts were the Babylonian, the Medo-Persian, the Macedo-Grecian, and the Roman. The ten horns of the fourth beast are said to be ten kingdoms rising out of the Roman empire; but what particular kingdoms are meant appears rather difficult to determine, if we may judge from the conflicting opinions of different writers. The Rev. Hartwell Horne, in his 'Introduction to the Bible,' has tabulated the theories of some of the most eminent commentators, which exhibit scarcely a single instance of agreement in any particular. Thus, in explaining the meaning of the first horn, Machiavel applies it to the Ostrogoths, Dr. Mede to the Britons, Drs. Lloyd and Hales to the Huns, Sir Isaac Newton to the Vandals, and Bishop Newton to the senate of Rome. This dream has always been much insisted on by Protestant writers as a prophecy relating to the destinies of the Church of Rome. Daniel's vision of the ram and the he-goat described in Chapter 8 is considered to signify the destruction of the Medo-Persian empire by the Macedonians, who were antiently called Ægadæ, or Ægeatæ, that is, the goat-people. The prophecy of the seventy weeks, communicated to Daniel by the angel called the man Gabriel in chapter 9, is regarded by all Christians as a striking prediction of the advent of Jesus as the Messiah. Sir Isaac Newton, in his Commentary on Daniel, declares it to be the foundation of the Christian religion. The weeks are understood as being prophetic weeks, consisting each of seven years. (*Leviticus*, xxv. 8.) No scriptural authority is to be found for this interpretation (Le Clerc, *Biblioth.* tom. xv. p. 201); but an instance of this mode of reckoning occurs in Macrobius, *Somn. Scip.*, l. i. c. 6. In the 25th and 26th verses it is said that from the first year of the reign of Darius (ver. 1. 3, 23) unto the Messiah the prince would be 69 weeks, or 483 years, and that then Messiah would be cut off, which disagrees with the best chronologists, who make the first year of Darius 538 B.C. (A. Clarke's *Bib.*) The chronological difficulties of this important prophecy have occasioned a great variety of interpretations, and exercised the pens of the most learned of the fathers and of modern divines. (*Improved Version of Daniel*, by the Rev. Thos. Wintle, 8vo. 1836; Prideaux's *Connect.* vol. i. p. 306; Vossius, *De 70 Hebdomad. Dan.*, p. 183). In the 10th and 11th chapters other visions are described which relate chiefly to the conquests and revolutions of several Asiatic nations. The prophecy in the 12th and last chapter extends to the end of time, and speaks of the resurrection and the day of judgment. In the time of Jerome some few Rabbis admitted the story of Susannah as canonical, while others rejected it as such; and Josephus, in speaking of Daniel, says nothing either of Susannah or of Bel and the Dragon. (Hieronymus, *In Dan.*) A learned dissertation on these books is given by Eichhorn in his 'Einleitung in die Apokriphishen Scriften,' p. 419. Porphyry, in the twelfth of his fifteen books against the Christians, impugns the genuineness and authority of the prophecies of Daniel, contending that they are falsely ascribed to him, and that they are really historical, and were written after the occurrence of the events to which they relate. Dr. N. Lardner has collected some of these objections, and accompanied them with the replies of Jerome (Lardner's *Works*, vol. viii. pp. 185-204). Bishop Chandler, in his 'Vindication of the Defence of Christianity,' and Dr. Samuel Chandler, in a Vindication of the Prophecies of Daniel,' have elaborately discussed the subject of the genuineness and canonical authority of this prophetical book. It is remarked by Mr. Horne, that 'Of all the old prophets Daniel is the easiest to be understood;' and that 'he writes more like an historian than a prophet.' Grotius, Le Clerc, and several other learned critics, have maintained that all the prophecies of Daniel relate to and terminated in the persecution of the Jews under Antiochus Epiphanes, in the age succeeding that of the prophet. In Mr. Horne's 'Introduction,' vol. ii. p. 792-3, an account is given of the principal commentators on Daniel, as Sir Isaac and Bishop Newton, Drs. Faber, Frere, Hales, &c., and of the numerous disquisitions on the particular prophecies, especially that of the seventy weeks. The commentary of Sir Isaac Newton is viewed by the divines who have written on Daniel in very different lights; some have bestowed on it the highest commendation, and others have treated it as of little or no value. Numerous sermons on texts, and commentaries on the book of Daniel, are named in the 'Bibliotheca Britannica' by Watts. (See Eichhorn's *Einleitung in das Alte Testament*, vol. iii. p. 382; *Preface to and Comment. on Dan.* in Dr. Adam Clarke's *Bible*, especially on chaps. ii. vii. and ix.; Prideaux's *Connect.*, vol. ii. p. 380; *Daniel's Seventy Weeks Interpreted by a Layman*, 8vo. 1836.)

DANIEL, SAMUEL, was born in Somersetshire, A.D. 1562, and educated at Magdalen Hall, Oxford, which, however, he left without a degree, 'his geny being,' according to Anthony à Wood, 'more prone to easier and smoother subjects than in pecking and hewing at logic.' He became tutor to Lady Anne Clifford, subsequently Countess of Pembroke, and was afterwards groom of the privy chamber to Anne, queen of James I. He is said to have been poet-laureat on Spenser's death; but it is more likely that he was only one of many employed about the court in writing masques and birth-day odes, and in this capacity he seems to have stirred the wrath of Ben Jonson, who probably held him in the light of a rival. Towards the end of his life he retired into Somersetshire, where he died in 1619. His will is preserved in the Prerogative-court at Canterbury, and in Rymer's Fœdera exists a patent granting him the exclusive printing of his 'History of England' for the term of ten years.

His poems consist of an Heroic, in six books, on the Wars of York and Lancaster: it contains many stanzas in his best style, which unite such grace of language with sweetness of thought as to render them much more intelligible at present than those of his contemporary Spenser.

Daniel partly conformed to the fashion then prevailing, which consisted in a mode of expression termed euphuism, so well known by the specimen given in 'Kenilworth;' but a perusal of his works will show that, of the numerous Latinized words which the revival of learning introduced into our tongue, his good taste prompted him to choose, with very few exceptions, those which are at present in use; that is, he only admitted those which were really necessary to complete the language. The poem next in length is 'Musophilus,' a dialogue between Musophilus and Philocosmus. It is, we think, his master-piece both in thought and execution; the somewhat irregular terza rima in which it is written seems well adapted for a union of sweetness and continuity of thought. It contains an apology for literary pursuits, against the objections urged by a man of the world, and might be applied with equal force at present; indeed the last couplet of the passage with which the poem opens seems far more applicable to the nineteenth century than to the sixteenth. The orthography is modernized in the following extract:—

Fond man, Musophilus, that thus dost spend,
In an ungrateful art, thy dearest days,
Tiring thy wits, and toiling to no end,
But to attain that idle smoke of praise;
Now, when this busy world cannot attend
The untimely music of neglected lays;
Other delights than these, other desires,
This wiser profit-seeking age requires.'

The other poems contained in the edition of 1602 are, a letter from Octavia to Mark Antony, which shows to a striking extent that faculty peculiar to a true poet, which has been called 'dramatic power;'* 'The Tragedy of Cleopatra,' in alternate rhymes, with chorusses on the antique model; and 'The Complaint of Rosamond,' who speaks from the infernal regions, but is little encumbered by classical imagery after the first few sentences; this poem is written in a seven-line stanza, of which the first and third, the second, fourth, and fifth, and the two last, rhyme; and contains much beautiful description as well as tender thought, introducing sensuous imagery without the least approach to indelicacy or impurity; indeed the whole character of his poems quite justifies the somewhat quaint assertion of old Fuller, that 'he carried in his Christian and surname two holy prophets, his monitors, so to qualify his raptures that he abhorred all profaneness.' Besides these poems, are 57 sonnets to Delia, several masques, odes, and epistles. His prose works are, 'A History of England, in two parts, extending to the reign of Ed. III.,' and 'An Apology for Rhyme,' which last shows a close acquaintance with the rules and niceties of his art, and contains several remarks on rhythm, interesting in illustration of the change in pronunciation which had taken place since Chaucer. It also shows, what is somewhat strange, that he considered rhyming tragedies the rule, and those in blank verse the exception; at least such seems the only meaning his words will bear: he says, 'I think a tragedy would indeed best comport with a blank verse and dispense with rhymes,' which is very unaccountable, unless we suppose him to have referred to tragedy on the antique model alone, for to attribute to him Dryden's ignorance on the subject of our early literature would be absurd. On the whole, whether as a poet or a prose writer, he has been most undeservedly neglected. In our judgment, he fully merits Southey's encomium—'Thoughtful, grateful, right-minded, and gentle-hearted, there is no poet in any language of whom it may be inferred with more certainty from his writings that he was an amiable and wise and good man.' (Southey's *British Poets*; Wood's *Athen. Oxon.*; Fuller's *Worthies*; and the *Biographia Britannica*.)

DANIE'L, LE PE'RE, a Jesuit, born at Rouen in 1649, wrote the history of France from the commencement of the monarchy, 3 vols., fol., 1713, which he dedicated to Louis XIV., who made him historiographer of the kingdom, with a pension of 2000 francs. The most valuable part of his history is that which relates to the reigns previous to Louis XI., and he is more correct with regard to facts than Mézerai. But the work altogether is very imperfect: the author says little concerning the state of society: it is a history of the kings rather than of the people. He enters very largely into religious controversies, and is very intolerant towards those whom he considers heterodox. His style also is feeble and uninteresting. The best edition of his history is that in 17 vols., 4to., Paris, 1755-60, with considerable additions by Father Griffet. The other works of Père Daniel are;—1, 'Observations critiques sur l'Histoire de France écrite par Mézerai,' in which he endeavours to throw discredit on the rival historian, who, although often inexact, is upon the whole more liberal-minded than Daniel, for which reason he lost his pension. [COLBERT.] Both their histories, however, have been superseded by the better one of Velly and Villaret, 1759. 2, 'Histoire de la Milice Françaíse,' exhibiting the changes that had taken place in the French military establishment, and system of discipline and tactics from the beginning of the monarchy to the reign of Louis XIV.; 3, 'Le Voyage au monde de Descartes,' a kind of satire of the system of that philosopher, and several other minor works; among which the 'Entretiens de Cleandre et d'Eudoxe,' are intended as a refutation of the 'Provinciales' of Pascal. Père Daniel died 1728.

DA'NTE or DURA'NTE, ALIGHIE'RI, was born at Florence A.D. 1265. By a familiar contraction of his Christian name, Durante, he was called Dante, by which name he has become generally known. His family was noble; he was a great grandson of Cacciaguida Elisei, who married a lady of the family of Alighieri of Ferrara, and whose children assumed the arms and the name of their mother. Cacciaguida accompanied the emperor Conrad III. in his crusade, was made a knight, and died in battle in Syria A.D. 1147; (*Paradiso*, cantos 15, 16 and 17,) in which Cacciaguida is made to relate to Dante his adventures, with an interesting account of the state of Florence and the primitive manners of its citizens in his time, before the breaking out of the great feud between the Guelphs and the Guibelines. Dante's father, Aldighiero Alighieri, died while Dante was yet a child. As Dante grew up he showed great capabilities for learning, in which he was assisted by Brunetto Latini, a celebrated scholar of the time. He became also intimate with Guido Cavalcanti, a young man of an inquisitive and philosophical turn of mind. It is asserted by some that Dante studied at Bologna, though this is not clearly ascertained; it is, however, evident from his works that he had deeply read and was imbued with all the learning of that age. By his own account he seems to have led rather a licentious life until he fell in love with Beatrice Portinari, of an illustrious family of Florence. His attachment however appears to have been purely platonic, but it served to purify his sentiments; the lady herself died about 1290 when Dante was about 25 years of age, but he continued to cherish her memory, if we are to judge from his poems, to the latest period of his life. It must have been about or a little before the time of Beatrice's death that he wrote his 'Vita Nuova,' which is a series of canzoni intermixed with prose, in which he speaks of his love in a spiritual and platonic strain, and of the change it produced in him, which was the beginning of his 'new life.'

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* It would perhaps be better understood by the words 'power of identification,' by which the poet speaks naturally in any character.

The party of the Guelphs was at that time predominant at Florence, having some years before driven away the Guibelines with the assistance of the pope and of Charles of Anjou, king of Naples. But in the neighbouring city of Arezzo the contrary had occurred; the Guibelines, with the bishop at their head, being the stronger party, had turned the Guelphs out of the town. It may be observed that the names of these two rival factions, which in their origin designated the respective partisans of the emperors and popes, lost much of their primitive meaning as the quarrel between the church and the empire subsided by the extinction of the house of Suabia. The rivalship however between the leading families of each party continued, mutual offences were remembered, and the remembrance was bequeathed from father to son; so that Guelphs and Guibelines were ever ready to fight in every part of Italy, not for the supremacy of church or empire, but for their own municipal superiority in their respective communities; and such was the ambition of domineering that prevailed among the wealthier families, that after the Guelphs had driven the Guibelines out of town, or *vice versâ*, the leaders of the party that remained in possession of the place began to quarrel among themselves, and it not unfrequently happened that some of them courted the assistance of the emigrant rival faction against their own colleagues. This occurred among other instances at Florence in 1280, when Bonaccorso degli Adimari, one of the Guelph leaders, connected himself by marriage with the Guibeline count, Guido Novello, which led to a temporary truce between the two parties. But the Guelphs soon after began to persecute the Guibelines again. The usual fate of the losing party in such cases was exile, with confiscation of property, and in case of armed opposition to or contravention of this sentence, torture and death were freely awarded, and the houses of the obnoxious individuals were not unfrequently set on fire or razed to the ground. The Guelphs of Arezzo being driven out of their town applied to those of Florence for assistance. This led to a war between Florence and Arezzo, in which the Guibelines of the latter place were defeated at Campoldino in June, 1289, when their bishop was killed. [AREZZO.] Dante was present at this engagement, and soon after his return to Florence he married Gemma Donati, of a powerful Guelph family. He now became a candidate for civic honours and offices. The citizens of Florence were classed into three ranks:—1st, grandi, or old families, formerly feudal nobles, many of whom had still feudal estates in various parts of the country, though in the town they enjoyed by law no exclusive privilege; 2nd, popolani grassi, or substantial citizens, men who had risen by trade, and many of whom were wealthier than the nobles; 3rd, piccioli, or inferior tradespeople, artisans, &c. The two last classes, weary of disturbances created by faction, and being directed by some well-meaning men, among whom was Dino Compagni the chronicler, who is the safest guide through this part of Florentine history, had made a law in 1282 by which the citizens being classed according to their trades, the higher trades, 'arti maggiori,' chose six priori, or aldermen, one for each district of the city, who were called also 'i signori' and constituted the executive. They were renewed every two months. No one could aspire to office who had not his name inscribed on the register of one of the trades. Dante enrolled his name on the register of physicians and apothecaries, though he never exercised that profession.

The institution of the priori did not prevent the town being distracted by factions as before, as those magistrates often availed themselves of their brief term of office to favour their friends and court favour with the wealthier citizens. To remedy this, the popular party, led by Giano della Bella in 1293 elected a new officer, called Gonfaloniere di Giustizia, who was to enforce order and justice, and gave him a guard of 1000 soldiers; they also excluded for ever thirty-three families of the grandi, or nobles, from political office. But a conspiracy of the wealthy families drove away Giano della Bella and his adherents in 1294, and the town again fell a prey to factions. Two powerful families, the Donati and the Cerchi, were at the head of the contending parties, and affrays between their respective partisans occurred repeatedly in the streets of Florence. Both were Guelphs, but the Cerchi were suspected of a bias in favour of the Guibelines, because they were less rigorous in enforcing the penal laws against the latter; and they had also for them the friends of the unjustly expelled Giano della Bella. The pope, Boniface VIII., favoured the Donati as being zealous Guelphs. About this time the town of Pistoia was likewise divided between two factions, called Bianchi and Neri, which originated with two branches of the family of Cancellieri. The Florentines being applied to as arbitrators, several of the more violent partisans were exiled from Pistoia, and came to Florence, where the Bianchi became connected with the Cerchi, and the Neri with the Donati, and from these connexions the two Florentine parties assumed the respective names of Bianchi and Neri. Both, as we have said above, were branches of the great Guelph party then predominant at Florence; but afterwards the Bianchi in their reverses joined the Guibelines, with whom they have been often confounded by subsequent writers. It is necessary to bear these things in mind, in order to understand the history and the political sentiments of Dante. Dante was a Guelph, and connected by marriage with the Donati, the leaders of the Neri. But he was also connected by personal friendship, and perhaps also by a feeling of equity, with the Bianchi, who appear to have shown themselves from the first less overbearing and violent than their antagonists, and to have been in fact the injured party. Dante being made one of the priori in June of the year 1300, proposed and carried a law by which the chiefs of both parties were exiled for a time out of the territory of the republic. The Bianchi were sent to Sarzana, and the Neri to Castel della Pieve. Some of the Bianchi however soon after returned to Florence, and Dante was accused of having connived at it, chiefly out of friendship for Guido Cavalcanti, who had suffered from the unwholesome climate of Sarzana, and died soon after his return. The Neri, by their agents at Rome, represented to Boniface VIII. that the Bianchi kept up a communication with the Guibelines of Arezzo, Pisa, and other places, and that if they obtained the preponderance in Florence, they would make common cause with the Colonna, the pope's personal enemies. [BONIFACE VIII.] Through these suggestions, aided by bribes distributed by the Neri at the Roman court, as Dino says, Boniface was induced to give his support to the Neri, and he sent them Charles de Valois, brother of Philippe le Bel, under the plausible title of peace-maker. Charles entered Florence in November, 1301, followed by 1200 armed men. Affecting impartiality at first, he let all the Neri return to Florence, followed by the armed peasantry: new priori were made, all favourable to the Neri, and the Bianchi began to be openly attacked in the streets. The Medici, who were already an influential family among the people, killed one of the Bianchi, and no notice was taken of the murder. A general proscription of the Bianchi now began, connived at by the peace-maker, Charles de Valois. 'People were murdered in the streets; others were dragged into the houses of their enemies, where they were put to the torture in order to extort money from them, their houses were plundered and burnt, their daughters were carried away by force; and when some large house was seen in flames, Charles used to ask, "What fire is that?" and those around him answered him that it was some wretched hovel, whilst in reality it was a rich palace.' (Dino, *Cronica*, lib. ii.) The house of Dante was one of those that were plundered. Dante was at the time at Rome, whither he had been sent by the Bianchi to counteract, if possible, the suggestions of their antagonists. On hearing the news of the proscription he hastily left Rome, and joined his fugitive friends at Arezzo. In January, 1302, a sentence was passed condemning him to two years' exile and a fine of 8000 florins, and in case of non-payment his property to be sequestered. By a second sentence, dated March of the same year, he and others were condemned, as barattieri, or guilty of malversation, peculation, and usury, to be burnt alive. The sentence was grounded merely on the public report of his guilt, 'fama publica,' which in this case meant the report of his enemies. This curious document was found in the archives of Florence in the last century, and has been transcribed by Tiraboschi, *Storia della Letteratura*, tom. v., part 2, cap. 2. Dante now began his wanderings, renouncing his Guelph connexions, and intent upon exciting the Guibelines of Italy against his enemies and the oppressors of his country. He appears to have repaired first to Verona, which was then ruled by the family of La Scala, powerful leaders among the Guibelines. But he soon after returned to Tuscany, where the Bianchi and Guibelines now united were gathering their strength in the neighbourhood of Arezzo.

The death of Boniface VIII. in September, 1303, inspired them with fresh hopes. Benedict XI., the new pope, a man of a mild and conciliatory spirit, sent Cardinal de Prato to endeavour to restore peace in Tuscany, but the cardinal was opposed by the ruling faction at Florence, who frightened him out of the town. Florence was left a prey to anarchy, during which a fire broke out which destroyed 1900 houses in June, 1304. The Bianchi and Guibelines thought of availing themselves of the confusion to surprise the town; and some of them actually entered one of the gates, but they were badly supported by those outside, and the attempt totally failed. Dante (*Purgatorio*, xvii.) censures the want of prudence and concord in the leaders on that occasion. He seems soon after to have left them in disgust, determined to regulate himself in future according to his own judgment. He says himself that 'it was difficult to say which of the two contending parties was most in the wrong.' (*Paradiso* vi., 102.) Dante appears to have been at Padua about 1306, and in the following year with the Malaspina, the lords of Lunigiana; he was also at times in the valleys of Casentino, and in the mountains near Arezzo; some say he went afterwards to Paris, and remained there some years; others believe that he did not go to France until after the death of Henry VII. in 1313. But his visit to Paris is very doubtful; though in canto x. of the 'Paradiso,' he speaks of a certain Sigieri, professor of that university, and designates the street in which he lived.

Dante made also an attempt to obtain the revocation of his own sentence by writing to his countrymen a pathetic letter beginning with the words—'Popule mee, quid feci tibi?' but all to no purpose. The family of Adimari, who had taken possession of his property, opposed his return. Accordingly in canto xvi. of the 'Paradiso,' he has launched a violent invective against them.

The election of Henry of Luxemburg, or Henry VII., to the crown of Germany, revived the hopes of Dante, as Henry was preparing to come to Italy in order to assert the long-neglected rights of his predecessors as kings of the Romans. The Guibeline leaders were ready to support his claims as imperial vicars, and the Guibeline cities, such as Pisa, were likewise in his favour. In order to strengthen their zeal, Dante, about 1310, addressed a circular letter 'to the kings, dukes, marquises, counts, the senators of Rome, and all the people of Italy, congratulating them on the prospect of happiness for Italy through the ministry of the pious Henry, who will punish the felons who opposed him and bestow mercy on the repentant,' &c. It was about this time that he wrote his book 'de Monarchia,' which may be considered as a profession of Guibeline political faith: it asserts he rights of the emperors, as successors of the Cæsars, to he supreme temporal power, entirely independent of he popes, who are the spiritual heads of the church. This creed was in opposition to the assumed rights of Gregory VII., Innocent III., and other pontiffs, who pretended to be above all crowned heads, and to have the disposal of hrones and principalities, an assumption which the Guelphs avoured in Italy in order to keep themselves free of the mperial authority. Both parties in fact acknowledged an external superior, although both wished to rule in their repective communities with as little subserviency as possible o the nominal supremacy of either pope or emperor. But here was this difference, that the imperial, or Guibeline party, was mostly supported by the nobles, especially of North Italy, who styled themselves vicars of the emperor, and was therefore more aristocratic in its spirit, while the Guelphs of Tuscany looked upon the pope chiefly as an auxiliary in time of need, whose temporal interference was less direct, and could be more easily evaded than that of the emperor, so as to admit of a more popular or democratic spirit in their institutions. Such at least was the theory of the two parties, for in reality the Guelph or popular families formed an aristocracy of wealth as much as the Guibelines were an aristocracy of birth and rank. Dante, in his book, 'de Monarchia,' is no servile advocate for despotism, for he maintains that sovereigns are made to promote the good of their subjects, and not subjects to serve the ambitious pleasure of their sovereigns. The latter are to rule so as to soothe the wayward passions of men, in order that all may live in peace and brotherly feeling. But still he derives their authority from God, and he quotes in support of his system, Aristotle, the Scriptures, and the Roman History, agreeably to the scholastic logic of his times. This book 'de Monarchia' was burnt at Bologna by order of the papal legate after Dante's death.

Henry VII. came to Italy in 1310, was crowned at Milan as king of Lombardy, and the following year he besieged Cremona, Brescia, and other places. It was about this time that Dante, impatient to see the emperor come into Tuscany to put down the Guelphs, addressed to him an epistle which begins thus:—'Sanctissimo triumphatori et domino singulari, domino Henrico, divina Providentia Romanorum regi, semper Augusto, devotissimi sui Dantes Aligherius Florentinus et exul immeritus, ac universaliter omnes Tusci qui pacem desiderant terræ, osculantur pedes.' He then entreats the emperor not to tarry any longer on the banks of the Po, but to advance south of the Apennines and put down the spirit of Guelph sedition at Florence, against which he inveighs in no moderate terms, and which, he says, strives to predispose against him the mind of the sovereign pontiff. He speaks of Florence as revolting unnaturally against her parent Rome, for Dante always affects to consider Rome as still the seat of the empire, and Rome and the empire are often employed by him as synonymes. This remarkable epistle, of which we had only an Italian version until the Latin text was discovered not many years since in the library of St. Mark, is dated from Tuscia, near the founts of Arno, April, 1311. (Dantis Allighieri *Epistolæ quæ extant, cum notis* Caroli Witte, Padua, 1827.) Henry came into Tuscany, threatened Florence, but without effect, was crowned at Rome, and on his return died suddenly at Buonconvento, near Siena, in August, 1313 This was a terrible blow to the hopes of the Guibelines, and of Dante especially. He now took refuge at Verona, at the court of Cane della Scala, where he appears to have been before, between 1308 and 1310. Cane was hospitable and generous to the Guibeline emigrants, but Dante, with his proud spirit and temper soured by adversity, could ill accommodate himself to the flattery of courts and the flippancy of courtiers, and he is said to have had some unpleasant bickerings with the people about Cane.

In a well-known passage of his poem he feelingly deplores the lot of the exile who is constrained to eat the bitter bread of patronage:—

> Tu proverai sì come sà di sale,
> Lo pane altrui, e com' è duro calle,
> Lo scendere, e 'l salir per l' altrui scale.'
>
> PARADISO, Canto xvii.

With Cane himself, however, he seems to have continued on good terms; he speaks very highly of his hospitality in a passage just preceding the above lines, and there is a cordial letter from him to Cane, written probably in the latter years of his life, in which he dedicates to him his 'Paradiso,' the latter part of his great poem, and explains the object of it. He says that he styled it a comedy, because, contrary to the style of tragedy, it begins with sorrow and ends with joy; he distinguishes between the literal and the allegorical sense of his verses, and observes that his poem may be called polysensuum, having many meanings. He tells Cane the title of his work:—'Incipit Comœdia Dantis Allagherii, Florentini natione non moribus.' But the title of the part which he sends to him with the letter is:—'Incipit Cantica tertia Comœdiæ Dantis quæ dicitur Paradisus.' It is evident from this and other circumstances, that Cane had not seen the rest of the poem; indeed it is not likely that Dante ever communicated the whole of it to any one during his lifetime, as it would have made it impossible for him to have found refuge anywhere, as Foscolo closely argues in his very elaborate and very critical 'Discorso sul testo di Dante,' which is one of the most judicious and scholar-like commentaries on that poem.

Of Dante's Commedia we cannot enter here into any details, and we must refer the reader to the numerous commentaries, illustrations, and translations of it in every language of Europe. It is one of the few works of imagination which have stood the test of ages, and which will pass down to the remotest generations. It resembles no other poem; it is not an epic; it consists of descriptions, dialogues, and didactic precepts. It is a vision of the realms of eternal punishment, of expiation, and of bliss, in the invisible world beyond death. Its beauties are scattered about with a lavish hand, in the form of episodes, similitudes, vivid descriptions, and above all, sketches of the deep workings of the human heart. It is especially in this last department of poetical painting that Dante excels. Whether he describes the harrowed feelings of the wretched father in Ugolino, or the self-devotedness of the lover in Francesca, or the melting influence of the sound of the evening bell on the mariner and the pilgrim; whether he paints the despair of the reprobate souls gathered together on the banks of Acheron, cursing God and the authors of their being, or the milder sorrow of the repentant, chanting the 'miserere' along their wearisome way through the regions of purgatory,—he displays his mastery over the human feelings, and his knowledge of those chords that vibrate deepest in the heart of man. No other writer except Shakspeare can be compared to Dante in this respect. His touches are few, but they all tell. His power of invective is grand and terrific; witness his imprecations against Pisa, against Florence, against his enemies, his address to the German, Albert, representing to him the anarchy of Italy, and his repeated denunciations of the vices of the court of Rome. Yet Dante was a sincere Catholic; in his poem he places the heretics in hell, and Dominic in paradise; and manifestly shows everywhere his belief in the dogmas of the Roman church, but he attacks its discipline, or rather the relaxation of its discipline. He urges, like Petrarch and other Catholic writers of that and the following ages, the necessity of a reform; and above all, of a total separation of the spiritual from the temporal authority, things generally confounded by the Roman canonists. That many parts of his poem are allegorical is evident, but that the whole poem is an allegory, a political mystification, as some have pretended, seems a far-fetched hypothesis, an ingenious paradox. Dante was a declared enemy to the Guelphs of Florence and their allies, the Papal court and the king of France; and he poetically represents these three at the beginning of his poem by the emblems of the panther, the wolf, and the lion; but soon after he drops all metaphor, and inveighs against all three in the plainest and the bitterest terms, which he would not have done had he meant to be understood only by the adepts of a secret sect. In canto xix. of the *Paradiso* he passes in review all the kings of his time, and spares none of them in his reproof; in another place he has something to say against almost every one of the Italian cities and populations. In fact Dante never published his whole poem in his lifetime, for he had spoken in it too plainly to be able to publish it in safety. He wrote it out of the fullness of his heart, in detached parts, and at different periods, and his strains were influenced by the various political vicissitudes of the times, and by his own alternate hopes and despondency. About the year 1316 he had still a chance of his recall to Florence. It was suggested to him by a friend whom Dante in his reply calls father, probably because he was a clergyman, that he might return, provided he acknowledged his guilt and asked absolution. His answer was characteristic of his mind: 'No, father, this is not the way that shall lead me back to my country. But I shall return with hasty steps if you or any other can open me a way that shall not derogate from the fame and honour of Dante; but if by no such way Florence can be entered, then to Florence I shall never return. Shall I not everywhere enjoy the sight of the sun and stars? May I not seek and contemplate truth anywhere under heaven without rendering myself inglorious, nay infamous, to the people and commonwealth of Florence? Bread, I hope, will not fail me.' (See text and translation of this letter in Foscolo's *Essays on Petrarch and Dante,* 8vo., 1823, with a sketch of Dante's character.

In 1317-18 Dante appears to have been still wandering about Italy. In 1319 he repaired to Guido da Polenta, lord of Ravenna, where he was hospitably received, and where he appears to have remained till his death, which happened in September, 1821. He was buried in the church of the Minorites, under a plain monument. Bernardo Bembo, senator of Venice and podesta of Ravenna, raised to him a mausoleum in 1483, which was afterwards repaired in 1692 by cardinal Corsi, of Florence, and lastly in 1780 reconstructed altogether in its present form by cardinal Valenti Gonzaga, legate of pope Pius VI. The reproof—

'Ungrateful Florence! Dante sleeps afar,

was at last felt by the Florentines; a subscription was made and a monument was raised to the memory of Dante in the church of Santa Croce, which was opened to public view with great solemnity on the 24th of March, 1830. (Missirini, *Delle Memorie di Dante in Firenze*, 1830.)

For the manner in which the whole MS. of Dante's poem was found, collected, transcribed, and published, after his death, by his sons Jacopo and Piero, the early commentaries on the poem, its early printed editions, and the whole bibliographic history of the work, the reader will find ample information in Foscolo's *Discorso sul testo di Dante*, London, 1825; and also in Missirini, *Rivista delle varie Lezioni della Divina Commedia, e Catalogo delle piu importanti Edizioni*, Padova, 1832. Among the most complete editions of Dante's poems are: that of Venice, 5 vols. 4to., 1757-8, with ample notes, and including Dante's Life, by Pelli, and his minor poems and prose works; Lombardi's edition, Rome, 3 vols., 4to., 1791; and that of Florence, with illustrative plates, 1819, 4 vols., fol. Among the host of commentaries the one called l'Anonimo, and also l'Ottimo, written by a contemporary of Dante, who was evidently familiar with the poet, has been published for the first time at Leghorn in 3 vols., 8vo., 1827.

Among the numerous translations of the 'Divina Commedia,' in almost every language of Europe, that in English verse by Cary deserves to be mentioned with especial praise. An Italian translation of Dante's philological treatise 'De Vulgari Eloquio,' was published by Trissino in 1529: and the Latin text in 1577: this work has occasioned a very animated controversy between Italian philologists in our days.

DANTON, GEORGE JAMES, born at Arcis-sur-Aube, October 26, 1759, was one of the most remarkable characters among the leaders of the first French Revolution. He was educated for the bar, and was pursuing the peaceful avocation of a king's counsel when the first shocks of the great political earthquake called him upon the revolutionary arena. Danton was gifted by nature with those faculties which qualify a man for the dangerous office of a political agitator. He was tall and muscular, his features harsh and striking, and his voice resembled the roaring of breakers or the growling of the thunder. He was ambitious and bold; his eloquence, the offspring of an impassioned imagination, though without the charms of rhetorical elegance and philosophical depth, was overwhelming by its vehemence. It is no wonder that such a man soon became the leader of popular commotions and the terror of all who dared to oppose him.

In 1790, supported by the revolutionary club of the Cordeliers, founded by himself, he presented to Louis XVI. the petition of the forty-eight sections of the town of Paris against the king's ministers, accusing them of having lost the confidence of the nation. In 1791 he was elected member of the departmental administration of the Seine. After the imprisonment of Louis at Varennes, he was the prime mover of the popular assemblage of the Champ de Mars in which he called for the dethronement of the king. On the 8th of August, 1791, he presented himself before the legislative assembly, and with unprecedented audacity told the representatives of France that their refusal to declare the throne vacant would be the signal for a general insurrection. The fate of Louis was decided, and Danton being elected minister of justice, became the head of that body of six men who were intrusted with absolute executive power. In this capacity he showed himself blood-thirsty, ambitious, vindictive, and mercenary; but he was also courageous and skilful in conducting public affairs at a time when every step was attended with danger.

When the Prussian army had entered France, and consternation began to spread in all quarters, when the leader of the republican party were at a loss what to do to avert the impending hurricane, Danton ascended the tribune, and addressed the convention in one of the most impassioned speeches ever uttered by a demagogue; he ended with these eventful words:—'The country is in danger; to avert the crisis one thing only is needful—boldness, incessant boldness, nothing but boldness.' These words acted like a spell upon the French nation; within a few weeks fourteen republican armies stood upon the field of battle, and repelled with unexampled bravery the aggression of the allied forces.

If Danton had turned his energies only against the enemies of his country, his memory might have passed unsullied to posterity: but he allowed his wild passions to rage against his fellow-citizens; and most of the horrors of the French Revolution, particularly those of the days of September, were originated, supported, or encouraged by him. After the abolition of royalty Danton gave up the office of minister of justice for that of a president in the constituent committee and in that of Public Safety. While discharging these functions he prepared public opinion for the decapitation of the king. When the tribunal whose business it was to pass the sentence of death was sitting, Danton was absent; but he returned in time to vote for the king's execution. Like Sieyes, he gave no reason for his vote.

In the meantime the people of Paris, or rather the party which was headed by the clubs of the Jacobins, had chosen another leader, who in his private conduct was the opposite of Danton, and in his political views his most powerful antagonist. This was Robespierre, a man of singular character, who combined with the greatest moral purity and disinterestedness a stern, profound, uncompromising political character. Danton acted the republican in order to elevate himself; civil bloodshed was for him only the gratification of private revenge; the proscription of others a rich harvest for his own cupidity. Robespierre sought nothing for himself; the social regeneration of his own country and of the whole of mankind was his only aim. In the presence of Robespierre, Danton felt himself shorn of his laurels; he trembled at the thought of losing his ill-gotten wealth, and having failed in overpowering his antagonist, he withdrew from the theatre of political action, stigmatizing his rival by the name of 'ultra-revolutionist.' When summoned to give an account of his financial administration, he refused to submit to such examination, unless his five colleagues were also compelled to do the same, and retired to his native place.

It appears that, under the influence of hatred of Robespierre, and prompted probably by his avarice or ambition, he entered into some treasonable plot with the Duke of Orleans ('Egalité') and some other enemies of the republic. St. Just denounced him as a traitor before the Comité de Salut Public, and Danton was arrested the 31st March, 1794, and beheaded the 5th April of the same year.

Danton belonged to the school of the French materialists, and did not believe in the immortality of the soul. During the trial, and even on the scaffold, he preserved his undaunted courage. 'Soon,' said he to the executioner, 'I shall fall back into my original nothingness; yet my name shall live for ever in the pantheon of history.' He left a wife, but no legitimate children.

DANUBE, The, called by the Germans Donau, and by he Hungarians Duna, is a river of the first rank, and the econd of European rivers, being inferior only to the Volga. Its course is calculated to be about 1770 miles, and the surace drained by it and its numerous tributaries probably xceeds 300,000 square miles.

In its long course from west to east it traverses more than 2° of longitude (from 8° 10′ to 30° 30′ E. long.); the most northern part of its basin falls only a little north of 50° N. lat., and the most southern does not reach 42° N. lat. But hough the countries drained by it do not extend over eight egrees of latitude, they differ greatly in climate and prouctions, a circumstance owing to the different elevation f the three great plains which are traversed by this iver. The most western, the plain of Bavaria, is between 1100 and 1200 feet above the level of the sea: the entral plain, or that of Hungary, about 300 feet, and the ower plain, or that of Wallachia, probably less than 100 eet. Geographers have divided the course of the river into hree parts. Its upper course is through the hilly country hich surrounds its sources, and through the Bavarian plain and the mountains which divide that plain from the plain of Hungary. It terminates a few miles east of Vienna. The middle course extends from Vienna to the Demirkapi, which divides the Hungarian from the Wallachian plain, and the lower course traverses the last-mentioned plain.

The Danube originates on the eastern declivity of the Black Forest, about twenty-four miles from the banks of the Rhine, in 48° 6′ N. lat., and 8° 9′ E. long., at an elevation of about 3000 feet above the sea. It is here a mountain torrent, which is called Breghe. Near Danaueshingen it is joined by another mountain-stream, after which junction it receives the name of Donau, or Danube. Its general course at first is to the east, but afterwards it declines to the north-east, in which direction it continues till it reaches Ratisbon. From this place to Efferding, some miles west of Linz, it runs south-east by east, and from Efferding its general course is east. At Ulm, where it is joined by the Iller from the south, the river becomes navigable for barges; its surface is here 1255 feet above the level of the sea, and at Donauwörth, where it enters the plain of Bavaria, 1160 feet. Before it enters that plain it runs for the most part of its course along the southern base of the dry and sterile table-land called the Rauhe Alp, which rises to an elevation of 2000 feet and upwards above its level, and contributes to it only a few rivulets. On the south numerous offsets from the Alps approach the river, forming hills of moderate elevation with gentle declivities, and inclosing charming valleys of great fertility. The affluents which descend from these valleys to the Danube are numerous. The Iller rises in the Alps, on the western declivity of the Hoch Vogel, and runs nearly due north to Ulm; the Lech originates in the Alps of the Vorarlberg, and runs near its source east, but afterwards north; it enters the Danube a few miles below Donauwörth, and bounds the Bavarian plain on the west.

The Danube runs through the Bavarian plain from Donauwörth to Passau, changing nearly in the middle of its course from north-east to south-east. At Ingolstadt it is 1140 feet, at Ratisbonu 1050 feet, and at Passau 800 feet above the level of the sea. That portion which lies south of the river is an extensive plain, which reaches to the very foot of the Alps, and on which comparatively few hills and rocks are dispersed. It is traversed in a diagonal line by the Isar, which rises in the northern districts of Tirol, and runs north-east; this river is not navigable by barges, but timber and fire-wood are floated down. On the eastern boundary of the plain runs the Inn, which has been noticed under AUSTRIA (vol. iii., p. 136). The plain north of the Danube has a much more uneven surface, rising frequently into gentle hills, which however nowhere attain the height of mountains. This plain extends beyond the boundary of the basin of the Danube, to the very banks of the Main, and even to the north of this river. As the high ground which separates the two river basins in this plain is not much elevated above the level of the Danube in this part, a water communication by a canal between the Danube and the Rhine could easily be effected. Charlemagne begun such a work, and near the town of Weissenburg a few traces of it are still visible. The Bavarian government took up the matter in 1834. This new canal is to begin on the Danube, near Kelheim, at the mouth of the Altmühl, to follow the bed of the last-mentioned river and of the Sulz to Neumarkt, and to pass thence over the water-shed to Nürnberg into the valley of the Regnitz; then to run in the bed of this river to Bamberg and the Main. [BAVARIA, note.] Besides the Altmühl, this plain is traversed by two other considerable affluents of the Danube, the Naab, which rises in the Fichtelgebürge and flows southward, and the Regen, which originates on the south-western declivity of the Böhmer Wald, and has a general western course.

The third part of the upper course of the Danube is that between Passau and Vienna. At Linz its surface is 650 feet, at Vienna 421 feet, and at its entrance into Hungary 417 feet above the level of the Black Sea. Through all this distance it runs between the steep offsets of the Böhmer Wald, and the northern ranges of the Alps of Salzburg and Styria, which here in some places attain a great elevation (from 3000 to 5000 feet). The level country on the banks of the river is of small extent, except as we approach Vienna, where the mountains recede so far as to leave a considerable plain on both banks. In this part of its course the Danube receives the Traun, the Ens, and the

Marosh [AUSTRIA], and divides in several places so as to form islands, especially above and below Linz, and in the neighbourhood of Vienna. But the current of the river here, as well as in the Bavarian plain, is so rapid, that, properly speaking, it can only be navigated downwards: the barges must be tracked up the river. It has no rapids, but several dangerous whirlpools.

In its middle course the Danube first traverses the Lesser Hungarian plain. At Presburg it is 401 feet, at Winshegrad 379 feet, above the sea, and at Ofen or Buda, which lies in the Great Hungarian plain, 348 feet above the sea. In its course through the lesser plain the current of the river is still rapid, though much diminished. It divides into numerous branches, which inclose islands, among which the largest is the island of Schütt, which is upwards of fifty miles long, and from four to nine miles across. As the adjacent country consists of very soft alluvial soil, the river frequently changes its course. Some ten years ago a minute survey was made of the river for the purpose of some important improvements. Several years were spent in considering these projected improvements, and when their execution was to begin, it was found that the maps which had been made were of no use, the river having changed its bed in nearly every part. In this plain the Danube is increased by the waters of the Leitha and Raab from the south, and the Waag and Gran from the north.

Between Gran and Waitzen the river flows between two mountain ridges. That on the south is the northern extremity of Mount Bakony, and on the north an offset of the Carpathians, called the Neograd range. At Waitzen it issues from the mountain defile, and changes its eastern into a southern course. In this direction it flows with a slow current and numerous windings through the greater plain of Hungary for nearly three degrees of latitude, till it meets, after its junction with the Drave, the Sirmian range or Mount Werdnik, which again deflects it towards the east. It then skirts the Hungarian plain on the south, dividing it from the hilly Slavonia and the mountainous Servia, till it arrives near Nova Moldava, where it again passes through a mountain valley. During its course through the Hungarian plain its waters are increased by those of the Sarvitz, Drave, and Save from the west, and Theiss and Temesh from the north. [AUSTRIA.] At Buda its surface is 348 feet, at Zambor 272 feet, and at Nova Moldava probably not much more than 200 feet, above the level of the Black Sea. Its average breadth between Waitzen and the mouth of the Drave is 600 yards, and its depth varies from 5 to 20 feet.

The mountain-valley of the Demir Kapi (the Iron Gate) is formed on the north by the Banat range, an offset of the Transylvanian Carpathians, and on the south by a lateral range of Mount Balkan; it extends from Nova Moldava in the Banat to Cherniz in Wallachia. In entering this narrow valley the rapidity of the river gradually increases. About four miles below the village of Dobra it forms a dangerous whirlpool, called Takhtali; and about the same distance below New Orsova is the Demir Kapi, where a ledge of rocks runs across the bed of the river, over which the water rushes with great noise, producing below it a number of dangerous whirlpools. Vessels drawing not more than 2½ feet may however descend it, when the water is not low; but it is impossible to ascend it, and thus this rapid, which does not occupy a space above 2000 yards in length, interrupts all water communication between Hungary and Turkey. It is supposed however that this obstacle could be removed at no great expense. At the Demir Kapi the Danube leaves the Austrian dominions and enters Turkey. A few miles lower down it issues from the valley, the country to the north sinks down to a flat, and the current of the river becomes slow and gentle.

On the mountains and hills which inclose the valley of the Demir Kapi on both sides are very numerous remains of Roman antiquities, which were investigated by Count Marsigli in the beginning of the last century, when this region was ceded to Austria by the peace of Passerowitz: an account of these remains is given in Marsigli's Danubius Panono-Moesicus, with a great number of inscriptions. Some few remains occur farther down the river, which are noticed by Marsigli. He also describes the remains of the bridge built by Trajan over the Danube, a short distance below the rapids of the Demir Kapi.

Along the lower course of the Danube the country on the south continues mountainous from the Demir Kapi to Lom Palanka; it afterwards becomes hilly, and by degrees sinks into a flat plain east of Silistria it presents nearly a level surface with some swamps. The country to the north is the great level of the Wallachian plain. In this tract the river first runs nearly south from Chernitz to below Widden, then turns to the east and continues in that direction to about forty miles from the Black Sea, where it suddenly bends to the north. In this direction it runs upwards of 100 miles to the junction with the Sereth, and hence again to the east to its mouth. In this course the river frequently divides and forms numerous large islands, especially below Silistria. Its width, where it is not divided by islands, is between 1500 and 2000 yards, and its average depth being above 20 feet, it is navigable by vessels of considerable burden. From the north it receives the Aluta, or Alt, Sereth, and Pruth, which rise in the eastern Carpathians [AUSTRIA], and from the south the Morava, which is formed by two large rivers, the Western and Eastern Morava, which drain a great portion of the northern declivity of Mount Balkan and the Isker. [BALKAN.]

After having been joined by the Pruth, the Danube divides into several branches, which do not unite again, and thus it flows into the Black Sea by seven mouths, which are (enumerating them from north to south) Kilia Bagasi, Suline Bagasi, Kedrille Bagasi, Salvoa Bagasi, Kutsuk Bagasi, Portesca Bagasi, and Kurte Bagasi. The three last issue from the lake of Ramsin. Suline Bagasi is considered as the principal mouth, and is most navigated. It forms the boundary between Russia and Turkey.

The following particulars on the subject of the steam navigation on the Danube are from the Report of the Vienna Society to the 31st December, 1836. The company will soon have ten steam-vessels afloat besides a towing steamer. The present voyages performed are from Vienna to Lintz; from Vienna to Pesth; from Pesth to Drenkova; from Skela-Kladova to Galaez; from Pesth to Semlin; from Galaez to Constantinople; from Constantinople to Trebisond and from Constantinople to Smyrna. The vessels engaged on these lines are eleven in number.

The Danube was known to the early Greek writers under the name of Istros (Ἴστρος), called by the Romans Ister, which was probably the genuine name of this river in the lower part of its course. The Romans learned the name Danubius from the natives on the upper course of the stream, with whom they were brought into contact by commerce and by conquest. Herodotus in his 4th book (chap. 48, &c.), has transmitted to us all that was known in his time of the Danube and its tributaries in the middle and lower part of its course. Strabo observes (p. 304), 'the upper parts of the river and the parts at its source, as far as the cataracts, are called Danubius, and flow chiefly through the country of the Daci; the lower parts as far as the Pontus (the Black Sea), and in the neighbourhood of the Getæ, are called Istrus.'

(Hoffmann's *Deutschland and seine Bewohner*; Berghaus, *Annalen*, Nos. 127 and 134.)

DANZIG, one of the four administrative circles of the province of Prussia, consisting of portions of what was formerly called Western Prussia. It lies between 53° and 55° N. lat. and 7° and 10° E. long. Its northern boundary for about 92 miles is the Baltic; on the east it is bounded by the circle of Königsberg, and on the west by Pomerania. Its area is about 3197 square miles. The surface is level, with a gradual slope from the banks of the Vistula to the Baltic, and is occasionally broken by small elevations, which the natives designate by the name of Berge (mountains), and of which the highest is but 500 feet. The soil is in many parts sandy, and there are several tracts of swamps; but in general it is productive, and along the banks of the Vistula exuberantly fertile. The circle raises more grain than its consumption requires, and great quantities of vegetables and fruit. The minor circle of Marienburg has extensive woods and forests, of which Danzig contains altogether nearly 800,000 acres. Horses and cattle, though in general of an inferior kind, abound in the luxuriant pasture grounds of the low lands. There are very considerable fisheries along the coast, and salmon, eels, and other fresh-water fish are taken in great quantities in the inland lakes, sheets of water, and streams, such as the Frische Haff, Strand See, Drausensee, &c. Amber is obtained on the shore in the vicinity of Danzig. The principal rivers which water this circle are the Vistula, Schweate, Sorge, which takes the name of the E before it falls into the Frische Haff, Thiene, and Motlau. Danzig contains 12 towns, 6 market-towns, and 2047 villages, and is divided into 7 minor circles; viz.

	Sq. miles.	Pop. 1831.	Chief Towns.
Danzig	491	112,827	Danzig, 54,800
Neustädt	553	35,264	Neustädt, 1450. Putzig, 1950
Karthaus	549	29,157	Karthaus, 350
Elbing	272	46,683	Elbing, 22,400. Toklemist 1700
Marienburg	317	44,907	Marienburg, 5600. Neuteich, 1640
Stargard	533	34,681	Stargard, 3000. Dirschau, 2200
Behrendt	482	23,130	Behrendt, 1600. Schöneck 1700
	3197	326,549	

In 1817 the number of inhabitants was 242,547, so that the population between that year and 1831 had received an accession of 84,002 souls. At present (1837), it is estimated at about 340,000. In 1835, the number of births was 13,444; and of deaths, 10,306; which gives an increase for that year of 3138. The manufactures of this circle, of which the leading branches are woollens, linens, leather, and beer, are not extensive, and are situated almost wholly in the larger towns. A very extensive trade is carried on with foreign parts from the ports of Danzig and Elbing.

DANZIG, or GDANSK, in 54° 21′ N. lat. and 18° 38′ E. long., the capital of the administrative circle, is on the left bank of the principal arm of the Vistula, about three and a half miles from the shores of the Baltic. It is traversed by the Motlau and Radaune, which flow by several channels into that river. In ancient records it is called Gidanie and Gedansk. The first mention of it occurs in the tenth century, and it was long afterwards a bone of contention between the Danes, Swedes, Pomeranian princes, and Teutonic knights. In 1454 it sought the protection of the kings of Poland, who recognized its independence to the fullest extent, and admitted its citizens to enjoy every right possessed by the Poles themselves. In 1733 it gave shelter to King Stanislaus, but, after enduring a furious bombardment by the Russians and Saxons, was forced to acknowledge Augustus II., his rival, as legitimate sovereign of Poland. Prussia, by her acquisitions, at last hemmed in this little state so completely, that in 1772 its commerce with the interior was almost annihilated by heavy dues laid on its exports by that power. On the re-partition of Poland in 1793, Danzig was compelled to admit a Prussian garrison, and to make its usages harmonize with the institutions of its new masters. From this time until the breaking out of the war between France and Prussia in 1806, the town again rose to affluence and prosperity, but it experienced another reverse in 1807, on its falling into the hands of the French, by whom it was besieged for four weeks, under the command of Lefevre, subsequently Duke of Danzig. In the same year the treaty of Tilsit erected the town and a surrounding tract of about 230 square miles into a free state under the antient Danzig code of laws. The French, in spite of this change, reated the town as their own possession, burthened it with enormous contributions, and governed it by the 'Code Napoleon.' Again its trade was almost annihilated; and his unfortunate state of things continued until the 24th December, 1813, when it capitulated to the Russians and Prussians, after sustaining a severe and destructive siege of eight months. On the 3rd of February following, the King of Prussia was again recognized as its full sovereign. Danzig is at this time one of the strongest fortresses and most flourishing towns in his dominions. Many parts of it re in the fine old style of building, though not regularly aid out; but a great number of the streets are narrow and rooked. Within the walls, which consist of ramparts, wetitches, crossed by four drawbridges, leading to as many ates, nineteen bastions and the citadel of Hagelsberg, orts Zigankaberg and Bischoffsberg on adjacent eminences, he town is divided into the Altstadt, Vorstadt, Rechtsadt, Niederstadt, Langgarten, and Speicher-insel, and is about wo and a quarter miles in circuit. Without the walls there re nine suburbs. The Langgarten, the finest quarter, is raversed by a broad handsome street, planted with lindenrees; the Rechtstadt too has some spacious streets and handsome houses in it; but the Old Town (Alt-stadt) is what its name almost implies, close, dirty, and ill-contructed. There are no spacious or even regular squares; he markets themselves being no more than broader kinds f streets. The Speicher-insel contains the storehouses and magazines. The number of houses was in 1804 5340, with 49,465 inhabitants; in 1817, 4561, with 52,821 inhabitants; in 1825, 4690, besides 600 in the suburbs; and in 1831, 5201, with 56,932 inhabitants, besides the garrison, the number of which is about 7000. There are 21 churches in all, 13 of which are Lutheran, 4 Reformed-Lutheran, and 4 Roman Catholic. St. Mary's, the High Church, a Lutheran place of worship, is a remarkable edifice built in the shape of a cross; it was commenced in 1343, and finished in 1401; the roof rests on 28 columns, and its exterior is ornamented with 10 small towers; it has a lofty steeple, 3722 windows, and 19 altars. A Dutch painting of the Last Judgment, for which the emperor Rudolph offered 40,000 dollars, is suspended against one of the columns. There are also 2 Mennonite places of worship, 2 synagogues, 3 monasteries, and a convent, in the town. Danzig is the seat of the provincial administration. Its schools consist of a royal school of navigation; a gymnasium with 7 professors, and a library of nearly 30,000 volumes, the 'Grey cloisters,' a public seminary founded in 1580, a normal school, 2 superior civic schools, a school of arts, and a peace society (Frieden's-gesellschaft), which enables 16 young men of talent to complete their studies at the universities and elsewhere. It has a board of trade and navigation, a tribunal of commerce, a humane society, a public library, an orphan asylum, and house of correction, a foundling hospital, an infirmary and obstetric institution, 4 hospitals, and societies of natural history and of natural and experimental philosophy, to the latter of which an observatory is attached. There are yards and slips for shipbuilding; sugar refineries, spirit and liqueur distilleries, breweries, copperworks, and manufactories of silks, woollens, linens, leathers, hats and gloves, soap and starch, earthenware, arms, steel-ware, hats, tobacco, &c. Independently of these branches of industry, the town has a very considerable trade with the adjacent provinces and foreign parts, and exports large quantities of corn, timber, pot and pearl ashes, quills, brandy and spirits, wool, flax and hemp, &c. It has been calculated that the annual value of the exports is more than six millions of dollars, or about 830,000*l*., and of the imports upwards of two millions, or about 275,000*l*. Above 630 vessels enter the port annually, and the tax on trading occupations produces above 4300*l*. a year. Among the outworks is the intrenched camp on the island of Neufahrwasser, which covers the approach from the Baltic.

DAPHNE, a genus of thymelaceous plants, containing many species, inhabiting the more temperate parts of Europe and Asia. Among them some are cultivated in gardens for their beauty or fragrance, others are of medicinal importance, and a few are employed in the manufacture of hemp and paper. We shall briefly notice the more remarkable of these.

The genus Daphne is distinguished in its natural order by having eight or ten stamens inclosed within the calyx, a simple stigma, a succulent fruit, and a calyx the orifice of whose tube is destitute of appendages.

D. Mezereum, the mezereon of the gardens, is a deciduous plant, with white or purple fragrant flowers, sitting close to the stem, and appearing on the naked branches before the leaves are unfolded. It is a favourite in gardens, and succeeds in almost any well-drained light soil where the air is not poisoned by the smoke of coal-fires. It is found wild in the mountainous woods of many parts of the middle and south of Europe. It is met with in woods in various counties of England: the berries are smooth, shining, and bright red.

All the parts of this and indeed of the other species, as far as they have been examined, are extremely acrid and poisonous. If the bark is bruised and applied to the skin it produces severe blisters, and is sometimes substituted for cantharides when that drug cannot be employed with safety. Taken internally, the bark, leaves, and fruit act as cathartics, but require to be administered with extreme caution; for they are apt to produce dangerous and even fatal consequences. Linnæus speaks of a person having been killed by a dozen mezereon berries; and they are employed in Sweden to poison wild animals. According to Fée, the very odour of daphne, agreeable as it is, is attended with danger; he says that if kept in sitting-rooms they will bring on headache and fainting. It is moreover asserted that Russian and Tartarian women sometimes rub the berries of the mezereon on their cheeks to produce a slight irritation, which of course gives the effect of rouge, only in a more permanent degree.

D. Laureola, the spurge laurel, is another British species, found wild commonly in woods and hedges. It is a handsome evergreen bush, with the aspect of a laurel. The leaves are placed very close together; they are of a leathery consistence, deep green, lanceolate, acute, and narrowed to the base. The flowers are green, and grow in little short clusters, which are nearly concealed by the leaves. The berries are, when ripe, a deep purple black. We have no species that grows more readily beneath the shade of trees; and as its appearance is highly ornamental, it would be a most useful garden plant, if it were not for the dangerous berries, which children are apt to eat. An ointment for keeping open blisters is prepared from this plant.

D. pontica, one of the plants which is reputed to have contributed to the poisonous quality of the honey that was eaten by Xenophon's soldiers, is very like this species, and is often cultivated as a hardy evergreen.

D. Gnidium, the Garou bush, an evergreen with narrow sharp-pointed erect light-green leaves, and branching clusters of white fragrant flowers, is a common plant in dry waste places in the south of Europe. It will not live in the open air in England, except in the warmest counties. Both the berries and leaves are employed by the French as purgatives; the plant also affords a good yellow dye.

D. Cneorum, a native of grassy places in the Alps of Switzerland and the rest of central Europe, with its trailing stems, numerous small narrow blunt deep-green leaves, and clusters of rich purple fragrant flowers, is one of the most beautiful of all plants, when it finds a soil and climate that suit it. At Bagshot, for instance, and in similar situations, it is, under good management, quite unrivalled by the other hardy shrubs among which it grows. It will not succeed where the soil is otherwise than sandy and peaty, nor can it bear the impure atmosphere of large towns.

D. Collina, Alpina, Neapolitana, and *Tarton-raira* are other species cultivated in gardens. The first has dull purple sweet-scented flowers, and is sufficiently common in collections; the others are rarer. All are impatient of wet in winter; but if at that season kept tolerably dry, will bear considerable frost, and are desirable garden plants in the milder parts of England.

In addition to the acrid and dangerous properties which appear to be common to them all, some species are remarkable for the toughness of their fibre, and for the economical purposes to which they are applied. From *D. Cannabina* is prepared the best kind of writing-paper in China, according to Loureiro; but it must be observed that this statement, if true, is at variance with what is observed in Nepaul, where the daphne-paper is very brittle and bad.

D. Lagetta, the lace-bark tree of Jamaica, is most remarkable for the tenacity of the fibre of which its bark consists, and for the facility with which it may first be separated into thin layers and then into distinct meshes. If the inner bark of this plant be macerated in water, it may be readily separated into layers no thicker than the finest lace, and which, after having been pulled a little sideways, resembles in some measure that fabric. King Charles II. is said to have had a cravat, frill, and ruffles of lace-bark presented to him by his governor of Jamaica.

DAPHNE MEZEREUM is an indigenous shrub; the bark obtained in spring from the stem, the thick branches, and even the root, is officinal. It is covered by a thin epidermis, green within, brown without. It is destitute of smell, but has a very acrid pungent taste, lasting for hours, and causing vesications. Its virulence even amounts to a poisonous degree, but is said to be lessened by camphor.

In the London Pharmacopœia it only enters as an ingredient into the decoction sarsap. comp. It consists of an acrid resin and daphnin.

The bark yields its properties to water, and still more perfectly to vinegar. The simple decoction of the Edinburgh Pharmacopœia certainly possesses considerable power. Mezereon in a small dose acts upon the secretions of the salivary glands, the mucous membranes, the kidneys, and the skin. It also rouses the nervous energy of the brain, as its action in many cases of coma and stupor proves.

It may be employed locally to stimulate the salivary glands, or to remove paralysis of the mouth or throat; when so employed it is to be chewed, but the saliva must not be swallowed, as its acrimony causes inflammation of the stomach and intestines; and this may even be fatal from the hæmorrhage, vomiting, and purging which attend it. The berries swallowed incautiously produce the same bad effects.

The simple decoction, along with carbonate of ammonia, given in proper doses every two or four hours, has in several instances rescued patients from a state of imminent danger in the stage of collapse of typhus fever, or that of coma and effusion at the base of the brain, which sometimes occurs in scarlet fever. In torpor of the brain, in leuco-phlegmatic subjects, and in approaching amaurosis, it is also of use. It has also been found serviceable in chronic rheumatism and chronic cutaneous diseases. A portion of the bark macerated in vinegar and applied to the skin, forms a powerful vesicant.

DA'PHNIA. [Branchiopoda, Vol. v. p. 343.]

DAPHNIN. Vauquelin first pointed out, in the 'Annales deC himie,' t. lxxiv., the existence of a peculiar acrid principle in the mezereon (*Daphne Mezereon*). Its properties have been since more particularly examined by Gmelin and Bär. It is prepared by precipitating a decoction of mezereon bark by subacetate of lead, and decomposing the washed precipitate by sulphuretted hydrogen: the solution is then filtered, evaporated, and the residue digested in cold anhydrous alcohol, from which daphnin crystallizes.

When it has been purified by washing with cold alcohol, solution in water, and recrystallization, it forms colourless bitter crystals, which are neither alkaline nor acid: in cold water they are sparingly soluble, but more so in hot, and also in alcohol and æther. Nitric acid converts it into oxalic acid. It does not appear to have been analyzed.

DA'PSUS, a genus of Coleopterous insects. [Eumorphus.]

DA'PTUS (Fischer), a genus of Coleopterous insects of the family Harpalidæ. Generic characters:—mentum deeply emarginated and without any tooth-like process in the middle; antennæ rather short, and moniliform; second joint of the labial palpi somewhat oval; four basal joints of the four anterior tarsi slightly dilated, short, and triangular; body more or less elongated, the elytra with their outer margins almost parallel. *Daptus Vittatus* is of a pale yellowish colour, with an oblong black spot on each elytron: the head and thorax are more or less clouded with brown or black in some specimens.

This species is about a quarter of an inch in length, and inhabits sandy districts in the vicinity of water in the southern parts of Russia and France.

Daptus in rassetus (Dejean) has the same colouring as the last, but it is of a larger size, being upwards of half an inch in length; it inhabits North America.

DARABGHERD, or **DARABJERD**, commonly called Darab, is a town in Persia, in the province of Farsistan, about 26° N. lat., and 54° 50′ E. long. It was formerly a town of great extent, but like many other towns in Persia it has fallen from its former splendour. But although a great part of it is in ruins it still contains between 15,000 and 20,000 inhabitants. It is on the banks of a small river in an extensive plain, which is intersected with villages and cultivated lands. The town is surrounded with groves of dates, oranges, and lemons; the juice of the lemon is exported to every part of Persia. The tobacco cultivated in its neighbourhood is esteemed for its mildness, and sent not only to Shirauz, and other parts of Persia, but also to India and Arabia. There are some antiquities in its neighbourhood, as the ruins of an aqueduct, some sculptured rocks, and a caravansarai, hollowed in the very heart of a mountain, but their age cannot be ascertained. (Kinneir. Sir W. Ouseley.)

DARDANELLES, The, are fortifications erected on both sides of the Hellespont, which from them take also the name of the Strait of the Dardanelles. This strait, which divides Europe from Asia and unites the sea of Marmara to the Archipelago, extends in a south-west direction between 26° and 27° E. long. and between 40° and 40° 3 N. lat. Its length is upwards of 50 miles, but its width varies. Near the sea of Marmara it is about ten miles across, but it narrows by degrees, so that opposite the town of Gallipoli it is only about two miles wide. This may be considered as the average breadth for the remainder of its extent. Towards the southern extremity it narrows still more, at some places even to one mile and less. A strong current runs always through it from the sea of Marmara to the Archipelago, and the Turks have erected fortifications at these narrow places for the purpose of rendering it impossible to attack their capital from the side of the Mediterranean Sea. Admiral Duckworth indeed sailed through the strait in 1807, but since that time the fortifications have been improved and increased in number.

The fortifications originally consisted of four castles, two in Europe and two in Asia. Two, called the New Castles, are situated near the entrance of the strait on the side of the Archipelago, where it is more than two miles across. The castle of Europe is called Kilid Bahr, and that of Asia Kum Kalesi; the former is provided with 70 guns and 4 mortars, and the second with 80 guns and 4 mortars. About 18 miles farther to the north-east are the Old Castles; that in Europe, the antient Sestos, is called Sed Bahr; that in Asia, the antient Abydos, Khanuk Kalesi. In the former are mounted 50 guns, and in the second 84. But it seems that the name of Dardanelles is now especially applied to some fortifications erected in modern times between the castles, but considerably nearer to the Old than to the New Castle. In these new works 64 guns are mounted in Europe and 120 in Asia. The number of guns mounted in all these fortifications and some others of less importance is 689, besides 8 mortars.

'Strong as the Dardanelles are,' says Major Keppel, 'where in every direction the eye rests upon guns bearing on a short and very narrow passage, the most dangerous part is the approach to the inner (old) castles. Their strength consists in the position of the castle of Sestos, to which, from the nature of the current and from the banks running far out, a ship must come stem on, and inevitably be raked, without the power of returning more than her bow-guns until just abreast, by which time she would be dreadfully cut up, if the fire were at all well directed.'

The same author states that the batteries are well built, and placed in spots judiciously chosen, and that the greater number of the guns are *à fleur d'eau;* but that they have no carriages, and cannot be pointed; they fire only when a ship covers them. Among them are several immense guns, from which they discharge stone shot. The quantity of powder which these large guns require is enormous: the largest is charged with 330 lbs.

No ship is permitted to pass the forts between sunset and sunrise, and the guns must previously be dismounted and the ports shut.

DARDA'NIA, a town of Troas, on the coast of Mysia, in Asia Minor. It was said to have been founded by Dardanus. (Strabo, p. 592, *a.*; *Iliad*, xx. 216.) The name Dardania was also given to Dacia Mediterranea. [Dacia.]

DAR-FUR, a country in Africa, between Bornou and Abyssinia, lying between 11° and 16° N. lat., and between 26° and 30 E. long. Its extent and real boundaries are very imperfectly known.

It may be considered as a large oasis, placed in the south-eastern corner of the Sahara, and divided by deserts of considerable breadth from Dar Berghami on the west, and from Kordofân on the east. The southern part of the country is hilly, and contains valleys with brooks and rivulets which have water all the year round. But the northern part is a level country, partly covered with sand, and in other places by rocks. water is only obtained from wells. During the rainy season it exhibits a fine vegetation, but during seven or eight months in the year the whole district is dried up, all the plants fade away, and even the trees lose their foliage.

The periodical rains commence in the middle of June and last to the middle of September; they are generally very heavy, and fall most frequently from three o'clock till midnight; they are mostly accompanied by lightning. The changes of the wind are not periodical but instantaneous. The greatest heat prevails with a southerly wind, and the greatest quantity of rain falls with a south-east. When the breeze is from north or north-west, it is most refreshing, but it does not generally continue long in that quarter. When southern winds blow the hot air is filled with thick dust.

As soon as the rains begin the agricultural operations commence. The grains raised are wheat, doku, kassob, and sesamum. They plant also beans, kidney-beans, lentils, and some leguminous vegetables peculiar to that part of Africa. Water-melons, together with some other kinds, abound during the wet season, and also before if they are irrigated. Among the fruit-trees are tamarinds and dates, but the latter are few in number and their fruit small, dry, and destitute of flavour. Browne says that tobacco is indigenous in Dar-fur.

Neither horses nor sheep are numerous. The flesh of the sheep is indifferent, and they are covered with coarse wool, resembling hair, which is wholly unfit for any manufacture: they have not a large tail, like other sheep in this part of Africa. Goats are more numerous. Asses are of small size, resembling those in Great Britain. Cattle form one of the chief branches of wealth, and they are paid as tribute to the sovereign. Camels are very numerous and of all colours and sizes; their flesh is used for food.

The ferocious and wild animals are principally the lion, the leopard, the hyæna, the wolf, and the jackal; the elephant, which is said to gather in herds of four or five hundred, the rhinoceros, the giraffe, the hippopotamus, crocodile, and wild buffalo; no tame buffaloes are found in this part of Africa. Antelopes, ostriches, and civet-cats are also common. Iron seems the only metal which is found in the southern districts; besides alabaster, various kinds of marble and common salt occur here. Nitre abounds, but is not used.

The population of Dar-fur, which Browne thinks cannot exceed 200,000, consists mostly of the descendants of emigrants from the countries along the banks of the Nile, especially Dóngola, Sennaar, and Kordofân. Among them are also some families from Egypt, Tunis, and Tripolis. They use the language of Barabra, though they also speak Arabic. Arabs are also numerous in some parts.

Cobbe, from whence the caravans depart for Egypt, is two miles in length, extending from south to north, but very narrow, and the houses, each of which occupies in its inclosure a large portion of ground, are separated from one another by a considerable space. The town is full of trees of every kind, and contains about 6000 inhabitants, all of them merchants. Other places are Cubcabîa, in the western district, the depôt of all the merchandise destined for Soodan, and Sweini, and the general resort of the merchants trading to Egypt, both in going and returning.

Dar-fur carries on some trade with Egypt by caravans, which go occasionally, but not every year. They take their route through the desert to Elwah, or the Great Oasis, passing in their way through the small oases, Bir el Malha, Leghea, Selimè, and Sheb. The articles which they bring to Egypt are slaves, camels, ivory, horns of the rhinoceros, teeth of the hippopotamus, ostrich feathers, gum, pimento, tamarinds, and leather sacks for water; also parroquets, monkeys, and guinea-hens, and a small quantity of copper brought from countries lying farther west. They take in return trinkets, cotton cloth, sword blades, small looking-glasses, fire-arms, coffee, silk unwrought, glass beads, copper culinary utensils, fessans, or red caps of Barbary, French cloth, and some silk stuffs of Damascus, Aleppo, &c., shoes of red leather, pepper, writing-paper, a considerable article, and soap of Syria. Hardly anything is known respecting the commercial intercourse between Dar-fur and the countries lying farther west; but it seems to be comparatively considerable, and thence the ivory, ostrich feathers, and slaves, seem to be brought. The inhabitants are Mohammedans, and are governed by a despotic sovereign. (Browne's *Travels in Africa*, which is the only authority.) [See Browne.]

DARIC (Δαρεικός, *Daricus*), a Persian coin of pure gold, stamped on one side with the figure of an archer crowned, and kneeling upon one knee, upon the other with a sort of quadrata incusa, or deep cleft. Harpocration (*in voc.* Δαρεικός) ascribes its origin and name to a Darius of a remote period; but Wesseling (*Observat. Variæ*, 8vo. Traj. ad Rhen. p. 241) and other later writers, upon the authority of Herodotus, give it to Darius Hystaspis, the father of Xerxes, who began his reign B.C. 521. The daric was equivalent in value to the Attic Chrysus (χρυσοῦς), and was worth twenty drachmæ of silver: five darics were consequently equal to an Attic mna of silver (Harpocration). Xenophon, in his 'Cyropædia' (vii.), informs us that the daric was a month's pay for a common soldier. Prideaux (*Connect. of Old and New Test.* 8vo. Lond. 1725, i. 183) observes, that in those parts of Scripture which were written after the Babylonish captivity (he refers to Chron. xxix. 7, and Ezra viii. 27), these pieces are mentioned by the name of *Adarkonim;* and in the Talmudists (see Bux torf's *Lexicon Rabbinicum*, p. 577) by the name of Darkonoth, both from the Greek Δαρεικός. The daric was the gold coin best known in Athens; and when we consider the great number which are recorded to have been employed in presents and bribes alone, exclusive of the purposes of traffic, it would seem extraordinary that so few should have reached modern times, if we did not know that upon the conquest of Persia they were melted down, and recoined with the type of Alexander. Very few Persian darics are now to be seen in cabinets. There is one in Lord Pembroke's, which weighs 129 grains; and there are three in the cabinets at the British Museum, weighing about 128½ grains each. Mr. Young, our most eminent dealer in coins, also possesses two, one weighing about 121¼ grains, the other 128¼; few other darics, it is believed, can be referred to in England. The witticism of Agesilaus (Plutarch, *Apophthegm. Lacon.* xl.) is well known, who, being forced to retire from an invasion of the Persian provinces by the bribery used by the great king, said that 30,000 *archers* had defeated him.

The silver coins which go by the name of darics are in truth miscalled. They had no such designation in antient times. The earliest of them, if we may rely upon Herodotus in a passage already referred to (iv. 166), were struck by Aryandes, the Persian governor of Egypt, in imitation of the darics. 'This Aryandes was governor of Egypt, and had been appointed by Cambyses. Some time after, presuming to put himself on an equal footing with Darius, he lost his life in consequence. Hearing by report, and seeing himself, that Darius was desirous to leave some memorial behind him, such as no other king had done, Aryandes followed his example, and met with his reward. Darius took the best gold, and purifying it to the highest degree, struck a coin. Aryandes, being governor of Egypt, did the same in silver; and the silver of Aryandes is now the purest. Darius being informed of what he was doing, put him to death, under the pretence that he was meditating a revolt.' The coining of these darics or Aryandics in silver, however, must have been continued after the time of Aryandes. No fewer than eight specimens of this description are in the cabinets of the British Museum. One, formerly Mr. R. P. Knight's, bears the name of Pythagoras, as Mr. Knight conjectured, a king or governor of Cyprus. Others, which have the figure of the archer crowned on one side, have a mounted horseman on the other. They are generally considered as antient Persian coins, and are commonly, though without any assignable reason, except as bearing the figure of an archer, called darics.

	Grains.
Daric of gold in the British Museum	$128\frac{4}{16}$
Do.	$128\frac{6}{16}$
Do.	$128\frac{1}{16}$
Daric of silver	$235\frac{8}{16}$
Do.	$228\frac{9}{16}$
Do. smaller of silver	84

Gold Daric. British Museum. Actual Size

Silver Daric. British Museum. Actual Size. Weight, 236 grains.

DARIEN, the GULF of, forms the most southern portion of the Caribbean Sea, extending from 7° 56′ to 10° N. lat., between 76° and 78° W. long. Its most southern recess is called the Bay of Candelaria, which begins on the north between Cape Tiburon and Punta Caribana. This latter bay forms a spacious harbour capable of containing all the fleets in the world, and has a good anchorage of from eighteen to thirty fathoms deep, sheltered against every wind, and only subject to a strong sea in the months when north winds prevail. Not far from the southern extremity of it is the mouth of the Rio Atrato. (Mollien, *App.*)

DARIEN, ISTHMUS of. [PANAMA.]

DARI'US, the name of several Persian kings. Darius I., commonly called Darius Hystaspis, or the son of Hystaspis, belonged to the royal house of the Achæmenidæ, and mounted the throne B.C. 521, after having, with six other conspirators, despatched the usurper Smerdis. It was one day agreed among them, according to Herodotus (iii. 82, 83), that they should assemble on the following morning before sunrise on horseback, and that he whose horse neighed first to the rising sun should be king: the horse of Darius neighed first, and Darius was saluted king (iii. 84-87).

Darius was in fact the founder of the Persian constitution. Countries which Cyrus and Cambyses had only subdued he first organized into a systematic kingdom. He divided his vast empire into twenty satrapies or provinces, and appointed a fixed tribute to be paid, as well as a regular supply to be sent for the provisions of the army and the king's household (iii. 89-96).

A system of communication between different parts of the empire was established by means of couriers stationed at certain distances for the transmission of the royal messages.

Soon after his accession to the throne, Darius was visited by Syloson, the brother of Polycrates, tyrant of Samos, who reminded him of the cloak with which he had obliged him in Egypt, when acting as one of the guards of Cambyses. Darius offered him any reward he would name: he asked to be restored to Samos, and put in possession of the kingdom of his late brother. Darius sent Otanes with an army to Samos, and soon succeeded in reducing the island. Mæandrius, who was in possession of it at the time, was allowed to quit it (iii. 139-141). Meanwhile the attention of Darius was called off to another and more important affair. The Babylonians had revolted, and made great preparations for resistance. Darius marched against them with considerable force, and besieged them for a year and eight months, but without success, till the artifice of Zopyrus put him in possession of the city. Zopyrus, one of the officers of Darius, after cutting off his own nose and ears, and lacerating his body in a frightful manner, went over to the enemy, telling them that this was the treatment he had got from Darius, and he had therefore come over to them that he might aid in taking revenge on the tyrant. The Babylonians received him gladly, and not doubting for a moment the truth of his story, gave him an important post of command, and soon intrusted to him the whole city, which he delivered up to Darius. Darius impaled 3000 of the chief citizens, and destroyed the walls and gates of the city (iii. 150-160). Darius employed the Greek navigator, Scylax of Caryanda, to follow the Indus to the ocean and to survey the country (iv. 44); and the discoveries which he made were followed by the subjugation of a portion of the Indians (iv. 44; iii. 101). One of the principal events in his reign was his expedition against the Scythians. He marched against them with a force which is computed at seven or eight hundred thousand men. A bridge of boats was laid across the Bosporus, and the work was executed by Mandrocles, a Samian, who received a present from the king as a reward for the skill which he displayed (iv. 85-87). Darius pursued his march through Thrace, across the Danube, to the Don, but met with very ill success, and had great difficulty in escaping eventually. He returned to the Danube, recrossed it, and came back into Asia, leaving Megabazus in Thrace with orders to subdue the Pæones (v. 12-16). Megabazus subdued them and transported them into Asia, where Darius allotted them a district in Phrygia.

In 501 B.C. some disturbances arose in the island of Naxos, which ended in the aristocratical party being obliged to quit the country. They applied to Aristagoras, governor of Miletus, for succour, which he was willing to afford, but was unable to grant without the aid of the Persians. Aristagoras communicated the scheme with splendid promises of success to Artaphernes, the king's brother and governor of Sardis, who, after procuring the king's consent, intrusted a fleet of two hundred ships to the command of Megabates, and ordered it to sail to Miletus to take on board the forces of Aristagoras. After a four months' siege their funds were consumed, and Aristagoras had contracted a debt with the Persian government which it was wholly out of his power to discharge. An insurrection of the Ionian states, whom he excited to revolt, speedily followed, and ended in the fall of Miletus 494 B.C.

The Athenians had given Aristagoras aid in the revolt, and had thus excited the bitter hostility of Darius, who sent, under the command of Datis and Artaphernes, an army to Attica, where they were opposed and defeated by Miltiades in the plain of Marathon B.C. 490. (Herod. vi., 113-117.) [Marathon.] The conquered Persians returned to Asia. Darius began to make preparations for another expedition against the Greeks, as well as for reducing the Egyptians, who had rebelled, but he died before the commencement of the war B.C. 485, after a reign of thirty-six years (vii. 4). He appointed his son Xerxes his successor (vii. 3.)

Before he became king, Darius had three sons, two of whom are mentioned (vii. 2-97), Artabazanes and Ariabignes. After his accession he had four sons by Atossa, and several by other wives.

DARIUS II., called Darius Ochus or Nothus, because he was the illegitimate son of Artaxerxes. Soon after the murder of Xerxes II., Darius succeeded in deposing Sogdianus, and ascended the throne himself B.C. 423. By his wife Parysatis he had Artaxerxes Mnemon and Cyrus the younger. Nothing very remarkable occurred during his reign, but some successful wars were carried on under Cyrus and other generals. He died B.C. 404, after a reign of nineteen years, and was succeeded by his son Artaxerxes, who is said to have asked him on his death-bed by what rule he had acted in his administration, that he might adopt the same and find the same success. The king's answer is said to have been, that he had always kept, to the best of his knowledge, the strict path of justice and religion. (Xenophon, *Anabasis*, i. 1; Diodorus, xii. 71; Justin, v. 11.)

DARIUS III., or Codomannus, the last of the Persian monarchs, succeeded Artaxerxes III., B.C. 336, after a short interval, in which Arses, the youngest son of Artaxerxes, was nominally king. Bagoas had poisoned Artaxerxes, and then put Arses on the throne, that he himself might reign in his name: but after two years he deposed him, and put in his place Darius Codomannus. Darius not being so obsequious to his wishes as he desired, he determined to remove him in the same way as he had done with Artaxerxes. The king, however, aware of his design, made Bagoas himself drink the poison which he had prepared for him. Darius was now firmly established on the throne, but had little time to enjoy his security before he found himself opposed by Alexander the Great.

It was in the second year of Darius's reign that Alexander passed over the Hellespont into Asia: he pursued his march till he arrived at the river Granicus (now the Oostvola), when his first encounter with the Persian army took place. The well-armed and well-disciplined troops of the Macedonians gained a complete victory. Another battle was fought at Issus, in Cilicia, where Darius took the command himself and was utterly defeated. He engaged in person again in a battle at Gaugamela, commonly called the battle of Arbela [Arbela], and was defeated. After the battle of Issus, Darius's camp was plundered, and his wife, mother, and children, came into the hands of Alexander, who treated them with the utmost consideration and care. Now that Susa, Persepolis, and all his treasures had come into the possession of the conqueror, Darius took refuge in Ecbatana, but was seized by Bessus, the governor of Bactria, who betrayed him in his misfortunes. Both the traitor and his prisoner fled before the march of Alexander, who hastened the pursuit till he came in sight of them, when they fled precipitately; and because Darius would not follow them, Bessus and those about him discharged their darts at him, and left him covered with blood at the mercy of the Macedonians. When the Greeks found in this state he had just strength enough left to ask for some water to drink, it was given him by a Macedonian, whom he requested to return his warm thanks to Alexander for the kindness he had shown to his wife, mother, and children, and to say that he prayed the Gods to prosper him in all his undertakings and to make him monarch of the world.

Alexander himself came up soon afterwards, and was much affected at seeing the king in this deplorable state. He took off his own cloak and spread it over the corpse, which he ordered to be embalmed and sent in a splendid coffin to Sisigambis to be interred with the other monarchs of Persia. Darius died B.C. 330, in the sixth year of his reign, and the fiftieth of his age. He enjoyed the reputation of a just and humane prince. With Darius ended the empire of Persia, which had lasted for upwards of two hundred years under thirteen kings. (Diodorus Siculus xvii. 5-77; Plutarch, *Life of Alexander*; Justin, x.) [Alexander III.]

DARLINGTON. [Durham.]

DARMSTADT, the capital of the grand duchy of Hesse and of the province of Starkenburg, lies in the bailiwick of the same name, in 49° 52′ N. lat., and 8° 37′ E. long. It is situated on the banks of the small river Darm, between the Main and the Neckar, about ten miles from the Rhine, and also from the commencement of the Bergstrasse, a Roman road leading from Darmstadt to Basle. It was formerly a village, but, under the Emperor Louis the Bavarian, became a town of the principality of Katzenellenbogen, and a castle was erected for its defence. After the extinction of that family it lost much of its importance, until George I., son of the Emperor Philip the Great, made it his residence, since which period it has increased considerably both in extent and consequence.

Darmstadt is divided into the old and new town; the former is inclosed within old massive walls, and has a gloomy uninteresting appearance; the new town, however, although similarly defended, is built in better style, has broad, clean, and well-lighted streets, and handsome houses, although, from the great number of uncovered spots in it, it has a somewhat desolate aspect. The town has six gates; five public squares; the ducal residence (a large edifice, with a library of about 100,000 volumes), the military school, the heir-apparent's palace, a museum of natural history, with a small but choice gallery of paintings and antiques, and the ducal pleasure-grounds; a very handsome opera-house, and a riding-school, the handsomest building in Darmstadt, 320 feet long, 150 broad, and 90 in height, without pillars or other support in the interior; an arsenal, excellent barracks, house of correction, and magazines; the town church, containing the ducal vaults; one Lutheran, one Reformed, and one Roman Catholic church, which is a handsome circular structure on an eminence, with a splendid dome, supported by twenty-eight large columns; one ducal chapel, one synagogue, an orphan asylum, two hospitals, and a large reservoir for supplying the town with water in case of fire. There is likewise the gymnasium, with twelve professors; the pedagogium, a seminary for teachers; the Real school for the education of merchants, mechanics, &c.; an academy of design; a drawing-school for builders; fourteen elementary schools, the town school for boys and girls, a military and a free school; a bible society, freemasons' lodge, &c.

Darmstadt is the residence of the grand duke of Hesse, and the seat of various public boards, and the civil and criminal courts. It contains a population of 24,500 (in 1817, 15,450), who are chiefly dependent for support on the expenditure of the court, public functionaries, and garrison. There are a few manufactures (chiefly of woollens and linens): the remainder of the inhabitants are engaged in tanning, gardening, &c. The environs, especially towards the mountains, are very picturesque, and the soil, which is sandy, is highly cultivated. In the vicinity of Darmstadt is a curious magnetic rock, and Carlshof, an interesting farm, cultivated in the most perfect manner and containing a large nursery of trees. Darmstadt has six fairs every year.

DARNETAL, a town in France, in the department of Seine Inférieure, in the immediate neighbourhood of Rouen, and on a road leading from that city to Beauvais. It is a busy town, with a population of 5572 inhabitants, who are engaged in manufacturing fine woollen cloth, blankets, druggets, and other coarse woollens, cotton yarn, and printed calico. There are also several paper-mills and dye-houses. Rouen is partly supplied with water from a spring at Darnetal.

DA'RNIS (Fabricius), a genus of insects of the order Hemiptera, and family Cercopidæ. The species of this genus have the posterior part of the pro-thorax prolonged so as totally to cover the upper part of the abdomen and wings, or nearly so: this portion of the pro-thorax is of the form of an elongated and arched triangle. [Cicadella.]

DAROO TREE is the Ficus Sycomorus, or Egyptian Sycomore; there is a picturesque view of this plant in

Salt's 'Abyssinia,' along with the Obelisk of Axum. [Ficus.]

DARTFORD. [Kent.]

DARTMOOR. [Devonshire.]

DARTMOUTH, a seaport, market and borough town, situated on the southern coast of the county of Devon, 30 miles south by west from Exeter and 203 W. S. W. from London.

In antient records this place is called Clifton-Dartmouth-Hardnesse, in fact comprising three adjacent towns. From the convenience of its harbour it was very early a place of some note, and in 1190 was the rendezvous of the fleet destined for the Holy Land. In the beginning of the 13th century it obtained a market and other valuable privileges. It sent two members to parliament from the 14th year of the reign of Edward III. to the passing of the Reform Act, which reduced the number to one. In the reign of Edward I. Dartmouth contributed 31 ships and 800 men towards the naval expedition against France.

Dartmouth was considered an important port during the Parliamentary war, and was strongly contended for by both parties; it was taken by Prince Maurice after a siege of four weeks, and garrisoned by the king's forces; but Fairfax shortly afterwards attacked it in person and took it by storm. The manor was granted by Edward III. to his servant Guy de Brien, and, after several mesne possessors, finally passed into the hands of the corporation.

The limits of the borough comprise 1650 acres, consisting of the parishes of St. Saviour, St. Peter's, and part of Townstall. Dartmouth has no less than 14 charters of incorporation, and also claims to be a borough by prescription. The jurisdiction is exclusive for all offences, except treason and capital felonies. The mayor, recorder, and justices hold quarter sessions, and the magistrates hold weekly petty sessions. The revenue of the corporation is about 1100*l.* a year.

Dartmouth is delightfully situated on a declivity on the west bank of the river Dart. Some of the houses are extremely old and possess some fine specimens of wood-carving; but generally the town is dirty and the streets narrow and ill-paved. The country around is exceedingly beautiful and picturesque, and contains some delightful country seats. A flying bridge has lately been established across the river Dart. The harbour is very safe and convenient, and can accommodate 500 ships. The entrance is between the ruins of Kingswear castle and the fort and church of St. Petrock, where a battery has been erected. The port is under the direction of a governor, appointed by the corporation, and extends from the river Teign to the river Erme, a distance of about 40 miles.

The parishes of St. Petrock, St. Saviour, and of Townstall, which now form the borough of Dartmouth, contain respectively 1035, 2316, and 1246 inhabitants, making a total of 4597.

The trade consists principally in the export of woollen goods and cider, and the import of wine, and formerly of iron. In 1828 there were 348 vessels belonging to the port. Nearly 3000 of the inhabitants are employed in the Newfoundland and other fisheries.

The river Dart is navigable as far as Totness, and its banks are surrounded with beautiful scenery. There are no fairs of any importance at Dartmouth. The market-day is Friday.

The living of St. Petrock is a perpetual curacy: the church is beautifully situated at the entrance of the harbour. St. Saviour is a perpetual curacy annexed to the vicarage of Townstall, in the patronage of the corporation. The interior of the church is highly ornamented. The pulpit is of stone, richly sculptured and gilt, and the screen is beautifully carved. The old oak ceiling is still in a good state of preservation. The living of Townstall is a discharged vicarage also in the patronage of the corporation. All three parishes are in the diocese of Exeter and archdeaconry of Totness. There are places of worship for Baptists, Independents, and Wesleyan Methodists. There are Sunday-schools in each parish supported by subscription. In 1715 there was a French church. There are several charitable bequests for the benefit of the poor and instruction of children: amongst others, Mr. John Lovering, in 1671, founded an alms-house for decayed seamen or their widows; but the house was accidentally burnt down and the charity has been entirely lost. In 1679 Walter Jago, John Haynes, and Arthur Holdsworth, gave a rent-charge of 18*l.* per annum to the parish of St. Saviour, 3*l.* 12*s.* of which was to be given to a Latin master and 3*l.* 12*s.* to an Arithmetic master. The grammar-school has no further endowment. Newcomen, the inventor of the steam-engine, was a native of Dartmouth.

DARWAR, a district in the province of Bejapore, was formerly part of the territory of the Peishwa, and came into possession of the English in 1818. In the following year there occurred a serious failure of the harvest, accompanied by an epidemic, which carried off one in twenty-four of the population, amounting to 600,000. The revenue of the district was at that time 152,150*l.* [Bejapore.]

From a return made by the political agent of the East India Company resident at Darwar in 1825, it appears that there were then in the district 1441 villages, only 150 of which were provided with schools, in which 2351 scholars were instructed; 871 of these learned only reading, writing, and simple arithmetic; 1390 learned to write on sand, or on boards besmeared with a kind of earth called dowlacharam, and 107 were taught to read Persian books.

DARWAR, the capital of the above district, is situated in 15° 28′ N. lat., and 75° 8′ E. long. It is a fortified town, and was besieged by an allied force of English and Mahratta troops for twenty-nine weeks in 1791, when it surrendered by capitulation. During the operations of the siege the town was nearly destroyed, but has long since been restored.

DARWIN, ERASMUS, an English physician and physiologist, was born at Elton, near Newark, on the 12th December, 1731. After studying at St. John's College, Cambridge, and taking the degree of doctor of medicine at Edinburgh, he established himself as a physician at Lichfield, where he married, and resided till after the death of his first wife, by whom he had three sons. In the year 1781, having again married, he removed to Derby, where he died on the 18th of April, 1802, in the 70th year of his age. He is said to have been a man of an athletic person, and of temperate habits, the advantage of which he lost no opportunity of pointing out to those over whom his influence extended; his biographers give him credit for having done much service to the poor of Lichfield in this respect.

Dr. Darwin claims a place in this work as a general physiologist and a poet. In the year 1781 he published his 'Botanic Garden,' a poem in two books; in 1793, his 'Zoonomia, or Laws of Organic Life,' which was succeeded in 1796 by a continuation of the subject, the whole forming two volumes in 4to.: and in 1800, his 'Phytologia,' or Philosophy of Agriculture and Gardening, in one volume 4to. of rather more than 600 pages. All these works have excited considerable attention; by some they have been extravagantly praised, by others as unreasonably depreciated, and at the present day they are little read or consulted. Nevertheless, they are far from deserving to sink into neglect and oblivion. This author was unquestionably a man of a highly original turn of mind; he was unusually well read in the physics of his day; he had a singular aptitude for seizing and illustrating natural analogies, and above all he was fully impressed with a sense of the important truths of a universal simplicity and harmony of design throughout the whole creation. It is true that his analogies are often imaginary, his theories untenable, and his illustrations overstrained, but many of these errors were inevitable in the state of natural history in his day, and the others are by no means sufficient to overbalance his claims to fame as a clear-sighted, ingenious, and often profound physiologist. Darwin's 'Botanic Garden' is divided into two books, very unequal in size and in merit. The first, which explains the principal phenomena of vegetation, is superior in every respect to the second, which is devoted to what he calls the 'Loves of the Plants,' forming a poetical commentary upon some of the most curious phenomena of vegetable fertilization. That the character of this poem is by no means of a high order must, we think, be on all hands allowed, for its language is often tawdry and tinselly, its similes extravagant, and its machinery fantastical and incomprehensible; but on the other hand it abounds in passages which have never been excelled for their elegant and forcible description of natural objects, in poetical language, and it can by no means be admitted that where an author's powers are expended upon an illustration of the laws of any part of the creation, they are applied to mean and insignificant subjects. It is only where he calls to his aid the fancies of the Rosicrucians that he wastes his talent and fatigues his reader. His 'Phytologia' is remarkable for the number of novel and ingenious ideas which it contains; they were too far in advance of those of his contemporaries to be much esteemed when they appeared, but they are singularly in accordance with many of those opinions which now are either altogether recognized or are under discussion, with a strong probability of being finally adopted. For instance, he particularly insisted upon the close analogy between plants and animals in their functions, showing that the difference between the two kingdoms is the necessary consequence of the difference between their wants, necessities, and habits of life. He urged with great force that every bud of a plant is the seat of a separate and in some measure independent system, that plants are therefore in one sense congeries of individuals living in concert but growing independently; finally, he pointed out the analogy between buds and seeds, showing that the woody part of plants is really analogous to the roots of seeds, and produced by the adhesion of the descending matter of organization which passes downwards from the buds. While, however, we thus give Darwin credit for a rank in science that has hardly been accorded to him before, we are bound to add that his errors were neither few nor unimportant. He was too fond of tracing analogies between dissimilar objects; he readily adopted the ingenious views of others without sufficient inquiry; he had the great fault of being often a credulous collector and a fanciful reasoner, and finally his prose writings are often inexcusably inelegant, ill arranged, and ungrammatical.

DASYORNIS. [THRUSHES.]

DASYPROCTA. [AGOUTI, vol. i., p. 212.]

DA'SYPUS. [ARMADILLO, vol. ii. p. 350.]

DASYU'RUS. [MARSUPIALIA.]

DATA, DATUM. A datum is any quantity, condition, or other mathematical premiss which is given in a particular problem. Thus in the question 'to draw a circle which shall have its centre in a given line, and shall touch two other straight lines,' the data are as follows: 1, That the figure described is to be a circle; 2, a certain straight line; 3, that the centre of the circle is to be on that straight line; 4, two other straight lines; 5, that the circle is to touch those straight lines. Data may be divided into two classes, the latter class being the restrictions which it is necessary to place upon the one already described in order that the problem may be possible. Thus the preceding problem becomes absurd when the three straight lines are parallel, unless the line on which the centre of the circle s to lie be midway between the two others. Either then he problem must be proposed with the limitation 'if it be possible,' or an express datum of exclusion must be introluced, namely, that the three straight lines must not be parallel, unless, &c.

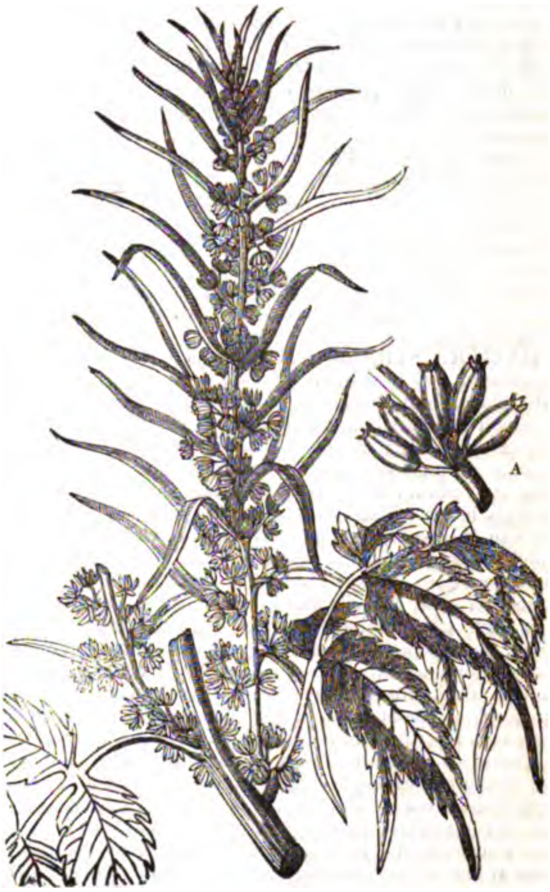
In the mere etymology of the word datum all legitimate consequences are data when the premises are data. Thus, given two circles which touch, there are also given two circles which have a common point in the line joining their centres. The book of Euclid known by the name of Data δεδομένα) is the deduction of magnitudes from other magnitudes, not as to what they are, but as to whether they re determined or not. Thus one of the propositions is, If a given magnitude be cut in a given ratio, the segments re given.' The preface of Marinus to this book contains dissertation on the meaning of the term. [EUCLID.]

DATHOLITE, a mineral which contains boracic acid, ilica, and lime. It has been found at Arendahl in Norway, and a few other places. It occurs both massive and rystallized in rhombic prisms, the lateral edges and the olid angles of which are usually replaced by planes. The olour of datholite is greyish or greenish white, and it is ranslucent; its specific gravity is about 3; it yields to the nife; the fracture is imperfect conchoidal; the lustre is omewhat vitreous. According to the analysis of Vauque-n, it consists of

Boracic acid	21·67
Silica	37·66
Lime	34·
Water	5·5
	98·83

DATISCA'CEÆ, a small natural order of plants allied o Urticaceæ and the other apetalous orders in their vicinity, ut distinguished by its inferior ovary with parietal placentæ. It has unisexual flowers; the males have a calyx of several pieces, and from eight to fifteen stamens; the females have an obsolete superior calyx, and three little recurved stigmas at the apex of an oblong one-celled ovary, with three many-seeded parietal placentæ. The seed-vessel opens at the end like that of Reseda; the seeds are inclosed in a finely netted bag, and contain a straight embryo without albumen.

Datisca cannabina, the commonest plant of the order, is an herbaceous diœcious perennial, with stems about three feet high, pinnated leaves with from five to nine ovate-acuminate coarsely-serrated leaflets, and long racemes of flowers collected in clusters in the axils of long linear bracts It is a native of the southern parts of Europe, where, especially in Candia, it is used on account of its bitter tonic properties as a substitute for Peruvian bark; it also affords a yellow dye.



A male plant of Datisca cannabina. A, a cluster of ripe fruit from a female plant.

DATU'RA, a genus of Solanaceous plants, with a funnel-shaped angular five-lobed calyx, a corolla of a similar form, but much larger, and a four-celled capsule, which is either smooth or muricated externally; the base of the calyx moreover adheres to the seed-vessel in the form of a circular disk.

Several species of this genus are known in cultivation, the very large size of their funnel-shaped flowers rendering them conspicuous objects; they have however a nauseous odour, and are only handsome when in flower, for which reason they are not general favourites. They are all exotics, with the exception of the following, in whose properties they coincide.

D. Stramonium, the Thorn-apple, is by no means an uncommon annual upon dunghills, rubbish-heaps, and waste-places near houses. It grows about three feet high, with a light-green stiff stout stem, which is slightly downy near the upper end. The leaves are broad, oval, stalked, sharp-pointed, sinuous, and angular. The flowers are large, white, or occasionally dull light purple, and grow singly from the side of the stem opposite the origin of the leaves; they are erect, and placed upon a very short peduncle. Their calyx is tubular, elongated, a little swollen at the lower end, with five prominent ribs, ending in as many sharp-pointed lobes; after flowering, it all drops off, except the base, which surrounds the fruit in the form of a circular disk. The corolla is much larger than the calyx, of a similar form, but its lobes are more taper-pointed. There are five stamens, which are inclosed in the tube of the corolla. The ovary is covered with small sharp points, and contains four cells, in each of which is a considerable number of ovules. The style is cylindrical, smooth, and enlarged at the upper end. The fruit is a spiny oval capsule of four imperfect cells, which communicate with each other in pairs. The seeds are brown, kidney-shaped, with a scabrous surface.

This plant is well known, under the name of Stramonium, as a powerful and dangerous narcotic. Its leaves and seeds are the parts employed, and they are found to possess properties similar to those of henbane and belladonna. The leaves are occasionally smoked, especially by country people, as a remedy for asthma; the seeds are employed by thieves to drug the beverage of their victims. In small doses they produce symptoms of frenzy; in larger quantities, stupor and death. The poisonous principle of this and other species is considered a peculiar vegetable alkali, and called Daturine.

Datura arborea and *bicolor*, beautiful arborescent South American plants, the former with long white flowers, and the latter with yellow or scarlet ones, are noble objects in the gardens of this country. They participate in the properties of the true Daturas, but they are not now considered to be genuine species, on account of their calyx slitting on one side and remaining permanent around the base of the fruit; they are stationed in a genus called Brugmansia.

DATU'RA STRAMO'NIUM, or THORN APPLE, an introduced but now frequently self-sown and consequently wild plant, found particularly wherever a garden has been in which it flourished. The leaves and seeds are officinal. The leaves during drying diffuse a stupifying odour, and become deep grayish green; the dried leaves scarcely possess any odour: the taste is disagreeable, saline, and strongly bitter. The seeds are kidney-shaped, flat, about the size of linseed, uneven, nearly black: when bruised the smell is disagreeable and repulsive; taste bitterish and oily; by expression sixteen ounces of fresh seeds yield two ounces of clear fat oil, which has neither taste nor odour. The seeds of the other species of Datura are often substituted, perhaps without any great disadvantage. They are also confounded with the seeds of Nigella Sativa, which, though black, are smaller, nearly three-cornered, and have an acrid aromatic taste, and in considerable quantity are poisonous like those of Stramonium.

The seeds are used to form the extract; they, as well as the unripe capsules, yield the alkaloid called Datura, which crystallizes from its solution in alcohol or water in colourless shining aggregated prisms; without odour when pure, but when impure possessing a strongly narcotic odour; taste at first bitter, then very acrid, and like tobacco. This is extremely poisonous: one-eighth of a grain can kill a sparrow in less than three hours; and the smallest quantity applied to the eye causes very lasting dilatation of the pupil. At the ordinary temperature of the air it is quite unalterable: it is much less decomposable than hyoscyamia or conia. In a hydrous state it has a strongly alkaline reaction: acids completely neutralize it and form salts, which are procured by solution of daturia in dilute acids and evaporation in a moderate temperature. They are easily crystallizable. Geiger recommends daturia or its salts as a preferable form to any hitherto in use.

Stramonium in small doses causes slight convulsive action about the throat, with dryness of the tongue, disposition to vomit, and general diminution of sensibility, with slight increase of secretion of the skin, mucous membranes, and kidneys, but if the dose be larger, the brain becomes affected, and vertigo, indistinctness of vision, with dilatation of the pupil, disposition to sleep, or coma, but more frequently delirium, are added. The delirium is always peculiar, and the individual manifests a disposition to perform ridiculous actions, or assume absurd positions. If the dose be still larger, and produce fatal effects, the brain is usually found to be much congested, the vessels being gorged with blood. Large bleedings generally save the patient; emetics can rarely be made to act, as is observed when other narcotic poisons have been taken. Stramonium is most useful in cases of increased sensibility, particularly in local affections of the nerves; it is decidedly useful in allaying pain of the sciatic nerve, particularly when combined with ipecacuan. It has been recommended in mania, especially when accompanied with lucid intervals, in epilepsy, and hysteria; but with very variable success, probably to be accounted for by the careless preparation of the medicine. It is popularly used for smoking, to allay paroxysms of asthma, but its employment in this way is quite empirical, and regulated by no clear principle. By the action of heat during smoking, an empyreumatic oil is found, similar in properties to that of hyoscyamus.

DATU'RIA, a vegetable alkali, obtained from the seeds of the *Datura Stramonium*, or stramony; it is a colourless crystalline substance, which has an acrid bitter taste, and is very poisonous. It is soluble in about 280 parts of cold and 72 of boiling water, and is readily dissolved by alcohol. It combines with acids, forming salts, which are generally crystallizable, soluble in water, and suffer no alteration by exposure to the air. These salts are decomposed by the alkalis, potash, soda, and ammonia, which precipitate the daturia in the state of colourless flocculi. It does not appear to have been analyzed; but, like the other substances of the same class, there is no doubt of its being composed of hydrogen, carbon, oxygen, and azote.

DAUBENTON, LOUIS JEAN MARIE, a justly celebrated naturalist and zootomist, born at Montbard in Burgundy, on the 29th of May, 1716. The church was his destination, and he was sent to Paris to study theology; but he gave in secret those hours to medicine and anatomy which his father hoped he was devoting to ecclesiastical reading. The death of this parent left him at liberty to follow the path he loved; and, having taken his degrees at Rheims, he returned to Montbard, for the purpose of exercising his profession. But there was a kindred spirit that, happily for zoology, had been connected from infancy with Daubenton. The Comte de Buffon, born at the same place, knew him well in youth, and when, in after life, Buffon was appointed intendant of the Jardin du Roi, his thoughts reverted to Daubenton as the person of all others qualified by his zeal and ability to prosecute those anatomical inquiries, the details of which his own feebleness of sight prevented him from investigating. The count drew Daubenton to Paris in 1742, and in 1745 the office of Curator and Demonstrator of the Cabinet of Natural History was conferred upon a man eminently fitted by his quick discernment, his untiring diligence, and his inexhaustible patience, to fill the situation with the greatest possible advantage to the public. No one can open the 'Histoire Naturelle des Animaux' without being struck by the multitude and justness of the facts (for he carefully avoided all theory) with which Daubenton enriched that work, and in some degree corrected the fervid imagination of his brilliant coadjutor. But he did this without presuming in the least to draw general inferences: he confined himself strictly to facts; and such was his modesty, that Camper used to say of him that he himself was not aware of the discoveries which he had made. His valuable labours adorned the fifteen first volumes of Buffon's great work in 4to.; and the editions in which this essential part of the publication is wanting, are justly considered as deprived of their fairest proportions. But Buffon in an evil hour suffered his ear to drink the intoxicating poison of fawning flatterers, and published a little edition (in 12mo.), of which Daubenton's labours formed no part. The hint was more than sufficient for the modest Daubenton, and from that time the assistance of Guéneau de Montbeillard and of Bexon in the ornithological department but ill supplied the exquisite dissections and demonstrations which had rendered the former part of the work so highly valuable to the physiologist. For fifty years did Daubenton labour without cessation in enriching and arranging the magnificent collection committed to his charge. He is said to have been the first professor of natural history who gave lectures by public authority in France; one of the chairs of the College of Medicine having been converted into a chair of natural history at his request, it was conferred on him in 1778. The Convention having elevated the Jardin du Roi into a public school, under the title of the Museum of Natural History, he was named Professor of Mineralogy, and retained the professorship as long as he lived. In 1783 he became Professor of Rural Economy at Alfort, and gave lessons in natural history at the normal school in 1795. To him France in a great measure owes the introduction and successful propagation of the breed of Spanish sheep. In 1799 he was elected a member of the senate, and the alteration in his habits caused by this new dignity is supposed to have hastened his death, which took place after an apoplectic attack of four days' duration in the night of the 31st December and 1st January, 1799 and 1800, when he was nearly 84 years of age.

Daubenton's life, with the exception of the cloud that came between him and Buffon, raised by the weakness of the latter, was a happy one. His hours were spent in pursuits that were dear to him; he was universally respected and beloved, for he was as amiable as he was learned; and his simple habits gave him, notwithstanding his natural weakness of constitution, a long life. Daubenton was married to the authoress of 'Zélie dans le Desert,' and though his union was in other respects most happy, he left no children.

Lacépède, Cuvier, and Moreau de la Sarte, have justly eulogized this good and great man.

Notwithstanding his incessant occupation at the Museum, he found time to publish much in addition to his writings in the 'Histoire Naturelle.' He was a contributor to the first Encyclopédie, and many of his papers on the natural history of animals and on minerals are to be found in the 'Mémoires de l'Academie des Sciences,' from 1754 to 1764. Two of his most interesting papers (though all are good) are those of 1762, on fossil bones pretended to be those of a giant, but which Daubenton referred to their true species, and of 1764, on the essential differences between man and the orang outang. His 'Instruction pour les Bergers,' 1 vol. 8vo., Paris, 1782, his 'Tableau Méthodique des Mineraux,' 1784, 8vo., and his 'Mémoire sur le premier drap de laine superfine du crû de France,' which also appeared in 8vo. in 1784, must not be forgotten in a recollection of his works. (*Biog. Universelle*, &c.)

DAUCUS, a rather large genus of umbelliferous plants, with hispid fruit, of a somewhat compressed ovate or oblong form, the primary ridges filiform and quite bristly, the secondary ridges prominent, winged, and divided at the edge into a number of fine teeth or hooks. De Candolle enumerates 38 species, chiefly biennials, but it is doubtful whether several of them are not mere varieties of each other. The only one to which general interest attaches is the *Daucus Carota*. This plant, which grows wild all over Europe in chalky soil, is believed to be the origin of our garden carrot, but there is no record of its having first begun to change its hard wiry juiceless wild root for the nutritious succulent carrot of the gardens. De Candolle gives for the range of the wild plant the meadows and pastures of Europe, the Crimea, and Caucasus, whence it has been transported into China, Cochin China, America, and elsewhere. [CARROT.]

DAUDIN, FRANÇOIS MARIE, the son of a receiver-general of finance, was born at Paris towards the close of the eighteenth century. Nearly deprived of the use of his limbs by natural infirmity, he early devoted himself to the study of the sciences, and more particularly to natural history. His memoirs soon found their way into the 'Magasin Encyclopédique' and the 'Annales du Muséum d'Histoire Naturelle,' and he contributed some articles to the 'Dictionnaire des Sciences Naturelles.' His two principal works are his 'Traité d'Ornithologie,' which was never finished, and his 'Histoire Naturelle des Reptiles.' For the first much cannot be said: it is on the second that his fame will rest. Cuvier speaks of the latter as the most complete work on that class of animals which had hitherto appeared. His wife, who is represented as amiable both in mind and person, and as having actively assisted in the composition and illustration of his works, died of consumption; and poor Daudin, whose life, as well as that of his partner, had been long embittered by the deranged state of his affairs, followed her in a few days, before he had attained thirty years of age. He died in 1804, and left no children. (*Biogr. Universelle*, &c.)

DAUNIA. [APULIA.]

DAUPHI'N, the title given to the eldest son of the king of France under the Valois and Bourbon dynasties. The origin of the word has been a matter of some dispute. The Counts of Albon and Grenoble are mentioned first in the ninth century as feudatories of the kingdom of Arles; they afterwards assumed the title of Counts of Vienne, and became independent, like other great feudatories. Guy VIII., Count of Vienne, is said to have been surnamed Le Dauphin, because he wore a dolphin as an emblem on his helmet or shield. The surname remained to his descendants, who were styled Dauphins, and the country which they governed was called Dauphiné. Humbert II. de la Tour du Pin, the last of the Dauphin dynasty, having lost his only son, gave up his sovereignty by treaty to King Philippe de Valois in 1349, after which he retired to a Dominican convent. (Moreri, and the French historians.) From that time the eldest son of the king of France has been styled Dauphin, in the same manner as the eldest son of the king of England is styled Prince of Wales. Since the dethronement of the elder branch of the Bourbons in 1830, the title of Dauphin has been disused. The last who bore it was the Duke of Angoulême, son of Charles X.

DAUPHINE', a province of France, constituting (with the principality of Orange) one of the thirty-two military governments into which that kingdom was divided before the Revolution. It was on the south-east frontier. In its form it approximated to a triangle, having its three sides respectively opposite to the north-east, south-south-east, and west. On part of the north-east side and on the west side it was bounded by the Rhône, by which it was separated from the district of Bresse, in Bourgogne, on the north-east, and from the Lyonnois and Languedoc on the west: on the south it was bounded by Le Comtat de Venaissin and by Provence, and on the remainder of the north-east side by the crests of the Alps, by which it was separated from Piedmont and Savoy. It now forms the three departments of Isère, Drôme, and Hautes Alpes; but the name continues in use, though a different division has been established by law.

Dauphiné is one of the most mountainous districts in France; branches from the Alps traverse it, and some of the loftiest summits of that mountain system are close upon or within its boundary: no other part of France has points equally elevated. Mont Olan is 13,819 feet, a peak west of Maurin 13,107, and Mont Trois Ellions, east of Grenoble, 12,737 feet. The country is watered by a number of streams, which flow into the Rhône, either immediately, or by the Isère, Durance, and other tributaries. The pasturage is excellent, both in the plains and on the mountains; and the wines good, especially the Hermitage, Côte Rôtie, and St. Peray.

Dauphiné was, under the old regime, subdivided into Haut (upper) Dauphiné and Bas (lower) Dauphiné. Haut Dauphiné comprehended the districts of Les Baronies, Le Gapençois, L'Embrunois, Le Briançonnois, Le Champsaur, Le Grésivaudan, and Le Royanès or Royanez. Bas Dauphiné comprehended Le Tricastin, or Tricastinois, Le Valentinois, Le Diois, and Le Viennois. Several of these districts took their names from their chief towns. Dauphiné had a provincial tribunal, or parlement, which held its sittings at Grenoble. This city, which may be considered as the capital of Dauphiné, as well as of the subordinate district of Grésivaudan, is on the Isère: it had in 1832 a population of 24,268 for the town, or 24,888 for the whole commune. The other chief towns are Vienne, capital of Le Viennois (population 13,410 for the town, or 14,079 for the whole commune); Valence, capital of Le Valentinois (population 8898 for the town, or 10,406 for the whole commune), both on the Rhône: Romans, on the Isère (population 7677 for the town, or 9285 for the whole commune); Voiron (population 6924); Montelimar, on the Jabron, which falls into the Rhône (population 5816 for the town, or 7560 for the whole commune); Gap, capital of Le Gapençois (population 4572 for the town, or 7215 for the whole commune): Crest, on the Drôme (population 3895 for the town, or 4901 for the whole commune); Bourgoin, on a small stream which flows into the Rhône (population 3447 for the town, or 3762 for the whole commune); Die, capital of Le Diois, on the Drôme (population 3213 for the town, or 3555 for the whole commune); Niens, or Nyons, on the Aigues, which flows into the Rhône (population 2700 for the town, or 3397 for the whole commune); Embrun, capital of L'Embrunois, on the Durance (population 2392 for the town, or 3062 for the whole commune); St. Marcellin, near the Isère (population 2191 for the town, or 2775 for the whole commune): Le Buis, capital of Les Baronies, on the Ouvèze (population 1886 for the town, or 2180 for the whole commune); Pont-en-Royans, capital of Royanès, on the Bourne, a feeder of the Isère; Briançon, capital of Le Briançonnois, on the Gursane, a tributary of the Durance; St. Bonnet, capital of Le Champsaur, on the Drac, a feeder of the Isère; and St. Paul-Trois-Châteaux, capital of Le Tricastinois, not far from the Rhône.

Dauphiné had two archiepiscopal sees, Vienne (now united with Lyon), established in the second century; the diocese of which comprehended the greater part of Le Viennois, and extended into Le Valentinois, and into Le Vivarais, a district of Languedoc, and included 355 parishes and 10 abbeys; and that of Embrun, established about A. D. 330, which comprehended L'Embrunois and Le Briançonnois, and extended into Provence, and included 400 parishes and one abbey. There were five bishoprics: Valence, established in the third century, the diocese of which comprehended part of Le Valentinois, and extended into Le Vivarais in Languedoc, and included 140 parishes and 4 abbeys: Grenoble, established in the fourth century, the diocese of which comprehended Le Grésivaudan, Le Royanès, and Le Champsaur, and extended into Le Valentinois and into Savoy, and included 334 parishes and 2 abbeys; Die, established A. D. 220, the diocese of which included Le Diois, and extended into Le Valentinois, and into Provence and Le Comtat Venaissin, and included 70 parishes and one abbey; Gap, established in the fifth century, the diocese of which comprehended Le Gapençois, and extended into Les Baronies and into Provence, and included 221 parishes and one abbey; and St. Paul-Trois-Châteaux, the diocese of which comprehended Le Tricastinois, and extended into Provence and into Le Comtat Venaissin, and included 34 parishes and one abbey. Beside these dioceses, those of Lyon (archbishopric) and Belley (in Bugey), extended into Le Viennois; and that of Vaison (in Le Comtat de Venaissin) into Les Baronies. When Expilly published his *Dictionnaire des Gaules et de la France*, A. D. 1764, there were 11 abbeys (including one which had been secularized) and 70 convents, and other religious houses for men, beside 5 houses of the Jesuits, suppressed in 1763; 10 abbeys and 41 convents for women: these establishments contained 1840 men and 1095 women, bound by monastic vows, and enjoyed revenues amounting in the aggregate to 837,200 livres, or nearly 35,600*l.* a year. The Great Chartreuse [CHARTREUSE] was the most important. There were beside 12 general hospitals, and 10 maladreries or hospitals for lepers. It is to be observed, that Expilly gives a very different account of the number of parishes from that given by Prudhomme in *Le Dictionnaire Universel de la France*, and quoted by us above; they must have adopted different principles in drawing up their respective tables. The archbishop of Vienne had for his suffragans the bishops of Grenoble, Die, and Valence; of Viviers in Le Vivarais (Languedoc), and of Geneva or Annecy, and Maurienne in Savoy: the archbishop of Embrun had for his suffragans the bishops of Digne, Glandèves, Grasse, Vence, and Senés, all in Provence, and Nice in Italy. The bishop of St. Paul-Trois-Châteaux was a suffragan of the archbishop of Arles, in Provence; and the bishop of Gap, of the archbishop of Aix, in Provence.

Since the Revolution, the ecclesiastical constitution of the district has been entirely changed; the archiepiscopal dignity of Vienne has been incorporated with that of Lyon; but the conjoint diocese comprehends scarcely any part of the antient Dauphiné: that of Embrun has been annexed to those of Aix and Arles, but no part of Dauphiné is in the conjoint diocese. The bishop of Grenoble, whose diocese comprehends the department of Isère, is a suffragan of the archbishop of Lyon and Vienne; the bishop of Valence, whose diocese comprehends the department of Drôme, is a suffragan of the archbishop of Avignon; and the bishop of Gap, whose diocese comprehends the department of Hautes Alpes, is a suffragan of the archbishop of Aix, Arles, and Embrun. The other bishoprics of Dauphiné have been abolished.

Before the Roman Conquest this country was inhabited by the Celtic tribes, the Allobroges in the north, and in the south the Segalauni, or Sego-vellauni, and the Tricastini, on the banks of the Rhône; the Tricorii and the Caturiges, among the Alps; and the Vocontii in the intermediate space. The Vocontii, the Segalauni, the Tricastini, and perhaps the Tricorii, were the earliest subdued. The Allobroges had been reduced to subjection by C. Pomptinius, the prætor, a short time before Cæsar's arrival in Gaul; but the Caturiges, in the fastnesses of the Alps, preserved their independence, and attempted with the other mountaineers to impede Cæsar's march when he led his forces out of Cisalpine Gaul to oppose the Helvetii. (Cæs., *Bel. Gal.*, I., 10.) They were probably subdued in the time of Augustus. In the first division of Gaul into four provinces (by Augustus), Dauphiné was included in the province Narbonensis: when, at a subsequent period, Gaul was subdivided into seventeen provinces, Dauphiné was included mostly in Viennensis, partly in Narbonensis Secunda, and partly in Alpes Maritimæ. Among the principal towns under the Roman dominion were Vienna (Vienne) and Cularo, afterwards Gratianopolis (Grenoble), in the territory of the Allobroges; Valentia (Valence), in the territory of the Segalauni; Dea (Die), in the territory of the Vocontii; and Ebrodunum (Embrun), in that of the Caturiges: Vienna, Valentia, and Dea, were colonies. Upon the downfall of the Roman empire, Dauphiné formed part of the kingdom of the Burgundians [BURGUNDIANS]; and upon the overthrow of that kingdom became subject to the Franks. It suffered from the ravages of the Saracens in the time of Charles Martel, and formed part of the kingdom of Bourgogne Cisjurane, founded by Boson near the end of the ninth century. [BOURGOGNE.] In the course of the eleventh century, or even earlier, many feudal principalities were formed in Dauphiné, the more powerful among which were called counties, the others baronies. The counts of Albon acquired the predominance among these nobles, and in course of time gained possession of Le Grésivaudan, Le Viennois, Le Gapençois, L'Embrunois, and Le Briançonnois. Guy VIII., who died about the middle of the twelfth century, was the first who had the title of Le Dauphin; his successors retained it, and insensibly the title of Count of Albon was lost in that of Dauphin of Le Viennois, and the country acquired from this new title of its lords the name of Dauphiné. These Dauphins owed feudal subjection to the Germanic empire, with which the crown of Bourgogne had been united. The Dauphin, Humbert II., by treaties made in the years 1343-49, disposed of his states in favour of the king of France. He nominated as Dauphin, by the treaty of 1343, the second son of Philippe VI. (de Valois), then king of France; so that the common notion that he stipulated that the eldest son should bear the title is erroneous. The territory thus ceded to the French crown comprehended the districts enumerated above as belonging to the counts of Albon: the other parts of Dauphiné are subsequent acquisitions. (Expilly, Prudhomme, *Dict. Universel de la France.*)

DAUPHINE' D'AUVERGNE, a small territory of Auvergne, ceded to Guillaume IV., Count of Auvergne, when deposed from his county by his uncle Guillaume l'Ancien (the elder). Vodable, a small town near Issoire, was the capital.

D'AVENANT,* WILLIAM, was born at Oxford in 1605. His father kept the Crown Inn there, and some have gathered, from Wood's words, hints of a connection having existed between his mother and Shakspeare, who frequented that place of entertainment. He was entered at Lincoln College, Oxford; but it does not appear that he took a degree. He then became page to the duchess of Richmond, and was afterwards in the family of Lord Brooke, the poet. In 1637 he succeeded Ben Jonson as laureat: and in 1641 was accused by the parliament, and forced to retire to France. Two years after, he was knighted by Charles, at the siege of Gloucester; but in 1646 we find him again in France, a Roman Catholic, and in the employ of Henrietta. Being taken prisoner at sea in 1651, he only escaped being tried for his life by the intercession of some friends, among whom are said to have been Milton and Whitelocke. His works consist of dramas, masques, addresses, and an unfinished epic called Gondibert, which he dedicates to Hobbes. The only work for which he is now remembered is an alteration of the Tempest, in which he was engaged with Dryden; 'and marvellous indeed is it that two men of such great and indubitable genius should have combined to debase and vulgarize and pollute such a poem; but, to the scandal of the English stage, it is their Tempest, and not Shakspeare's, which is to this day represented.' (Southey.) He appears to have been the first to mix the English drama with the French heroic play, and to introduce the examples of moral virtue 'writ in verse, and performed in recitative music.' (Dryden.) As he established a theatre as early as 1657, the times might be partly in fault, but his long residence in France had probably influenced his taste. He died in 1668, and was buried in Westminster Abbey. (Wood's *Athen. Oxon.*; *Biogr. Brit.*; Southey's *British Poets.*)

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* Or Davenant: a joke in Wood's 'Athen. Oxon.' renders it probable the alteration was his own.

DAVENTRY. [NORTHAMPTONSHIRE.]

DAVID. [PSALMS.]

DAVID, JACQUES LOUIS was born at Paris in 1750. In 1774 he went to Rome to study; he returned to France ten years afterwards, and attained considerable reputation, both as an historical and portrait painter. Upon the breaking out of the revolution he threw himself amongst the foremost ranks of the revolutionists. He was the intimate friend of Robespierre, and was appointed manager of all the spectacles and allegorical shows of the republic. He proposed to construct a colossal figure of the people out of the ruins of the statues of the kings, to be placed on the Pont-Neuf, but never proceeded farther than a model, from which, however, the design for the reverse of the republican coin was taken, which was used several years. When Robespierre, anticipating his downfall, expressed himself ready to die the death of Socrates, David, who was present, exclaimed, 'Robespierre, if you will drink the hemlock I will drink it also.' In 1794 he was denounced, and imprisoned, altogether for about a year; but was ultimately liberated, and appears thenceforward to have taken a less prominent part in political matters. He was appointed principal painter to the National Institute. In 1815 he was banished from France with those who had voted for the death of Louis XVI., and took up his abode in Brussels, where he died December 29, 1825. Many anecdotes of his cruelty during the revolution are related by his enemies, but they are not well authenticated; others, in proof of his patriotic magnanimity, are scarcely better established. He appears in truth to have been a man of narrow capacity, and of a warm but not malicious disposition. He is described as being afflicted with a tumour in his jaw, which disfigured his appearance, and so disturbed his utterance that he could not speak ten words in the same tone. To this imperfect speech he added a blustering manner.

David is said to have expressed a wish, that, if an Athenian were to revisit the earth, he might take him for a Greek painter. This is the key to his style, which is a servile imitation of the Greek sculptures; his figures are like statues coloured and put in motion; his drawing is correct, and his composition classical; but his design is constrained and artificial, with a hard outline and harsh colour. The 'Rape of the Sabines' is considered one of the best of his works, which are chiefly at Paris. His portrait of Napoleon is well known.

DAVID'S, ST., a city and parish in the hundred of Dewisland, in the western extremity of Pembrokeshire. It was antiently large and populous, and during the middle ages was the resort of a great number of pilgrims. At present its appearance is that of a poor village, the houses, excepting those of the clergy, being mostly in a ruinous state. The locality is lonely, and the neighbouring district wild and unimproved; but it is still an interesting place as the seat of a large episcopal see, with a fine cathedral and the remains of other magnificent religious edifices. The situation is near the rocky promontory called St. David's Head, on a declivity, a mile from the northern shore of St. Bride's Bay, 16 miles north-west of Haverfordwest, 26 north-west of Pembroke, and 270 west of London. In 1831 the population of the parish, of which the Isle of Ramsay constitutes a part, was 2388. Druidical remains are numerous in the neighbourhood, consisting of sepulchral heaps of stones, barrows, tumuli, holy wells, and some antient fortifications. It is said that a church and monastery were first founded here by St. Patrick about A.D. 470. It is certain however that in the first period after the introduction of Christianity into Britain, three archbishops' seats were appointed, namely, London (transferred afterwards to Canterbury), York, and Caerleon, in the county of Monmouth, and that this last was removed about A.D. 519, in the reign of King Arthur, to Mynyw (called by the Romans Menevia), which received the name of St. David's in honour of the archbishop and saint, by whom the transfer was accomplished. Hence the appellation of *Menevensis*, assumed by the bishops of this see, which was the metropolitan and archiepiscopal see of Wales until A.D. 930, when Sampson, the last of twenty-five archbishops, withdrew to Britanny, and carried with him his clergy and the sacred pall of office. (See a description of this holy ephod by Cressy, l. 35, c. 15.) His successors continued however to administer consecration to the priesthood until the reign of Henry I., when Bishop Bernard acknowledged subjection to the see of Canterbury. The diocese of St. David's contains the entire counties of Pembroke, Caermarthen, Brecknock, and parts of Radnor, Monmouth, Hereford, Montgomery, and Glamorgan. The ecclesiastical corporation consists of a bishop, four archdeacons, a precentor, chancellor, treasurer, nineteen prebendaries, eight vicars choral, four choristers, and several subordinate officers. On the south side of the city, towards the sea-shore, stands the cathedral, the episcopal palace, and college of St. Mary, in ruins, and several other buildings for the residence of the clergy and other appropriate uses. This group occupies a spacious area called The Close, which is surrounded by a lofty wall about a mile in circumference, having four entrances, north, south, east, and west. The principal gate is the eastern, between two massive towers, one sixty feet high. The little river Alan runs through the area, and was crossed by a marble bridge, worn and polished by the pilgrims' feet. Though great damage was done to these edifices by the puritan fanatics of the seventeenth century, their former magnificence, when the episcopal power was equivalent to sovereignty, is apparent in all that remains. The bishop's palace was the most magnificent in the kingdom, the kitchen and cellars being no less admirable than the state apartments. The first cathedral, from its nearness to the sea, was often plundered, and at last was burnt and destroyed by Danish and Norwegian pirates in 1087. The architecture of the present structure, which was erected by Peter, the forty-ninth bishop, is Norman, blended with the richly-pointed Gothic. It is cruciform, 307 feet in length, with a lofty square tower at the west end, a nave, choir, transepts, side aisles, and lateral chapels, one of which is roofed with slabs of freestone. The rood-loft, screen, and roof, which is of Irish oak, are specimens of great architectural skill. The choir is very lofty, containing twenty-eight stalls and a curious moveable pulpit. The bishop's throne is of exquisite workmanship, and resembles that in Exeter cathedral. An altar-tomb, of the son of Owen Tudor, is similar to that of Prince Arthur in the cathedral of Worcester. Numerous antiquarian relics are collected and preserved in the building. In the walls and floor are many sepulchral monuments of the early bishops of the see, as Giraldus Cambrensis, Anselm, Gower, &c. The most antient is that of Rhys ap Gruffyd, prince of South Wales, A.D. 1196; and the most venerated is the shrine of the Archbishop St. David, the tutelar saint of Wales. During many ages it was visited by innumerable pilgrims, among whom were many nobles and kings. William the Conqueror paid his devotions in 1077, Henry II. in 1171, and Edward I. and Queen Eleanor in 1284. The shrine has four recesses for the deposit of the offerings of the pilgrims, who at once relieved their consciences and their pockets. It was ordained by Pope Calixtus that two pilgrimages to St. David's should be accounted equivalent in efficacy to one to Rome. 'Roma semel quantum dat bis Menevia tantum.' The handsome college of St. Mary was founded in 1365 by John of Gaunt. The chapter-house contains a school-room for the instruction of the choristers, and an elegant dining-room, with kitchen and cellars, for the use of the canons when they assemble to audit the accounts of the see. The bishop of St. David's formerly possessed several other palaces and manor-houses in the counties of Pembroke, Cardigan, and Brecknock. The present episcopal residence is at Abergwilly, near the city of Caermarthen, in a noble palace rebuilt by Bishop Burgess. Among his distinguished predecessors in the see have been Dr. Davies, a translator of the English Bible at the Reformation, and Drs. Laud, Bull, Louth, and Horsley.

(Tanner's *Notitia Monastica*, p. 717; Dugdale's *Monasticon*, vol. vi., p. 1301; Fenton's *Pembrokeshire;* Bishop Burgess's *Vindication*, &c., 4to., 1812; *Life of St. David* in *Acta Sanctorum Martiri*, tom. i., p. 39; Brayley and Britton's *Beauties of Wales*, vol. xviii., p. 821-840. The Harleian MS., No. 1294, contains the statutes of the cathedral, and documents relating to its possessions.)

DAVID'S DAY, ST., March 1. St. David, archbishop of Menevia, now called from him St. David's, in Pembrokeshire, lived in the fifth and sixth centuries of the Christian æra; Pits tells us that he died at the age of 146 years. He is said, in the days of the memorable Arthur, to have gained a victory over the Saxons, his soldiers during the conflict, for distinction and as a military colour, wearing *leeks* in their caps. In memory of this fight the Welsh still wear the leek on St. David's Day; and it is to this that Shakspeare alludes in 'Hen. V.,' act v. sc. 1, when he makes Gower upbraid Pistol for mocking 'at an antient tradition, begun upon an honourable respect, and worn as a memorable trophy of predeceased valour.' (See Brand's *Popular Antiq.* 4to., vol. i. p. 86; Brady's *Clavis Calendaria,* 8vo. Lond. 1812, vol. i. p. 228, &c.)

DAVIS, JOHN, a celebrated navigator of the sixteenth century, was born at Sandridge, near Dartmouth in Devonshire, and distinguished himself by three voyages for the discovery of a north-west passage, which he undertook between 1585 and 1587. He discovered the strait, which bears his name, and sailed along the coast of Greenland as far as 72° N. lat., but was not able to approach the opposite coast, on account of the numerous icebergs which lined it north of the Polar Circle. He afterwards made five voyages to the East Indies, and was killed in the last (1605) in the strait of Malacca, by some Japanese, as it is reported. He published an account of his second voyage to the north-west, and of one to the East Indies.

DAVIS'S STRAIT unites Baffin's Bay to the Atlantic, extending between Greenland on the east and Cumberland island on the west, in a northern direction. Its extent is not well determined. Navigators commonly understand by this name the sea extending west of Greenland from Cape Farewell (60° N. lat.) to Disco Island (70° W. lat.) Its narrowest part is near the Polar Circle, where it is about 200 miles across. It is the principal resort of the whalers, the fish being more numerous here than in other seas near the pole. But the immense icebergs, which even in summer line the western coasts of the strait, and the violence of the currents, render these voyages very dangerous. Many of the icebergs rise some hundred feet above the level of the sea, and the whalers which arrive at the end of April or in the beginning of May find the whole strait blocked up by a barrier of icebergs between Cape Walsingham and the Greenland coast. The current, which runs along the eastern coast of Greenland, turns round Cape Farewell and continues along the western coast of Greenland, nearly up to the Polar Circle, where it crosses the strait to Cape Walsingham and continues in a southern direction to Labrador and Newfoundland. By this current the immense icebergs of Davis Strait are carried down to the centre of the Northern Atlantic, where they sometimes are met with as far as 40½ N. lat. The countries on both sides of the strait rise in rocky mountains to a considerable elevation, and exhibit a very scanty vegetation. They are inhabited by the Esquimaux.

DAVISON, SECRETARY. [ELIZABETH.]

DAVITE, a name given to a sulphate of alumina, found in a warm spring which contains sulphuric acid, near Bogota in Columbia. It occurs massive, is of a fine fibrous structure, a white colour, and silky lustre. It is very soluble, and has a very astringent taste.

DAVY, SIR HUMPHRY, was born at Penzance in Cornwall, on the 17th of December, 1778. His ancestors had long possessed a small estate at Varfell, in the parish of Ludgvan. His father was a carver in wood. According to Dr. Paris, one of Sir Humphry's biographers, his father was not remarkable for any peculiarity of intellect; and his mother appears to have been a very respectable woman, who conducted herself, according to Dr. John Davy, the brother of Sir Humphry, so as to gain the regard and good will of every one. At the time of his father's death Humphry was sixteen years old; but his mother lived to witness the rapid progress made by her son in the various departments of chemical science. In speaking of his early days, Dr. Davy admits that many boys have shown precocious indications of talents superior to his; 'there belonged, however, to his mind,' he adds, 'it cannot be doubted, the genuine quality of genius, or that power of intellect which exalts its possessor above the crowd, and which, by its own energies and native vigour, grows and expands, and comes to maturity, aided indeed and modified by circumstances, but in nowise created by them.' It appears that in his early youth he had a vivid and fertile imagination, and was fond of poetry, and his brother has preserved several favourable specimens of his poetic talent. He does not appear to have been fortunately placed at school in the first instance; but he was afterwards, till he was fifteen years of age, with Dr. Cardew, whose school he quitted in 1793. Here he appears to have made considerable progress in learning, but certainly not such as gave any indication of his future eminence.

In the beginning of the year 1795 he was apprenticed to Mr. Borlase, a surgeon and apothecary of Penzance, where he appears to have laid down an extensive plan of study, not merely of the sciences which related to his profession, but the learned languages, mathematics, history, &c. Dr. Davy states that he is not able to give a precise account of the nature and extent of his medical studies; but in the fourth year after he had commenced them he was considered competent by Dr. Beddoes to take charge of an establishment which he had founded at Bristol under the name of the Pneumatic Institution; this was in 1798, when he was scarcely twenty years old.

In the following year Dr. Beddoes published a work, entitled 'Contributions to Physical and Medical Knowledge, principally from the West of England.' Among these were contained 'Essays on Heat, Light, and the Combinations of Light, with a new Theory of Respiration; on the Generation of Oxygen Gas, and the Causes of the Colours of Organic Bodies. By Humphry Davy.' These essays, his first publication, his brother characterizes 'as the bold attempts of an original and enterprising mind,' and observes that they 'bear the stamp at the same time of youth and of genius, in the faults of the one and the redeeming qualities of the other.' Most of the peculiar views developed in these essays were speedily abandoned by the author; and his brother admits that many of the speculations, he might perhaps have said most, were wild and visionary, and adds, what will be readily admitted, 'that the wildest of them are most natural to a young mind just entering on the twilight of physical science, gifted with high powers and a vivid imagination.'

His next recorded experiments relate to the existence of silica contained in various plants, especially in the epidermis of cane; and in 1800 he published in one volume 8vo. a work entitled 'Researches, Chemical and Philosophical, chiefly concerning Nitrous Oxide and its Respiration.' In this work, which contained the details of numerous highly interesting experiments, he has minutely detailed the extraordinary effects produced both upon himself and others by respiring nitrous oxide, a gas till then deemed irrespirable. This work also contains an account of some extremely hazardous experiments which he made upon himself in breathing carburetted hydrogen, carbonic acid gas, azote, hydrogen, and nitric oxide; in these dangerous trials his life was more than once nearly sacrificed.

In 1801 Davy came to London, and on the 25th of April he gave his first lecture at the Royal Institution. He began with the history of galvanism, detailed the successive discoveries, and described the different methods of accumulating it; and on the 31st of May, 1802, he was appointed professor. From the year 1800 to 1807 a great variety of subjects attracted his attention, especially galvanism and electro-chemical science; the examination of astringent vegetable matter in connection with the art of tanning, and the analysis of rocks and minerals with relation to geology and to agricultural chemistry. In November, 1807, his second Bakerian lecture was read, in which he announced the most important and unexpected discovery of the decomposition of the fixed alkalis by galvanism, and of the metallic nature of their bases, to which he gave the names of potassium and sodium. Dr. Paris has well observed that 'Since the account given by Newton of his first discoveries in optics it may be questioned whether so happy and successful an instance of philosophical induction has ever been afforded as that by which Davy discovered the composition of the fixed alkalis.' From the year 1808 to 1814, the following papers by Davy were read before the Royal Society, and published in their 'Transactions':—

'Electro-chemical Researches on the Decomposition of the Earths; with Observations on the Metals obtained from the Alkaline Earths, and on the Amalgam procured from Ammonia,' read June 30th, 1808.

'An Account of some New Analytical Researches on the Nature of certain Bodies, particularly the Alkalis, Phosphorus, Sulphur, Carbonaceous Matter, and the Acids hitherto uncompounded; with some general Observations on Chemical Theory,' December 13th, 1808.

'New Analytical Remarks on the Nature of certain Bodies; being an Appendix to the Bakerian Lecture for 1808,' February, 1809.

'The Bakerian Lecture for 1809; on some new Electro

Chemical Researches on various Objects, particularly the Metallic Bodies, from the Alkalis and Earths, and on some Combinations of Hydrogen,' November 16th, 1809.

'Researches on the Oxymuriatic Acid, its Nature and Combinations, and on the Elements of Muriatic Acid; with some Experiments on Sulphur and Phosphorus,' July 12th, 1810.

'The Bakerian Lecture for 1810, on some of the Combinations of Oxymuriatic Acid Gas and Oxygen, and on the Chemical Relations of those Principles to Inflammable Bodies,' November 15th, 1810.

'On a Combination of Oxymuriatic Gas and Oxygen Gas,' February 21st, 1811.

'On some Combinations of Phosphorus and Sulphur, and on some other Subjects of Chemical Inquiry,' June 18th, 1812.

'On a new Detonating Compound,' Nov. 5, 1812.

'Some further Observations on a new Detonating Substance,' July 1st, 1813.

'Some Experiments and Observations on the Substances produced in different Chemical Processes on Fluor Spar,' July 8th, 1813.

'An Account of some new Experiments on the Fluoric Compounds; with some Observations on other Objects of Chemical Inquiry,' Feb. 13th, 1814.

After the enumeration of these important subjects, we cannot do better than refer to them in the words of his brother and biographer. 'I shall not,' says Dr. Davy, 'attempt an analysis of these papers; I shall give merely a sketch of the most important facts and discoveries which they contain, referring the chemical reader to the original for full satisfaction. After the extraction of metallic bases from the fixed alkalis, analogies of the strongest kind indicated that the alkaline earths are similarly constituted; and he succeeded in proving this in a satisfactory manner. But owing to various circumstances of peculiar properties, he was not able, on his first attempts, to obtain the metals of these earths in a tolerably pure and insulated state for the purpose of examination. On his return to the laboratory after his illness, this was one of his first undertakings. He accomplished it to a certain extent, by uniting a process of MM. Berzelius and Pontin, who were then engaged in the same inquiry, with one of his own. By negatively electrifying the earths, slightly moistened, and mixed with red oxide of mercury, in contact with a globule of mercury, he obtained amalgams of their metallic bases; and by distillation, with peculiar precautions, he expelled the greater part of the mercury. Even now, in consequence of the very minute quantities of the bases which he procured, and their very powerful attraction for oxygen, he was only able to ascertain a few of their properties in a hasty manner. They were of silvery lustre, solid at ordinary temperatures, fixed at a red heat, and heavier than water. At a high temperature they abstracted oxygen from the glass, and at ordinary temperatures from the atmosphere and water, the latter of which in consequence they decomposed.

'The names he proposed for them, and by which they have since been called, were barium, strontium, calcium, and magnium, which he afterwards altered to magnesium.

'The same analogies were nearly as strong applied to the proper earths; and he attempted their decomposition in a similar manner, but not with the same success. By the action of potassium proof was obtained that they consist of bases united to oxygen; but whether these bases were inflammable substances merely, or metallic inflammable substances, was yet a problem, which has since been solved by the labours of Wöhler, Bussy, and Berzelius. Analogy was in favour of the latter inference, as was also the circumstance that the bases of these earths are capable of entering into union with iron; and this has been confirmed by the inquiries just mentioned, as regards the majority of them, all but the basis of silica, which yet remains doubtful.

'The application of these facts to geology was full of promise; and he indulged in the hope that they might serve to explain not only some of the most mysterious phenomena of nature, as earthquakes and volcanoes, and the combustion of meteoric stones and falling stars, but might ultimately lead to a general hypothesis of the formation of the crust of the earth.'

His ideas on this last subject, which he afterwards in great measure relinquished, may be seen in Dr. Davy's Life of Sir Humphry, vol. i., p. 397.

After effecting the decomposition of the fixed alkalis, Davy, reasoning from analogy, conjectured that ammonia might also contain oxygen; and his first experiments were favourable to this supposition; but they contained a fallacy. In his various papers on 'oxymuriatic acid and its compounds' he establishes the views of Scheele respecting its nature, and proves that the reasoning of Berthollet, which had generally been admitted by chemists, was fallacious. He shows that oxymuriatic acid is not a compound, as supposed of muriatic acid and oxygen, but an undecomposed body, to which, on account of its green colour, he gave the name of chlorine. In 1810 he published the first volume of his 'Elements of Chemical Philosophy,' which, although they bear marks of haste, contain much interesting matter: no further portion of this work was printed. His 'Elements of Agricultural Chemistry,' which appeared soon after, is a work containing much useful matter, and replete with sound and practical views of the subject.

One of his greatest inventions was that of the miner's safety-lamp, the first paper in relation to which appeared in the Philosophical Transactions for 1815, and the last in 1817.

Sir Humphry became President of the Royal Society in 1820, and he continued to contribute papers on subjects of great interest for some years. Among the most curious of these, and full of promise as to utility, were those which related to the modes of protecting the copper sheathing of ships; from causes however which even his sagacity could not foresee, the plan proved abortive.

We have thus given a very imperfect and slight sketch of the discoveries of this very extraordinary man and eminent chemist; a list of his works, or at any rate, the principal of them, will be found at the end of Dr. Paris's Life of him. With respect to his philosophical character, the parallel which has been drawn between him and Dr. Wollaston by the late Dr. Henry, while it does justice to both, presents the powers of Davy in a strong and clear point of view, and in the language of one who was deeply versed in the sciences of which he is speaking, and intimately acquainted with the philosopher whose portrait he draws.

'To those high gifts of nature which are the characteristics of genius, and which constitute its very essence, both these eminent men united an unwearied industry and zeal in research, and habits of accurate reasoning, without which even the energies of genius are inadequate to the achievement of great scientific designs. With these excellencies, common to both, they were nevertheless distinguished by marked intellectual peculiarities. Bold, ardent, and enthusiastic, Davy soared to greater heights; he commanded a wider horizon; and his keen vision penetrated to its utmost boundaries. His imagination, in the highest degree fertile and inventive, took a rapid and extensive range in the pursuit of conjectural analogies, which he submitted to close and patient comparison with known facts, and tried by an appeal to ingenious and conclusive experiments. He was endued with the spirit and was a master of the practice of the inductive logic; and he has left us some of the noblest examples of the efficacy of that great instrument of human reason in the discovery of truth. He applied it not only to connect classes of facts of more limited extent and importance, but to develop great and comprehensive laws, which embrace phenomena that are almost universal to the natural world. In explaining these laws he cast upon them the illumination of his own clear and vivid conception; he felt an intense admiration of the beauty, order, and harmony which are conspicuous in the perfect chemistry of nature; and he expressed those feelings with a force of eloquence which could issue only from a mind of the highest powers and the finest sensibilities.' (*Elements of Chemistry*, 11th edition.)

Davy was knighted on the 8th of April, 1812, and on the 11th of the same month he married Mrs. Apreece, the widow of Shuckburgh Ashby Apreece, Esq., eldest son of Sir Thomas Apreece; this lady was the daughter and heiress of Charles Kerr, of Kelso, Esq., and possessed a very considerable fortune. He was afterwards created a baronet. He died on the 28th of May, 1829, at Geneva.

DAVYNE, a silicious mineral found in cavities in some of the masses ejected from Vesuvius; the primary form is a rhomboid, but it occurs in regular hexagonal prisms, with the terminal edges truncated. Its fracture is conchoidal; cleavage parallel to the planes of the hexagonal prism. It is transparent, colour white or yellowish brown. Streak white, lustre vitreous, pearly upon the cleavage planes. Hardness, 5.0, 5.5.; specific gravity, 2.4.

DAWES, RICHARD, was born at Market-Bosworth in the year 1708. His first teacher was Anthony Blackwall, the well-known author of The Sacred Classics, after which he spent some time at the Charter House, and went to Emanuel College, Cambridge, in the year 1725; he was elected fellow in 1731. In 1736 he published a specimen of a translation of 'Paradise Lost' into Greek hexameters, which proved, as he afterwards admitted (*Pref.* to his *Miscellanea Critica*), that he was then very insufficiently acquainted with the Greek language. He became master of the grammar-school at Newcastle-upon-Tyne in 1738; but his disagreeable manners diminished the number of his scholars, and he resigned the situation in 1749. In his latter days his principal employment was rowing in a boat on the Tyne; he died at Haworth 21st of March, 1766. The work on which his fame rests is his 'Miscellanea Critica,' published at Cambridge in 1745, which places him in the same class with Bentley and Porson as a verbal Greek critic. The work is divided into five sections, of which the first contains some emendations of Terentianus Maurus; the second is a specimen of the want of accuracy in the Oxford edition of Pindar; in the third are some general observations on the Greek language, to which are added some emendations of Callimachus; the fourth is a short discussion on the Digamma; and the fifth is devoted to the illustration of Aristophanes. The leading characteristic of the scholarship of Dawes is a proneness to rash generalization; and though it has been termed the scholarship of observation, it must be admitted that Dawes is too apt to form general rules from an insufficient number of passages, and consequently that his system scarcely deserves that title. Hardly one of the syntactical rules which Dawes has laid down has been admitted as unexceptionable; and some of them have been completely overthrown by the number of passages in which they are violated. The authority of the 'Miscellanea Critica' was however so great for some twenty or thirty years after its publication, that many readings supported by MS. authority were altered to meet the canons in that book. The violent animosity which Dawes everywhere shows towards Bentley is only to be accounted for by the universal dislike which that great scholar had incurred during his quarrels with Trinity College, about the time when Dawes was a young member of the university. The best editions of the 'Miscellanea Critica' (which may now be considered as superseded by the advances which Greek scholarship has made during the last thirty years) are those by Burgess, Oxon. 1781, and by Kidd, Cantabr. 1817, in which specimens of his other writings may be seen.

DAWLISH. [DEVONSHIRE.]

DAX, a town in France, in the department of Landes. It is on the south-east bank of the Adour, just to the left (across the river) of the high road from Paris by Bordeaux to Bayonne: 502 miles from Paris, 124 from Bordeaux, and 37 from Bayonne, in 43° 42′ N. lat., 1° 3′ W. long.

This town is situated in a beautiful plain. It is well laid out, and not badly built: the remains of the antient ramparts and of the towers by which they are flanked show traces of Roman work. The waters for which the town is famous rise out of the earth at the bottom of a large basin, about thirty feet square, and two and a half to three feet deep, paved at the bottom and sides, and situated in the centre of the town; they are inodorous and insipid, and so hot that the hand cannot be held in them. The temperature of the water in the basin is about 56° of Réaumur or 158° of Fahrenheit; but a thermometer plunged into the pipe by which the waters enter the basin, rises to 66° of Réaumur or between 180° and 181° of Fahrenheit. The vapour which rises from this basin, condensed by the cold morning air, sometimes forms a dense mist, which envelops the whole town. The waters are not used medicinally; some laundresses use them, and some bakers for making bread. There are however in another part of the town mineral waters which are used in the cure of rheumatism, but not to any great extent. The cathedral is not remarkable. There are an antient episcopal palace, a high school, and an hospital: also an agricultural society, and a small museum of natural history. There is a bridge over the Adour, and some pleasant public walks along the bank of the river. The inhabitants, who in 1832 amounted to 4716, carry on a considerable trade with Bayonne in the produce of the neighbouring districts,—wines, liqueurs, hams, resin, and wool. There is a considerable weekly market for corn and cattle.

Dax is of great antiquity: its mineral waters were known to the Romans, who called it Aquæ Augustæ (Pliny), and Aquæ Tarbellicæ (*Itinerary* of Antoninus), from the name of the tribe (Tarbelli) in whose territory it was situated. It appears to have held a high rank among the towns of Novempopulana. In the writings of the English chronicler, Roger de Hoveden, the town is mentioned under the name of Civitas Akensis: at a later period the name was corrupted into Aqs or Acqs, from which, by the addition of the preposition *de*, we have the modern designation D'Ax or Dax.

After the downfall of the Romans, the town passed into the hands of the Goths and the Franks. From the twelfth century to the year 1451, it was under the English crown. When the English were driven out of Gascogne, Charles VII. united Dax to the French monarchy.

The bishopric of Dax is very antient. It is said to have been founded in the third century by St. Vincent, a martyr, whose body was said to be preserved in a church near the town. Nothing certain is however known respecting the see until A. D. 506, when the bishop, Gratian, assisted at the council of Ayde. The diocese comprehended parts of Béarn and Basse Navarre (Lower Navarre), as well as of the district of Les Landes, in Gascogne. The bishop was a suffragan of the archbishop of Auch. The see is now abolished. Before the Revolution there were several convents in the town and suburbs.

Dax is the chief town of an arrondissement, which comprehends the south-western part of the department: the population of the arrondissement in 1832 was 99,463.

DAY, any astronomical period which depends directly upon the earth's rotation; or the interval between two transits over the meridian of any point in the heavens, real or imaginary. But the only *days* distinguished by that name in astronomy are the *sidereal day*, the *real solar day*, and the *mean solar day*.

The *sidereal day* is the interval between two transits of the same fixed star; that is, the absolute time of revolution of the earth. It is divided into 24 sidereal hours, &c. It begins when the equinox is on the meridian of the place.

The *real solar day* is the interval between two noons or transits of the sun over the meridian. Owing to the unequal motion of the sun, as well as the obliquity of the ecliptic, it is not of the same length at all periods of the year. The *mean solar day* is the average of all the real solar days; it is derived by supposing a fictitious sun to move round the equator, and uniformly in the same time as the real sun moves from an equinox to the same again. The method of adapting the motion of this fictitious body to that of the real sun will be explained in TIME, EQUATION OF.

The civil day, in England at least, is the mean solar day, and begins at midnight; that is, when the fictitious sun is on the invisible part of the meridian. But the astronomical day always begins at the noon of the civil day, and the hours are reckoned forward up to 24. Thus eleven o'clock in the morning on the twelfth of January (civil reckoning) is 23 hours of the astronomical *eleventh* of January. Afternoon, and up to midnight, the astronomical and civil reckoning coincide.

The mean solar and sidereal days are thus related: the mean solar day is 24 h. 3 m. 56 s., 55 of sidereal time; and the sidereal day is 23 h. 56 m. 4 s., 09 of a mean solar day.

The antients almost universally began their day at sunrise, with the exception of the Arabians, who began at noon, and the Egyptians at midnight. Among the moderns, most of the eastern nations begin at sunrise, with the exception of the Arabians, who still begin at noon, and the Chinese, who reckon from midnight. The Austrians, Turks, and Italians reckon from sunrise, and other European nations from midnight.

DAY, THOMAS, was born at London in 1748. His father held a place in the Custom House, and died when he was a year old, leaving him a fortune of 1200*l.* a year. He received his school education at the Charter House, and at the age of sixteen was entered a gentleman commoner of Corpus Christi College, Oxford, where he remained for three years, but left without taking a degree. He then spent some summers in travelling through and residing in France and other parts of the continent. He had already adopted certain strong and peculiar opinions on the subject of education, holding, apparently, on the one hand that the common mode of education was wholly vicious, and on the other, that by a proper education there was scarcely any thing that might not be accomplished. About the year 1769 he proceeded to put his theories to the test of a bold experiment, by selecting from the foundling hospital at Shrewsbury two girls of twelve years of age, with the design of rearing them according to his own notions, and then making one of them his wife; and although this speculation failed in the main point, its eccentric author never having married either of his protegées, both the girls, with the portions he gave them, obtained husbands, and by the propriety of their conduct through life did honour to his training. In 1778 Mr. Day married Miss Milnes, of Yorkshire, a lady similar to himself in her tastes and opinions, and having a fortune as large as his own. The following year he was called to the bar; but he never practised. Meanwhile, in 1773, he had made his first appearance as an author, in conjunction with his friend Mr. Bicknell, in a poem entitled 'The Dying Negro,' a production which is said to have had a considerable share in exciting the public feeling against the atrocities of the slave-trade. In 1776 he published another poem, called 'The Devoted Legions,' being an attack upon the American War. It was followed the next year by another on the same subject, entitled 'The Desolation of America.' After this he published several political pamphlets in prose; namely, in 1784, 'The Letters of Marius; or Reflections upon the Peace, the East India Bill, and the Present Crisis,' and 'A Fragment of a Letter on the Slavery of the Negroes' (in the United States); in 1785, 'A Dialogue between a Justice of Peace and a Farmer;' and in 1788, 'A Letter to Arthur Young, Esq., on the Bill to prevent the Exportation of Wool.' In 1783 appeared the first volume of the work by which he is now principally remembered, his 'History of Sandford and Merton;' the second volume was published in 1786, and the third in 1789. The object of this fiction is to illustrate and recommend the views of the author on education and on human nature generally; and it is a good picture of both his intellectual and his moral character. Its freshness and vigour, and the strain of disinterestedness and philanthropy that pervades it, have a charm, especially for the young; but the narrowness of the writer's views makes it useless for any practical purpose, and nearly equally valueless as a piece of philosophy. He is one of those speculators who look at the wide and varied field of human affairs through an oaten pipe. Day is also the author of another shorter work of fiction, called 'The History of Little Jack.' He was killed 28th September, 1789, by a kick from a young horse, which he was training upon some new principle; for his schemes for the improvement of education embraced the inferior animals as well as his own species. It ought to be added, however, that a spirit of uprightness and disinterestedness, and a scorn of everything mean, marked the conduct not less than they do the writings of this able and good man, but not very profound thinker. (Chalmers, and *Biog. Brit.*)

DEACON, an ecclesiastical term of Greek origin, from Διάκονος (Diáconus, literally, *a servant*), introduced into the Saxon vocabulary, and continued in use to the present time.

It designates one of the *orders* in the Christian priesthood, the lowest of the three—bishops, priests, and deacons.

The first institution of the order is particularly set forth n the sixth chapter of the Book of Acts. The administration of the charities in the Church of Jerusalem was complained of as partial by the Grecian converts. The apostles, n whom the administration had been vested, thought it expedient to divest themselves of this duty, and to devolve t on other persons, that they might devote themselves to prayer and to the ministry of the word. Seven persons were selected for the office, and by prayer and the imposition of hands ordained deacons.

It appears by the first Epistle of St. Paul to Timothy, that there were deacons in other Christian churches, and probably in all where such an officer was needed. He gives nstructions (chap. iii. 8-13) respecting the character which became persons who should be admitted into the office. See also *Phil.* i. 1. There were also deaconesses in the primitive church, one of whom, Phœbe, is mentioned *Rom.* xvi. 1. This female officer may be traced to the eleventh or twelfth century.

The peculiar office of both deacons and deaconesses was to attend to works of mercy, to be the administrators of the alms of the more opulent members of the church.

In the English church the name continues, and the peculiar form of ordination, but the peculiar duties of the office seem to be lost sight of. In fact the Poor Laws, by creating certain civil officers whose duty it is to attend to the necessitous, have rendered the services of the deacon in this his characteristic capacity less necessary.

In some dissenting communities there are deacons who still discharge the duties for which the office was instituted, collecting the alms of the people at the sacrament, and distributing them among the poor. But they are always laymen, or persons who have not gone through the forms, generally few and slight, of ordination, as practised among the dissenters.

There is a form for the ordination of deacons in the English church: some clergymen never take priests' orders. It appears by the Rubric that a person in deacon's orders is empowered to read publicly the Scriptures and homilies, to catechise, to preach when licensed to do so by the bishop, and to assist a priest in divine service, and especially in the Communion. When contemplated in the light in which this form places him, he appears as an assistant to a priest, for he is to seek out the sick and poor and report them to the priest, and in the absence of the priest to baptize. This latter permission has led to the introduction of the performance of other ecclesiastical duties, namely, the celebration of matrimony, and the burial of the dead. In fact the deacon performs all the ordinary offices of the Christian priesthood, except consecrating the elements at the administration of the Lord's Supper, and pronouncing the absolution.

A person may be ordained deacon at twenty-three. He may then become a chaplain in a private family; he may be curate to a beneficed clergyman, or lecturer in a parish-church, but he cannot hold any benefice, or take any ecclesiastical promotion. For this it is requisite that he take priest's orders.

DEAD SEA, called also Lake Asphaltites, is situated in the Holy Land, or Palestine, between 31° and 32° N. lat. and 36° and 37° E. long. It extends nearly north and south about 50 miles, and measures about 25 miles where widest, but it narrows considerably towards its extremities. The Arabs call it Bahr Lot or Lud, and those of them who inhabit the adjacent country sometimes conduct the traveller to a pillar coated with asphaltum, which they pretend is the pillar of salt into which Lot's wife was transformed, according to the account of the sacred volume. The towns of Sodom, Gomorrah, Adama, Seboyn, and Segor, which were swallowed up by its waters, are said to have been on its western bank, where some few ruins occur.

The water of the lake is pungent and bitter. Asphaltum floats on its surface, and covers also the whole of the extent of its shores, and likewise the ruins still existing upon it. The lake throws up on its banks pieces of petrified wood and porous stones in a calcined state. The river Jordan falls into it at its northern extremity, but the lake has no outlet. From its northern extremity a sandy plain extends along the Jordan; but on all other sides it is enclosed with masses of bare stones and rocky hills, on which only small tufts of certain shrubs grow, from which a balsam is extracted. The deep but narrow valleys which traverse these masses of stone are inclosed by high mountains, and the whole presents a dismal and sombre sight. At the most southern extremity begins a stony valley, which traverses Arabia Petræa nearly in a southern direction, and terminates at the gulf of Acaba, the north-eastern arm of the Red Sea. The northern part of this waterless valley is called El Ghor, and the southern El Araba. On both sides of it extend the high and stony table-lands of Arabia. (Count Forbin's *Travels in Greece, Turkey, and the Holy Land.*)

DEAF AND DUMB. The subject of deafness and its consequences has not received that degree of attention which its importance deserves. Few persons have an idea of the extent to which it prevails, and fewer still form correct notions of the amount of deprivation under which a totally deaf person labours. Till institutions for the instruction of the deaf and dumb began to multiply, and thus to attract public notice and sympathy towards this unfortunate class of persons, it was believed that the deaf and dumb formed a very minute fraction of the population; and a very few years ago one of the highest dignitaries of the Church of England assured a gentleman who applied to him on behalf of the deaf and dumb in his province, that during his long life he had never heard of more than two persons in this melancholy condition. Perhaps one cause of the general want of knowledge on this subject is the incapability of the deaf and dumb to give utterance to their own deficiencies; the very nature of their deprivation prevents their making it known and obtaining relief: thus generations have lived and died in wretchedness and obscurity.

The most complete tables which have been formed for showing the proportion of deaf persons to the rest of the population are contained in the 'Third Circular of the Royal Institution for Deaf Mutes' at Paris. From this circular the following table is taken, which shows not only the extent, but the universality of the calamity, and the proportion which the deaf bear in different countries to the whole community.

Countries.	No. of Deaf and Dumb.	Proportion to Population.
Portugal	2,407	1 in 1585
Spain	7,255	„ 1585
France	20,189	„ 1585
Italy	12,618	„ 1585
Switzerland	3,976	„ 502
Grand Duchy of Baden	1,983	„ 559
Würtemberg	1,250	„ 1240
Bavaria	2,908	„ 1388
Austria	16,684	„ 1585
Prussia	8,223	„ 1548
Saxony	883	„ 1585
Grand Duchy of Saxe Weimar	142	„ 1585
Electoral Hesse	400	„ 1375
Duchy of Nassau	210	„ 1428
Principality of Lippe Schaumburg	16	„ 1585
Hanover	946	„ 1585
Duchy of Brunswick	176	„ 1170
Duchy of Oldenburg	151	„ 1585
Frankfort	47	„ 1585
Hamburg	86	„ 1585
Bremen	31	„ 1585
Belgium Holland	2,166	„ 2847
Denmark	1,260	„ 1714
Sweden and Norway	2,397	„ 1585
Russia	27,834	„ 1585
Poland	2,334	„ 1585
Great Britain, England	7,570	„ 1585
Scotland	1,324	„ 1585
Ireland	3,500	„ 1714
United States of America	6,000	„ 2000

According to this statement, the general accuracy of which has been repeatedly confirmed in various districts by special returns, the proportion of deaf persons to the population of Europe is 1 to 1537. The United Kingdom contains 12,400, or 1 to 1622 of the population.

Deafness occurs in every degree, in some cases only amounting to an insensibility to very sharp notes. Many people cannot hear the squeaking of the bat and the mouse. By holding the nose, inflating the ears, and ceasing to breathe, the ear is rendered more open to base notes, and more deaf than it naturally is to sharp notes. Dr. Wollaston constructed a small organ, whose notes began where the sharp notes of ordinary instruments end; the notes of his organ increased in sharpness till they became inaudible, though he was certain that it continued to give sound from feeling the vibrations equally with the lower notes. He thus found that some people could hear seven or eight notes higher than others, and that children could generally hear two or three notes higher than grown-up people. In some persons the accuracy of the ear is merely impaired in distinguishing faint sounds, and sounds somewhat similar; instances of this kind are particularly evident in infants, whose first attempts at speech are a very remote similarity to the sounds they hear, and become more perfect as their ear is educated, and in some cases, remain imperfect through life, in consequence of defect in the organs of hearing. All imperfections of speech do not arise from imperfect hearing: an indistinct articulation may result from various other causes, from carelessness, from defective organs of speech, or an imperfect formation of those organs, from irregular respiration producing hesitation, and in some instances proceeding from nervousness. The principles which regulate utterance have been practically considered and acted upon by Mr. Cull, to whose pamphlets on 'Impediments of the Speech,' and on 'Stammering,' reference may be made with satisfaction by those persons whose utterance is defective. The discovery of these principles is however due to Dr. Arnott. Up to the period of the publication of his 'Elements of Physics,' in 1827, scientific and regular practitioners had no cure for stuttering. This work should be consulted by all those persons who wish to ascertain the causes, moral or physical, which tend to produce defective speech.

By total deafness is meant that state in which the organs of hearing are as insensible to sound as any other part of the body. To persons in this condition, sound is a mere vibration which can be felt, but very imperfectly distinguished. Yet persons who are generally considered as totally deaf are not all equally so. There are cases where the firing of a gun is unheard though immediately near the deaf person, and others where a gun fired at a quarter of a mile distant is heard, and distinguished from the falling of a heavy weight upon a boarded floor. In some instances, the human voice in a great variety of its louder single intonations can be recognized, though the loudest reading or the highest pitch of a speaker would make no impression. Dr. Itard, of the Royal Institution for the Deaf and Dumb, at Paris, considers that more than half of the pupils received into that Institution are of that class who hear the least; about the same proportion would be found in the English Institutions. The other half comprise cases more or less of imperfect deafness, an expression which must by no means be confounded with imperfect hearing. In all these conditions of deafness, the person is consequently *mute*, or *dumb*. Hence the expression *Deaf-Mute*, as used in the continental languages, and *Deaf and Dumb*, as used in England and America, to designate a person so deaf as to be inaccessible by the ordinary means of lingual communication, and unable to make known his thoughts, wishes, and feelings, in our conventional tongues. As articulation can only be acquired by those who hear, it follows that according to the condition of the power of hearing, will be, *ceteris paribus*, the distinctness of articulated sounds. Hence in the instruction of deaf-mutes, it is generally found that those pupils who distinguish the different tones of the human voice most correctly become the best speakers of the artificial pronunciation, which is taught in some of the institutions for the deaf. There are certainly cases where the articulation of a totally deaf person is pleasanter to hear, softer and less monotonous, than in some instances of imperfect deafness, but these depend upon other causes, as the natural tone of the voice, the attention of the pupil, or the care of the instructor.

In cases where deafness is not congenital, but supervenes at a period after articulation has been acquired, at the age for instance of four or five years, the power of speech is gradually lost, the voice becomes monotonous, and unless the practice of speaking is continued, the power of speech is lost almost as completely as though it were a case of original deafness. A case of this kind has come under our notice, in which the patient lost his hearing before he was five years of age. At thirteen years of age, his pronunciation of the words *hat*, *coat*, *book*, was, as if they were written *hat-a*, *coat-a*, *book-a*. His knowledge of things had been kept up entirely by vocal practice, for he knew nothing of written words or writing. A case somewhat analogous to this, is that of a nobleman now living, who was an officer in the battle of Waterloo; his auditory nerve was destroyed by the concussion of the air, from the bursting of a shell, or from the report of a cannon. He is now totally deaf and has consequently lost all control over his voice, which has become discordant, and difficult to be understood, even by those who are accustomed to associate with him. A similar instance is mentioned by an American writer, 'in which entire deafness, taking place at the age of eighteen, so affected the articulation, that the individual was no longer intelligible, even to his friends.'

The importance of an inquiry into the causes of deafness, induced the directors of the institution at Paris to issue circular letters, containing a series of questions, as follows, addressed to the parents of their pupils.

1. Was the child born deaf, or has he become so since his birth?

2. In the first case, what circumstances preceded, accom-

panied, or followed his birth? In the second case, at what age was he found to be deaf?

3. Since the time of his birth till that when he lost his hearing, has he suffered under any illness, or met with any accident?

4. Is the loss of hearing to be attributed to this illness, or this accident?

5. Independent of deafness, has he any other infirmity?

6. In this case, was this infirmity anterior or posterior to the deafness, and for how long?

7. Had the child spoken before he lost his hearing?

8. How many children are there in the family, and among them how many deaf-mutes?

9. Are the father or mother deaf and dumb, or have they any other disease?

10. What was the age of the father and mother at the time of the child's birth?

11. What is their occupation?

12. Is the residence of the parents in a flat, mountainous, or marshy country? Is it exposed to humidity, or to any other peculiar atmospheric influence?

Lastly, The parents or the friends of the child are requested to give all the particulars which it is possible to furnish explanatory of the causes of deafness.

The following is a brief notice of the result of this inquiry. Out of 102 children whose parents furnished the required information, 52 were born deaf, 37 became so after birth, and of the remaining 13 no positive information could be obtained. Of the 37 who became deaf after their birth, 7 lost their hearing during the first year, 13 in the second, 7 in the third, 1 in the fourth, 5 in the fifth, and 4 in the eighth year of their age. On examining into the causes of the deafness of these children, 8 cases were found to arise from violent convulsions during the period of dentition or from fright; in 10, deafness supervened upon epidemic fevers—cerebral, nervous, scarlatina, inflammatory, putrid or catarrhal; 2 cases followed measles, 6 arose from verminous diseases, 1 from a deposit of matter under the ear, 1 from a violent sore throat, 1 from a fall, 1 from a cold, and 1 from ophthalmia caused by a scrofulous habit; 7 cases of deafness were attributed to virulent diseases, of which the parents could not explain the nature; lastly, four children who were not born deaf lost their hearing without it being possible to refer the loss to any illness of a serious nature. Of these 102 deaf-mutes, 21 belong to families in which there are other children afflicted with the same infirmity; 9 families contain each two deaf and dumb children among two, three, four, five, six, and eight; 7 families have each three deaf-mutes, out of three, four, seven, eight, and twenty-six children; 3 families contain each four, out of four, seven, and ten children; 1 family has five deaf and dumb children out of eight, and there is 1 family which out of ten children contains seven deaf-mutes; with the exception of one brother and one sister who lost their hearing after birth, all these children, belonging to families where there are several deaf mutes, are afflicted with congenital deafness.

Many cases of deafness are attended by circumstances which deserve to be especially recorded. One deaf-mute from birth had a maternal great-grandmother who was afflicted with the same malady; another child, who lost its hearing at the age of four years, is the issue of a father who was also affected with deafness at the age of seven years, and there are several other parents who have laboured under the same infirmity. In the family which numbers 7 deaf-mutes out of ten children, the father had an aunt who was deaf from birth; in another family, which contains 2 deaf-mutes, the sister of the father married with the brother of the mother has five male children, of whom three are afflicted with congenital deafness. In one family the father has been twice married; by his first wife he had two children who can hear; by his second he has one daughter born deaf and dumb. In a second family the father has also contracted two marriages; he had three deaf and dumb children by his first wife, and four children who hear by his second. In the family which contains 3 deaf-mutes out of twenty-six children, the father has been married four times; his last wife, who is affected with goître, has had five children, three of whom are deprived of hearing. Lastly, in the family which, out of eight children, numbers five deaf and dumb from birth, all the five were born in a damp house, where the persons who had formerly resided had three children, of whom two were deaf and dumb.

We are enabled to compare the above results with the results of an inquiry into a nearly similar number of cases obtained at one of the English institutions, the Yorkshire Institution for the Deaf and Dumb. The details in the latter case are upon 110 pupils, and while they, in many respects, verify and corroborate the evidence already before us, in some important particulars there is considerable variance. It appears that all ordinary means are used to obtain correct statistical data at the Yorkshire Institution, not only on the physical influences which cause deafness, but also on the effects of moral and intellectual culture. A sufficient number of years has not yet elapsed since the institution was established to enable us to draw any important inferences from the facts hitherto recorded. From November, 1829, to August, 1835, 110 pupils were received into the Yorkshire Institution: of this number 75 were born deaf, 26 became so after birth, and of the remaining 9 no accurate information could be obtained. The statements as to the time at which deafness was first perceived in the 26 above mentioned are very vague, but it is certain that a very large majority became so under the age of three years, and that only one occurred at five years of age. Respecting the diseases on which deafness followed, the information is full and complete, so far as the observation of parents and the attestation of the medical practitioners of the various families could make it. In 9 cases the deafness is reported to have arisen from hydrocephalus and other affections of the brain, as inflammation, brain-fever, &c.: in 5 from general fever, scarlet-fever, &c.; in 4 from measles; in 3 from convulsions and other fits; in 2 from inflammation of the lungs; in 1 from cold; and in 3 cases from diseases which were unknown, or on which the friends of the children had no positive knowledge. Seventy-four of the 110 cases are in families where there are only these single instances of deafness, the remaining 36 belong to 27 families, and these 27 families contain 68 cases of deaf and dumb offspring. Seventeen of them have each 2 deaf and dumb; seven have each 3; two have each 4; and one has 5, making in all 68. Of these 27 families

1	has	5 d.d.	(5)	out of 9 children;	(9)
2	have each	4	(8)	,, 7 ,,	(14)
3	,,	3	(9)	,, 7 ,,	(21)
3	,,	3	(9)	,, 6 ,,	(18)
1	has	3	(3)	,, 5 ,,	(5)
1	,,	2	(2)	,, 10 ,,	(10)
3	have each	2	(6)	,, 8 ,,	(24)
1	has	2	(2)	,, 7 ,,	(7)
3	have each	2	(6)	,, 6 ,,	(18)
2	,,	2	(4)	,, 5 ,,	(10)
5	,,	2	(10)	,, 4 ,,	(20)
1	has	2	(2)	,, 3 ,,	(3)
1	,,	2	(2)	,, 2 ,,	(2)
27			68		161

This statement presents us with 27 families containing 161 children, of whom 68 are deaf and dumb. It has been mentioned that 26 of the 110 cases now under consideration are the effects of accident or disease; 24 of these instances may be somewhat positively concluded to be in families free from congenital deafness, from the fact that these are the only instances known in the families. The other case of two children, making the 26, is that of a brother and sister who are said to have become deaf after birth, in each case from inflammation of the lungs at two and a half years of age; it is proper to remark that in this instance both the father and the mother of the two children died of consumption at an early age, and that both the children are subject to pulmonary complaints and other affections indicative of disease.

Out of the total number of children that have been received into the Yorkshire Institution 8 were subject to goître; 7 to other scorbutic tendencies; 5 to fits; 2 to partial paralysis; 2 to consumption, and 8 were of otherwise delicate constitutions; three have died, 1 of inflammation of the lungs, one of dropsy supervening on scarlatina, and one of a very gradual consumption. In five families idiocy exists; in several, goître is found in the parents; in 19, one or both the parents died early, or before middle age; in several, deafness exists in collateral branches of the family; in one case, where the father is deaf and dumb, he has two children who can hear, and one who is deaf and dumb. In another, the family consists of four children, two of whom are deaf and dumb, and twins. The number of families employed in agriculture in the district to which the operations of the institution extend is 62,377; employed in trade and manufactures 140,856; other families 73,333. Of the 110 pupils 63 were from mining and manufacturing districts, and chiefly from large towns, and 47 were from agricultural districts. Of these 110 pupils 20 were found to be of decidedly superior intellectual powers; 61 were of ordinary talents; 19 were inferior in mental endowments, and 10 were very low in intellect—compared even with those of the next grade, but not so low as to be considered idiots, for even these were able to connect simple ideas in writing, to comprehend all ordinary subjects connected with their daily exercises and wants, and were capable of moral improvement. In each of these *ten* instances it is remarkable that causes exist which partly account for this intellectual barrenness; in one instance the child and both the parents are unhealthy; in another there exists paralysis of one entire side of the body, and doubtless of one side of the brain, as the child is of a very active temperament; in the next case, there is a general feebleness of the constitution (in this case both the parents are healthy, and a very large family of children are remarkably so); in two instances the children are subject to fits, in another case the child is a species of dwarf, being physically and mentally undeveloped, remarkably good humoured, and the moral sense good, considering the unfavourable circumstances under which the child was brought up; in the ninth instance the pupil laboured under St. Vitus's dance, and scorbutic affections; and in the tenth, the mother has goître, the father is dwarfish, and one of the brothers is an idiot.

Such are some of the results which have been obtained at one institution, and we now submit the form in which the information is recorded. This form embodies particulars which, from the comparatively short existence of the institution, cannot yet be completed, and it is probably capable of improvements which in due course will present themselves. At the same time it is a document which, as far as it goes, is satisfactory, and which even in its present form may serve as a model till something better is suggested. The book in which the details are kept is divided into columns varying in width according to the information to be written in them. The heads are as follows:—No. of Case, Name of Child, Description and Circumstances of Parents, Moral and Physical Habits of Parents and Family, Residence, Physical Character of the District, No. of Family, No. of Deaf and Dumb, Age of Pupil, When Admitted, Born Deaf or became so, and when, Under what Circumstances became Deaf, If otherwise Diseased and its Nature, No. of Years at School, Intellectual Character, Moral Character, Why left School, Deafness in Family, Cases of Consanguinity existing between Parents before Marriage, Business on leaving School, Additional Remarks.

The only statistical document which the publications of the London Asylum for Indigent Deaf and Dumb Children furnish is the following very important one, extracted from their Report for June, 1833, by which it is shown that 20 families, containing 159 children, number 90 deaf-mutes.

Names.	Parents' Description.	No. of Children.	No. of D. & D.
Mary Martin	Father a labourer	10	7
James Wm. Kelly	do. a porter	8	7
Mary Aldum	do. a broadcloth weaver	12	6
William Coleman	Mother a widow	11	5
David Thompson	Father a smith	10	5
James Cousens	do. a brickl.'s labourer	8	5
George Franklin	Mother a widow	8	5
Silas Vokins	Father a labourer	7	5
Thomas Barnes	do. a cobbler	6	5
Thomas Pounceby	do. a dyer	12	4
Henry Tatler	do. a working jeweller	10	4
Abrm. Murgatroyd	do. a cloth weaver	9	4
William Baynes	do. a schoolmaster	8	4
Mary Lovegrove	do. a labourer	8	4
Elizabeth Cherry	do. a watch-finisher	7	4
William Cockton	Mother a widow	6	4
Robert Mortimer	Father a cloth weaver	7	3
Francis Hancock	do. a small farmer	6	3
Susannah Rye	Mother a widow	3	all 3
Eliza Fox	(An orphan)	3	all 3
		159	90

From a circular issued by the National Institution for the Deaf and Dumb of Ireland, we are enabled to extract some interesting statistical details which other institutions do not supply; they are stated as follows:—'We have kept an accurate registry as to all the circumstances of 489 These belonged to families in which there were 2020 children, of whom 563 were deaf and dumb. Of the above 489 applicants, 279 were boys, and 210 girls: 423 were born so, and 66 became deaf after birth, from various diseases and accidents, such as falls, blows, kicks of animals, colds, measles, fevers, worm-fevers, abscesses, palsy, &c. Ninety-seven were not wholly deaf, though so much so as to be quite incapable of learning in the common way; and all those born deaf, as well as almost every one of such as had lost their hearing in early childhood, as a consequence of surdity, were totally dumb. The following scale will show the number of cases of deaf-mutes in different families of from 1 to 12 children:—

Total Number of Children in the Family.	Number of these Children Deaf and Dumb.				
	1	2	3	4	5
1	39				
2	39	6			
3	70	8	1		
4	53	8	2		
5	61	14	8		
6	45	4	3		
7	30	7	7	1	1
8	17	7	1		
9	5		1	1	
10	4	1			
11	1				
12	1				

Number of Families in which these proportions occurred.

'In one case twins were born deaf and dumb. Several had minor defects of sight in one or both eyes. Four (3 in one family) could not see during sun light; 3 had lost 1 eye, and 5 were blind of both; about a dozen had epileptic fits; very many were afflicted by scrofula (king's evil); and about 12 or 13 have been since ascertained to be more or less idiotic. To show the poverty of the families the following classification is sufficient:—in 115 cases the parents were labourers; in 79, small farmers; in 32, servants: in 28, weavers; (in 13 unknown;) in 11, shoemakers, blacksmiths; in 10, tailors, soldiers; in 9, carpenters; in 8, petty grocers; (7 were foundlings;) in 6, washerwomen; in 4, beggars, clerks, fishermen, masons, pensioners, policemen, seamen, shopkeepers, tradesmen; in 3, bakers, carriers, house-painters, schoolmasters, tide-waiters, woollen-drapers; in 2, butchers, confectioners, gardeners, innkeepers, hackney-coachmen, hucksters, millers, publicans; in 1, bleacher, brass-founder, broker, brogue-maker, cap-maker, chandler, chimney-sweeper, constable, cooper, cork-cutter, corn-merchant, currier, cordwainer, dairyman, dancing-master, dyer, flax-dresser, game-keeper, harness-maker, mate, millwright, navy-officer, oyster-seller, pedlar, plasterer, postman, postmaster, sawyer, spinner, surveyor Of these almost exactly one-half were residents in towns, and one-half in country places.'

The 'Thirteenth Report of the American Asylum at Hartford,' contains many interesting particulars on the statistics of deafness. Since the commencement of that institution in 1819 to 1829, 279 pupils had been received, 157 males, and 122 females. 'Of these, 116 were born deaf, and 135 lost their hearing in infancy or childhood, by disease or accident; with regard to 28, it is uncertain, or doubtful, in what way this misfortune befel them. It appears from this that a somewhat greater proportion have become deaf, and consequently dumb, by some adventitious cause after their birth, than by any constitutional defect. So far as accurate information has been obtained among those who have become deaf by disease or accident, 15 became so quite in infancy; 27 before 1 year of age, 58 between the ages of 1 and 4 years; 14 between 4 and 5 years, and 9 between 5 and 7 years of age. Among the causes producing this calamity, 25 cases are attributed to the scarlet fever, 16 to various kinds of fever not defined, 7 to the canker-rash, 5 to the measles, 2 to an inflammation of the brain, 1 to the small-pox, 1 to the hooping-cough, 1 to palsy, 1 to the discharge of cannon at a military review, and 1 to sudden falls. In very many cases it has been found impossible to procure satisfactory information. The 279 pupils have come from 247 families, 47 of which have contained more than 1 deaf and dumb child; 20 families have each contained two; 4 families, three; 7, four; 4, five; 2, six; and

, seven. In one family the father is deaf and dumb, and also four of the children. In another, the father and two children are deaf and dumb. These are the only instances in which either of the parents of the pupils has laboured under this defect, while in several other cases which have come to our knowledge, one or both of the parents have been deaf and dumb, yet their children have heard perfectly well; so that it does not appear that the malady is always an hereditary one. It seems rather to be found among certain families and their collateral branches. Thus two of the pupils (sisters) have had fourteen kinsfolks deaf and dumb, the whole sixteen being descended from the same great-grandmother; while what renders this fact the more singular is, that their common ancestress, all her children, and all her grand-children, possessed the faculties of hearing and speech.'

In Bébian's 'Journal de l'Instruction des Sourds-Muets,' No. ii., p. 117, 118, it is remarked that the canton of Vaud, in Switzerland, containing 122 parishes, presents a remarkable phenomenon. In 67 parishes there is not a single deaf-mute; in the other 55, there are 152, which is about one in every hundred of the population. In the district of Moudon there are 43 deaf-mutes among 6602 inhabitants; in Payerne only 25 in 6095; in Eaubonne 20 in 9688; and in Vallée, 12 in 3938. The physical causes of this difference are unknown, but of 152 deaf-mutes 66 were found capable of instruction. Most of the other 70 are also afflicted with cretinism; age and diseases of various kinds unfit the others for instruction. Almost all are the children of poor parents, who could not contribute to the expenses of education.

On the origin and transmission of peculiarities, whether resulting from conformation or from disease, there is a arge assemblage of facts in the writings of Blumenbach, Lawrence, Esquirol, Gall, Spurzheim, the Combes, and others; sufficient perhaps to enable the inquirer to come o some general conclusions, and to point towards laws which influence the physical condition of man. The more he inquiry descends into detail, the greater are the difficulties which attend it. The physical history of deafness s an almost unexplored field for research. Of late years, he writings of Deleau and Itard have made known some facts calculated to assist in the diffusion of correct views on his malady, and their experience has led to some results favourable to the sufferers; but at the same time it is highly desirable that facts should be collected wherever hey can be obtained, as these alone can lead to the formaion of correct opinions and the suggestion of remedial measures. The bad effects of in-breeding are known to all who are engaged in the rearing of horses and other animals; t has also produced some melancholy instances in the human race. To these it may be added that many cases of deaf-mutes known to the writer of this article, are the offspring of first-cousins and of other marriages of near consanguinity. Should the offspring of such marriages be frequently found to labour under physical defects, may we not safely infer that a natural law is transgressed, and that t is followed by its peculiar punishment? We conclude his portion of our subject with a powerful conviction that public institutions should unite their efforts for the common improvement of society; that they should obtain every nformation directly or indirectly bearing upon those cases which come under their observation; and from time to time bring their details into one general form. Connected with system of registration, very ample details might be obained. In the operation of such a system every case of physical defect observed at the birth of a child, or soon after, should be recorded; and at stated periods the heads of families should report on any deficiencies to which their hildren have become subject, whether arising from an original but previously unnoticed infirmity, or derived from accident or disease. Thus all cases of physical defect, whether organic or functional, all instances of mental imbecility, would be accumulated, and such a body of facts would prove in no small degree useful to society.

Before the practicability of instructing the deaf was known, it was generally supposed that instruction by means of language was limited to those who could hear. The idea never occurred, or if it did, was as instantly reected, that the deaf man was not, by reason of his deafness, excluded from the means of acquiring knowledge. It was not till the sixteenth century that the possibility of carrying forward the process of education in the absence of all hearing, received any serious consideration. Even at the present day there are many persons who are at a loss to conceive not only how abstract notions, but even how the names of palpable objects are made known to the deaf, and at a still greater loss to imagine how they can be brought to use language to express their ideas. Having themselves obtained knowledge through the ear, having been accustomed to impart their thoughts by oral communications, they seem to forget that the mind has intelligence in all the senses, connecting it with the external world, and conveying knowledge to those higher faculties which compare, discriminate, and judge. In an intelligent though uneducated deaf person, an observer would find these processes going forward, though confined indeed to a very limited sphere, owing to the poverty of his knowledge, but still knowledge, and deduced from observation. The existence of the reasoning power being thus evident, the means to cultivate it would be the next object for philosophic investigation. That Aristotle had never made these observations and investigations is evident, or he would not have come to that absolute conclusion which excludes the deaf from all participation in knowledge. Among other people of antient times these unfortunate beings were the objects of a species of proscription, being supposed to labour under the curse of Heaven. Previous to the time of Justinian the Roman laws maintain an absolute silence upon the deaf and dumb. They speak frequently of deaf persons, not being dumb; and also of dumb persons, not being deaf; but never of those labouring under both these deprivations The Code (lib. vi., tit. xxii. l. 10) mentions the deaf and dumb in a manner express and special. Five classes of persons labouring under one or both of these deprivations are established. Those who from their birth were deaf and dumb were legally incapable of making a will, or of manumitting a slave, and laboured under other civil disabilities.

The reader will find in the work of C. Guyot, of Groningen, which is a dissertation written in Latin on the legislation relative to the deaf and dumb down to 1824, with a list of authors, all that relates to this part of the subject. Saint Augustine declares that the deaf and dumb are shut out from obtaining religious knowledge; and many respectable ecclesiastics in the time of the Abbé de l' Epée openly condemned his undertaking. The benevolent abbé also informs us that parents considered it a discredit to have deaf and dumb children, and they believed that they fulfilled every claim such offspring could have on them by merely supplying their animal wants, concealing them from the eyes of the world within the walls of a cloister, or in some other obscure abode. He also asserts that in some uncivilized countries the deaf and dumb were in *his* time regarded as monsters, and were put to death as soon as their calamity was ascertained. So that we find naturalists, legislators, divines, philosophers, and even parents, agreeing in the impracticability of conveying knowledge otherwise than by speech, and thereby excluding the deaf and dumb from all means of intellectual improvement.

From the advantages which instruction has afforded to a certain proportion of the deaf and dumb for the last half century, a tolerably correct estimate may be formed of their capabilities for improvement. The deaf-mute living in society, but without instruction, must be regarded as one of the most solitary and melancholy of beings. He is shut out from all but the most imperfect intercourse with his species; and the very intellect by the possession of which he is raised above the lower creation serves only to heighten his calamity, and to render the sense of his deprivation more acute. His perceptions of external objects are indeed accurate but superficial, and confined to a very small sphere. Of the various arts by which the necessaries and conveniences of civilized life are produced, he can have no knowledge beyond that which is included in the range of his own vision. Animal desires he feels, and he is led by the conventional usages of society to the performance of moral duties and the avoidance of open and flagrant crime. Thus he becomes experienced as other human beings are in what is right or wrong. He sees that virtuous actions have a certain amount of reward, in the opinions of good men; for he learns to discriminate between those whose actions are proper and those who do wrong; and again, he sees that in many cases vice meets with disapprobation and punishment among mankind. How this kind of experience shall affect his own conduct must depend not only on the circumstances in which he is placed, as to example and the moral influence of those with whom he has to associate, but also on his own natural tendencies.

The performance of moral duties implies the exercise of intellectual faculties; and from his birth the deaf-mute makes use of his reasoning powers. He is subject to changes of purpose, to changes of feeling, to the passions, the pleasures, and the infirmities common to his species. He is sensible of kindness; he gives proofs of affection. That such is the uneducated state of the deaf and dumb might be proved by the observations of their parents, friends, and instructors in hundreds of instances. That such must necessarily be the case, supposing them not to be idiots, it would be easy to show. We affirm, in contradiction to those who contend that deaf-mutes are naturally more debased than other men in intellect and in morals, that there is not an individual deaf-mute now under instruction—improving, and thereby evincing rational faculties—who, previous to instruction, however disadvantageous the circumstances which attended his earlier years, did not evince moral sentiments and intellectual operations. We have traced the history of many of this class in different ranks of society down to the period when the deprivation under which they have laboured was first ascertained; and we have found invariably that mixture of good and evil in their actions and tendencies which is seen amongst other children. We have also had sufficient proofs of the exercise of intellect even while they were in a state of childhood. The parents of deaf and dumb children can sufficiently attest the truth of these observations.

At the same time, it must be acknowledged that the deaf and dumb are generally inferior in their moral and intellectual powers to those who do not labour under the same defect. But this inferiority is only one of degree, and may be satisfactorily accounted for, in accordance with the opinions above expressed. Andral has described the state of an uneducated deaf and dumb person; and to a certain extent we can adopt his sentiments. Experience and observation among this class of persons would have induced this accomplished pathologist to have bestowed on them even a more liberal endowment. 'The deaf-mute exhibits in his intellect, in his character, and in the development of his passions, certain modifications which depend on his state of isolation in the midst of society. We find him remain habitually in a sort of half-childishness, and he has great credulity: to balance this he is like the savage, exempt from many of the prejudices which we owe to our social education. In him the tender sentiments are not very deep; he appears not to be susceptible either of lasting attachments or of lively gratitude; pity touches him but feebly; he is an entire stranger to emulation; he has few enjoyments and few desires; and the impressions of sadness but slightly affect him. This is what is most commonly observed in deaf-mutes; but this picture is not universally applicable. Some, more happily endowed, are remarkable for the great development of their intellectual and moral nature; there are others, on the contrary, who continue in a state of complete idiocy.' (*Dictionnaire de Médecine*, article Surdi-Mutité.) This last remark of Andral's requires some qualification. Deaf and dumb persons who possess intellectual faculties are no more liable to become idiots than others whose organs perform their appointed functions. Their powers may remain undeveloped; they may be ignorant of every thing which depends on intercourse with mankind; their reasonings may be inconclusive, and their inferences erroneous from their confined observations; but still their mental powers will be called into action, and they will be, to a great extent, under the control of their reasoning faculties. This is not the case with idiots: in them there is a total want of self-government, a total absence of intellectual control. There are, at the same time, numerous cases of idiots who are *dumb;* not, however, in consequence of deafness, but from their incapacity to understand the meaning of language, to imitate it, and to apply it. These persons cannot be classed with *the deaf and dumb*. It may be this class to which Andral particularly alludes in the latter part of our quotation; for he qualifies his remark in some measure by adding, 'The difference in the intellectual and moral nature of man is often primitive, and independent of all external influences.'

Of the same opinion with ourselves we find Degérando, Bébian (the successor of Sicard), Piroux of Nancy, and all the more successful teachers of the deaf and dumb of the present day in this country, and throughout Europe and America. The empiricism and deceptions which dishonoured the earlier schools for the deaf are gone. The credulity and the delusions of which these were the effect are no longer a disgrace to our institutions. The craft is no longer confined to a few individuals, for whose benefit it is necessary that mankind should be ignorant of the nature and capabilities of those who are deaf and dumb. To corroborate the views we have taken, the deaf may be allowed to speak for themselves. The beautiful account of the early life of Jean Massieu, which was written by himself for the author of 'La Corbeille des Fleurs,' exhibits the intellectual and moral condition of Massieu, prior to the education which he received from Sicard. Many passages in that account will abundantly illustrate what we have advanced. Massieu is a metaphysician of no common cast, as will be seen from the following answers to questions proposed to him, by various persons, at different times and places. He was asked, 'What is gratitude?' 'Gratitude is the memory of the heart.' 'What is a sense?' 'A sense is an idea-carrier.' 'What is the difference between things physical and moral?' 'Things physical are the objects which fall under our senses; things moral are manners and actions of mankind, the operations and qualities of the soul. Things physical are material; things moral are immaterial.' 'What is ambition?' 'Ambition is the immoderate desire of governing, gaining riches, or possessing anything which we have not. Ambition is also an excessive ardour for honour, glory, places of distinction, exaltation. It is the movement of a soul which hovers round an object which it is coveting or ardently pursuing.' 'What is hope?' 'Hope is the flower of happiness.' 'What is eternity?' 'A day without a yesterday or to-morrow—a line that has no end.' 'Does God reason?' 'Man reasons, because he doubts, he deliberates, he decides. God is omniscient; he never doubts: therefore he never reasons.' The account of Massieu's early life is printed at the end of Sicard's 'Théorie des Signes.' Several translations of it have been published.

The first mention we meet with of the capacity of those born deaf to receive instruction, is in the writings of Rodolphus Agricola (born A. D. 1442) of Groningen. He does not inform us who was the parent of the art; but he mentions in his posthumous work, 'De Inventione Dialecticæ,' that he had himself witnessed a person deaf from infancy, and consequently dumb, who had learned to understand writing, and, as if possessed of speech, was able to note down his whole thoughts. The truth of this relation was doubted by Louis Vives, of Valentia, who wrote in the beginning of the sixteenth century; but there is as good reason to put trust in Agricola's account as to join in Vives's disbelief. (See the treatise, *De Anima*, of Vives, *L. ii. c. De Discendi Ratione.*) Not long after the death of Agricola, and during the life of Vives, the theoretical principles on which the art rests were discovered and promulged by the learned Jerome Cardan, of the University of Pavia, his native place. He was born in 1501 and died in 1576. Cardan thus expresses himself:—'Writing is associated with speech, and speech with thought; but written characters and ideas may be connected together without the intervention of sounds, as in hieroglyphic characters.' (See *Journal of Education*, No. VI. p. 204.) The first practitioner of the art of instructing the deaf was Pedro de Ponce: this fact is authenticated by two of his contemporaries, Franciscus Vallesius and Ambrosius Morales. Ponce was a monk of the order of St. Benedict at Oña. Morales, in his 'Antiquities of Spain,' thus speaks of Ponce:—'He has already instructed two brothers and a sister of the constable, and he is now occupied in instructing the son of the governor of Aragon, deaf and dumb from his birth, as the others were. What is most surprising in his art, is, that his pupils speak, write, and reason very well. I have from one of them, Don Pedro de Velasco, brother of the constable, a written paper, in which he tells me that it is Father Ponce to whom he is indebted for his knowledge of speech.'

The register of deaths of the monastery of the Benedictines of San Salvador de Oña, informs us of the death of Pedro de Ponce, in August, 1584: it records of him that he 'was distinguished by his eminent virtues, and that he obtained a just celebrity throughout the world in instructing deaf-mutes to speak.' John Paul Bonet, also a Spaniard published a work on this subject nearly forty years after he death of Ponce. He had probably heard of the success which had been attained in this infant art; and from tradition he might have gained some glimpses into the methods Ponce had pursued; but it appears that he was unacquainted with those methods in any serviceable form, as he epresents himself as the inventor of the modes which he pursued, including mimic signs, writing, dactylology, and he oral alphabet. His work, which was in after-years useful to de l'Epée, is entitled *Reduccion de las Lettras, y Arte para enseñar á hablar los Mudos*. [Bonet.] During he time of Bonet, the art was also making some progress n Italy. Several individuals are mentioned in Degéando's work who were more or less engaged upon the ubject. Affinate wrote at the commencement of the eventeenth century on a manner of teaching the deaf to peak; and Fabrizio d'Acquapendente wrote upon the phenomena of vision, voice, and hearing; and on speech and ts instruments. In 1616, Jean Bonifacio published a reatise on the language of action. Pierre de Castro, who was chief physician to the duke of Mantua, instructed the on of Prince Thomas of Savoy, but it is not known on what principles. Pierre de Castro died in 1663. About 670, Father Lana-Terzi, a Jesuit of Brescia, who is decribed as 'an ardent investigator of nature,' employed himself on the subject of giving language to the deaf, and eaching the blind to read and write.

Many first discoveries were probably made of this art: everal of them originated with, or were carried forwards by, philologists, and particularly among the schemers for an niversal language. In England, John Bulwer's name must stand prior to that of any other individual as an author n the subject, and his views, as given in 'Philocophus,' re sound and practical. It has often been attempted to lace Dr. Wallis at the head of this list of discoverers in England; but Bulwer's 'Philocophus, or the Deafe and Dumbe Man's Friend,' was published several years before Wallis attempted even his treatise on speech, and he did not publish his claims as an instructor of the deaf till 1670. We find on consulting the above-named work of Bulwer's, hat Chap. XV. contains the relation of Sir Kenelm Digby s to what Bonet had accomplished in Spain; and there is no doubt but Wallis obtained information from the same ource, as he was in constant correspondence with Sir K. Digby. [Bulwer.]

A degree of credit is certainly due to Dr. Wallis for the pains he took to systematize what had been done up to this period, and to bring the philosophy of language to bear upon the art. His two great objects, as stated in a letter o Mr. Boyle, were 'to teach a person who cannot hear to *pronounce the sound of words*,' and to teach him 'to *understand a language* and know the signification of those words whether spoken or written. whereby he may both express his own sense and understand the thoughts of others.' Writing, reading on the lips. and speech, the manual alphabet, logical induction, the natural signs—acquired from the deaf—were the means he made use of. From the accounts which have come to us, he succeeded in his purpose. His pupil, Daniel Whalley, was exhibited before the Royal Society in the year 1662. The priority of his invention was disputed by Dr. William Holder, rector of Bletchington, who asserted that he had, in the first instance, taught Popham, one of Dr. Wallis's pupils, to speak. Holder published his *Elements of Speech, with an Appendix, concerning persons Deaf and Dumb*, in 1669, which was some years after Wallis's first writings and practice had been made known.

In the same year in which Wallis made known his nventions for the deaf, 1670, George Sibscota published little work on the subject, entitled the 'Deaf and Dumb Man's Discourse.' He had learned from the writings of Franciscus Vallesius to what extent Ponce had succeeded. Very little can be gleaned from this work, which consists chiefly of reasoning and theory.

The next author on the subject whose work we shall notice s George Dalgarno. His treatise, though full of the conceits of learning, is essentially practical, and even at the present day it might serve as a guide to an intelligent person who desired to become an instructor of the deaf. The date of this little work is 1680. [Dalgarno.]

Dalgarno announces on the title-page of 'Didascalocophus,' that his treatise is the first (for aught he knows) that has been written on the subject. He commences by showing that a deaf man is as capable of understanding and expressing a language as a blind man, inasmuch as that all information is conveyed to the mind through the bodily organs. He goes too far however in attempting to show that the deaf man has even superior advantages in acquiring languages to those of the blind. Dalgarno's alphabet is exhibited in the article Dactylology.

We will now trace the earlier progress of the art in Holland. Peter Montans offered some remarks on the instruction of the deaf so early as 1635. F. M. Van Helmont published in 1667 a small tract, entitled *Alphabetum Naturæ*, in which he shows how the deaf may be made to understand the motions of the organs of speech, much after the manner of others who are taught to read. His book is remarkable for some singular opinions on the nature and origin of language; and he mentions instances of the result of his system, too improbable to be received even by the most credulous. In 1690, John Conrad Amman, a Swiss physician, residing at Haarlem, undertook the instruction of a girl, deaf and dumb from birth. He seems not to have been aware how much had been accomplished in this art: his own success was decisive; and while his work was in the press, he became acquainted with the writings of Wallis, and entered into correspondence with him. His essay, entitled 'Surdus Loquens,' the speaking deaf man, was published in Latin. His methods were founded on articulation. Amman requires that his pupils' organs of speech shall be rightly formed, then, he says, 'my first care is to make him to sound forth a voice, without which almost all labour is lost; but that one point, whereby deaf persons do discern a voice from a mute breath, is a great mystery of art, and if I may have leave to say so, it is the hearing of deaf persons, or at least equivalent thereto; viz., that trembling motion and titillation which they perceive in their own throat whilst they, of their own accord, do give forth a voice. That the deaf may know that I open my mouth to emit a voice, not simply to yawn, or to draw forth a mute breath, I put their hand to my throat, that they may be made sensible of that tremulous motion when I utter my voice; then I put the same hand of theirs to their own throat, and command them to imitate me; nor am I discouraged if, at the beginning, their voice is hard and difficult, for in time it becomes more and more polite.'

Amman goes on to explain how he communicates the pronunciation of letters singly and combined, in a way sufficiently plain for any intelligent person to follow his plan. He concludes by saying, 'if there occurs to anybody anything either too hard or not sufficiently explained, he may expect a more full edition; or else let him repair to the author, who, according to the lights granted to him, will refuse nothing to any man.'

At the commencement of the eighteenth century the art began to attract the notice of the learned of Germany. Very early in the eighteenth century, Kerger commenced the work of instruction at Liegnitz, in Silesia. His sister was associated with him in his labour. He used drawing, pantomime, articulation, and writing; it is uncertain whether he employed dactylology, but he speaks highly of mimic language. Contemporary with Kerger was George Raphel, pastor and superintendent of the church of St. Nicholas at Luneburg, who had six children, and among them three daughters who were deaf and dumb. Paternal affection made him an instructor of the deaf; he succeeded beyond his hopes, and wrote an account of his proceedings for the benefit of others. His work was published at Lunenburg in 1718. Other teachers in Germany were Otho Benjamin Lasius, the pastor Arnoldi, and Samuel Heinicke. Lasius confined himself almost solely to the teaching of visible language, as reading and writing, associating the forms of the words with the ideas they were intended to convey. It is said that his pupil made a satisfactory progress, and that at the end of two years she could answer important questions on religious subjects. Arnoldi used the means more commonly employed; articulation, drawing, dactylology, writing, and natural signs. Heinicke was the instructor at Leipzig of an institution founded in 1778. He had announced previously to this time that in the course of six weeks he had taught a deaf and dumb person to answer whatever questions were proposed to him. He used those means which had been employed by previous instructors. and he also placed instruments in the mouths of his pupils to regulate the positions of the vocal organs in emitting sounds. He claimed the honour of invention on many points, and guarded with strict secrecy some of his proceedings. He was a man of great self-conceit, irritable, rude, and overbearing. He had adopted the philosophic system of Kant, and published some writings relating to it. He is said to have been a man of considerable talent in the instruction of the deaf and dumb, and of an active and indefatigable spirit. In his controversy with the Abbé de l'Epée, he certainly gained little credit either as a teacher of the deaf, or as a philosopher.

France commenced this art later than the other enlightened nations of Europe. Indeed she opposed its progress by those philosophic prejudices which in other countries had been refuted by actual experience. A deaf-mute from birth, named Guibal, had made his will *in writing* so early as 1679; and proofs of his knowledge and intelligence were produced in court, so that it was confirmed. It is unknown who had been his instructor. About the middle of the seventeenth century, several individuals in different parts of France turned their attention to the subject. Those of whom we know most are Father Vanin, a priest of the Christian doctrine, Rodrigue Péreire, a Portuguese, Ernaud, the Abbé Deschamps, and the Abbé de l'Epée. Father Vanin employed design both for giving information on sensible objects, and also in an allegorical way to illustrate abstract and intellectual ideas. Very crude and erroneous notions must have resulted from a system so imperfect, and so little capable of extensive application. The first person who excited general attention in Paris was Péreire; he obtained the approbation of the Academy of Sciences, to the members of which learned body he exhibited the progress of his pupils. His processes were made a secret even to the members of his family; he however offered to disclose them for a suitable consideration, which was withheld, and the nature of his system is only imperfectly known at the present day. His pupils were highly instructed, more highly perhaps than any of an earlier or a subsequent period. A judgment may be formed of the efficacy of his methods from the report of a committee of the Academy of Sciences, where it is stated that his pupils were able to understand what was said to them, whether by signs or by writing, and that they replied *vivâ voce*, or by writing; they could read and pronounce distinctly all sorts of French expressions; they gave very sensible replies to all questions proposed to them; they understood grammar and its applications; they knew the rules of arithmetic, and performed exercises in geography; and it appeared that M. Péreire had given them, with speech, the faculty of acquiring abstract ideas. The two best known of Péreire's numerous pupils were Saboreux de Fontenai, and D'Azy d'Etavigny. The former of these two has written an account of the means pursued by his teacher, for which we must refer to the work of the baron Degérando before mentioned. It appears that Péreire employed articulation, reading from the lips, the manual alphabet, and a method of syllabic dactylology. By this latter instrument of instruction he was enabled to communicate very rapidly with his pupils, and by the frequent use of words in different combinations a knowledge of their value was imparted to them. Thus the frequent recurrence of words, through so rapid a mode of intercourse, assimilated the acquisition of language to the ordinary process with hearing and speaking persons. The channel of communication being established, and a copious knowledge of words acquired, the art of the instructor would be little more difficult than that of ordinary education. A few years after Péreire's methods had received the approbation of the Academy of Sciences, Ernaud presented to them a memoir on what he had attempted for the deaf and dumb. The Society gave him encouragement, but it appears that the pupil brought under their notice was not far advanced in instruction. Ernaud's attempts were more particularly directed to measures of physical relief; he revived the sense of hearing in some cases where it had been partially lost, and he asserts that he had never met with an instance of total deafness. Articulation was the principal means he employed. In 1779 the Abbé Deschamps published his 'Cours Elémentaire d'Education des Sourds-Muets.' To the education of this class of persons he devoted his life and his fortune. He followed in the track of Amman, giving the preference to articulation, and the alphabet upon the lips, over the methodical signs of the Abbé de l'Epée. His establishment was at Orleans, where he received paying pupils, and instructed the indigent gratuitously.

In tracing these early steps in the instruction of the deaf and dumb, we have attended more particularly to the working parts of the different methods by which such instruction was intended to be conveyed. We have passed over the various philosophic theories with which some of these methods are encumbered, because they are either forgotten, or rendered obsolete by recent discovery. Much learning was antiently wasted on subjects in themselves trivial, mysterious, or incomprehensible, yet to such researches we owe much valuable knowledge. It seems that no investigation into the laws of nature, however absurd or unattainable the immediate object of such investigation, is utterly without reward. The alchemists of olden times, though failing to discover the wonderful stone for which they sought, found out new properties, new substances, and new combinations, which cheered their labours and conferred direct benefits on society. So, with many of the writers we have noticed, their speculations, though wild, have not been in vain; the useful parts of their systems have been retained, and are now diffusing good among the class for whom they laboured.

The Abbé de l'Epée was one of the most active and benevolent labourers in this task of humanity. He brought into systematic operation the notions which had previously prevailed on the possibility of conveying intellectual knowledge to deaf-mutes, and added to these stores of experience from the resources of his own highly-gifted and well-disciplined mind. He certainly succeeded to a greater extent than any of his predecessors in enlisting the public feeling in his favour, and in drawing the attention of sovereigns to one of the most unquestionable works of charity and of mercy; yet his name has not been suffered to descend to posterity unstained by obloquy, nor undimmed by malignant censure. It appears that accident first made him acquainted with the deaf and dumb; benevolence led him to the consideration how their wants might be supplied. He remembered that his tutor had once proved to him that there is no more natural connection between metaphysical ideas and the articulated sounds that strike the ear, than between the same ideas and the written characters that strike the eye, and that his tutor drew this conclusion —that it was as possible to instruct the deaf and dumb by writing, always accompanied by visible signs, as to teach other men by words delivered orally, along with gestures indicative of their signification.

In the early part of de l'Epée's career he met with the work of Bonet before mentioned, and the enlarged treatise by Amman, 'Dissertatio de Loquela.' With these guides, aided by the enthusiasm which formed a part of his character, he pursued his task vigorously and with a certain amount of success; not with the success of some of his forerunners in the art, who had devoted themselves entirely and for years to individual pupils. The Abbé had a large number of pupils to whom he devoted his life and patrimony. Every one who has been a teacher knows well the degree of success which he may expect if his whole mind is concentrated upon the improvement of a few individuals, and the difficulties he may anticipate if his attention is divided among a great number of pupils. The Abbé appears to have made use of articulation in one part of his career, for he wrote a treatise on the mode of teaching by this auxiliary; this treatise was chiefly derived from the writings of Bonet and Amman. He employed dactylology, as it ever must be employed, so long as it is confined to the alphabet only, in a subordinate degree. Pictures he found an uncertain resource, and only useful in the earlier stage of instruction. Methodical signs and writing were the means on which he chiefly depended for the conveyance of intellectual knowledge. The employment of methodical signs for words is only the substitution of one artificial language for another. He established a connection in the mind of the pupil between these signs and the language of their country, but it is by no means satisfactory that he established a connection between these signs and the ideas which they were intended to represent.

The Abbé de l'Epée commenced his work by endeavouring to perfect a language of methodized signs as copious and accurate as the spoken language of a highly civilized country. He seems to have believed that he had only to do this to reduce the process of teaching the deaf to a mere translation. He appears to have lost sight of the fact that he had minds to cultivate and to fill with knowledge, and that without this cultivation the mere knowledge of words, the translation of words into gestures, and of gestures again into writing, would be but labour lost. When he gave his pupils signs for words, he imagined that with the signs he gave them ideas, but he only gave them words. In acquiring a second language, those who already possess one have at command a comparative grammar which informs them to a certain extent of the value of certain words in certain connections with others; but the deaf have no such advantage; their natural and uncultivated language—gesture—is powerless for everything but the expression of their most ordinary wants; they have no separation of their ideas into classes, such as produce the parts of speech in more perfectly formed languages. Adelung mentions the nhabitants of the countries on the Asiatic continent as having 'but one sound to signify *joyful, joy, to rejoice;* and that through all persons, moods, and tenses. The mere radical ideas are set down together, the connecting links must be guessed at. They form plurals as children do, either by repetition, as *tree. tree*, or by adding the words *much* or *other*, as *tree much, tree other.*' *Mithridates*, v. i. p. 18. Thus it is with the naturally deaf, the radical idea s all that their gestural language is capable of expressing until modified by those arbitrary forms of speech which are the accessories of every polished language.

An example of the mode of communication which the Abbé de l'Epée adopted may be taken from his work. M. Linguet had observed that the deaf and dumb were demi-automatons. The Abbé addressed him, and a short time after Linguet visited the Abbé and his pupils. 'I requested him,' says the Abbé de l'Epée, 'to propose at his fancy, some abstract ideas to be delivered by methodical signs to he deaf and dumb. As, out of compliment, he referred he choice to me, I addressed him to this effect:—"*Intel-ect, intellectual, intelligent, intelligence, intelligibility, ntelligible, unintelligible, intelligibly, unintelligibly, unin-elligibility:* here are nine words all generated from 'in-ellect,' to be expressed by distinct methodical signs. *Comprehensible, incomprehensible, comprehensibly, incomprehensibly; Conceivable, inconceivable, inconceivably; Idea, magination, imaginable, unimaginable; Faith, credence, credible, credibly; incredible, incredulous, incredulity:* here, learned sir, is a cluster of abstract ideas, which shall be left to your option." After some further little contest of politeness, he selected the word *unintelligibility*, doubtless conceiving it of greater difficulty than the rest. It was nstantly rendered to the pupil and written down. While he was viewing it with eyes of amazement, I thus resumed: 'Barely to produce the word you specified, learned sir, is a mere nothing. I will now unfold to you the means taken o prompt it by methodical signs; the exposition will not detain you long. Five of these signs were fully sufficient o designate the word; and you saw with what celerity they were given. The *first* signifies 'not an external but an nternal action;' the *second*, 'of reading the mind, that is exhibiting the disposition of apprehending the things proposed to it;' *the third* announces 'the possibility of this disposition,' whence arises the appropriate noun-adjective, *intelligible;* which, being a concrete quality, is converted nto the abstract by a *fourth* sign, forming *intelligibility;* and a *fifth* sign being added for negation, *unintelligibility* s produced." By this and other examples M. Linguet was convinced that his expression was inaccurate and inconsiderate; but we need not follow out the examination which the pupils underwent in his presence. We have quoted this example in order to show the mechanical nature of methodical signs. That these signs were well qualified for dictation of words was sufficiently proved in he Abbé's experience, but the words might be produced by he pupil from the signs of the teacher without their being understood, just as an ordinary schoolboy, unused to Latin exercises, might, from the dictation of his teacher, produce examples without understanding a single idea which they contained. These remarks are not made without some reservation; the Abbé professed to teach the meanings which the signs and words were to represent; but why did he not use the words only, without taking his pupils through a double mental process?

Herein is the great imperfection of the system of methodical signs, yet all his operations were not controlled by this peculiar system, and, when it was possible, the Abbé made use of the *natural* signs used by the deaf-mutes themselves, and interwove them with others of his own composition. Thus, in distinguishing gender, he says, 'The gender is explained by putting our hand to our hat for the masculine, and to the ear, the part to which a female's head-dress extends, for the feminine.' In the English institution the hand is placed to the beard to denote the masculine, and drawn along the forehead, in allusion to the parting of the hair, for the feminine. The following is the generally-received sign for singular and plural: 'The elevation of the right thumb designates the singular, the motion of several fingers the plural.' The following is also good: 'To express doubt, we turn our head to the right, a *yes*, and to the left, a *no;* which of the two will take place we cannot tell; we shall know only by the event.' Many similar examples might be adduced: how superior are these to 'twirling two fingers round each other while declining, that is, while descending from the first to the sixth,' to signify the 'term *case;* or 'the left hand under the right for the noun-substantive,' and 'the right under the left for the adjective, will be readily perceived.

We do not regard the success of the Abbé de l'Epée as complete, but we are satisfied that he pursued his methods with openness and candour, and with the single desire of promoting the moral and intellectual advancement of the deaf and dumb. Heinicke of Leipzig, and Péreire of Paris, must be regarded as his rivals, but he invited them to a discussion of the merits of the various systems, which they declined. While the good Abbé, with that frankness which formed a beautiful feature in his character, solicited the examination and the judgment of the learned upon his methods, his rivals shrouded their proceedings under a veil of mystery. The Abbé devoted his life and whole fortune, excepting a bare supply for his own wants, to the service of the class whom he had taken under his protection. Péreire refused to disclose his methods except for a large recompense; and Heinicke, in addition to receiving payment from the rich, had four hundred crowns annually allowed him by the grand duke of Saxony. Both these persons made the art they professed an interested speculation; the Abbé de l'Epée only tolerated the rich—he was proud of being the instructor of the indigent. His successor, the Abbé Sicard, carried forward the principles of De l'Epée: he instructed his pupils in the elements of composition, a branch of their education comparatively new, and in which Sicard most completely evinced his superiority over his master. Sicard at first conducted a school at Bordeaux; on the death of the Abbé de l'Epée, Sicard was called to fill his place at Paris. The philosophical opinions and penetrating views which Sicard maintained and practised are well developed in his 'Cours d'Instruction d'un Sourd-Muet,' in which is developed the plan on which he conducted the education of his celebrated pupil Massieu. He followed the leading principles of De l'Epée, particularly in employing methodical signs as one of the chief instruments of instruction; he considered well the nature of language, and by his clear and analytical methods of sensible illustration, he contrived to make the leading principles of grammar familiar to his pupils. In the latter years of Sicard's practice he thought more favourably of articulation, as a means of rapid communication between master and pupil, than he had done at the commencement of his career. The Baron Degérando says of his most popular work, 'When we read the "Cours d'Instruction d'un Sourd-Muet," we almost fancy that we are reading a kind of philosophical romance. It borrows its forms, and creates a similar interest; we find in it something of the romance of the Arabian Theophail (*Le Philosophe Autodidactique*); something which appears borrowed from the pictures of Buffon, the statue of Condillac, and the Emilius of Rousseau; it is a soul which has hitherto slumbered, which awakes; a hitherto darkened mind, which opens to the light; an intelligent life, which begins to develop itself, amid a variety of scenes, to the voice of the instructor; it is a kind of savage, strange to our customs, who is initiated into our ideas, our knowledge, and at the same time into our language. The Abbé Sicard enlarges upon each of these progressive stages, and he spreads over them the charm of a drama; he paints with warmth the uncertainties and the joys of the master and the pupil; and he succeeds in thus showing, in an animated picture, definitions and processes which appear the most barren in their nature; he gives a shape to the most abstract notions; it might be said that the Abbé Sicard is the *painter of syntax*, and the *poet of grammar*. This work went through several editions, and we need not be surprised at it, for it is not to the deaf and dumb alone that it may be profitable.'

Of the Theorie des Signes,' a work founded on the principles of the Abbé de l'Epée, we can only give a faint sketch. It is a kind of dictionary, in which the expressions of the face, and the attitudes of the body, for the communication of certain ideas, are described. The arrangement is not the ordinary alphabetical form of a dictionary, but a kind of logical order 'more conformable to the nature of things, and the growth and expansion of ideas.' The work is divided into twelve classes of things, adopting in each class an alphabetical order corresponding to the French language. These classes are arranged as follows:—

1. Signs of names of the most common objects, and such as come under observation during infantile years; these are the parts of the body, clothing, food, beverages, a town and its parts.

2. Vegetables, comprising forest-trees, shrubs, fruit-trees, culinary vegetables, medicinal herbs, wild plants, &c.

3. Minerals—gold, silver, copper, brass, lead, tin, iron, &c.

4. Of man—ages of man, relationships, school, institution, college, officers, domestics and servants of a house, tradespeople, mechanics, merchants; the liberal arts; titles, dignities in towns, cities, and states, and their functions; terms of war; ecclesiastics, and monastic functionaries.

5. Of God, angels, saints.

6. Of the elements, of fiery, luminous, and watery meteors; the firmament, earth, cardinal points, signs of the zodiac.

7. Parts of the world; names of nations, empires, kingdoms, republics, capitals, principal islands, &c.

8. Numbers, measures, weights, time, money, exchanges, commerce.

9. Organic qualities of man; abstract organic qualities of man; maladies of the body.

10. Qualities of matter; such as strike the senses of man, dimensions, shapes, surfaces, extent, quantity, lines, angles.

11. Physical actions of man, such as are expressed by verbs.

12. Intellectual and moral actions of man, expressed by verbs, nouns, adjectives, and adverbs.

These are the divisions Sicard adopted for his nomenclature, which occupies nearly the whole of the two volumes comprising the work, the latter portion of which is purely grammatical: in it the different parts of speech are considered not only under a general view, but under certain divisions which indicate their value, and assimilate those which bear a relationship to each other; thus adverbs of *manner*, of *number*, of *place*, of *quantity*, of *quality*, of *interrogation*, of *affirmation* and *negation*, of *time*, of *doubt* and *inquiry*, and of *comparison*, are distinctly and separately treated of. Without questioning whether the classification adopted in the twelve divisions of the 'Theory of Signs' be the best, we may see in such a classification the kind of gradations needful for supplying the deaf with an extensive nomenclature; and though few instructors would make the work a practical one, so far as to adopt the system of methodical signs there developed; yet, as a text-book, it unfolds a plan which any teacher may modify according to his own views. We think the work is less valued than it deserves to be, for as signs will, to a certain extent, be always in use among the deaf and dumb, especially in those institutions where they are educated, the theory of signs would be found of great use as a work of reference to all teachers. We need not panegyrize the Abbé Sicard; his exertions for the deaf and dumb are well known in this country, which he visited during the political troubles of France in 1815; his merits are acknowledged wherever the education of the deaf is pursued. We have sometimes been surprised that the 'Cours d'Instruction d'un Sourd-Muet' has not been translated into our language. Independent of its novelty and interest as connected with its more immediate design, its gradual unfolding of a great mind involved in moral and intellectual darkness, by a metaphysician of high endowments, presents some interesting psychological facts which would make it serviceable in general education; the illustrations of language and the development of ideas are just such as an accomplished and lively teacher would desire to place before his pupils to assist in conveying to their minds a just estimation of the value of words and the knowledge which they serve to impart.

In England, after the time of Bulwer, Wallis, Sibscota, and Dalgarno, the art slumbered for many years. It was revived by Henry Baker, the naturalist and microscopic observer, who taught dumb persons to speak, and of whom it is recorded by Dr. Samuel Johnson, that he once 'gave him hopes of seeing his method published;' he however kept the plan he followed secret. Of the extent of his success we know nothing, but it is said that the names of some of the first families in the land are among those of his scholars. [Baker, Henry.] About the year 1760 Thomas Braidwood had an academy at Edinburgh, where he taught the dumb to speak, and cured impediments in the speech. He professedly pursued the plan of Dr. Wallis, as developed in the 'Philosophical Transactions.' Articulation was therefore the chief instrument of instruction and the principal medium of communication between the pupil and teacher. In 1783 Braidwood removed his school to Hackney, where he enjoyed for many years a deserved reputation for his successful application of the discoveries of his predecessors. [Braidwood.] Under him the late Dr. Watson became acquainted with those principles which he brought to much greater perfection than his predecessors, and developed in his work on the 'Instruction of the Deaf and Dumb,' and which he practised during his long superintendence of the Asylum in Kent Road, London. Indeed Dr. Watson was to Mr. Braidwood what Sicard was to De l'Epée; the disciples in each instance gave solidity and permanence to the systems of their respective masters.

The primary instruments by which the deaf and dumb are now generally taught, are *speech*, including *articulation* and *reading on the lips;* and natural or imitative signs. By these a communication more or less direct may be established between the teacher and the pupil. The subordinate auxiliaries are *writing*, *pictures*, *methodic signs*, and *dactylology;* the last may be *syllabic*, as employed by M. Péreire, or *stenographic*, as employed by M. Recoing, of Troyes, in the education of his deaf and dumb son. By this gentleman, *stenography*, in its wider sense, was also made available with success. We have seen that artificial articulation was among the earliest means resorted to as a medium of communication. Ponce, Bonet, Wallis, Van Helmont, Amman, Arnoldi, Heinicke, Péreire, Ernaud, Deschamps, Baker, Braidwood, and Dr. Watson, used their pupils to understand the speech of others and to speak themselves. The great advantage of speech is that it is the readiest method of intercourse between teacher and pupil. In teaching the deaf and dumb, the first object in view is to impart to him the language of his country, the second is grounded on this: to fill his mind with intellectual, moral, and religious truth. These two objects are generally made to accompany each other; the communication of knowledge in easy language familiarizes him with the use of language, and the exercises in speech are made the vehicle of valuable knowledge. In teaching vocal sounds to the deaf, the eye and the sense of touch are chiefly employed; the letters of the alphabet are classified; the sounds that are labial, dental, lingual, guttural, nasal, and those which are combinations of two or more of these, are taken in such an order that the pupil may discern differences in their similarities, and in some instances the organs of speech are shown, by means of drawings, in the required positions for the emission of certain sounds.

The open mouth, the widening lips, and part of the tongue, may be shown in the pronunciation of *a*, the nearly closed lips, hiding both tongue and teeth in *u*; in *b* the compression of the lips can be accurately shown, and the labial-nasal sound *m*, may be said to be exhibited in closed lips, and by a line of dots to show the emission of it through the nostrils. It must be clearly understood that such drawings are chiefly useful in showing the position of the organs.

Accompanying the exercise, the pupil must be made to notice the external organs of speech in his teacher, to feel the vibration with his own hand which sound creates in the trachea, and also to feel those emissions of breath which are caused by the production of certain sounds. He be made to imitate such utterances; and by the exercise of patience and ingenuity on the part of the teacher, ingenuity chiefly directed to those little arts which refer to the mechanism of speech, and patience that will not be discouraged by repeated failures, the pupil will succeed in imitating what he observes, and in time he will accomplish what is required. In Wilkins's 'Essay towards a Real Character' there is a diagram of the positions of the organs for producing vocal sounds, which may be consulted with advantage, though not in every instance accurate. While a pupil is engaged in acquiring the articulated sounds he may also be employed in writing the letters which they indicate, and in learning their shapes by the eye; he may also be initiated in the manual alphabet. It appears desirable that a system of syllabic articulation should be invented for the deaf; it would render the combinations of sounds more easy than at present, assimilating them more with spoken language. In Edgeworth's 'Practical Education' the consequence of teaching hearing children alphabetic sounds is thus exhibited. A child having learned the alphabet, and having to read the words *Here is some apple pie*, would, it is fairly enough suggested, pronounce thus: *Acheare ies esoeme apepele pewie*. This is not exaggerated; with hearing children, constant reading corrects the tendency; but numerous instances of this nature must and do occur among the deaf, who in many cases retain the first impressions they receive as to the sounds of letters. The medley of sounds which we heard a deaf person produce on attempting to utter the word *greyhound* a short time ago convinced us that a syllabic arrangement of sounds would, if practicable, be accompanied with many advantages. Of late years, artificial articulation, with or without the exercise of reading from the lips of a speaker, has come almost into general favour in the institutions for the deaf. At the London Asylum it has always occupied a prominent place; it has been most successfully introduced at the Royal Institution at Paris; it is also employed at Groningen, at Gudensberg, at Quedlinbourgh, at Breslau, at Gmünd, at Pforzheim, at Zürich, at Sleswig, at Leipzig, at Munich, and at many other institutions, under the charge of eminent teachers. Not many of the provincial institutions of this kingdom make *speech* an object of the first importance; the principals of such instiutions generally are convinced of its value as a vehicle for he transmission of knowledge, but do not make use of it, chiefly on account of its occupying more time than can be given to it, where a large number of pupils require attenion, and where the funds will not support a sufficient number of instructors to enable them to teach it effectually. Of its value as a rapid mode of communication, after the acquirement is gained, the instructors of our country are well satisfied; and it is partially taught at the institutions of Manchester and Exeter. At the London Institution some of the pupils articulate not unpleasantly; their readng is monotonous, but their animation in ordinary conversations, especially on subjects of interest to them, gives a species of natural tone and emphasis to what they say.

Another primary auxiliary in the education of deaf-mutes is that modification of the language of gesture called natural signs. In this language the deaf and dumb ake great pleasure; if unrestrained, it would be their only mode of communication with each other; and they appear to find in its resources all that is necessary to give life and force to their ideas. The quick changes of countenance which they exhibit, the sparkling eyes, the lighted-up features, the sarcasms, the sensibilities thus expressed; the transitions 'from grave to gay, from lively to severe,' all faithfully portrayed in the ever-varying index of their mind, speak at once in favour of this language as the truest mirror of their thoughts, hopes, wishes, and feelings, and inform us that this language is nature's most perfect, most expressive interpreter. To this rude though powerful mode of intercourse, which all the deaf possess in a higher or lower degree, those who are more intelligent add signs of description, by which they are able to explain facts and circumstances which have been brought under their observation. The teacher takes advantage of this method of communication to add to their stores of knowledge, to enrich and extend the sphere of their thoughts, to give them new food for the mental operations, all of which may be accomplished during the time that words and the language of their country is imparted to them. Thus a conventional language is formed which assists in their intellectual culture, increases their happiness, and shows them in some degree the connexion which exists between themselves and the objects by which they are surrounded. In many institutions this use is made of signs: new knowledge is most effectually communicated by their aid. The sixteenth report of the New York Institution for the Deaf and Dumb furnishes an example of which we can avail ourselves to show the great benefit of signs in the business of instruction. The natural signs for the words in which the sense of the sentence is comprised will readily occur to the reader. 'Let it be supposed that an instructor should wish to produce the following sentence: "A horse runs away with a boy, throws him off, and kills him." It is not at all probable that such a combination of circumstances would occur at the moment, and thus enable him to take his pupils to the window and point them out. He must have recourse, then, to signs. It is immaterial what selection of place and circumstance is made, provided only that the facts to be enunciated are clear and prominent. The scene of the occurrence may be laid in the city. The boy is riding slowly along, staring at the multitude of new objects which meet his view, and wholly forgetful of his horse. Suddenly a military company appears from a cross-street, with drums beating and colours flying. The horse becomes frightened and beyond control: he dashes through the street at a furious rate. The boy clings to the saddle, but is at length thrown with violence on the pavement. The blood is seen spouting from his mouth and nostrils. People gather around and raise him up. They feel his pulse; but it has ceased, and the breath of life is gone the boy is dead. During this description, the class are looking most intently on the instructor. Every eye is fixed, and every countenance full of expression. He has now obtained every thing for which he laboured. Their ideas and notions of the fact are as clear and explicit as his own; and it only remains to express them by written language. To imagine, as some have done, that this process of writing is a *translation* of signs into language, is wholly erroneous. It is no more a translation than the same expression of a speaking child would be, when the casualty should actually occur.' To this we will only add, that the rapidity with which such a description is conveyed to the pupils is inconceivably great, and takes very little longer than the communication of the occurrence vocally, in its shortest form. But the disadvantage attending such a mode of intercourse, when a language has to be taught, is not recompensed by its rapidity, as the words and the syntax of spoken languages are not employed in such descriptions; the pupils are consequently left ignorant of the grammatical construction of sentences. It is therefore found necessary to unite natural and descriptive signs with writing or dactylology, in the use of which the idiom of the maternal language is preserved. Most of the English and American institutions employ the signs we have described; this auxiliary is also employed at Paris, at Yverdun, at Vienna, Toulouse, Nancy, Besançon, Bachtelen, Pisa, and at several other institutions. Mimic signs will always possess this advantage to the deaf over every other mode of intercourse, that they present to them a lively picture, in which facts and circumstances can be constantly and instantaneously reproduced; they address themselves immediately to their perceptive powers, and lead them intuitively, and by a direct process, to form just connexions and conclusions; while our conventional tongues, whether addressed to them by articulation, by writing, or by dactylology, act upon them by the circuitous paths of association, and the habit which they long follow of converting our language into their own.

One important influence which the mimic language exercises on the intellectual development of the deaf has yet to be noticed. This results from its employment among themselves. Much of the knowledge which the younger pupils of an institution obtain is through this medium. The lessons of the teacher for many months have less influence on the minds of his pupils than the intercourse with their associates. This is a powerful argument for bringing up the deaf and dumb in public rather than in private schools. Independent of the stores of knowledge which an assemblage of deaf-mutes bring from the districts in which they have lived, the fruits of their personal observation and experience, the events that have occurred within the walls of the institution, particularly as they bear upon actual occurrences, are handed down by mimic and descriptive signs from one generation to their successors; and a very valuable and available store of intelligence is thus preserved, which at the same time contributes to the formation of character and familiarizes the pupil with the use of this species of language. Respecting *methodical signs* we need add nothing to what has already been said of the method of the Abbés De l'Epée and Sicard. We think they are not much used at the present time in the education of deaf-mutes.

It has been stated that the other aids employed in developing the minds of the deaf are subordinate to those which have now engaged our attention. *Writing* is employed in all institutions; it is an art which is soon acquired sufficiently well for all school purposes. At first it engages the attention of the pupils, while they endeavour to form on their slates those combinations of letters, the meaning of which has been conveyed to them; and thus it relieves the teacher and employs a new set of faculties in the pupils. This slow but permanent repetition of their lesson assists in fixing the forms of words, and the matter conveyed by them, in their minds. At a later stage, it exercises similar influences upon them in a higher degree, and it is, besides, the instrument by which they give permanency to their thoughts and observations in those *compositions* which form an important exercise in these seminaries. It is also the medium to which they chiefly have recourse among strangers, and among their friends, if they find their articulation is imperfect, and their signs are not well understood.

Dactylology is another auxiliary in almost universal use. For a more particular view of the utility and value of this instrument of instruction we refer to the article DACTYLOLOGY.

Pictures and the art of drawing are valuable helps at the commencement of instruction. A collection of all objects cannot be made, nor can objects be so conveniently referred to as representations of them. Either by reference to pictures or real objects, the first lessons are conveyed to the deaf, and they impart an interest to the exercises which no other means could supply. To those who have not well considered the subject, it is a matter of surprise how much of language can be represented by a graduated series of engravings, or even by the rude sketches which a teacher can draw upon his tablet whenever they are wanted, to elucidate the subject which he is desirous to impress on the minds of his pupils. In the work of Bébian, the successor of Sicard (*Manuel d'Enseignement Pratique des Sourds-Muets*), the pictorial art is employed to exemplify substantives, their gender and number, adjectives, the cardinal numbers, fractional numbers, verbs neuter and active, personal pronouns, prepositions, articles, and degrees of comparison; many other portions of language may be explained by diagrams. Drawing is thus of essential service, and the pupils often have recourse to the advantages it offers for any communications which they think will be better comprehended through its medium than others. This art is therefore encouraged, and in many institutions direct instruction is given to the pupils from an early period of their education.

The auxiliaries we have now indicated are used for the conveyance of all kinds of knowledge; in some branches of study one may have a preference to others, from its being better adapted to their elucidation. Thus geography will always be taught from maps, geology from sections, geometry from diagrams; pictures will be used to describe historical events; and signs will be in requisition for the illustration of the arts and trades of men, as well as for showing the manners and customs of distant nations. Collections of metals, minerals, vegetables, animals, animal substances, vegetable substances are of the highest value, and furnish direct evidence of properties and changes which cannot be described. It will even be necessary occasionally to call in the assistance of the workshop and its implements, the laboratory and its apparatus, in order to perform experiments, and to exhibit processes before their eyes; and while the excitement prevails, to make use of the opportunity to communicate not only knowledge, but the primary aim of all instructors of the deaf and dumb—*language*. Having the latter, the attractive form in which knowledge is presented will raise in them a desire to possess this also, and the object of the teacher is fully accomplished.

The period allowed for instruction in the public institutions for the deaf and dumb varies in different countries; in few cases is it so short as in England: in nearly all the continental institutions of celebrity it is considerably longer. With us only five years in most instances are allowed for the education of pupils, who are wholly or partially sustained by the funds contributed for their support. Throughout France, Switzerland, Würtemberg, Sweden, and Poland, the pupils are permitted to continue six years. At the institution of Groningen, and at those of Copenhagen and Sleswig, the pupils remain seven or eight years, at Vienna from six to eight years; at Berlin they continue from six to nine years; and at Leipzig for a like period. Should no other modification of the institutions of Great Britain take place with regard to the duration of a pupil's continuance in them, it would be well if some provision were made to enable pupils of superior talent, and those intended for the more liberal arts and trades, to continue under special instruction, to qualify them for their future business, for a longer period than those who need no such preparation. Nearly every boy may learn to make shoes, to hew wood, and to draw water; but it requires a peculiar training to form artists, engravers, clerks, carvers, modellers, and superior mechanics—arts in which there is nothing to prevent the deaf and dumb from excelling.

The subjects on which instruction is imparted must necessarily vary with the length of time given to education. The following plan of a course of instruction cannot be satisfactorily accomplished in less than six years: it is, however, an approximation to what is attempted in some of the British institutions. We have already noticed the instruments of teaching, and shall proceed to mention the matter of instruction and its division with regard to time, which is assumed to be pretty nearly what is actually accomplished. With regard to a sixth year, were our institutions so modified as to enable the pupils to be kept for such additional time, it would generally be devoted to confirming the pupils in their previous acquirements, to a repetition of subjects of more than common interest, and to special instruction, according to the dispositions and endowments of the pupils, connected with their future destination. In short, it should in every way be made a retrospective year as regards their school acquirements, and prospective as to their future interests.

The subjects for instruction are:—

Language, including nomenclature and syntax.

Writing, as an acquirement, and a means towards higher attainments.

Reading, by dactylology or by articulation.

Religion and morals, preceptal and applied.

Geometry and mechanical drawing.

Geography, physical and political.

Arithmetic, elementary and applied.

Drawing, as an art and in connexion with design.

History, antient (from the Old Testament).

History, modern (of England especially, and exemplary biography).

History, natural (animal, vegetable, and mineral kingdoms).

Physics (properties of natural bodies, astronomy, mechanics, chemistry, &c).

Composition (to induce the ready use and application of language).

The *first year* would be generally devoted to instruction in language by means of natural signs, dactylology, or articulation, and writing. Instruction in numbers and their combinations by sensible objects, by manual notation [DACTYLOLOGY], by figures, and by words. Occasional instruction in moral and religious duties by signs.

Second Year.—Instruction in language continued by the same instruments as in the former year; in arithmetic. Geography commenced with ground-plans of school-room, house, and neighbouring grounds, streets, roads, fields, &c. Lessons on form, introductory to geometry. Moral and religious duties. Composition, commenced by pupils writing down their own observations on facts and occurrences in short sentences.

Third Year.—Language continued; the two former years are chiefly given to nomenclature; syntax will now more especially demand attention. Lessons continued in geometry, geography, arithmetic, physics, and composition. Scripture history and drawing commenced.

Fourth Year.—Language continued, and especially applied to composition. Direct instruction continued on all the subjects named for the preceding year.

Fifth Year.—In addition to bringing the branches of knowledge commenced to a close, abstract ideas and figurative language; doctrinal religion; the human body, its parts and organs; the moral and social duties of man, his dispositions and faculties, should be brought under consideration during this year, and continued for as long a period as the pupil remains under instruction. Those parents who can afford to continue their children as private pupils might have them instructed in every department of a sound English education, and, if they thought proper, qualified for the more liberal arts and professions; for there exists no insurmountable barrier to the acquisition of classical learning, mathematical and scientific attainments, and a knowledge of the modern languages.

The foregoing outline of a course of instruction for deaf-mutes is somewhat similar to what is actually in operation at the Royal Institution of Gmünd, Würtemberg, which is under the direction of M. Jaeger.

After the explanations into which we have entered on the modes and subjects of instruction, no lengthened remarks on the processes seem to be requisite. In teaching substantives the object is pointed out, and the name is written, spelled on the fingers, articulated, or signed, as the medium of communication may be; all these are so many modes for expressing the object referred to. Thus if *man* be the object, it is pointed to, or the word *man* is presented before the eyes of the pupils, or it is spelled by means of the manual alphabet, or it is pronounced, or the beard is touched, and the height of man is indicated. In the same manner other names of objects are conveyed to the pupils, who soon see that a connexion exists between *our* conventional signs and objects, as well as between *their* conventional signs and objects. Adjectives are taught in a somewhat similar way; the colours are as easy as any other qualities to introduce pupils to this class of words. A few wafers, all of the same size but of different colours, are good mechanical aids. When the colours are known the teacher will pass on to other adjectives. The nature of the indefinite article is easily exhibited; the definite can only be acquired by practice, in the manner of hearing and speaking children. Verbs of action are easily imitated by signs, and the pupils are prepared to expect that there are words to indicate *action*, as well as *objects*, *number*, and *qualities*. Adverbs, which indicate the manner of an action, naturally follow verbs; to *run quickly*, to *walk quickly*, to *walk slowly*, may, it will be seen, be accurately conveyed by the means employed to bring instruction so immediately under the cognizance of the senses. The possessive, demonstrative, and personal pronouns are exemplified by real facts which come under the observation of the pupil, or which are purposely contrived to arrest his attention. Many of the prepositions and conjunctions can be rendered sensible and intuitive; other particles are taught by diagrams, and by examples produced as occasion requires, and reproduced by the pupils from instances supplied by themselves. The moods and tenses of verbs, and the auxiliary verbs, can only be taught effectually by the events and casualties which bring them into use in ordinary life; these are constantly occurring, and it is the business of the teacher to turn them to account for the improvement of his pupils. Abstract ideas must be traced downwards to those simple ideas from which they originate; indeed the constant application of analysis and induction, which is continually called forth in conveying instruction as far as may be through a sensible vehicle, renders this office of language more easy than can be conceived by those not accustomed to employ such powerful instruments in the process of education. Figurative expressions, comparisons, similes, metaphors, require a series of progressive lessons, in which language should be employed to illustrate each step from the easiest to the most complicated figures of speech. Examples might be taken from the Scriptures, from fables, allegories, and parables; they should be especially written with a view to utility, and adapted for the explanation of such subjects as occur in any course of education. Though in the plan marked down we have given two years to *nomenclature*, and have not recommended the commencement of *syntax* till the third year, it is not intended that this shall interfere with the pupil's gradual introduction to small sentences expressive of sensible ideas. Indeed the progress in language of a deaf and dumb pupil, to be successful, must be assimilated as nearly as possible to the progress of other children, and he must be continually accustomed to those ordinary exemplifications of language, affirmative, negative, and interrogative, which other children use, and which advance in complexity as their years increase and their minds become enlightened. As the manner and substance of a child's conversations indicate the society in which he has been brought up, and the educational advantages he has received, so will the ordinary remarks and compositions of the deaf and dumb exhibit the benefits they have derived from the means employed to bring them into communion with society, and to elevate their thoughts and understandings to the level of those who labour under no such deprivations.

The public establishments for the reception and education of the deaf and dumb of England are situated respectively at London, Birmingham, Manchester, Liverpool, Exeter, and Doncaster; those of Scotland at Edinburgh, Glasgow, and Paisley; and those of Ireland at Claremont near Dublin, and Belfast. The asylum at London, situated in the Kent Road, was opened in 1792; it was the first asylum in the kingdom for extending to the indigent deaf and dumb the benefit of education, and, from its establishment to the present time, nearly 1500 pupils have been received and educated there. A bust of the Rev. John Townsend, which is placed in the committee-room, perpetuates his memory as the founder of the institution. Two hundred and twenty children reside in the asylum, which receives ample support from the wealthy in all parts of the kingdom; indeed it possesses, besides its annual receipts from subscriptions, donations, and legacies, a funded property of probably not less than 100,000*l.*, by which its permanent income is greatly increased. The instructor of the asylum is Mr. T. J. Watson, a son of the late Dr. Watson; he is assisted by twelve male and two female teachers. The whole is under the management of a committee. The cost per head of each pupil is much greater at this establishment than at any other of a similar kind in the kingdom. To an extent this may be accounted for in the greater display which an institution in a wealthy metropolis is expected to make, and also in some measure from the articles of maintenance being dearer than in the provinces.

The second institution which came into operation in this kingdom was that of Edinburgh, which was established in 1810, and at first placed under the care of Mr. Braidwood; he was succeeded by Mr. Kinniburgh, who has continued to conduct the education of the children to the present time with the greatest success. The number of children at present under instruction is sixty. Mr. Kinniburgh has two assistants. The institution has occasionally had to struggle with difficulties from want of funds, and its usefulness has consequently been much circumscribed. Lately, a ladies' association has been formed, whose funds have already placed nine children in the institution; and it is believed that by the means thus brought into operation, all needful help will be afforded for the ordinary wants of the charity.

The general institution for the deaf and dumb at Edgbaston, near Birmingham, was opened in 1814. It was formed in consequence of a lecture on the subject which was read by the late Dr. de Lys before the philosophical institution of Birmingham. This gentleman, and Dr. Alexander Blair, late professor of English literature in the university of London, are to be regarded as the first promoters of the institution. It was placed under the superintendence of Mr. Thomas Braidwood, one of the sons of Mr. Braidwood of Hackney. On the death of this gentleman in 1825, M. du Puget, a Swiss Protestant, and a pupil and teacher in the seminary of Pestalozzi, at Yverdun, was appointed to the charge of the institution. For many years the establishment was confined in its means, but it is now rising into prosperity, extending its buildings, and increasing its number of pupils. About fifty pupils are at present received. M. du Puget has a male and a female assistant; the management of the house is superintended by a matron. The funds are at present rather more than adequate to the expenditure; they are derived from donations, subscriptions, and legacies.

The national institution for the deaf and dumb of Ireland is situated at Claremont near Dublin. It owes its origin and progress to the strenuous and unwearying exertions of Dr. Charles Orpen. Soon after its commencement in 1816, it was placed under the care of Mr. Joseph Humphreys, who has continued to be the instructor to the present time. The number of its pupils was limited during the early existence of the institution, but in consequence of the active operations of numerous juvenile associations during more than ten years, it has now funds and accommodation for the education of about 130 pupils, the number under instruction. Mr. Humphreys is assisted by three male and three female teachers. A workmistress, a shoemaker, a tailor, and a gardener, form also a part of the establishment. These persons instruct a certain number of the pupils in their respective employments. At this institution there is a very complete library of works on the education of the deaf and dumb.

The Glasgow institution, formed in 1819, has had several teachers. Its present master is Mr. Duncan Anderson, whose persevering efforts have raised it to a high degree of prosperity both as to rank and character. It contains sixty pupils. It has no fund more permanent than that derived from payments of pupils, donations, legacies and annual subscriptions. Mr. Anderson has one assistant. The work of the girls is superintended by the matron.

The school for the deaf and dumb at Manchester was opened in 1824. Mr. Vaughan was appointed master; he had been an assistant for several years to Dr. Watson at the London institution. The accommodations of the building were only calculated for 50 children, and in a few years after its establishment many applications for admisssion were annually rejected. A fund has been subscribed for the erection of a commodious building which is now in progress. The death of Mr. Vaughan took place in 1834; his labours and talents have received honourable testimony in that town. The school has been lately committed to the care of Mr. Bingham, a teacher of much experience, at first as an assistant at the Birmingham institution, and afterwards as the master of that at Exeter.

The Liverpool school owes its origin to Mr. William Comer of that town: it was opened in 1825, and commenced as a day-school, but its original plan has undergone some modifications, and its pupils are of the mixed character of boarders, day-boarders, and day-pupils. Several changes have taken place in its mastership; the present teacher is Mr. Rhind, lately an assistant at the London asylum. This school contains 48 pupils.

The West of England institution for the deaf and dumb was established in 1827. It is situated at Exeter. Its especial object is the 'instruction of the deaf and dumb resident in Devon, Cornwall, Dorset, and Somerset.' Like the others it is supported by subscriptions, donations, legacies, and by payments on behalf of the children. Its funds are about equal to the maintenance of fifty children, the number at present in the institution; there are also six pupils who pay liberally for their education. Since the removal of Mr. Bingham to Manchester, the credit of this institution has been amply sustained by his successor, Mr. Gordon. The assistants are one male and one female. The superintendence of the domestic arrangements is confided to a matron.

The Yorkshire institution for the deaf and dumb, situated at Doncaster, is the latest formed in this kingdom. It was commenced in 1829. Throughout its whole course it has been prosperous. Its funds have gradually increased, chiefly in consequence of the exertions of the Rev. W. C. Fenton, its first promoter; it has been enabled to admit every applicant, and for several years a portion of its income has been set aside towards the establishment of a permanent fund. The interest derived from this source at present supplies the annual falling off of subscriptions by deaths and other casualties. Seventy pupils partake of the benefit of the institution, which is under the charge of Mr. C. Baker, and four assistants, two of whom are deaf and dumb. A workmistress has the care of the girls out of school hours, and the domestic arrangements are superintended by a matron.

All these institutions are under the direction of committees chosen from the subscribers residing in or near the towns where they are situated; these committees appoint masters and other officers not chosen at the annual meetings; they establish the general rules of the institutions which they control, but they do not interfere with the course of instruction. One or more examinations of the pupils take place in the course of each year, which the subscribers and the public generally are invited to attend.

In some of these institutions instruction in trades is blended with intellectual instruction; such are those of Dublin and Exeter. In others, industrial occupations are chiefly used as furnishing exercise or a change of employments; of these the institutions of Birmingham and Yorkshire are instances. The schools at Paisley and Belfast are merely day-schools. In most of the institutions there are three classes of pupils; the most numerous are the poor, who are either instructed gratuitously, as at London and Manchester, or who pay a small sum, varying from 2*s.* 6*d.* to 3*s.* 6*d.* per week, as at Birmingham, Exeter, and Doncaster. These sums are paid by the parents or friends of the children, or by the parishes to which they belong. In the latter case, it has often been found a difficulty to convince overseers of the policy of educating their indigent deaf and dumb, and thus restoring them to society; but under the operation of the new poor law, section 56 (a clause which was introduced by the Earl of Harewood), the difficulty is in some measure provided for; permission being there given for the advance of sums for the 'deaf and dumb and blind.' The second class of pupils received into our institutions are those whose parents can afford to pay their expenses, so that no burden is in such cases imposed on the funds subscribed for charitable purposes. The payment is generally 20*l.*; this being about the average expense of pupils in the provincial institutions. The third class of pupils are those whose friends can afford to pay a large sum for their education; 80*l.*, 100*l.*, and in some instances more, is the payment required from this class. The number of such pupils being very limited, the masters of institutions are generally allowed this privilege, or a proportion of the income arising from this source is assigned to them.

There are 8000 deaf-mutes in England; the institutions at present in operation are not capable of educating more than 600. It is calculated that at least one-eighth of the whole number are within the age and other qualifications generally prescribed for education. It therefore seems necessary that more extended provisions should be made for their instruction. The densely populated country between the Tees and the Cheviot Hills appears to be an eligible district for the support of a public institution of this kind; and as large towns are in all respects preferable to small ones, offering greater educational advantages and permanent settlements in after-life, the rapidly improving town of Newcastle suggests itself as a proper locality for such an establishment. Another institution should be established in the intelligent and populous city of Norwich, which might include the counties on that portion of our coast. A third desirable point for an institution seems to be Caermarthen, which would take in the whole of Wales, and be conveniently situated for the populous manufacturing counties of Glamorgan and Monmouth. Such is the feeling of interest with which the deaf and dumb are regarded, that it has frequently been only necessary to make known their wants to procure for them that sympathy and aid which their circumstances require.

The adoption of a few simple measures would immediately tend to place the education of the deaf and dumb in this country much higher, and make it more permanent than it has ever been. At present each teacher follows his own plan, for he has no means of learning those of other teachers. The systems are all more or less modified from general principles which have been long known. The matter of instruction and the processes vary in a greater or less extent in different schools, and take their complexion from their respective teachers. The experience of one and the ameliorations introduced into his practice are unknown to all the others. A centre of union is wanted in which the successful expedients of all shall be accumulated. But we do not see how it would be feasible to form such a centre without exciting jealousy and distrust. We have therefore to consider how these institutions might mutually serve each other without endangering that unanimity which it is desirable to preserve among a number of individuals engaged in the same labour of benevolence and charity. The course we would suggest is, that each instructor should draw up an outline, with sufficient detail to make it intelligible, of the branches of study taught in his school; that he should explain generally those processes by which he obtains his results; state the average extent of progress made by pupils in half-yearly or yearly periods throughout the term of education; the portion of school discipline and instruction under his own peculiar charge; and that portion which is confided to the assistants; the arrangements for the management of the pupils when not in school, including physical education and industrial employments. Such outlines would have a direct and immediate tendency to assimilate conflicting systems, and to lead to the adoption of processes which would produce the most satisfactory results. The expense of printing 200 copies of a pamphlet of this nature would be under 5*l.*; it might be transmitted to all institutions, and those left would be sold to visitors, and defray the cost of printing thus incurred. Nearly all the institutions in this kingdom publish a report annually. These reports never hint at methods of teaching, and speak only in very general terms of the results produced, state the difficulties or successes of the preceding year, proclaim the continued good conduct of masters and matrons, sometimes acknowledge their talents and industry, and as a consequence allude to the progress and improvement of the pupils. With such remarks, and a statement of the income, expenditure, list of subscribers, and regulations, the publications we have alluded to are generally filled, and perhaps it is all that is needful to satisfy the public generally and the subscribers in particular. The 'Circulaire' of the Royal Institution of Paris is a very different production. It is designed to accumulate, diffuse, and perpetuate the plans pursued in all institutions in correspondence with it. It is stated in the third circular, that thirty-seven institutions have co-operated with the Paris institution in this labour. Since the commencement of this publication, the institution of New York has published two reports, the sixteenth and seventeenth, which are chiefly devoted to the explanation of the principles and practice followed in that institution; and it is to be hoped that the British institutions will adopt some course by which the intelligence and ability evinced in their management may be more widely diffused. No work exists in the English language worthy of ranking, either in theory or practice, with many in other European languages. In France there are the writings of Sicard, the classic production of Degérando, the practical illustrations of Bébian and Piroux, and the exciting volume of Paulmier. There are besides a host of others, from which much solid satisfaction may be derived. In Germany there are the writings of Wolke, of Daniel, of Venus, of Schwartzer, of Neumann, and many more. We want, in the English language, a full explanation of those principles on which the education of the deaf and dumb rests, and an insight into the philosophy on which such principles are founded. We want also practical lessons, introductory to other school-books, and forming an elementary library or literature for the pupils. No persons are better qualified to write good school-books than those whose practice is founded on a sure theory; the teacher of the deaf and dumb cannot teach *words* alone; an acquaintance with *things* is essential to his pupils' progress; in this respect his instructions are beyond comparison more valuable than those conveyed to the children in the generality of our schools, and his school-books might be introduced into common education with advantage.

The provision for a succession of teachers of the deaf is in our kingdom very inadequate and insecure. The emoluments of principals in the provincial institutions vary from something more than 150*l.* to 350*l.* a year; the assistants receive from 10*l.* to 50*l.* a year, in addition to board. The principals are generally men of education, of acknowledged ability, and of long experience. With one or two exceptions, the principals of the public institutions for the deaf and dumb in the United Kingdom have been engaged in their present occupation from ten to twenty-five years. When such men from any circumstance quit their profession, it would be natural to suppose that their situations would be easily supplied from the number of assistants educated by them; but the difficulties in which several institutions have been placed show the contrary. The committees of the Dublin, the Birmingham, and the Liverpool institutions have at different times experienced such difficulties. Intelligent assistants will not permanently connect themselves to a profession in which the chances of succeeding to a head-mastership are so few. They therefore take the first opportunity to embark in some occupation which promises more satisfactory hopes of advancement; thus the training they have undergone is thrown away; or, it has been, that such assistants are considered too young to be intrusted with the charge of an establishment where both sexes are committed to their control; for the arrangements of the matron are subordinate to those of the master, and much of her power even with regard to the girls must be derived from him. It seems desirable to devise some plan by which the situations of second-masters shall be rendered permanent, and this can only be done by such an increase to their income as shall bind them to their profession. It cannot be expected that committees of institutions should augment these incomes from their funds; they might thus pay a security for services for a series of years, which would never be directly beneficial to the institutions under their management. A few hundred pounds granted annually from the state would at once remove the difficulty, and enable each second-master to receive from 80*l.* to 100*l.* a year, in addition to his board. Fifty pounds a year granted from the government to the second-master of each institution, to be added to his salary after he has attained the age of twenty-one, and provided he has been engaged as a teacher of the deaf and dumb three years, would remove this difficulty, and furnish an intelligent and experienced class of head-masters, whenever vacancies should occur for such appointments. These persons would also, from the facilities they would acquire in imparting knowledge to the deaf and dumb, become admirable teachers in every branch of primary education. They might take departments in normal schools; they might become superintendents or inspectors of districts of common schools; and when such removals took place, their situations in institutions for the deaf would be filled by the junior teachers. Such assistance as this would not interfere with the established plans of any institution; it would cost the government but little, and very great advantage would be derived from it. In some states the entire cost of educating the indigent deaf and dumb is defrayed by the government; in others a large portion of the expense is thus sustained. It does not therefore seem too much to expect that England should contribute towards providing a supply of teachers for an occupation so useful and so important to the well-being of a large number of the community. The noble decree of the king of Denmark is worthy of imitation: 'Every deaf and dumb child born in this kingdom shall receive the education necessary to render him a useful member of society.' The number of institutions for the deaf in Europe, and some particulars, are given in the table below.

Countries.	Population.	No. of Deaf and Dumb.	No. of Institutions.	Pupils under Instruction.	No received annually.
Portugal	3,815,000	2,407	1	20	
Spain	11,500,000	7,255	1	30	
France	32,000,000	20,189	28	798	159
Italy	20,000 000	12,618	6	147	29
Switzerland	2,000,000	3,976	5	80	16
Austria	26,444,000	16,684	6	197	39
Prussia	12,726,823	8,223	18	314	62
Other German States	9,905,475	8,283	28	410	81
Hanover	1,500,000	946	1	10	2
Holland and Belgium	6,166,584	2,166	5	249	50
Denmark	1,800,000	1,260	2	190	38
Sweden and Norway	3,800,000	2,397	1	40	8
Russia	44,118,000	27,834	2	111	22
United Kingdom	25,365,807	14,328	12	745	149

With respect to the capabilities of the deaf and dumb for instruction, and the means by which instruction may be imparted to them, the following principles are firmly established:—

1. That the deaf and dumb are naturally equal to other persons in their intellectual faculties and manifestations.

2. That these faculties may be developed by means of articulated language, or by natural and descriptive signs, accompanied by writing.

3. That the less important auxiliaries in the instruction of the deaf and dumb are dactylology, writing, drawing, and the use of pictures.

4. That by these means the mother-tongue can be perfectly taught to the deaf and dumb; and,

5. That during instruction in language by the above auxiliaries they may also acquire the elements of an ordinary education.

The suggestions offered in the course of this article, for improving and extending the education of the deaf and dumb, are as follow. We doubt not but the co-operation of philanthropists, committees, and teachers would, in a very few years, effect all these ameliorations.

1. That the schools at present in operation in this country are insufficient for the instruction of the number of deaf and dumb persons ascertained to be within the usual ages of education.

2. That the time necessary for the common education of a deaf and dumb person, according to the experience of those best informed on the subject, is not less than six years.

3. That the education of the indigent deaf and dumb should be made imperative on the parishes to which they belong.

4. That some means by the press or otherwise, are neces-

sary for making known the principles, the practice, and the experience of the various institutions.

5. That it seems desirable, in order to secure a succession of experienced teachers, that the government of the country should be solicited to furnish means for augmenting the salaries of second-masters in the various institutions.

The following deductions regarding deafness may be assumed to be correct; they are founded not only on the facts communicated at the commencement of this article, but on many other documents, the general accuracy of which cannot be doubted:—

1. That deafness is not always hereditary, though it is found in families, and often among collateral relations.

2. That the diseases to which infants are liable are a fertile source of deafness.

3. That the deaf are in many cases subject to other diseases, the principal being those of a scrofulous tendency.

4. That the manufacturing and agricultural portions of this kingdom appear, about equally, to furnish instances of the calamity.

5. That a perfect system of registration would tend to furnish a correct census of the deaf and dumb, and would exhibit many facts calculated to throw light on some of the causes of deafness.

NOTE.—There is considerable discrepancy in the statements of the various institutions as to the number of persons born deaf and the number becoming so after birth, as will be seen in the following view:—

	Born Deaf.	Became Deaf.	Uncertain.	Total.
Paris . . .	52	37	13	102
Yorkshire . .	75	26	9	110
Dublin . .	423	66	—	489
Hartford, Conn.	116	135	28	278

American Institutions.—The first institution for the deaf and dumb in America was established at Hartford, Connecticut, in the year 1817. It originated in the desire of the late Dr. Cogwell, to promote the education of his own daughter, who was deaf and dumb. The first instructor at this institution was the Rev. T. H. Gallaudet, whose useful publications for children have been widely circulated in this country. He visited the institution at Paris, then under the charge of Sicard and Bébian, and on his return to America he was accompanied by Mr. Clerc, who was at that time the 'glory and support' of the institution at Paris. The early instructors of the institution at Hartford were men of high literary reputation: among them were Mr. W. C. Woodbridge, the editor of the 'American Annals of Education,' Mr. Lewis Weld, for some years the instructor at the Philadelphia institution, and at present the principal of the Hartford institution, and Mr. Harvey P. Peet, the present principal of the New York institution. The Hartford institution has also supplied instructors to all similar establishments in the United States. For several years the number of pupils instructed in this institution has been 130. We find from the seventeenth report (May, 1833), that 25 pupils were supported by their friends; 38 by the state of Massachusetts; 20 by Vermont; 16 by Connecticut; 15 by New Hampshire, and 16 by Maine. There are eight assistant-teachers in addition to the mistresses who conduct the education of the girls in female duties and occupations.

The New York institution was commenced in 1818. It had at first to contend with differences of opinion as to the system of instruction, and several changes of masters were the consequence of this indecision. In the year 1827 the legislature of New York, by which the institution was chiefly sustained, authorized Mr. Flagg, the superintendent of common schools of the state, to visit this and other institutions, and to compare the results of the different systems of instruction. Mr. Flagg therefore visited the schools at New York, Hartford, and Philadelphia, and in his report he gave a decided preference to the system of the two latter institutions, and he recommended the directors to engage an instructor acquainted with the improved modes of teaching there pursued. Mr. H. P. Peet was accordingly engaged as principal of the New York institution, and the school is at present conducted by him with great ability. There are seven teachers, a matron, an assistant-matron, and five instructors in trades. The trades, which are taught in the intervals of school-hours, are those of a cabinetmaker, a shoemaker, a bookbinder, a tailor, and a gardener. One hundred and forty pupils partake of the benefits of the asylum, of whom 102 are supported by the state of New York; 9 by the corporation of New York; 2 by the commissioners of the Alms-House, New York; 7 by New Jersey; 6 by the institution; 1 by the supervisors of Duchess County, and 13 by their friends. (See 17th *Annual Report*, 1836.) The reports of this institution are of a highly valuable nature; for, independent of their local and temporary interest, they contain some of the best essays in the English language on the practical instruction of the deaf and dumb. The building occupied by this institution is both splendid and convenient; it is surmounted by an observatory, which is 70 feet above the ground, and which commands an extensive prospect. The institution possesses a library of works on the instruction of the deaf as ample as can be procured at the present time, in the collection of which neither expense nor labour have been spared. The circular issued by the directors on the course and manner of instruction is an interesting and satisfactory document. The principals of the New York and Hartford institutions are not personally occupied in the work of instruction. The different classes are each under the care of a separate teacher, and the principal gives a general superintendence to all, and regulates the internal economy of the institution. The article on the Instruction of the Deaf and Dumb in the 'North American Review' (No. 83) is understood to have been written by Mr. Barnard, one of the teachers of the New York institution.

The Pennsylvania institution was opened at Philadelphia in 1824; it was organized by Mr. Clerc, and placed under the direction of Mr. Lewis Weld, from the Hartford institution, who, in 1830, was recalled to take the charge of that institution, on the resignation of Mr. Gallaudet. Since that time the Pennsylvania institution has been ably conducted by Mr. A. B. Hutton. The trades taught are weaving, shoemaking, and a few branches of carpentry. Mr. Hutton is assisted by six other teachers, two of them being deaf and dumb, and former pupils of the institution. The directors, in their thirteenth report, state that one supernumerary teacher is employed to guard against the inconveniences which result from the occasional loss of experienced teachers. The state of Pennsylvania provides for the support of 50 indigent pupils for five years, it also provides the more needy with clothing. Maryland supports 20; New Jersey 6; and a few are received from Virginia and other southern states. A few years ago 20,000 dollars were bequeathed to this institution by the will of Stephen Girard the founder of Girard College.

The Kentucky asylum is situated at Danville, Mercer county: it was opened in 1824. Mr. J. A. Jacobs is its master; he has one assistant and 25 pupils. A certain number of these are supported by the state of Kentucky. This institution was endowed by an act of congress with a township of land in Florida, but, up to the present time, this endowment has yielded a very trifling revenue. Mr. Jacobs has published a most useful series of practical lessons for the deaf and dumb.

In the state of New York a second institution has existed since 1824 at Canajoharie, Montgomery county. The act of legislature in its favour expired in 1836, and it is expected that the pupils will either be transferred to the New York institution, or to a new institution, to be created farther west in the state. Mr. Dix, the superintendent of common schools, recommends the former plan in his report to the legislature. (See *Appendix to* 17th *Annual Report: New York institution.*)

In 1829 an institution was commenced at Columbus, Ohio. It is partly supported by funds supplied by the state, and partly by the payments of pupils. The principal is the Rev. H. N. Hubbell. There are 50 pupils, who are received between the ages of 10 and 30, and four deaf and dumb teachers, who were all educated at Hartford. The State of Ohio supports 48 pupils.

At Quebec, Lower Canada, there is an institution for the deaf and dumb, under the charge of Mr. M'Donald, who studied the system of instruction under the Hartford institution. There are also institutions at Mexico and Calcutta.

DEAFNESS, the sense of hearing diminished or abolished. Deafness is either congenital or acquired. When congenital, it arises from an original malformation of the ear, and is then always accompanied with dumbness. When acquired, it arises from a variety of diseases affecting the ferent parts of the complex apparatus connected with the sense of hearing. Some parts of this apparatus are placed beyond the reach of examination, and the function of other parts is but imperfectly known; so that it is often difficult to ascertain the exact seat of the disease; still more difficult to ascertain the exact nature of the disease, and even when this is discovered, more difficult than all to apply an effectual remedy. Hence the study and treatment of deafness are attended with peculiar difficulties; yet the subject has by no means engaged such a share of the attention of the scientific surgeon and physician as its importance deserves.

Deafness may arise from disease of the organ of hearing, or from disease of the brain. The organ of hearing consists of two parts, that destined to collect and transmit sound to the auditory nerve, and that composed essentially of a peculiar arrangement of the sentient extremity of the auditory nerve destined to receive sound and to transmit the impressions to the brain.

That part of the apparatus whose office it is to collect sound is termed the auricle, or the external ear—the ear commonly so called. From the auricle proceeds a narrow winding passage, termed the external auditory passage (*meatus auditorius externus*), which is closed at its farthest extremity by a membrane called the *membrana tympani*, or the drum of the ear. Beyond the membrana tympani is the cavity of the tympanum, which is a chamber of air, containing a curious and complex apparatus, put in motion by the vibrations of the air that produce sound. These vibrations are communicated to the internal apparatus by the membrana tympani, or drum of the ear, and, variously modified by that apparatus, and communicated to the air in the chamber of the tympanum, are conveyed to the internal organ, or the ear properly so called. Besides all this there is the passage called the Eustachian tube, which leads from the throat to the cavity of the tympanum. All these parts of the ear are subject to various diseases, any one of which is capable of impairing in a greater or less degree the sense of hearing, or of producing deafness.

Any considerable malformation of the auricle, or external ear, whose office it is to collect the vibrations of the air that produce sound, is found to occasion a greater or less degree of deafness. But the external auditory passage is lined by a vascular and highly sentient membrane, studded with organs of secretion, by which are elaborated the cerumen, or wax, with which the passage is kept in a state of moisture, and by which it is defended from the entrance of external bodies. A certain quantity and a certain quality of this secretion are indispensable to a sound condition of the function of hearing. If the secretion be diminished or suppressed, the hearing becomes extremely imperfect; if it be increased and thickened, the hearing may become altogether abolished. The quantity and quality of this secretion may be changed, in either of these modes, by many diseases; by inflammation, for example, induced by the application of cold and other causes. Accordingly, a vitiated state of the secretion of the wax, which may be accumulated in such a degree as completely to block up the passage, and so to prevent the transmission of sound to the internal ear, is among one of the most common causes of deafness. But inflammation may pass into ulceration; purulent matter may form, collect, and completely obstruct the transmission of sound. Moreover, morbid growths, as polypi, may spring from the lining membrane of the meatus, and plug up the passage. In these different modes there may be a complete obliteration of the auditory passage. This obliteration of the auditory passage is ordinarily attended with the total abolition of the sense of hearing; yet cases are on record in which the canal has been reduced to less than a line in diameter, and in which its walls at different points have even touched, without a great degree of deafness having resulted. In these cases, instead of deafness, there has been a constant noise or buzzing in the ear. Occasionally, though very rarely, there is the opposite state of the auditory passage; it is preternaturally enlarged; in one case it was so much enlarged, that the ring-finger could easily penetrate to the bottom of the canal. Deafness equally resulted from this enlargement of the auditory passage as from its obliteration.

The diseases of the auditory passage may be communicated to the membrana tympani, which may be inflamed, thickened, ulcerated, and rendered wholly incapable of performing the office of transmitting sound. It has been observed to acquire a thickness as great as that of the sclerotic coat of the eye, by a successive deposition of adventitious membranous layers. It is then of a yellowish colour, and quite opaque. Deafness often coincides with this altered condition of the membrana tympani; but it is doubtful whether, if this be the sole affection, it be capable of abolishing the sense of hearing.

The membrane which lines the chamber of the tympanum may partake of the diseases of the parts of the auditory apparatus which are external to it, or it may itself be the primary seat of disease. It may become inflamed and thickened, in consequence of which the capacity of the chamber for containing air must be proportionally diminished. The fluid commonly secreted by its membrane may be increased in quantity and vitiated in quality, and this increased and vitiated liquid may occasion deafness by the exclusion of air from the chamber. Such an altered secretion occurs chiefly in children and young persons whose mucous secretions in general are easily deranged. This accumulation may take place without any pain in the ear, without any discharge of fluid from the ear, and without any appreciable lesion of the auditory passage. It may be suspected to be the cause of deafness when the sense of hearing varies materially at different periods of the day; when the deafness is greatest in the morning, and is suddenly and manifestly increased by a damp day, or by exposure to a cold and humid atmosphere. There may also be an accumulation of pus or of blood in the chamber of the tympanum. Pus may be suspected to be accumulated in the tympanum when deafness follows severe pain in the internal ear, attended with other signs of inflammation; and when inflammation and ulceration of the auditory passage are either absent, or exist only in a slight degree. Blood may be suspected to be contained in the chamber when deafness follows a severe blow on the head in the neighbourhood of the ear; or a fall, or any cause by which a preternatural quantity of blood is determined to the head. Whether the cavity of the tympanum be obliterated by an increased secretion of the fluid which moistens its walls, or by an accumulation of pus, or of blood, the effused matter is often spontaneously removed by absorption, and the sense of hearing gradually returns as the process of absorption goes on.

One of the conditions essential to the sense of hearing is a free passage of air to the chamber of the tympanum through the Eustachian tube. But the diameter of this tube may be diminished or wholly obliterated by an accumulation of the mucus which moistens its internal surface, by the thickening of its lining membrane, and by the adhesion of this membrane at different points. The entrance of air into the Eustachian tube may also be obstructed by various diseases of the throat, as inflammation attacking the soft palate and the tonsils, the consequent enlargement of the tonsils, which may cover and completely close the opening of the Eustachian tube. The inflammation may also spread from the throat into the Eustachian tube; hence the pain in the ear and the deafness which so often accompany severe sore throat.

The internal ear, or that part of the auditory apparatus in which the impression of sound is received, the true and proper ear, is, without doubt, subject to its own diseases; and it is probable that a very slight change in this delicate structure is sufficient to occasion deafness. But this organ is placed so far beyond the reach of examination, and the function of its different parts is so little understood, that its morbid changes, as the causes of deafness, are alike obscure during life, and difficult to be appreciated by inspection after death. The same is true of the diseases of the nerve which transmits the impression from the internal organ of hearing to the brain, and of the diseases of the brain itself. We know that it is indispensable to the sense of hearing that this part of the auditory nerve be sound, and that that portion of the brain with which the auditory nerve is in immediate communication be sound; we know that the auditory nerve and the brain are both subject to numerous diseases which impair or abolish their functions. The substance of the nerve may be diseased, or a tumour may press upon it in some part of its course to the brain; the brain may be diseased,—inflamed, softened, hardened, oppressed by the effusion of water, lymph, pus, blood, or by the growth of tumours in its substance, occasioning general diseases, the most severe to which the body is subject, as phrenitis, hydrocephalus, epilepsy, apoplexy, &c. Among the local morbid phenomena produced by these diseases, deafness is always one. Often also this malady immediately follows repelled cutaneous eruptions and retrocedent gout, and it is the frequent concomitant of fever. In all these cases deafness is the consequence either of disease of the brain, or of disordered secretions of the auditory apparatus, or of both conjoined; and the hearing always returns as these diseases diminish and disappear.

When deafness arises from inflammation of the auditory passage, the deafness can be cured only by the removal of the inflammation, which must be treated according to the principles proper for the treatment of inflammation in any other part of the body. When deafness results from a disordered action of the follicles which secrete the wax, it is often removed by introducing into the auditory passage, night and morning, a dossil of cotton, containing some stimulating substance, as camphor, ammonia, or alcohol, suspended in almond-oil. When the auditory passage is loaded with hardened wax, the ear should be syringed night and morning with warm milk and water, or soap and water. When polypi grow from the lining membrane of the passage, they must be removed by a surgical operation, and the proper precautions taken to prevent, or the proper remedies employed to remove, inflammation. When there flows from the passage an acrid or fetid discharge, the ear should be cautiously syringed night and morning, and counter-irritation kept up by repeated blisters behind the ear, or by a perpetual blister, caused by daily dressing the vesicated surface with unguentum lyttæ. When the deafness arises from a diminished secretion of wax, good effects have often been experienced by the employment of galvanism, which is found not only to occasion a grateful warmth in the meatus, but also considerably to augment the secretion of wax. When deafness arises from inflammation of the membrane which lines the chamber of the tympanum, and from the consequent thickening of the membrane, or the effusion of fluid into the cavity, the most effectual remedies are blisters behind the ears and active purgative medicines. When closure of the Eustachian tube is the cause of deafness, the imperfection of hearing is often immediately removed by perforating the membrana tympani, this operation immediately establishing a free communication of air to and from the tympanum. When deafness is the consequence of disease of the auditory nerve, or of the brain, the nature of the nervous or cerebral affection must be discriminated and ascertained before any remedy can be applied with the slightest chance of success; and even when this is accomplished, it is too often only to satisfy us that the disease is beyond the reach of art.

DEAL, a borough, market-town, and parish, in the hundreds of Cornilo and Bewsborough, in the county of Kent, and a member of the town and port of Sandwich as a Cinque Port. It is situated close to the sea, on a bold open beach, between the north and south Forelands, eighteen miles south-east from Canterbury, and seventy-two E.S.E. from London. The number of inhabitants in 1831 was 7268, who live for the most part in the three streets lying parallel to the beach, which, in distinction from the middle and upper parts, are called Lower Deal. By a decree of Henry III., in 1229, and by letters patent of the sixteenth year of Henry IV., the town is shown to have been at that time annexed to the Cinque Ports. A charter was granted by the 11th of William III. constituting it a borough, with a corporation, consisting of a mayor, twelve jurats, 24 common council men, a town clerk, and recorder. On the south side is a strong castle, erected in 1539 by Henry VIII., with a moat and a drawbridge. There is no harbour, but the fine roadstead called the Downs, between the shore and the Goodwin Sands, is a usual place of anchorage for vessels of all dimensions, of which, occasionally, four or five hundred are riding windbound, and with safety, except during heavy gales from the north and east, when some put into Ramsgate for greater security. The pilots of Deal have a high character as intrepid and excellent seamen in affording assistance to vessels in distress. The town is paved, lighted, and watched, and contains a custom-house, a naval storehouse, a naval and military hospital, and a gaol. The inhabitants are chiefly engaged in boat-building, sail-making, and other pursuits subservient to maritime business. Besides a church and chapel of ease, there are several Dissenting chapels, and a subscription school for ninety poor boys and girls. Markets are held on Tuesday and Friday, and two small fairs in April and October. Deal is the birth-place of Mrs. Elizabeth Carter, the learned translator of Epictetus. [CINQUE PORTS.] (Brayley and Britton's *Beauties of England*, vol. viii., p. 1018; *Municipal Corporation Report*, part ii., p. 931.)

DEALS (German, *dielen;* Dutch, *deelen;* Danish, *deler;* Swedish, *tiljar;* French, *planches minces;* Italian, *ta*[illegible] Russian, *doski.*) Deals are boards of fir above 7 inches in width, and of various lengths exceeding 6 feet. If less than 7 inches wide they are called battens, and when under 6 feet long they are called deal-ends. The deals imported into the United Kingdom are brought from Prussia, Sweden, Norway, and Russia in Europe, and from our principal North American colonies. The following statement, compiled with much care by the inspector-general of imports and exports from the entire importation of the year 1[illegible] will show the average dimensions of deals, the produce of various countries, the cubical contents of the great hundred (120), and the rate of duty chargeable upon the importation of each class. The dimensions within which each scale of duty is chargeable, are—

Deals.

	per 120
6 feet and not above 16 feet long, not exceeding 3¼ inches thick,	£19
16 „ „ 21 „ „ 3¼ „	22
21 „ „ 45 „ „ 3¼ „	44
Above 45 ft. in length, or above 3¼ in. thick, the load of 50 cubic feet,	£2 [illegible]
and further, the 120 . .	6

If of the growth of British possessions in America—

6 ft. and not above 16 ft. in length, not exceeding 3¼ in. thk., per 120.	£[illegible]
16 „ 21 „ 3¼ „	[illegible]
16 „ 21 „ and exceeding 3¼ „	4
exceeding 21 ft. in length, not exceeding 4 „	[illegible]
„ 21 „ and exceeding 4 „	1

Deal-ends.	From Europe.	From American Colonies.
Under 6 ft. long, and not exceeding 3¼ in. thick, the 120,	£6	£0 15
„ 6 „ and exceeding 3¼ „ „	12	1 10

DEALS FROM EUROPE.

	Average dimensions.			Russia.	Prussia.	Sweden.	Norway.	Total from the preceding countries.
	Length.	Thickness.	Width.					
	feet.	inches.	inches.	gt. hunds.	gt. hunds.	gt. hunds.	gt. hunds.	gt. hunds.
1st Class, paying duty £19 per Gt. Hundred.								
From Russia and Prussia . . .	15	3	11	1,897	1,314	1,548	4,138	8,897
Sweden	15	3	10					
Norway	15	3	9					
2nd Class, paying duty £22 per Gt. Hundred.								
From Russia and Prussia . . .	19	3	11	13,635	2,043	1,891	549	18,118
Sweden	19	3	10					
Norway	19	3	9					
3rd Class, paying duty £44 per Gt. Hundred.								
From Russia and Prussia . . .	40	3	11	6	415	—	—	421
Sweden	40	3	10					
Norway	40	3	9					
Total of Importations in Gt. Hundreds . .	..	..	..	15,538	3,772	3,439	4,687	27,436
Ditto ditto converted into loads . .	..	..	..	158,268	41,390	29,574	22,625	251,787
Average cubical contents of the Great Hundred of deals—loads and feet	..	..	..	10.9	10.48	8.60	6.48	9.17
Average rate of duty per load actually paid . .	..	..	..	£2 2 6	2 2 8	2 8 0	2 15 7	2 4 9

DEALS FROM BRITISH AMERICA.

	Average dimensions.			
	Length.	Thickness.	Width.	
	feet.	inches.	inches.	gt. hunds.
1st Class, paying duty £2 per great hund.	12	2½	9¼	18,695
2nd ,, ,, £2 10 ,,	19	8	11	837
3rd ,, ,, £5 ,,	40	4	10	30
Total importation in great hundreds				19,562
Ditto ditto converted into loads . . .				107,228
Average cubical contents of the great hundred of deals—in loads and feet . .				5.14
				s. d.
Average rate of duty per load actually paid . . .				7 4¼

The effect of this method of charging duties, viz., to exact fixed rates upon all deals within given dimensions, has been to interfere greatly with the natural course of trade. When the duty was charged at a fixed rate per great hundred without reference to dimensions, and when that duty was on a moderate scale, it was the practice in the wood-producing countries to cut deals of those dimensions which would produce the greatest cubical quantity of sound wood from each tree, and it then rarely happened that deals were longer than 12 feet, but when the duty was greatly increased, and it was charged according to their dimensions in classes with varying intervals, as shown in the foregoing scale, it became an object to introduce as much wood as possible at each specific rate of charge, and without much regard to economy in cutting. This will be at once apparent when it is seen that under the present scale of duty, a deal brought from Europe 12 feet long and 11 inches wide, pays a duty equivalent to 57*s.* 6*d.* per load of 50 cubic feet, while a deal of the same length, but 2 inches narrower, pays at the rate of 70*s.* 4*d.* per load; and on one of 16 feet long and 11 inches wide, the charge is equal to only 43*s.* 2*d.* per load. It will be equally apparent that with a rate of duty forming a large per-centage upon the first cost of the article, no person will import any deals much short of each of the maximum dimensions admissible at each rate of duty, but will sacrifice a part of the material when necessary, in order to escape a higher rate of charge; by this means the cost is necessarily enhanced to the consumer. The same motive does not operate with respect to the lower taxed deals of the English colonies, nearly the whole of which are accordingly brought of such dimensions that the duty amounts to one-third more upon the cubical contents than it would amount to if the importers availed themselves of the provisions of the law in the way adopted by the importers of European deals. It will be seen that the duty charged upon the deals of Sweden, and still more upon those of Norway, is, by the working of the system, much higher than upon the shipments from Russia and Prussia; this arises partly from the different sizes to which the trees grow in the respective countries, and partly from the difficulty experienced in Sweden and Norway in conveying the trees after they are cut down rapid or narrow rivers to the places of manufacture. In France, where the duties on timber are low, deals are imported of all sizes suited to the convenience of the producers, and consequently the price is lower to the consumer; besides which, the quality of the wood is in some instances better, because thinner deals than are brought to England may be cut from the best part of the tree nearest to the sap, and these are now virtually excluded from our markets. The deals of North America are inferior in strength and durability to those brought from the north of Europe, and to these the preference is usually given for the flooring of houses and other purposes where durability is of importance. In building smaller houses, where cheapness is the principal consideration, Canadian deals are used. For small articles, such as mouldings, picture-frames, hat-boxes, musical instruments, as well as for many of the internal fittings of houses, and other purposes which call for the employment of wood that can be easily worked, Canada deals are preferred.

Great fault has been found with the present scale of timber duties, because encouragement is given by it to the importation of deals over that afforded to the introduction of the timber out of which the deals are cut, but among all the evils attending the present system of duties, this one is not to be reckoned, inasmuch as the true interest of the consumer is best consulted by giving that greater encouragement to the importation of deals. In its natural form the timber could not be brought in a state fit for sawing. If the deal be not cut from the log as quickly as possible after this is felled, the grain of the wood will open, and it will be full of splits, or what is called shakey, and if afterwards cut into thin boards they will be fit for nothing. The splits or fissures here noticed are not of equal detriment to timber in the log, which is sawn into large scantlings to be used for beams, rafters, and quartering: from the moment the saw has divided the log into thinner pieces the tendency to split is at an end.

The quantity of deals and deal-ends imported from the north of Europe and from the British American colonies respectively in each of the last 10 years, has been as follows:—

	From Europe. Great hundreds.		From America. Great hundreds.		Tota.. Great hundreds.
1827 .	37,910	.	12,084	.	49,994
1828 .	33,892	.	15,730	.	49,622
1829 .	33,332	.	18,256	.	51,588
1830 .	30,551	.	19,653	.	50,204
1831 .	32,848	.	22,067	.	54,915
1832 .	25,210	.	26,053	.	51,263
1833 .	24,823	.	30,975	.	55,798
1834 .	33,105	.	34,000	.	67,105
1835 .	27,492	.	34,239	.	61,731
1836 .	31,865	.	37,388	.	69,253

The demand for timber in the United States of America has of late much increased, owing to increasing population on the one hand, and the progressive diminution of the forests in the settled states on the other. Under these circumstances measures are in progress on the part of the United States' government which will encourage the transmission of timber in all its forms across the river St. Lawrence to a degree which may materially interfere with the power of Canada to supply this country on the same scale as heretofore.

DEAN, French *Doyen*, and in Latin *Decanus*, a word which on a first view would be thought to be allied to Deacon, but which has probably a different origin. Etymologists seem not to be agreed concerning the etymon; but the most usual origin assigned to it is the word *decem*, ten, as if a dean were a person who presided over collective bodies of men or things, in number *ten*. This we regard as very uncertain.

Dean, however, is a term of ecclesiastical presidency. In Scotland it is used for the head of lay communities, but in England we believe it is exclusively confined to promotions or presidencies spiritual.

In England there are three classes of ecclesiastical presidencies to which the title dean belongs.

1. *Deans rural.*—It will be seen that in all the books which treat of the ecclesiastical divisions of the country, the dioceses are divided into archdeaconries, and the archdeaconries into deaneries, below which there is no other subdivision till we come to parishes, the minutest of the proper ecclesiastical divisions of the country. The whole country is thus divided, with the exception of certain districts of no great extent, which claim to be exempt jurisdictions.

Those who contend for the derivation of the word dean, whence deanery, from decem, suppose that originally there were *ten* churches or parishes forming each of these deaneries. This is a very obscure point, and it is equally uncertain at what time this distribution of the dioceses was made. It appears, however, that there were deaneries before the Norman Conquest.

In each of these deaneries there was a clergyman who was dean; he was usually a beneficed clergyman within the deanery. His duties were to exercise a superintendency over the clergy, to preside at their assemblies, and to be the medium of their communication with their spiritual superiors. He had his public seal. He appears also to have discharged those duties which are now performed by clergymen called surrogates.

By degrees this office in the English church fell into disuse. The history or the reason of its decline is not very well known, for the advantage of having such an officer, especially where the archdeaconries were extensive, must have been always evident. The office, however, did by degrees disappear in one diocese after another, till it became totally lost. There was a dean of Chalke, in the diocese of Salisbury, as late as the reign of Charles the Second; and a dean of Doncaster, in the diocese of York, in the reigns of George the First and Second.

Attempts have been made to revive it. Berkeley, bishop of Cloyne, tried to establish the office again in Ireland; and soon after the late Dr. Burgess was made bishop of Salisbury, he did actually revive the office in that diocese, appointing Mr. Dansey, the rector of Donhead St. Andrew, rural dean of Chalke: this was in 1825. The Report of the Ecclesiastical Commissioners, 1835, under the head Territory, recommends that each parish shall be assigned to a deanery, and each deanery to an archdeaconry.

Whoever desires to see more concerning the constitution and office of the rural dean will be amply gratified by referring to a work, in two volumes quarto, entitled 'Horæ Decanicæ Rurales, being an attempt to illustrate by a series of notes and extracts the name and title, the origin, appointment, and functions, personal and capitular, of Rural Deans, by William Dansey,' &c., 1835.

The office existed in other parts of christendom.

2. *Dean in a Cathedral Church.* [See CANON.] The canons who formed the bishop's council were presided over by a dean; this has been the case from the remotest times. *Decanus et Capitulum* is the form in which all the acts of such communities run.

Antiently the deans were elected by the chapters; but here, as in other points, the royal power has encroached on the privileges of the church. Now the form is for the crown to issue a *congé d'elire*, naming the person whom the chapter is to choose, in the bishoprics of antient foundation; while, in the bishoprics founded by Henry the Eighth, the king names the dean by his letters patent merely. In the former case the bishop is called in to confirm the election, and he issues his mandate for the installation of the person elected.

3. *Deans in Peculiars.*—There are in England certain ecclesiastical promotions, in which the person holding them is called by the name of dean, and they seem to have all had antiently, as some of them have now, capitular bodies connected with them, and in all there is something peculiar in their reference to their spiritual superiors, and in the jurisdiction exercised by them. We cannot descend into the particular character of each of these officers, and shall content ourselves with naming the principal of them: the dean of Westminster; the dean of the chapel of St. George, of Windsor; the dean of Christ Church, Oxford; the dean of the Arches; the dean of the King's Chapel; the dean of Battel; the dean of Bocking; the dean of Middleham, &c. If the history of these foundations were traced to their origin, it would be seen that they were ecclesiastical establishments, mostly of royal foundation, possessing peculiar privileges and a peculiar jurisdiction, which escaped dissolution when the framework of the ecclesiastical institutions of England underwent some alteration at the time of the Reformation.

DEATH-WATCH. Every one has heard of the death-watch, and knows of the superstitious notion of the vulgar, that in whatever house its drum is heard, one of the family will die before the end of the year. These terrors, in particular instances, when they lay hold of weak minds, especially of sick or hypochondriac persons, may cause the event that is supposed to be prognosticated. A small degree of entomological knowledge, however, would relieve them from their fears, and teach them that this heart-sickening tick is caused by a small beetle giving a call to its companion.

Authors were formerly not agreed concerning the insect from which this sound of terror proceeded, some attributing it to a kind of wood-louse, and others to a spider; the earliest scientific account of it is probably that by Mr. Benjamin Allen, written in 1695, and published in the Philosophical Transactions, vol. xx., p. 376, where the writer calls it *Scarabæus galeatus pulsator*: followed, vol. xxii., p. 832, by another account from the celebrated Dr. William Derham, dated Upminster, July 21, 1701. Swammerdam (*Bibl. Nat.*, edit. Hill, i., 125,) and Shaw (*Nat. Misc.*, iii., 104,) have also written upon this insect. It is a received opinion now, adopted upon satisfactory evidence, that the sound called the death-watch is produced by certain beetles belonging to the timber-boring genus *Anobium*. Latreille observed *Anobium striatum* to produce the sound in question; but the species whose proceedings have been most noticed by British observers is *Anobium tessellatum*. When spring is far advanced, these insects commence their ticking, which, as already mentioned, is only a call to each other, to which, if no answer be returned, the animal repeats it in another place. It is thus produced: raising itself upon its hind legs, with the body somewhat inclined, it beats its head with great force and agility upon the plane of position; and its strokes are so powerful as to make a considerable impression if they fall upon any substance softer than wood. The general number of distinct strokes in succession is from seven to nine or eleven. They follow each other quickly, and are repeated at uncertain intervals. In old houses, where these insects abound, they may be heard in warm weather during the whole day. The noise exactly resembles that produced by tapping moderately with the nail upon the table; and when familiarized, the insect will answer very readily the tap of the nail. (Brand's *Popular Antiq.*; Kirby and Spence's *Introd. to Entomology*, edit. 1828, i. 36; ii. 382; Wallis's *Hist. Northumb.*, i. 367.) The superstition that the clicking of this insect is a death-omen is mentioned by Baxter in his 'World of Spirits,' p. 203.

DEBENTURE (Latin, debentur, from debeo, to owe), formerly written debentur, is a kind of certificate used at the Custom House, which entitles a merchant exporting goods upon which a drawback or bounty is allowed to receive payment. (As to drawback or bounty see 3 & 4 William IV., cap. 58, sec. 86, 87.)

The word has been used in some acts of parliament to denote a bond or bill, by which the government is charged to pay a creditor or his assigns the money due on auditing his account. Debentures were used to secure the arrears of pay to the soldiery during the Commonwealth, and are mentioned in the Act of Oblivion, 12 Car. II., cap. 8. They are in use now in the receipt of Exchequer and Board of Ordnance, and it is believed in the king's household. (Cowel's *Interpreter*; M'Culloch's *Commercial Dict.*)

DEBRECZIN, or DEBRECZYN, a royal free town in the western part of Upper Hungary, is the capital of the county of Bihar, and the largest town in the kingdom, Pesth only excepted. It lies in 47° 32′ N. lat., and 21° 36′ E. long., in the centre of an extensive sandy plain, which stretches from this neighbourhood through the counties of Bihar and Szabolts, and is known by the name of the 'Debreczyne Heide.' The southern part of this great plain in the vicinity of Debreczin has been brought into a state of high cultivation, and produces abundant crops of wheat, buckwheat, millet, and water-melons: it also affords pasturage for cattle and sheep. The town is open, and has a rustic appearance; for the houses, which are about 4000 in number, seldom exceed one story in height, and are as humble in their exterior as common cottages. Including the three suburbs, from which it is separated by a slight pallisade, Debreczin contained, in 1816, 38,962 inhabitants, and now has about 45,370, of whom about 43,800 are of the Protestant church. The country being destitute of stone, the streets are unpaved, and the foot-passenger has consequently to wade either through mud or sand, according to the season of the year, with the aid of a few planks, laid down for crossing the streets. It is the seat of civil administration (*Districht-Gerichts-Tafel*) not only for the county but for the province 'on this side of the Theiss,' and is the occasional place of meeting for the provincial assemblies of the county. Debreczin has several handsome buildings, among which are the town-hall, the Protestant and Roman Catholic churches, the Franciscan and Piarist monasteries, and the handsome Protestant Collegium, which is conducted by six professors, and attended by 600 students, and to which a small church and a library of 20,000 volumes are attached. There is also a Roman Catholic gymnasium, a school of design for mechanics, &c., an orphan asylum, three dispensaries, three hospitals, and a house of correction. Nor must we omit to notice Councillor Fay's fine collection of paintings and engravings. Independently of agricultural pursuits, the inhabitants derive their subsistence from numerous manufactures, principally of coarse woollens, sheepskins, pottery, leather, saltpetre, and soap. The manufacture of tobacco-pipes amounts to about eleven millions per annum, and employs two classes of artificers, one for turning the mouth-pieces out of horn, and the other for fashioning the heads out of red or black clay. Debreczin manufactures also knives and other cutlery, combs, buttons, pearl necklaces, &c. Its central position between Transylvania and the north and west of Hungary affords it a ready vent for its various products: this is also facilitated by four periodical fairs, which are held in wooden booths outside the town, and are the resort of buyers and sellers from all parts of the kingdom. They are a great market also for the linens and other fabrics of Germany. Debreczin is noted for the excellence of the bread, as well as the immense loaves, made by its female bakers. It suffers greatly from want of water in summer. The yearly income and expenditure is about 137,000*l.* (1,500,000 guldens.)

DEBT, ACTION OF, lies for the recovery of a sum certain, or capable of being ascertained, due upon bond, specialty, or simple contract, or upon the judgment of a foreign or colonial court. It may also be maintained against a gaoler for the escape of a prisoner in execution, or upon a statute by the party grieved, or by common informer. Previous to 3 & 4 William IV., cap. 42, sec. 13, the defendant in an action of debt upon a simple contract (except for rent) was allowed to wage his law, for which reason the action of indebitatus assumpsit [ASSUMPSIT] was frequently preferred; but now the action of debt is the better remedy in such cases, the judgment being final in the first instance. The action of debt will not lie for money due by instalments till all the days are past, unless the payment be secured by a penalty, or the amount to be paid on each day be specified; nor can debt be supported against an executor or administrator upon a simple contract of his testator or intestate, because as they are presumed to be ignorant of his contract they cannot wage their law: though this distinction is still observed, it has been judicially declared not to be founded in good sense. Where, however, the deceased would not have been allowed to wage his law, as in actions in the Court of Exchequer, in London (by the custom), &c., debt is maintainable against executors and administrators. (Selw. *Nisi Prius;* Saunders's *Reports.*) [DAMAGES; PLEADING.]

DEBT, NATIONAL. [NATIONAL DEBT.]

DECAGON, a figure of ten sides; but the term is most commonly applied to an equilateral and equiangular decagon, or a *regular* decagon.

The side of a regular decagon inscribed *in* a circle is ·6180340 of the radius; and of that about a circle ·6498394 of the radius. Similarly, the radii of the circles inscribed in and circumscribed about a decagon are 1·5388418 and 1·6180340 of the side. The area of a decagon is 2·938927 of the square on the radius of the circumscribed circle, or 7·694209 of the square on the side.

DECANTATION, an operation often resorted to both in common life and in chemical operations; it is the action of pouring off the clear portion of a fluid from that which contains suspended impurities, or from the impurities themselves when they have perfectly subsided. Sometimes this method is employed in order to avoid the use of filters; and there are cases in which it is preferable, as when the solution is so acid or alkaline that it would destroy paper or linen.

DECAPITATION, beheading: a punishment, in all probability, of very antient date, and certainly known among the Greeks and Romans. Xenophon, at the close of the second book of *Cyrus's Expedition,* says, that losing the head was looked upon as the most honourable death. The decollation, as it is called, of St. John Baptist shows the existence of this punishment among the Jews under the Roman government of Judæa. Suetonius (*Calig.* c. 32) tells us that Caligula kept a soldier, an artist in beheading, who decapitated prisoners in his presence, fetched indiscriminately for that purpose from the gaols. Hoveden and Florence of Worcester agree that Earl Waltheof, who was beheaded by William the Conqueror in 1075, was the first Englishman who suffered that punishment.

The Messrs. Lysons speak of beheading as an ordinary punishment, in old time, of felons, in Cheshire. They say, 'An antient MS. relating to the earls of Chester informs us that the serjeants or bailiffs of the earls had power to behead any malefactor or thief who was apprehended in the fact, or against whom guilt was proved by sufficient witness, or confession before four inhabitants of the four neighbouring towns.' Then follows an account of the presenting of several heads of felons at the Castle of Chester by the earl's serjeants; and it appears that the beheading of malefactors was the usual mode of execution in this county; for in a roll of 3 Edward II. it is called the custom of Cheshire. In France criminals capitally convicted are beheaded, not hanged. (Lysons' *Chesh.*, p. 299, from the Harl. MS. 2009, fol. 34, b.)

From another part of their work it appears that criminals convicted of felony were punished in the same manner in the barony of Malpas; and that this power was even exercised by the several possessors of the moiety and fourth parts of that barony. In the 6 Edward II., David Bulkeley, serjeant of the peace to Richard Sutton, presented the heads of two felons executed for burglary, and Hugh Cholmondeley, serjeant of the peace to John de St. Pierre, presented the head of Thomas Burness, executed for theft, and had his fee called the radyng fee. (Ibid., pp. 677, 678, from the Harleian MS. 2079, fol. 124 and 131.) The foresters of Hardwick, in Yorkshire, had this punishment allotted to them for theft.

At a somewhat later period decapitation became a punishment more especially appropriated to the higher orders of society. Henry VIII. beheaded two of his queens. Elizabeth beheaded a sister sovereign. The High Court of Justice beheaded Charles I. In 1644, Archbishop Laud was condemned by the two houses of parliament to suffer death by hanging; and the only favour granted to him upon supplication, after delay and with reluctance, was, that his sentence should be changed to beheading. Losing the head still continues to be considered the most honourable mode of receiving capital punishment in England; but there has been no recent instance of its being inflicted. The last was in the case of the rebel lords of 1745.

DECA'PODA. [CRUSTACEA, vol. viii., p. 197.]

DECCAN (DACSHINA, THE SOUTH) was antiently understood to comprehend the whole of the peninsula of India, situated to the south of the river Nerbudda and the southern boundaries of Bengal and Bahar, and included nearly one-half of the territory generally known under the name of the Mogul empire. The Mohammedan invaders being unable, after several centuries, to fix their possessions south of the Kistna, the name Deccan came to denote the countries lying between the Nerbudda and the Kistna, and the latter river is still understood to form its southern boundary. The Deccan therefore comprehends the following divisions: Candeish, Gundwana, Orissa, Berar, the Northern Circars, Beeder, Aurungabad, Hyderabad, and Bejapore.

The first Mohammedan invasion of the Deccan occurred at the close of the thirteenth century, in the reign of Feroze. Alla, the nephew of that prince, then marched to Deoghur, and exacted heavy contributions as the price of his return. Alla, having succeeded Feroze, again invaded the Deccan in 1304, overran several of the districts, which he divided among his Omrahs, and laid siege to Deoghur, and compelled the rajah to submit, and acknowledge that he held his territory as a dependency. In 1310 Cafoor, one of Alla's generals, was again sent into the Deccan, and penetrated to the Carnatic, which kingdom he ravaged, taking its rajah prisoner, and collecting an immense amount of treasure. Upon the accession of Mohammed the Third, that prince sent a large army into the Deccan, and entirely reduced the Carnatic to his dominion. In a few years thereafter he not only transferred the seat of his government to Deoghur, the name of which he changed to Dowlatabad, but he forcibly removed thither the entire inhabitants of Delhi, leaving the antient capital desolate. Upon the death of Mohammed, which took place amidst rebellions and insurrections in all parts of his dominions, the rebel chiefs agreed to elect a sovereign, and chose an Afghaun named Ismael for king. When this prince had reigned only a few years, he resigned his throne in favour of one of his generals, Hussun, who had originally been an Afghaun slave, and who, on mounting the throne, assumed the title of Sultan Alla ad Dien Hussun Kongoh Bhaminee, and was the founder of the Bhaminee dynasty. During his reign, which lasted eleven years, Alla reduced to his sway all the districts of the Deccan which had at any time acknowledged the sovereignty of the emperors of Delhi, and was the first independent sovereign of the Deccan. His reign was marked by wisdom and moderation: he died in 1357, and was succeeded in turn by twelve sultans of the Bhaminee dynasty, the last of whom, Mohammed Shah Bhaminee, died in confinement in 1518. The Deccan after this was divided into five kingdoms, viz. Bejapore, Golconda, Berar, Ahmednuggur, and Beeder. The sovereigns of these kingdoms were engaged in constant wars with each other. Towards the close of the sixteenth century, the Deccan was invaded by Akbar, and the territory of Ahmednuggur was subdued, and formed into a province of the Mogul empire. In the reign of the Mogul emperor Shah Jehan, his son, the celebrated Aurengzebe, was appointed to command the army on the southern frontier of the empire, and he was not long without a pretext for invading the Deccan, the sovereigns of which he soon reduced to a state of dependence. When he ascended the throne, this prince made war upon these dependent sovereigns, and reduced the whole under his immediate sway: these operations were not completed until the year 1700. In the subsequent reign of Ferokhsere, Nizam al Mulk was sent as viceroy into the Deccan, and soon became its virtual sovereign. The whole country was in fact, from 1717, independent of the Mogul empire, and so continued until the year 1818, when a great part of the Deccan came under the dominion of the English. The Northern Circars were indeed acquired from the Nizam in November, 1766, but it was not until 1818 that the districts known as the British Deccan came immediately into our possession. Candeish was then acquired from Mulbar Rao Holkar; Poona, the Concan, and the Southern Mahratta country was conquered from the Peishwah; and some lands in the Southern Concan were acquired from the rajah of Sawuntwarree. The remaining parts of the Deccan are in possession of the rajah of Berar, the Nizam, and the rajah of Sattara. The territory acquired by the English in 1818 has been divided into four collectorates, viz., Poona, Ahmednuggur, Darwar, and Candeish, the state of which in 1827-8 has been thus given by Colonel Sykes, statistical reporter to the government of Bombay.

Collectorates.	Area.	Number of Houses.	Number of Villages.	Number of Inhabitants.	Number of Cultivators.	Begahs of Cultivated Land.	Amount of Land Revenue.	Total Revenue.
	Sq. Miles.						Rs.	Rs.
Poona	8,281	114,887	1,897	550,313	52,668	1,527,372	15,16,323	19,92,000
Ahmednuggur . . .	9,910	136,273	2,465	666,376	41,948	1,468,180	18,15,837	20,33,995
Darwar	9,122	187,222	2,491	838,757	60,701	2,649,598	19,45,323	24,21,516
Candeish	12,527	120,822	2,682	478,457	44,608	1,056,345	16,64,905	19,87,733
	39,840	559,204	9,535	2,533,903	199,925	6,701,495	69,42,388	84,35,244

The Deccan begah is equal to three-fourths of a statute acre, so that the average assessment on the land is equal to 2*s.* 9½*d.* per acre, and constitutes more than four-fifths of the total revenue of the collectorates. All lands are comprised within the limits of some village, each of which has a constitution for its internal government, consisting of a patel or chief, assisted by a chaugula, the kulkarni, or village accountant, and other officers called barnballi, the number of the latter depending on the population of the village. A few villages constitute a naikwari, over which an officer presides with the title of naik. Eighty-four villages constitute a pergunnah, or county. Over this number there was formerly placed a desmukh, or governor, assisted by a district accountant and registrar. The lands in this part of India were held under an hereditary tenure; the land-tax is said to have been fixed, but the former governments assumed the power of levying supplementary assessments. Many of the Maharatta families who were in possession of these hereditary estates are extinct, and their lands are now held by a class called upari, a word which signifies strangers, and who are rated each year to the land-tax by mutual agreement between them and the government, the rates being usually the same, or nearly so, as the permanent assessment. A third class hold their lands under leases for five, seven, or nine years, at a rent low at first, and increasing every year till the expiration of the lease. This mode is resorted to in order to encourage men to undertake the cultivation of waste land. Two other tenures, those of Jaghire and Inam, are recognized in the Deccan. Lands so held are free from any government tax. Jaghire is the term applied to lands given for personal or military service, and which must be considered in the light of a fief, implying the obligation on the part of the holder to support the government either by personal service or by maintaining troops. In the four collectorates of the Deccan more than 400 villages have been thus granted by the government. Inâm, a word signifying a gift or present, is applied to lands granted usually in small portions in return for some personal service, such as playing music or dancing in the temples: the lands thus given seldom exceed a few begahs in extent. In most villages of the Deccan are to be found some Ramosis, who are thieves by birth, and who have lands given to them in Inam, that they may hold themselves responsible for the safety of property in the district where they reside. Various witnesses who were examined before the Committee of the House of Commons in 1832 concurred in stating that the condition of the cultivators and of the inhabitants generally has been much improved since the Deccan came into the possession of the English government.

DECEMBER. This month still retains the original name assigned to it in the Alban, and first Roman calendar adopted according to tradition by Romulus, in both of which it was the tenth, as the name signifies, or last of the year. Our Saxon ancestors called it Mið-ƿinter-monað, *mid-winter-month*, and ʒeola or *yule-month*, from ʒehƿeol, *a wheel*, emblematical of the sun's revolution or return in his annual course.

December was antiently consecrated to Saturn: Alexander ab Alexandro, in his 'Genialium Dierum Libri sex,' says to Vesta, the daughter of Saturn. In the Alban calendar this month consisted of thirty-five days. Romulus reduced it to thirty; and Numa to twenty-nine days. Julius Cæsar restored the day of which Numa had deprived it; and Augustus added another day, which it still retains. Commodus, who attempted to change the names of several of the months, with the assistance of his flatterers, gave that of Amazonius to this, in honour of his mistress, Martia, whom he delighted to see clothed in the Amazonian habit. (Pitisci, *Lexicon*, i. 633, *in voce;* Court de Gebelin, *Allégories Orientales;* Brand's *Popular Antiq.*, vol. i., p. 364; and Brady's *Clavis Calendaria*, i. 92.)

DECE'MVIRI, or Ten Men, the title of various magistrates or functionaries in antient Rome.

1. *Decemviri legibus scribendis*, *i.e.* ten men for the purpose of making a new code of laws, were certain extraordinary magistrates, or rather a commission of ten men invested with the power both of framing a new code and administering the republic. In the early times of antient Rome the judicial power belonged to the kings, and, after their expulsion, to the consuls, who did not decide according to written laws, but only according to usages and customs. As such usages and customs were necessarily subject to doubt, and as the consuls were chosen only from the patrician order, the disputes between patricians and plebeians were probably often decided partially in favour of the former; and this would happen more especially in criminal cases, for which no certain law was provided. These circumstances led to the institution of the decemvirs.

After many violent struggles, the senate and the plebeians, B.C. 453, agreed that certain written laws should be framed, to which every citizen, without any distinction, should be subject. A commission of three members was appointed to visit Athens for the purpose of getting a copy of Solon's laws and making themselves acquainted with the institutions of other Greek states. (Liv. iii., 31.) The commissioners having returned at the expiration of two years, the tribunes immediately called for the new code. For this purpose another commission, consisting of ten members, was named by the comitia centuriata. Uncontrolled power, both administrative and judicial, without any appeal, and accompanied with the suspension of all other magisterial offices, including the consuls and tribunes, was conferred on them. The names of the ten commissioners are recorded in Livy (iii. 33) and Dionysius Halicarnassus (*Antiq. of Rom.*, xi., 56). Appius Claudius was the leading member of the ten; he was the soul of the commission and directed all the business. The decemvirs conducted themselves with great moderation and justice. On the expiration of their year of office, they had framed a body of laws, distributed into ten sections, which were approved by the senate and the comitia, and engraved on ten tables of metal.

As the new laws seemed imperfect in some respects, a new commission was named, at the head of which was the same Appius Claudius (Liv. iii., 35). But the decemvirs now began to behave in a very different manner; they became true tyrants, and formed a most pernicious oligarchy. They framed, however, several new laws, which were approved by the centuries and engraved on two tables. Though their commission and the year of their office were now at an end, they still would not resign, but continued to hold their power in the year 447 B.C., and to exercise it in a most arbitrary manner. Appius Claudius, by a most unwarrantable decision, declared Virginia, the daughter of Virginius, an officer in the Roman army, a slave, because she had refused to listen to his dishonourable proposals. Virginius, the father, to save his daughter from violation, murdered her in the public place, and, with the bloody knife in his hand, called on the people to take vengeance on their oppressors. Both the citizens resident in Rome and the army united themselves to overthrow the tyrannical power of the decemvirs, who were forced to abdicate, and the ordinary magistrates were re-established. Appius Claudius was put in prison, where he died.

The ten tables of the former and the two of the latter decemvirs together form the laws of the twelve tables.

2. *Decemviri litibus judicandis*, *i. e.* ten men for the purpose of deciding suits, formed a court of justice under the superintendence of the prætor, which was established about B.C. 287. The establishment of this body was caused by the great increase of suits, which rendered it impossible for the prætor to get through the business of his court. As to the powers of these decemvirs, we have no distinct notices.

3. *Decemviri sacris faciundis*, were an ecclesiastical college, the members of which were elected for life. The care of the Sibylline books belonged to them, and were consulted by them on important occasions.

4. *Decemviri agris dividundis*, were a commission for the temporary purpose of dividing lands among the colonists when a new colony was to be established.

DECHALES, CLAUDE FRANÇOIS MILLIET, was born at Chambery, the capital of Savoy, in 1611. He wrote largely on several branches of mathematical, mechanical, and astronomical science; but the only work by which he is generally known is his edition of Euclid, which was long a favourite text-book in France, and in other parts of the Continent. It was also translated into English; but did not obtain great popularity among our countrymen, whose taste in geometry continued, till recently, to partake strongly of the pure severity of the antient Greek writers.

Dechâles was, however, an accurate and elegant writer on the subjects which he treated; and there are interspersed through his works many marks of considerable invention, as well as of a happy power of adaptation of the knowledge of his predecessors and contemporaries. Still he was not one of those men who had the power greatly to extend the boundaries of science: it was his province rather to place it in such a light as to facilitate its acquisition by others.

He was appointed professor of mathematics in the College of Clermont, the chair of which he appears to have filled for about four years; and thence he removed to Marseilles, where he taught navigation, military engineering, and the applications of mathematics to practical science. From Marseilles he went to Turin, where he was appointed professor of mathematics in the university; and died in that city in 1678, being sixty-seven years of age.

As a teacher, Dechâles was remarkable for his urbanity, and for the adaptation of his instruction to the previous acquirements of his pupils; and as a man, his probity and amiable spirit gained for him the admiration and love of all with whom he was associated.

The works of Dechâles were published at Lyon in 1690, in four folio volumes, under the title of Mundus Mathematicus. A former edition of these was also published in three volumes; but this edition is far less complete than that of 1690.

DECIMAL FRACTIONS. [FRACTIONS, ARITHMETIC.]

DECIMAL NOTATION. [NUMERATION, ARITHMETIC.]

DECIMAL SYSTEM OF WEIGHTS AND MEASURES. [WEIGHTS AND MEASURES.]

DE'CIUS MUS, a Roman who distinguished himself by many warlike exploits, and received many honours. In a battle against the Latins he voluntarily devoted himself to the Dii Manes. He had made an agreement with his colleague, Manlius Torquatus, that the consul whose wing first gave way should devote himself to death. The ceremony of consecration was performed with great solemnity, and having directed the lictors to acquaint the other consul that he had given himself up for the safety of the army, he rode into the thick of the enemy, and was soon overpowered by a shower of darts, about B.C. 338. His son Decius Mus followed his heroic example in a war against the Gauls, B.C. 295, as well as his grandson in the war with Pyrrhus, B.C. 280.

DECIUS CAIUS MESSIUS QUINTUS TRAJANUS, the Roman emperor, succeeded Philip, and chiefly distinguished himself for his violent persecution of the Christians. He and his son fell in an expedition against the Goths, about A.D. 251.

[Coin of Decius Trajanus.]

British Museum. Actual Size. Copper. Weight 343¼ grains.

DECKER, THOMAS, flourished as a dramatic author in the reign of James I., though the precise time of his birth and death, like those of many of his contemporaries, are uncertain. He is celebrated for a quarrel with Ben Jonson, who satirized him under the name of Crispinus in his 'Poetaster;' Decker returned the compliment by writing his 'Satyromastix,' wherein Jonson is attacked under the name of 'Young Horace.' The author of the 'Biographia Dramatica' says that he became more famous from this quarrel than from any merit of his own. Later critics have, however, been more favourable to Decker, and Mr. Hazlitt pronounced the character of Friscobaldo in the 'Honest Whore' to be perfect in its way, as a picture of a broken-hearted father with a sneer on his lips and a teardrop in his eye. This comedy is written with great power and with a high moral feeling. Decker composed many plays in union with other dramatists; and the collected works of Webster, Massinger, and Ford exhibit specimens of his partnership-writing, though it is hard to assign the respective portions of productions of this sort to their right authors. Mr. Gifford has attributed all the gross indecencies of Massinger's 'Virgin Martyr' to the hand of Decker; but many have considered this slur on the morality of the latter to be unjust. Of the plays written solely by Decker the 'Honest Whore' is the most celebrated, and is printed in Dodsley's Collection. Besides his dramatic works, his 'Gull's Hornbook' has become better known by an edition recently published.

DECKER, JEREMIAS DE, one of the most esteemed Dutch poets of the seventeenth century, was born at Dordrecht, in 1610, as is generally supposed, but certainly between the years 1608 and 1612. His father Abraham de Decker, who had embraced the reformed religion, was, although of good family, in very moderate circumstances, first as a tradesman, afterwards as public broker. Attached to reading himself, particularly the works of all the best historians, he endeavoured to cultivate a similar taste in his children, and was rewarded by finding his son Jeremias display considerable talents and application at a very early age. Aided merely by such instruction as his father could give him and his own natural aptitude for learning, which was seconded by an excellent memory, young De Decker made so great proficiency that while yet a lad he made himself master of the Latin, Italian, French, and English languages, notwithstanding he was even then obliged to assist his father in his business. At no time of his life in fact can literature be said to have been his occupation, yet that and poetical composition continued to the last the solace of an existence passed in so uniform a tenor as to afford no materials for biography beyond what immediately relates to his writings.

His earliest essays in poetry consisted of paraphrases from Jeremiah, &c., and of translations and imitations from Horace, Prudentius, Buchanan, to which may be added his 'Good Friday,' a collection of pieces breathing the most pure devotional feeling. Indeed a strong vein of unaffected religious sentiment runs through all his compositions, for, as with our own Cowper, religion was with

De Decker an abiding influence. Nowhere does sincerity of piety or the warmth of the domestic affections display itself more touchingly than in his poem on the death of his father, in that of consolatory exhortation to his widowed mother, and in another piece on his brother David, who died at Batavia. Even his *Puntdichten* are many of them of a religious, all of a moral tendency, being for the most part so many condensed ethic lessons and reflections rather than epigrams, except as to the ingenious turn and point, which frequently render them highly impressive, although their subjects may be familiar truths. The longest of all his productions is his *Lof der Geldzucht*, or 'Praise of Avarice,' a poem in which that vice is satirized in a strain of most amusing irony. It is replete with learning, felicity of illustration, and a playfulness of tone which only serves to render it all the more caustic; no wonder therefore that it has been greatly admired, and has earned for itself a place beside Erasmus's celebrated 'Moriæ Encomium.' This was almost the very last piece he ever wrote, nor did he live to enjoy its reputation, for he died while it was in the press, in November, 1666.

DECLARATION (declaratio), in law, is the statement of his case by the plaintiff in an action at law: in a real action it is properly called a count (narratio). In this, the first of the pleadings in a cause, the plaintiff states the nature and quality of his case, in general more fully than in the writ, but still in strict conformity with the tenor of that instrument, any substantial variance being a ground of objection. (Co. Litt.; Stephen.) [Pleading.]

DECLINATION. When a star is not in the equator, the angle made by two lines drawn from the spectator's eye, one to the star, the other to the nearest pole, is called its polar distance. The complement of the polar distance, or the angle subtended by the star and the nearest point of the equator, is the declination of the star. It is called north or south according as the star is north or south of the equator. The declination (it is becoming very common to use the polar distance in preference) and the right ascension [Ascension, Right] are the usual co-ordinates to which a star's place is referred. Confining ourselves here to declination, we must merely remark that the effect of a diminution in declination is to bring the star nearer to the equator, and its time of appearance above the horizon nearer to twelve hours. The length of a star's (or of the sun's) time above the horizon is found as follows:—Multiply together the tangents of the latitude of the place and of the declination of the star. If the answer be greater than unity, the star is too near the north pole to set, or too near the south pole to rise (according as the declination is north or south); if equal to unity, the star grazes the horizon at the north (or south) points, but does not set (or rise); if less than unity, find the angle which has the preceding product for its cosine, convert it into time at the rate of 15° to an hour, and the defect from twelve hours is the half of the duration required, expressed in sidereal time.

DECLINATION OF THE MAGNETIC NEEDLE (or Variation of the Magnetic Needle), is the angle which the horizontal needle makes with the geographical meridian of any given place.

The Chinese were the earliest observers of the property of the magnet of turning, when poised on its centre, continually in the same direction. [Compass, History of.] The natural magnet being, of course, the first employed, it would be difficult to cut it so that the axis of the magnetic power should strictly coincide with the axis of the bar: and hence it was scarcely to be expected, that with an instrument thus formed, the declination should be discovered. The Chinese, however, had observed this phenomenon at an early period, as has been proved by Klaproth in his letter, cited under Compass. In the dictionary of Hiu-tchin, the magnet is described as the 'stone by which we give direction to the needle;' and this refers to the date A.D. 121. Again, under the dynasty of Tsin (which, according to Duhalde, is included between the years A.D. 265 and 419), the great dictionary of Poi-wen-yun-fou says, 'they had then ships whose course was directed by the magnetized needle;' and in another place, quoting a work composed in the eleventh century of our æra, we find 'the fortune-tellers rub the point of a needle with the stone of love (the frequent name of the magnet in many distinct languages) to render it capable of indicating the south.' (*British Annual*, 1837, p. 291.)

Though there is no reason to believe that the Chinese were acquainted with any other method of making artificial magnets than by friction upon the natural one, yet as all artificial magnets, however produced, have precisely the same directive properties, we can hardly conceive it possible that a people so remarkable as they are for observation could fail to discover that the needle did decline from the true geographical meridian. 'Indeed (as Mr. Davies observes in his History of the Mariner's Compass before referred to in the *British Annual*), when we look at the lines of equal variation in the Indian seas, which is peculiarly the great inexplicable region of our time, and which throws suspicion on every theory of terrestrial magnetism, and suppose they were in a similar state then, we cannot think the Chinese could remain ignorant of it, whilst their commerce extended to the Persian Gulf and the Red Sea.' But we are not left entirely to conjecture, however probable, on this head, as there is at least one authority in the Chinese annals which is sufficiently decisive and is borne out by collateral evidence. 'The magnet is covered with small points (hairs) of a slight red tinge, and its whole surface is rough. It attracts iron, and adheres to it; and is accordingly called the stone which sucks iron. The Hi-nan-chy, a dark blue stone, is also a dark-coloured loadstone. When an iron point is rubbed with the loadstone, it acquires the property of showing the direction of the south; nevertheless, it always declines to the west, and is not due south.' And, after describing the construction of the compass, the passage proceeds to say that the instrument 'indicates the south, but always with a declination towards the point ping, that is to say, it is § to the south.'

The earliest mention of the magnetic declination amongst other than Chinese writers, is in a manuscript known as the Adsiger or Leyden Manuscript. The first distinct notice of it was taken by Senebier of Geneva; and ample extracts from it, both in the original Latin and English translations, were given by Cavallo in a supplement to his Treatise on Magnetism, in 1795. This manuscript has been the subject of much discussion; but its authenticity is still greatly doubted.

It has been usual among European writers to refer the discovery of the declination of the needle to Columbus, on his first voyage of discovery in 1492. This opinion rests entirely on the testimony of the son of that great navigator, who states the circumstance in the life of his father, with considerable probability of its being a real case. It is however hardly to be conceived, that the compass should have been in use amongst the enterprising sailors of Europe, upon voyages so extensive as were then frequently undertaken, without the circumstance being not only observed by some, but known to all who were engaged in maritime affairs. At all events, it appears from various printed works and manuscripts to have been familiarly known very soon afterwards to all the commercial nations of Europe.

When it was found that the needle declined from the meridian by different quantities in different places, it was still assumed that at each given place the declination was constantly the same. In 1581 Burrough published his 'Discourse on the Variation of the Compass,' in which he states as the result of numerous observations, that the declination at Limehouse was 11 15 E but in 1633, Gellibrand, the Gresham professor of geometry found by careful observations that it only amounted to 4 5 E. It has indeed been stated by Bond, that the variation of the declination was first discovered by Mair, and secondly by Gunter, but as he gives us no authority for this assertion, we are unable to judge of its truth or falsehood. Bond was addicted to paradox, and his statements should therefore be received with caution.

Careful observations (subject, however, to several sources of then unsuspected error) have been made from that period down to the present time, and they all concur in showing that this variation of the declination is continually going on, though not with a uniform angular motion. It was therefore inferred, that the needle would continue to revolve round the horizon by slow degrees, till at last it came round again to any given position; and it appears to have been suspected by some, that the irregularity of its indicated motions was only apparent, and arising either from the imperfection of the instruments employed, or the inaccuracy of the observations themselves. The scientific world was, consequently, not prepared to expect the results of Major Sabine's observations on the declination, and the truth which they unfolded, when in 1818 he determined o be 24° 30 W., and four years afterwards to have retroraded to 24° 12′, at London. Subsequent observations, however, bear out this conclusion; and not only do the obervations made in this country but throughout Europe undeniably establish the fact, that the western declinaion had about 1818 or 1820 attained its maximum value, nd that the needle, instead of continuing to gradually move round the points of the horizon, is now returning towards he geographical meridian. The general opinion is therefore that the needle performs a series of oscillations on each ide of the meridian, and after attaining its extreme limit eturns again through another slow oscillation. As no easterly declination equal in quantity to the recent westerly maximum value has been observed with care, we are left only to conjecture on this point. If, indeed, we adopt this hypothesis, and take Bond's authority for the declination being 0 in 1657, we ought to expect on such an hypothesis hat it will be 0 again in 1979, and attain its greatest easterly value in 2140. We are not, we confess, very devoted beievers in the opinion that its oscillations are regular; and we think we could furnish strong reasons for our scepticism on this head: but while so few steps have been made towards a satisfactory theory of terrestrial magnetism, it would be rash to affirm that conclusive reasons can be given for either one opinion or the other. At all events, the popular hypothesis depends entirely on an analogy supposed to hold rue between the pendulum and the magnetic needle, in a case where the analogy is unphilosophically applied, that is, where the analogy of the causes is by no means apparent, and where there even seems to be a direct contrast between them.

The daily variation of the declination was first observed by Graham in the early part of the last century. He found by very careful experiments upon excellent needles, that the declination was not uniform during the whole period of a day; sometimes being to the east, and sometimes to the west of the general mean declination at the time and place of observation. Canton, less than half a century later, made a considerable number of observations, and a great number of experiments on a subject, which he, like Graham, supposed to be collateral with it,—the influence of temperature upon the intensity and direction of the needle. These inquiries have been pursued with great success by Mr. Christie of the Royal Military Academy, and M. Kupfer of Casan. Separate parts, too, of this inquiry have been attended with very curious results in the hands of Mr. Barlow, likewise of Woolwich Academy, on the influence of high temperatures; and by Colonel Beaufoy, in his careful observations on the actual daily variation for several years before his death.

It may be sufficient here to state the results, and refer to the articles Magnetism, Temperature, and Variation for details of the methods of observation and the theoretical views which have been proposed to account for the phenomenon.

The needle attains its maximum easterly variation from the mean between seven and eight in the morning; it moves westerly till about two in the afternoon, when it attains its westerly maximum; it then returns eastward again till the evening; after which a slight westerly motion succeeds; and this is finally followed by a return easterly during the night, which continues till from seven to eight the next morning, when it is found to be nearly the same as it was twenty-four hours before. These oscillations were found by Colonel Beaufoy (as the mean of five years' observations) to have the greatest amplitude in June and in August, while Canton and Wargentein fix it in July. It is however certain that it is greater in the hotter than the colder seasons of the year in England, and throughout Europe; and this will probably also be found to be the case in all parts of the world.

For fuller details on all these subjects, reference is made to the words before quoted; this article being intended only as a slight historical sketch preliminary to the reader's understanding the general state of the science. To these articles we more especially refer, because coming later in the order of time of publication, we shall be enabled to bring before the reader some important inquiries, which we have reason to know are in existence, but not yet before the world.

DECOCTIONS are formed by subjecting the harder parts of plants, which are not easily penetrated by liquids, or are insoluble in water of a low temperature, to the process of boiling, generally in water, but sometimes in oil. By this means much of the substance is dissolved, and the active principles of the plant are imbibed by the fluid, which is then used medicinally either internally or externally. This method of extracting the medicinal properties of plants is inadmissible when their powers depend upon any aromatic or volatile principle, such as essential oils, which are dissipated by the high temperature. In many other instances this process is not only unnecessary but injurious, being employed when infusion is sufficient, even when cold water is used for the purpose of infusion. Of this nature are all purely mucilaginous substances, such as marsh-mallow (Althæa officinalis), quince-seeds (Cydonia vulgaris), &c., from which Trommsdorf has shown that a purer mucilage, which keeps longer, may be obtained by cold water. All substances, the astringent properties of which depend upon the presence of tannic acid, such as oak-bark, tormentil-root, &c., have their astringent power impaired or completely destroyed by long boiling. Besides, boiling dissolves many principles, such as starch, &c., which are quite inert, and which do not contribute to the efficacy of the medicine, while their presence disposes the decoction to decomposition, a process very apt to occur in decoctions, and rendering them unfit for use in a few days or hours. Decoction is a mode of preparing substances most suitable to those which are both nutritious and medicinal, such as Iceland moss (Cetraria islandica). Many principles which are dissolved by the water at a boiling temperature are deposited by it on cooling, on which account the liquid should always be strained while hot, and the contents of the bottle shaken up before each dose be poured out. Aromatic liquids are frequently added to the fluid after it is strained; or the aromatic substance may be placed at the bottom of the vessel into which the hot decoction is strained, and, after being allowed to infuse for a few hours, may then be applied to the use intended. A better method, however, is to add some aromatic tincture after the straining, as the presence of the spirit retards the tendency to decomposition, while it imparts the flavour and qualities of the substances from which it had been prepared.

DECOMPOSITION. When a compound body undergoes an entire change of properties, either spontaneously or from chemical agency, it is said to be decomposed; thus, during fermentation, whether the spirituous, acetous, or putrefactive, the substance undergoing it suffers decomposition, and its elements recombine so as to form new compounds. This distinguishes it from mere mechanical division, to whatever extent that may be carried. [Analysis; Fermentation.]

DECREE, DECRETA'LES. The term decree (decretum) denotes a decision or order by a competent power or magistrate, by which some doubtful or disputed point of judicial inquiry is determined.

We must distinguish between decrees in civil and in canon law.

As to the former, it was usual among the Romans to take the opinion of lawyers in doubtful cases. Such opinions, which were called 'responsa prudentum,' obtained the authority of law when they were unanimous. (Gai. 1—7.) When all legislative power was centred in the emperors, it became the custom to ask for their opinion and decision in disputed cases. Their decisions were called decrees, and formed a part of the imperial constitutions. [Constitutions; Roman Law.]

In the same manner in ecclesiastical matters it became usual to ask the opinions of the bishops, particularly of the bishop of Rome. The replies of the pope ultimately obtained great authority, though they had not at first the force of laws. The legislative power still belonged to the councils. But, in the 12th century, the pope being regarded as the highest ecclesiastical authority, the whole ecclesiastical legislation was centred in him. The papal decrees now became the only source of ecclesiastical law, as the imperial constitutions had been for the civil law. The decrees of the pope, which are called *decretales*, may be defined as decisions of the popes in ecclesiastical matters of law. (Gratiani *Decret.*, part i.) The decrees of the popes retained their authority as law till the 14th century, when the power of the holy see began to decline.

From the 5th century the decretales of the popes have been collected:—1. The compilation of the abbot Dionysius Exiguus extends from 499 to 514. Pope Adrian I. gave a MS. of this compilation to Charles the Great, of which our present editions are copies. The oldest edition is that by J. Wendelstein, Mentz, 1525, under the title 'Canones Apostolorum, veterum conciliorum constitutiones, decreta pontificum. 2. The compilation, which is ascribed to Bishop Isidorus of Seville (633—636), is, for the most part, only a copy of the collection of Dionysius. But it became of importance by the edition made in the 9th century of spurious decretales of the popes, from Clement I. (A.D. 100) to Siricius (A.D. 398), on the authority and the independence of the holy see. The object of these false decretales, called those of the Pseudo-Isidorus, or of Isidorus Mercator or Peccator, was apparently to increase the papal power. This collection was considered as authentic during the middle ages, but no person now maintains its authority. (*Pseudo-Isidorus et Turrianus vapulantes*, by Blondell, Geneva, 1628.) The authentic Isidorus was first edited at Madrid, 2 tom. 1808 and 1821, and the Pseudo-Isidorus is in Merlin's collection, Paris, 1523. 3. Some other collections of Reginus, Prum, Burchardus of Wurms, and Ivo of Chartres. They may be considered as preparatory to the collection of Gratian. [Canon Law.]

After the time of Gratian many new collections were made. The most important are:—1. The collection of Bernardus Papiensis (A.D. 1213), called Breviarium Extravagantium. It contains partly decretales, which were omitted in the work of Gratian, and partly the decretales of the popes from Alexander III. 2. The collection of Petrus Beneventanus, published by the authority of Pope Innocent III. which contains the decretales of the twelve first years of the reign of that pope. 3. The collection of Joannes Vallensis, who collected the decretales of Alexander III., which Bernardus Papiensis had omitted, and those of the popes to Innocent III. 4. As the collection of Petrus Beneventanus contained only the decretales of the first twelve years of the reign of Innocent, a collection of the decretales of the following years of this pope was made by an unknown author. 5. Under the public authority of Pope Honorius III. a new collection, containing the decretales of this pope, was published about the year 1226 by an unknown author.

These five collections, often called the Quinque Compilationes, were edited together under the title 'Antiquæ Collectiones Decretalium, cum Ant. Augustini and Jac. Cujacii notis et emendationibus,' Par. 1609.

The collections after the time of pope Honorius III. form parts of the Corpus Juris Canonici. [Canon Law.]

(J. H. Bœhmer, *De Decretalium Pontificum Romanorum variis collectionibus et fortuna*, prefixed to the 2nd volume of his edition of the *Corpus Jur. Can.*)

DECREE. [Equity.]

DECREMENT. [Increment.]

DECREPITATION is the name given to a series of slight explosions, which occurs when various bodies, especially certain salts, are subjected to heat; and it is generally attributed to the loss of water which they contain mechanically deposited between their particles. The noise which occurs when common salt is heated affords a familiar instance of decrepitation.

DECURIO'NES, a term which denotes certain persons who corresponded to the senate at Rome, in the Roman towns and colonies in Italy which enjoyed free municipal rights. The body of the decuriones was called ordo decurionum, and in later times also curia decurionum, whence the members of the order were also designated by the name curiales. The whole administration of the internal affairs of such towns and colonies was in their hands. They were required to have a certain estate, and to be at least twenty-five years old. It is commonly said that their number was ten, but it was usually greater, and sometimes amounted to 100 members. At the head of the body were the duumviri, *i. e.* two men, like the two consuls, who presided in the Roman senate. Those municipal corporations forming, as to their internal administration, little republics, the citizens had the right of choosing the duumviri just as the citizens of Rome elected their consuls; but under the emperors they were deprived of this privilege, and the decuriones at the same time lost their power. The municipal corporations were administered by officers appointed by the emperor; and the decuriones were only employed to receive the taxes, which subjected them to a great responsibility. The office of a decurion being now considered as a burden, was no longer sought after, and lost its former importance. (Sigonius, *De Antiq. Jur. Ital.* ii. 4.

DEDICATION. [Consecration.]

DEE, the River, rises in Merionethshire, of which it drains the eastern districts and also the south-eastern part of Denbighshire. It afterwards separates Denbighshire from the detached portion of Flintshire and from Cheshire, but the lower part of its course is entirely within Cheshire. The lake of Bala or Llyn Tegid, which may be considered as the source of this river, receives several mountain-streams, one of which is called Dee [Bala-Pool]. The waters of this mountain-lake are discharged at its north-eastern corner by a stream of considerable size and depth, which is soon increased by other considerable mountain-streams, as the Treveryn and Alwen. The Dee so far flows in a fine open valley, and its course is not very rapid until it reaches Corwen. Here the river begins to descend from the mountain table-land of North Wales, and in ten miles from Corwen to Trevor it probably falls above 300 feet; its course in this part is consequently extremely rapid, though without cataracts. Below Trevor it enters the plain, in which it runs with numerous windings upwards of thirty-five miles to the tideway at Chester. Here it is joined by the Alyn from the west, and changes its western course into a northern. At Chester the Dee is about 100 yards wide, and runs farther down in an artificial channel along the marshes for about nine miles. The river now enlarges into a spacious æstuary three miles across, which at high water forms a noble arm of the sea; but at ebb-tide it is dry, and resembles an extensive dreary waste, covered with sand and ooze, through which the river runs in a narrow and insignificant stream. It enters the sea near the island of Helbree, where the æstuary is about six miles wide. In its natural state the Dee is wholly unnavigable; but by means of a weir at Chester, the water is dammed up so as to allow the passage of small boats two or three miles above Chester. The whole course of this river from Bala Pool to the beginning of the æstuary may be about seventy miles.

DEE, JOHN, a distinguished astrologer and mathematician, was the son of a wealthy vintner, and born in London in 1527. Lilly says he was a Cambro-Briton, but this is not in accordance with better authorities. At the age of fifteen he was entered of St. John's College, Cambridge, where his attention seems to have been chiefly directed to mathematical, astronomical, and chemical studies, and his assiduity was there, as through life, even to extreme old age, truly remarkable. At twenty he made a twelvemonth's tour on the continent, chiefly in Holland, for the purpose of scientific intercourse; and returning to Cambridge, was made one of the fellows of Trinity Coll, upon its foundation by Henry the Eighth in 1543; and in 1548, the suspicion entertained of his being addicted to 'the black art' induced him again to go abroad, having first taken his degree of A.M. Whether this prejudice really arose from his having already begun the astrological career for which he was in subsequent life so celebrated, or whether it arose simply from his astronomical pursuits and his mechanical inventions, there is no distinct proof. Judging from other circumstances, especially in connection with the vulgar belief, even among the learned, that all exercise of the powers of natural agents in an uncommon manner was only an exercise of the 'powers of darkness,' we should incline to the latter opinion: whilst, judging from his later life, we should be induced to adopt the previous hypothesis in accounting for the annoyances he met with at Cambridge.

His first residence on this second continental visit was the University of Louvain, at that period in high repute as a place of education; and he was much esteemed for his mechanical skill and his intellectual resources, which, combined with his manly character, caused him to be visited by persons of the highest rank. Two years afterwards he went to France, where he read lectures on the Elements of Euclid at Rheims. The character of the 'lectures' on Euclid was in those days extremely different from that of our own time. A series of speculations in all the sciences, whether physical, moral, or mental, was usually given under this title, the propositions of Euclid being taken as so many 'pegs to hang a speech upon.' The more visionary and romantic of these 'lectures' generally contrived to render a course on Euclid a discourse on all the dogmas of the schoolmen of the middle ages, whilst the more reasonable and sober of the lecturers confined their discourses to natural phenomena and the practical applications of geometry. It is almost unnecessary to say that a proof that 'space would be in earth and heaven at the same time' (founded n Euc. i. 37), would be more attractive in an academical course than any 'vulgar mechanical' application of the same proposition could be. Of Dee's lectures we may form a toerably good estimate from his preliminary discourse in Bilingsley's English Euclid, and a few other occasional paragraphs of his in that work. It places Dee's acquirements n a very favourable light; and his judgment, considering is time and circumstances, in one still more favourable. The dissertation of Dee is however to be found in works ubsequently printed and much more easily obtained; as n Leeke and Serle's Euclid, two or three editions, &c. To read that dissertation is sufficient to convince us that is lectures would be received at Rheims 'with great applause,' as indeed from direct testimony we otherwise know hey were.

In 1551 he returned to England, and was presented to King Edward VI by Cecil, and a pension of a hundred crowns was assigned to him. This he however relinquished for the rectory of Upton-on-Severn.

Shortly after the accession of Mary, he was accused of practising against the queen's life by *enchantment;*' so hat his fame as a dealer in the black art still clung to him. This charge was founded on some correspondence which was discovered between him and the 'servants of the lady Elizabeth;' and it led to a long and tedious imprisonment, with frequent examinations; but as nothing could be stablished against him, he was ultimately (1555) set at iberty by an order of the council.

On the accession of Elizabeth, Dee was consulted by Lord Dudley respecting 'a propitious day' for the coronation. The queen, to whom he was presented, made him great promises. In 1564 he again visited the continent to present a book which he had written and dedicated to the Emperor Maximilian, under the title of *Monas Hieroglyphica*, and which he printed at Antwerp in that year; and within the year he returned to England.

There is reason however to doubt whether the charge of neglecting Dee, brought against Elizabeth and her minisers, is well made out, however strongly and confidently it has been assumed and repeated. Even this visit to the court of Maximilian might have had an object very different from the ostensible one. There is much probability in Lilly's statement, who says, 'to be serious, he was queen Elizabeth's intelligencer, and had a salary for his mainenance from the secretaries of state. He was a ready-witted man, quick of apprehension, and of great judgment n the Latin and Greek tongues. He was a very great nvestigator of the more secret hermetical learning, a perfect astronomer, a curious astrologer, a serious geometrician; to speak truth, he was excellent in all kinds of earning.' Lilly's *Memoirs*, p. 224. Where could a man better adapted to the purpose of 'secret intelligence' than such a one be found? This view, too, is borne out by many striking circumstances. Being in 1571 seized with a dangerous illness in Lorraine, the queen sent two physicians to his relief. This is an act the signification of which cannot be doubted.

He afterwards returned to England and settled at Mortake in Surrey, where he led a life of privacy for some years, devoting himself to study with great ardour, and to he collecting of astronomical and philosophical instruments, not omitting of course a sufficient number of beryls, alismans, &c. His reputation as one who dealt with the devil seems to have strongly manifested itself during this ime in his own vicinity, as the mob in 1576 assembled, and destroyed all his collection, or nearly so; and it was with difficulty that he and his family escaped the fury of the rabble.

In 1578, the queen being much indisposed, Mr. Dee was ent abroad to consult with the German physicians and philosophers (or rather astrologers) relative to the means to be employed for her recovery. This was at least the ostensible object; but as no account of the result of this mission exists, except that we know that the queen recovered, we may be led to infer that it was a secret political mission. After his return to England he was employed by the queen o draw up a condensed account of those countries which belonged to her crown, on the ground of being discovered by British subjects, both as to geographical description and he recorded and other evidence upon which her claim ested. With his usual activity he speedily accomplished his task, and in an incredibly short time he presented her majesty with two large rolls in which the discovered countries are geographically described and historically illustrated. These two curious MSS. still exist in the Cottonian Collection in the British Museum. About this time, too, he paid much attention to the reformation of the Calendar, a treatise on which subject by him, and which is considered both 'learned and rational,' is still in manuscript in the Ashmolean Library at Oxford.

Most of the proceedings and writings upon which his fame with posterity as an astrologer rests, were written subsequent to this period, and he was now upwards of fifty years of age. This is not the general period at which men of activity both of mind and occupation sink into dotage; and it is impossible, taking into account several of the succeeding circumstances of the life of Dee, to imagine that this hypothesis can be applied to his case, in explanation of the extravagances which he perpetrated about this time, and soon after. The belief in supernatural agency was general at that period, and the belief in the power of controlling that agency was equally general, we may say universal. That Dee, admitting this in common with all the orthodox whether of the Catholic or reformed religion, was liable to be the dupe of crafty men, older than himself, is evident, and that with a strong and active imagination he should be led to interpret any sensible phenomena in accordance with it, is extremely probable. Whether he intended to be understood literally, or merely to express under those disguises information and memoranda of a very different nature, it is difficult now to determine. We incline to the latter opinion, and we think this view is borne out by circumstances; we shall, however, annex the usual account, which does indeed contain the ostensible view of his later life.

In the year 1581 he took into his service an apothecary of Worcester, named Edward Kelly, as an assistant. The 'conversations with spirits' were held by Dee, in common with this person; and indeed Kelly was in general Dee's amanuensis during the time they were together. They had a black speculum, of what material cannot be ascertained, but it is generally said 'a polished piece of cannel coal,' in which the angels Gabriel and Raphael appeared at their invocation. Hence Butler says

'Kelly did all his feats upon
The devil's looking-glass—a stone.'

The 'Book of Spirits,' is not, however, to be considered a fair sample of Dee's absurdity, if taken literally; and we are not sure that Dee was himself the author of it. It was published in 1659, more than half a century after Dee's death; and hence its authenticity is very questionable; but even admitting its authenticity, we can only infer from it that it was in reality only an envelope of other information which it was not considered safe to commit to writing in an intelligible form, nor to trust entirely to the memory. Possibly, indeed, it might have been a mere cipher, in which special passages that were worked into the general discourse were to be taken in a secretly specified order, so as to express other facts of a political nature. This was a favourite method of cipher at that period.

In 1583, a Polish noble, named Albert Laske, palatine of Siradia, being in England, Dee and Kelly were introduced to him; whether with a political object or not, no direct evidence exists to inform us, but they accompanied him to Poland. It is said that the attachment arose from the similarity of their pursuits, that he soon became weary of them from finding himself abused by their idle pretensions, and that, to get rid of them, he persuaded them to pay a visit to Rodolph, king of Bohemia; that, moreover, though a weak and credulous man, Rodolph was soon disgusted with their nonsense; and that they had no better success with the king of Poland; but that they were soon after invited by a rich Bohemian noble to his castle of Trebona, where they continued for some time in great affluence owing, as they asserted, to their power of transforming the baser metals into gold.

It was very probably from the circumstance of Laski's being addicted to astrology and alchemy, as well as the king of Poland, that Dee was employed by the queen's crafty ministers as a fitting person for a political mission to that country, in the real character of a 'secret intelligencer.' It was in keeping with the unvarying policy of Elizabeth's government, and with the habits and previous occupation of Dee. The ridiculous pretensions which he and Kelly set up were well calculated to lull all suspicions of their real purpose. No other hypothesis seems capable of affording a key to Dee's conduct during this singular excursion;

and all the circumstances admit of complete explanation by it.

Kelly appears to have been one of those sordid and servile characters that look only at the immediate gain to be made of each single transaction, without having either principle or honour in his composition. Dee, on the contrary, was, as Lilly in his gossiping memoirs tells us, 'the most ambitious man living, and most desirous of fame and renown, and was never so well pleased as when he heard himself styled Most Excellent.' Lilly also gives a curious narrative of the means by which the servant Kelly obtained the art of transmutation from a poor friar, with whom Dee would have no intercourse; and that when the secret was obtained, the friar was made away with; and one reason given by this arch-knave of the Protectorate, Butler's 'Sidrophel,' why 'many weaknesses in the manage of that way of Mosaical learning (' conference with spirits,' in the book ascribed to Dee), was because Kelly was very vicious, unto whom the angels were not obedient, or willingly did declare the questions propounded.'

Dee and Kelly separated in Bohemia, the former returning to England, the latter remaining at Prague. Of the circumstances attending this rupture nothing is certainly known; though the narrative given by Sidrophel is characteristic enough of Kelly's character. See William Lilly's History of his Life and Times from 1602 to 1681, p. 224. Baldwin's Edition.

In 1595 the queen appointed Dee warden of Manchester College, he being then sixty-eight years of age. He resided there nine years; but from some cause not exactly known he left it in 1604, and returned to his house at Mortlake, where he spent the remainder of his days. He died in 1608, aged 81, leaving a numerous family and a great number of works behind him. 'He died,' says Lilly, 'very poor, enforced many times to sell some book or other to buy his dinner with, as Dr. Napier of Linford in Buckinghamshire oft related, who knew him very well.'

Had Dee lived in better times, his great talents, application, and ambition, would have won for him the highest honours; as it was, he was merely the spy of Elizabeth's base ministry, and to effect that purpose obliged to have recourse to stratagems which debase the moral as well as the intellectual character. We have seen his reward too, penury in his old age.

Dee's writings are very numerous, several of which still remain in MS. A catalogue of his printed writings may be seen in his *Compendious Rehearsal*, or his letter to Whitgift; and from these it appears that he then had by him more than forty unpublished writings, the titles of which he gives.

DEED (in law), an instrument in writing or print, upon paper or parchment, comprehending the terms of agreement between parties able to contract, duly sealed and delivered. Deeds are of two kinds, indented and poll: a deed indented is called an indenture, and has a waving line cut (*in modum dentium*) on one of the edges of the material upon which it is written, usually the top edge; and when the deed consists of more sheets than one, on the first sheet only. The term indenture implies that the deed is of two parts, and that they were divided by the line in order to afford additional means of authentication, but, except in the case of leases, marriage settlements, partnership deeds, and some few others, there are seldom more parts than one. In deeds effectuating modern transactions, indeed, the expense of stamps is so heavy, that frequently, where two or more parties are equally interested in a deed, it is deposited with some person for their joint use. Hence the term indenture, in common acceptation, now implies little more than that the deed is made by and between two or more parties. Antiently some word, as for instance 'chirographum' (whence 'chirograph'), was written in capital letters upon the part where the parchment or paper was to be divided, and afterwards cut in an indented or, in some cases, a straight line.

A deed poll is cut even, or polled at the edges, and is usually of one part only, *i.e.* the deed of one party, or of several parties of the same part. The form commences in the mode of a declaration, 'Know all men by these presents, that,' &c.; the form appropriated to an indenture or a deed among several parties is 'This indenture, made, &c between, &c. Witnesseth,' &c. A deed *inter partes* is not necessarily indented, except in those cases where an indenture is required by statute, and except in the working of an estoppel. [ESTOPPEL.] The indenting is not essential, even though the instrument should commence 'This indenture,' &c. It has been said that the indenting may be supplied after the deed is executed, and even in court; but in all cases where the indenting is essential to the validity of the deed, it seems clear that this must be a mistake.

A deed, to be absolute and irrevocable, must be founded on a valuable or good consideration, untainted by anything immoral, illegal, or fraudulent, though a gift or voluntary conveyance will be effectual as between the parties, and is only liable to be questioned in certain cases by creditors or subsequent purchasers; and a voluntary deed may become irrevocable by a subsequent sale by the grantee of the subject-matter conveyed by it

Antient deeds were short, and suited to the simplicity of the times. When transactions became more complicated, it was customary to divide deeds into several formal parts: but it is not absolutely necessary that a deed should be so divided, provided there are sufficient words to show the meaning and intention of the parties. These formal parts are, 1. The premises: that is, the date, the parties' names and description, the recitals, the consideration and receipt thereof, the grant, the description of the things granted, and the exception, if any; 2. The habendum, which defines the estate or interest to be granted; 3. The tenendum, which was formerly used to express the tenure by which the estate granted was to be held; but since freehold tenures have been converted into common socage, the tenendum has grown out of use; 4. The reddendum, the reservation of some new thing, as rent, to the grantor; 5. The condition (if any) annexed to the grant; 6. The warranty; 7. The covenants: the office of these two last, in modern conveyances, is served by special covenants for the validity of the title, and to do or abstain from doing certain specified acts; 8. The conclusion, which mentions the execution, &c.

Previous to its execution, the deed should be read, if any of the parties require it; or, as to that party, it may be avoided. The modern mode of executing deeds is by signing, sealing, and delivering. Signing is not essential to the validity of a deed, though it is required as to less formal instruments by the statute of frauds, 29 Ch. II. c. 3; but sealing is absolutely necessary, which is the most antient mode of authentication, and has been in use from the earliest times. At present the seal affords no real security against fraud, for any impression upon wax or other substance employed is sufficient; indeed it is generally affixed by the stationer who engrosses the deed, and it is not even necessary that there should be a seal for each party; one is sufficient for all. In some of the American states the impression upon wax has been disused, and a flourish with the pen at the end of the name, or a circle of ink, or a scroll, is allowed to be a valid substitute for a seal. The last essential to the due execution of a deed is delivery, except in the case of a corporation, where sealing by the common seal has the effect of delivery. The usual manner of delivering a deed is for the executing party to say, 'I deliver this as my act and deed:' but any less formal mode by which the party signifies his intention to deliver it will be effectual. A deed may also be delivered as an escrow, *i.e.* to a third person to keep till something is done by the grantee: when the condition is performed the deed becomes effectual. A deed takes effect from the delivery, and not from the date, and therefore if it have no date, or a date impossible, the delivery ascertains the time from which it is to take effect. Evidence is admissible also of delivery on a day different from the date written. The execution is usually attested. Enrolment and registration are rendered necessary in some cases by statutory enactment, and the revenue laws have imposed certain stamps upon every description of deeds, the absence of which prevents them from being admissible in evidence.

The principal rules for the interpretation of deeds are, that the effect be fair and reasonable, and as near as possible to the apparent intent of the parties as the rules of law will admit: that the construction be made upon the entire deed, and not upon disjointed parts: that where the intention is clear, too minute a stress be not laid on the strict and precise signification of the words, and that if there be two clauses totally repugnant to each other, the first shall be received, and the latter rejected. There are many other rules of construction, which are exactly the same in courts of law and equity. Courts of equity also rectify mistakes in deeds, and give relief in cases of fraud, and where instruments are lost, &c. [EQUITY.]

After execution, a deed may become void by erasure, inerlineation, or other alteration in any material part; but, generally speaking, such alterations will be presumed to have been made before the execution, if nothing appear to he contrary, or there be no cause to suspect that it has been done in a clandestine manner. A grantee may also disclaim the grant or disagree thereto; and a deed may be destroyed or cancelled, but such destruction or cancellation will not revest the thing granted in the grantor, though all personal engagements established by the deed between the parties will be put an end to.

A confirmation is an assent to an estate or interest already created, by which act the person assenting confirms and gives validity to the estate or interest so far as he can. A confirmation can only have this effect with respect to estates voidable or defeasible: it has no operation upon estates which are absolutely void. (Butl. n. Co. Litt., 295 *b.*) (Shep., *Touchstone;* Dixon; Co. Litt.; Cruise's *Digest.*)

DEEMSTERS. [MAN, ISLE OF.]

DEER, CER'VIDÆ, a family of solid-horned ruminants, he horns caducous, and belonging, generally speaking, to the male only.

HORNS.

Before we enter upon the other details of the natural history of the species composing this noble natural group, it will be necessary to say a few words on the development of the horns, which form so remarkable a part of the organization of the animals, as weapons of attack and defence, and as being indicative of the presence or the absence of the power of continuing the species, and the more or ess vigorous degrees of that power.

In the Museum of the Royal College of Surgeons (*Physioogical Series*, No. 179) will be found a section of part of the *os frontis* and of the base of a *fallow deer's* horn (*Cervus Dama*), the growth of which is nearly completed. It shows the horn to be a continuation of bone from the outer table of the skull, and the velvet-like covering of the horn to be equally continuous with the integuments of the head. It shows also the burr or pearl which has been formed round the base of the horn, and illustrates the effects of this part on the growth of the horn.

In the formation of the burr, which is the last part of the process, and takes place rapidly, the osseous tubercles of which it is composed are projected outwards, and by their pressure induce absorption of the vascular external covering, and increasing at the same time laterally, they enclose and compress the blood-vessels; thus, in a short space of time, the circulation is entirely obstructed, and consequently the whole of that once very vascular and sensible tegument loses its vitality, dries, shrinks, and peels off, leaving the horn a naked insensible weapon. In one of the branches (the brow antler) in this preparation, the whole of the vessels appear to have been thus obliterated; in the other a slight degree of vascularity remains, and one of the large external arterial branches is still uncompressed (*Catalogue, Physiol. Series*, vol. i.) The beautiful preparations illustrative of the process are numbered 163 to 187, both inclusive.

The rapidity with which this firm mass of bone is secreted is worthy of note. The budding horns of a male wapiti were several inches high in ten days from their first appearance; a month afterwards there was an interval of two feet between them, measuring from branch to branch.

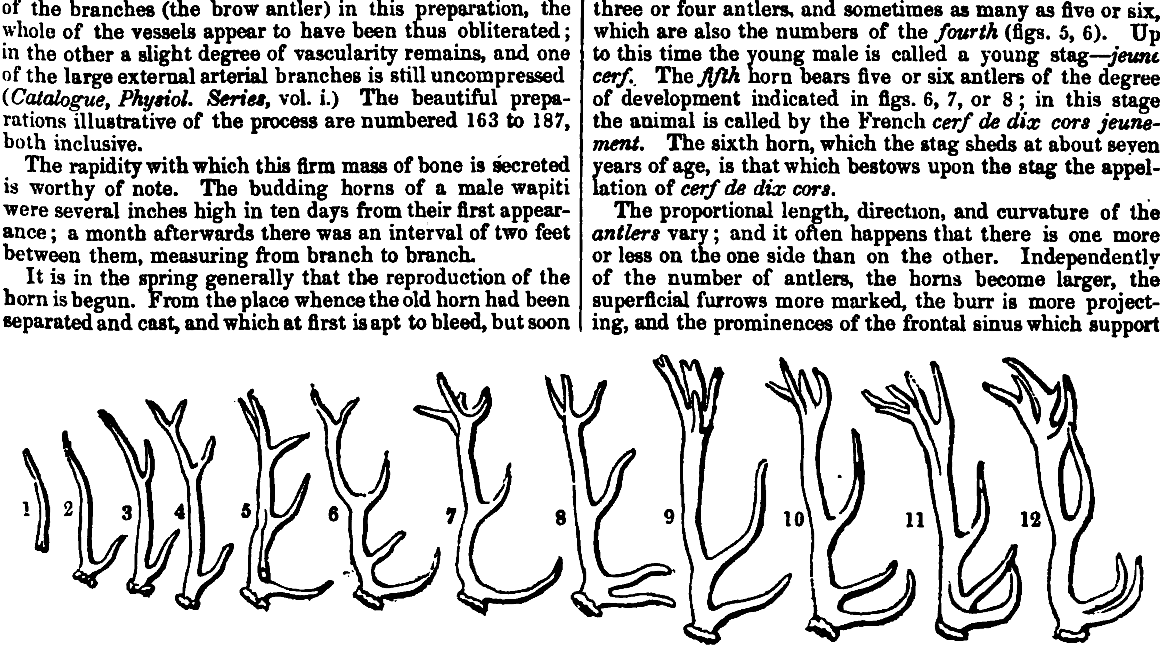
It is in the spring generally that the reproduction of the horn is begun. From the place whence the old horn had been separated and cast, and which at first is apt to bleed, but soon is skinned over with a fine film, the new horn sprouts. At this time there is a strong determination of blood to the head, great in proportion to the demand for such an enormous and ultimately solid secretion. The vessels from the roots swell, the vascular horn pushes up, protected by a delicate and soft covering. In this its early stage it is nearly cylindrical, and the quantity of animal heat which it contains may be in some degree imagined by gently grasping it with the hand. Gradually the antlers appear; the whole 'head,' to use the sporting term, is developed, and becomes of the firmest solidity; the animal feels its powers, and proceeds to rub off the drying and decaying 'velvet,' which may be seen at this period hanging from the horn in ragged strips, against trees and other resisting bodies, leaving at last the magnificent ornament and weapon with only the traces on its now hard surface of the blood-vessels which had produced it. Then it is that the deer, conscious of his strength, comes forth in all his grandeur, ready to do battle with any creature, even man himself, who may dare to invade his haunts. Fierce fights ensue, and the strongest male reigns paramount. The rutting season dies away, spring returns, the antlers are shed, again to be regenerated in time for the season of love.

In the common stag or red deer (*Cervus Elaphus*), the shedding of the horns takes place about the end of February or during March. The fallow deer sheds his horns from about the middle of April to the first weeks of May.

For the production of these annually regenerated bony masses Nature has provided with her usual care. 'We find it a common principle in the animal machine,' says John Hunter, 'that every part increases in some degree according to the action required. Thus we find muscles increase in size when much exercised; vessels become larger in proportion to the necessity of supply, as for instance in the gravid uterus. The external carotids in the stag, also, when his horns are growing, are much larger than at any other time; and I have observed that in inflammation the vessels become larger, more blood passes, and there appear to be more actions taking place; but the nerves do not seem to undergo any change. The nerves of the gravid uterus are the same as when it is in a natural state; neither do the branches of the fifth and seventh pair of nerves in the stag become larger.' (*Hunter on the Blood.*)

But it must not be supposed that the antlers reach their full amplitude in the first years of the male deer's life. In the stag or red deer the horns of the male do not appear till its second year, and the *first* which is shed (fig. 1) is straight and single, like a small thrust-sword or dagger, whence the young male is termed by the French *daguet.* The *next* horn has generally but one antler, as in fig. 2; but it has sometimes two, and even three (figs. 3, 4, which are horns of stags in their third year). The *third* horn has three or four antlers, and sometimes as many as five or six, which are also the numbers of the *fourth* (figs. 5, 6). Up to this time the young male is called a young stag—*jeune cerf.* The *fifth* horn bears five or six antlers of the degree of development indicated in figs. 6, 7, or 8; in this stage the animal is called by the French *cerf de dix cors jeunement.* The sixth horn, which the stag sheds at about seven years of age, is that which bestows upon the stag the appellation of *cerf de dix cors.*

The proportional length, direction, and curvature of the *antlers* vary; and it often happens that there is one more or less on the one side than on the other. Independently of the number of antlers, the horns become larger, the superficial furrows more marked, the burr is more projecting, and the prominences of the frontal sinus which support

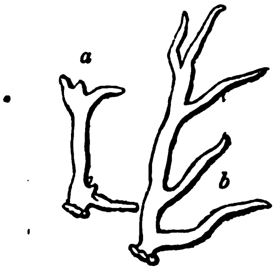


[Horns of Stag, Cervus Elaphus. Left Horns.]

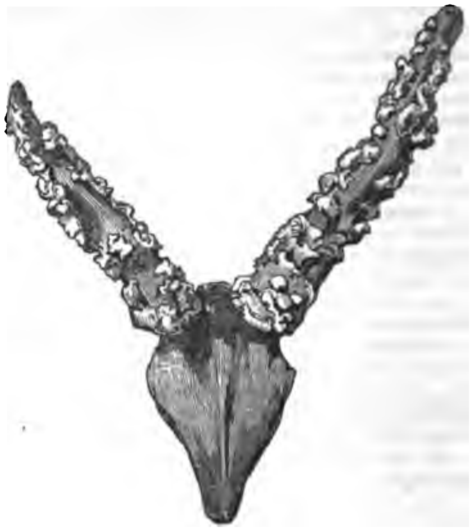
the horns become shorter and wider every year. By such signs is the age of old stags, or those of from eight years upwards, determined; for after the seventh year the number of the antlers is regulated by no fixed rule; they are multiplied towards the summit of the beam, where they are conjoined into a kind of crown or palmation (figs. 9, 10, 11, 12). The oldest heads do not in general present more than ten or twelve antlers (*tines*, Scotticè); but some have been seen that bore the enormous number of thirty-three. Such was the noble *cerf à* 66 *cors* killed by the first king of Prussia, and presented by that monarch to Augustus I., elector of Saxony and king of Poland. This noble head is said to be still preserved at Moritzburg.

In all gradations of age after the appearance of the antlers, the second antler is more or less approximated to the first or brow antler, *maître andouiller* of the French; a name given to it because it is the largest.

The sympathy between that part of the system which regulates the development of the horns in the deer tribe and the organs of generation is most remarkable. For instance, if a stag is castrated when his horns are in a state of perfection, they will, it is affirmed, never be shed; if the operation is performed when the head is bare, the horns, it is said, will never be regenerated; and if it is done when the secretion is actually going on, a stunted, ill-formed permanent horn is the result, more or less developed, according to the period at which the animal is emasculated. Any disturbance of the system generally produces a corresponding deterioration in the horn. In the subjoined cut fig. *a* represents the horn of a deer (*Cervus Canadensis*) produced during a voyage from America, and *b* a horn subsequently developed in the French Menagerie by the same individual, which afterwards produced a head of surprising dimensions.

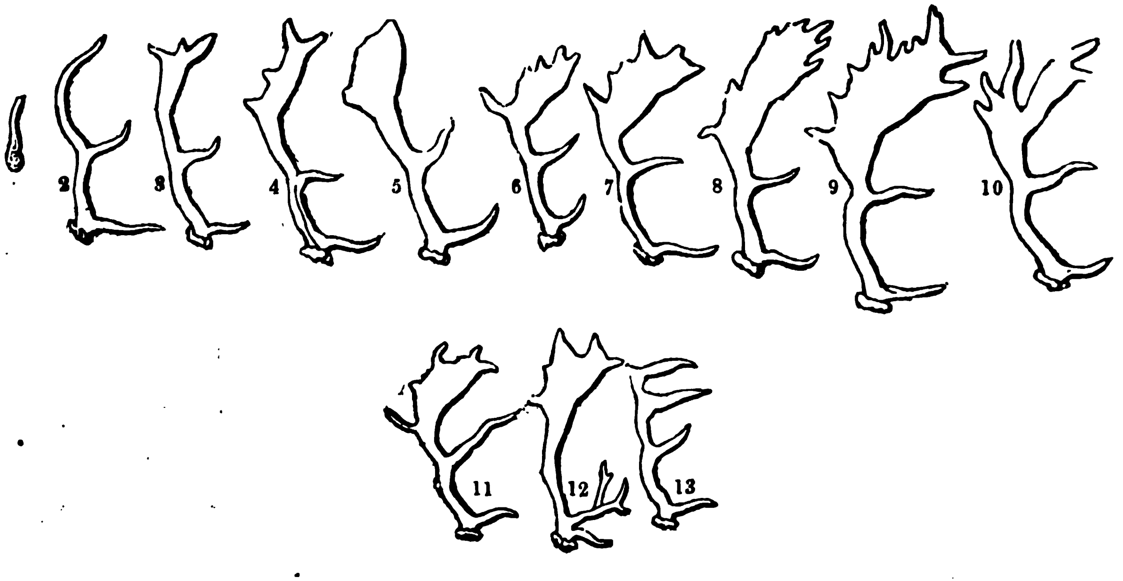


a, Horn of Deer produced under unfavourable circumstances; *b*, horn of same deer produced under more favourable circumstances.



[Horns of a Fallow Deer that were not shed at the usual time in consequence of the castration of the animal. From the Museum of the College of Surgeons.]*

The same system of development which we have observed in the *horn with branching antlers* is in great measure to be traced in the other leading form of *horn*, viz., *the palmated horn*. Taking the horn of the fallow deer (*Cervus Dama*) as an example of the latter, we find the horn first put forth by the buck at two years old, (when he is called a pricket,) a simple shaft, slightly curved, the concavity turned forwards (fig. 1); this curvature the horns retain throughout. The second year there are two antlers directed forwards (fig. 2), and the summit of the horn in some cases begins to spread into a palm (figs. 3, 4,) which afterwards increases, throwing out a greater or less number of dentelations on its posterior and superior border (figs. 5, 6, 7, 8). Sometimes one or two of these dentelations form true recurrent antlers (figs. 6, 8). Figs. 8 and 9 are horns of the fourth growth, and it will be seen that they begin to be divided above. In the following years the palm is irregularly and variously divided (figs. 10, 11, 12, 13), so that the horns of old bucks are very frequently oddly shaped, and hardly to be recognized. With still more advanced age they continue to dwindle. Cuvier, from whom this account and the figures of the growth of the deer's horn are taken, says that it is asserted that these palmated horns of the buck finish by putting on the simple appearance of the horn first developed (*dague*), and states that he in fact possessed the head of a fallow deer which had only simple horns, and whose teeth were ground down to the very roots by long use.



[Horns of Fallow Deer, Cervus Dama. Left Horns.]

The reproduction of the horns is annual in the deer of temperate and cold climates; but it has been supposed that some of the species inhabiting hot climates do not cast them every year. The palmated horn seems to be more especially given to those deer which inhabit the northern latitudes;

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* It is apparent from the specimen that these horns could never be shed; they form one bony continuance with the os frontis. They are evidently the result of highly disordered functions, and the bony excrescences from the beam seem to have the character of exostosis.

and Colonel Smith is of opinion that it is a provision to enable the animals to remove the snow from their food.

Dental formula, generally speaking, the same as in the giraffes, goats, antelopes, sheep, oxen, &c.; viz., incisors, $\frac{0}{8}$; canines, $\frac{0-0}{0-0}$; molars, $\frac{6-6}{6-6}=32$.

Of the molars, both in the upper and lower jaws, six are true and six false. In the upper jaw the three first molars are bordered by a thick crest on their internal surface; the three next have all the characters of the molars in the dromedaries. [CAMEL.] In the lower jaw, the first incisor is the longest, the second and the third rather decrease, and the fourth is very small; all have cutting edges. The two first false molars are simple; the third has a process or heel at its posterior part, and the three others do not differ from those of the upper jaw. In the formula given above, the canines are noted as absent; but this general rule is not without exception, some of the species presenting canines similar to those of the *Musks* (*Moschus*) in the upper jaw. The *Muntjak* has these teeth largely developed. (See, p. 362.)

The Deer-tribe possess the *lachrymal sinus*, or as it is often termed the *suborbital sinus* (*larmiers* of the French, *tear-pits* of the English), even more universally than the Antelopes. Under the title ANTELOPE (vol. i. p. 68), will be found a very good description of them, with the different opinions as to their functions, up to the time when the article was written.

The late lamented Mr. Bennett, at a meeting of the Zoological Society (22nd March, 1836), proceeded to remark that it appeared to him that the lachrymal sinus, the use of which has long remained a problem to zoologists, must be referred to sexual relations. Referring to its structure, as to that of a sac, opening externally by a lengthened slit, but perfectly closed within, he remarked, that that organ could not possibly be in any degree connected with the functions of respiration; there being no aperture through it for the passage of air. Its inner surface is covered by a smooth skin, with a few scattered and very short bristles, and is defended by a dark-coloured and copious secretion of ceruminous matter, which has a heavy urinous and sexual odour. He did not feel himself competent, he stated, to explain the precise manner in which this organ is available for sexual purposes; yet he felt convinced that such is its use, from the consideration of its relative development in the several *Indian Antelopes* of the Society's Menagerie.

In the more aged of these individuals, as indeed in the adult *Indian Antelope* generally, the large cutaneous follicle beneath the eye known as the lachrymal sinus, is so prominent as to form a most striking feature in the animal's physiognomy: it never appears as a simple slit, its thickened edges pointing so widely as to be at all times partially everted. When the animal is excited, and it is constantly highly excitable, the eversion of the bag becomes complete, and its thick lips being thrown widely back, the intervening space is actually forced forwards so as to form a projection instead of a hollow: the animal is, on such occasions, delighted to thrust repeatedly the naked lining of the sac against any substance that is offered to him, which soon becomes loaded with the odour that has been referred to as belonging to the secretion. In the second individual, although it is perfectly mature, the protrusion of the inner surface of the sac is not quite to so great an extent as in the more aged male; and the less thickened edges of the sinus allow of a nearer approximation to its closure in the unexcited state of the animal. The youngest male has the lips of the sinus small and closely applied to each other, so as to hide completely the whole of the internal lining of the sac, and to exhibit, externally, a mere fissure: in it the lips are but slightly moved when the animal is interested. The emasculated individual, notwithstanding its full growth, has its suborbital sinus nearly in the same condition as that of the immature male: it is merely a slight fissure, the edges of which are closely applied to each other; and in it those edges do not appear to be at all moved, the animal being generally careless and inanimate. It would consequently seem that the same cause which induced the retention, by this individual, of its immature colours, and which arrested the perfect growth of its horns, was adequate also for the checking of the development of the suborbital sinuses. Those organs, therefore, would appear to be dependent on sexual perfection; and consequently to be, in some manner yet to be ascertained, subservient to sexual purposes, with the capacity for which they are evidently, in the phases of their development, essentially connected.

Mr. Owen, who had conceived it possible that the secretion of these glands, when rubbed upon projecting bodies, might serve to direct individuals of the same species to each other, remarked that he had endeavoured to test the probability of this supposition by preparing a tabular view of the relations between the habits and habitats of the several species of *Antelopes*, and their suborbital, maxillary, post-auditory, and inguinal glands; in order to be able to compare the presence and degrees of development of these glands with the gregarious and other habits of the *Antelope* tribe. He stated, however, that it was evident from this table, that there is no relation between the gregarious habits of the *Antelopes* which frequent the plains, and the presence of the suborbital and maxillary sinuses; since these, besides being altogether wanting in some of the gregarious species, are present in many of the solitary frequenters of rocky mountainous districts. The supposition, therefore, that the secretion might serve, when left on shrubs or stones, to direct a straggler to the general herd, falls to the ground. (*Zool. Proc.* 1836.)

The reader will find the table above alluded to in the Proceedings of the Zoological Society of London, for 1836.

The osteological structure of the Deer-tribe is such as would be expected when it was necessary that the bony framework should exhibit a union of lightness and strength, necessary for an animal whose life is to depend on its agility and defensive powers. The general character of the skeleton may be collected from the different skulls figured in this article and from the FOSSIL ELK. (p. 364.)

Geographical Distribution.—The form is widely spread, and seems capable of being so modified as to withstand the extremes of heat and cold.

The species are very numerous, and our limits will only permit us to give a few examples of the various sections.

Character of the Family.—*Horns* caducous or deciduous, proper to the male only, generally. *Body* plump. *Legs* slender. *Lachrymal sinuses* under the eyes. A *muzzle* in the greater part of the species. *Ears* moderate, pointed. *Tail* very short. *Mammæ* four, inguinal. (Dental formula given above.)

a.

Horns sessile, more or less subdivided, without either basilary or mesial antlers, but terminated by a vast palmation, digitated on its external border only.

THE ELKS.

Example, *Alces Americanus*, *Cervus Alces*, Linn. *The Elk* or *Moose Deer*.

This noble animal is, according to Dr. Richardson, the *Ellan*, *Stagg*, or *Aptaptou* of De Mont; *Eslan ou Original* of Sagard-Theodat; *Original* of La Hontan, Charlevoix, Denys, Du Pratz, and of the French Canadians of the present day; *Orignac* (Hist. de l'Amerique), and of the Basque settlers in Canada (De Mont); *Moose Deer* of Dudley, Pennant, and Warden; *Moose* of Umfreville and Heriot; *Mongsoa* of the Algonquins; *Mousöa* of the Crees; and *Denyai* of the Chipewyans.

Description.—'This animal is the largest of the genus, being higher at the shoulders than the horse; its horns weigh sometimes near fifty pounds; accordingly, to bear this heavy weight, its neck is short and strong, taking away much of the elegance of proportion so generally predominant in the deer; but when it is asserted that the elk wants beauty or majesty, the opinion can be entertained by those who have seen the female only, the young, or the mere stuffed specimens; for us who have had the opportunity of viewing the animal in all the glory of its full-grown horns, amid the scenery of his own wilderness, no animal could appear more majestic or more imposing. It is however the aggregate of his appearance which produces this effect; for when the proportions of its structure are considered in detail, they certainly will seem destitute of the harmony of parts which in the imagination produces the feeling of beauty. The head measuring above two feet in length, is narrow and clumsily shaped, by the swelling upon the upper part of the nose and nostrils; the eye is proportionably small, and sunk; the ears long, hairy, and asinine; the neck and withers are surmounted by a heavy mane; and the throat furnished with long coarse hair, and in younger specimens, encumbered with a pendulous gland: these give altogether an uncouth character to this part of the animal. Its body, however, is round, compact, and short; the tail not more than four inches long; and the legs, though very long, are remarkably clean and firm; this length of limbs and the overhanging lips have caused the antients to fancy that it grazed walking backwards. The hair of the animal is coarse and angular, breaking if bent. Its movements are rather heavy, and the shoulders being higher than the croup, it does not gallop, but shuffles or ambles along, its joints cracking at every step, with a sound heard to some distance. Increasing its speed, the hind-feet straddle to avoid treading on its fore-heels, tossing the head and shoulders like a horse about to break from a trot to a gallop. It does not leap, but steps without effort over a fallen tree, a gate, or a split fence. During its progress, it holds the nose up, so as to lay the horns horizontally back. This attitude prevents its seeing the ground distinctly; and as the weight is carried very high upon the elevated legs, it is said sometimes to trip by treading on its fore-heels, or otherwise, and occasionally to give itself a heavy fall. It is probably owing to this occurrence that the elk was believed by the antients to have frequent attacks of epilepsy, and to be obliged to smell its hoof before it could recover; hence the Teutonic name of *Elend* (miserable), and the reputation, especially of the fore-hoofs, as a specific against the disease.' (Smith.)

In 'A perfect Description of Virginia,' (small 4to, 1649,) we find it thus written: 'The elkes are as great as oxen, their horns six foot wide, and have two calves at a time.' Hearne remarks that the horns of the moose occasionally exceed 60 lbs., and that their texture is harder than that of any other deer-horns to be found in the fur countries. Lawson ('Nat. Hist. of Carolina') says, 'The elk is a monster of the venison sort. His skin is used almost in the same nature as the buffelo's (bison's). Some take him for the red deer of America, but he is not; for if brought and kept in company with one of that sort, he will never couple.* * * His horns exceed (in weight) all creatures which the New World affords.' Dr. Richardson states that he has been informed that the males sometimes attain a weight of eleven or twelve hundred pounds.

Utility to Man.—'The flesh of the moose is very good, though the grain is but coarse, and it is much tougher than any other kind of venison. The nose is most excellent, as is also the tongue, though by no means so fat and delicate as that of the common deer (rein-deer). The fat of the intestines is hard like suet; but all the external fat is soft like that of a breast of mutton, and, when put into a bladder, is as fine as marrow. In this they differ from all the other species of deer, of which the external fat is as hard as that of the kidnies.' (Hearne.) In the 'Perfect Description of Virginia' above quoted, it is stated that the 'skins make good buffe, and the flesh as good as beefe.' Lawson, though he speaks of the good qualities of the skin, does not seem to have so high an opinion of the flesh. 'His flesh,' says Lawson, 'is not so sweet as the lesser deers.' Dr. Richardson remarks that the flesh of the moose is more relished by the Indians and residents in the fur countries than that of any other animal, and principally, he believes, on account of the soft fat. In his opinion, corroborating the old book above quoted, the flesh bears a greater resemblance in its flavour to beef than to venison.

The same author describes the dung of the animal as being in the form of brown oval pellets, and such were the droppings from the individuals kept at the garden of the Zoological Society in the Regent's Park. The skins, Dr. Richardson observes, when properly dressed, make a soft, thick, pliable leather, excellently adapted for mocasins, or other articles of winter clothing. The Dog-ribs, he adds, excel in the art of dressing the skins, which is done in the following manner. They are first scraped to an equal thickness throughout, and the hair taken off by a scraper, made of the shin-bone of a deer, split longitudinally; they are then repeatedly moistened and rubbed, after being smeared with the brains of the animal, until they acquire a soft spongy feel; and lastly, they are suspended over a fire made of rotten-wood, until they are well impregnated with the smoke. This last-mentioned process imparts a peculiar odour to the leather, and has the effect of preventing it from becoming so hard, after being wet, as it would otherwise do. (*Fauna Boreali-Americana.*)

Locality.—'Du Pratz,' writes Dr. Richardson, 'informs us that, in his time, moose-deer were found as far south as the Ohio: and Denys says that they were once plentiful on the Island of Cape Breton, though at the time he wrote they had been extirpated. At present, according to Dr. Godman, they are not known in the state of Maine, but they exist in considerable numbers in the neighbourhood of the Bay of Fundy. They frequent the woody tracks in the fur countries to their most northern limit. Several were seen on Captain Franklin's last expedition at the mouth of the Mackenzie, feeding on the willows, which, owing to the rich alluvial deposits on that great river, extend to the shores of the Arctic Sea, in lat. 69°. Farther to the eastward, towards the Copper Mine river, they are not found in a higher latitude than 65°, on account of the scarcity on the Barren Grounds of the aspen and willow, which constitute their food. I have not been able to ascertain whether they occupy the whole width of the continent or not. Mackenzie saw them high up on the eastern declivity of the rocky mountains, near the sources of the Elk river; but I suspect that they are rarely, if ever, found to the westward of the mountains. Authors mention that the moose generally form small herds in Canada. La Hontan, who travelled in that country in 1683, says, that whilst he accompanied the Indians, they hunted the Elk with dogs when there was a crust on the snow; and that after a chase of a few leagues they generally found ten, fifteen, or twenty of them in a body: in three months his party killed fifty-six, and might have taken as many more. It is probable, however, that La Hontan in this passage confounds the Canada-stag and moose-deer together. He mentions the animal being able to run, in the summer season, for three days and nights in succession, and the excellent flavour of its flesh,—facts which apply to the moose-deer, but not to the Canada-stag; on the other hand, the weight of the horns, which he says sometimes amounts to four hundred weight, is true only of the stag. In like manner the accounts of the other antient writers on Canada are liable to suspicion.'

Habits, Chase, &c.—Lawson observes of the elks that 'they will often resort and feed with the buffelo, delighting in the same range as they do.' Dr. Richardson gives the following succinct account of their habits and food, and of the mode of hunting them.

'In the more northern parts the moose-deer is quite a solitary animal, more than one being very seldom seen at a time, unless during the rutting season, or when the female is accompanied by her fawns. It has the sense of hearing in very great perfection, and is the most shy and wary of all the deer species, and on this account the art of moose-hunting is looked upon as the greatest of an Indian's acquirements, particularly by the Crees, who take to themselves the credit of being able to instruct the hunters of every other tribe. The skill of a moose-hunter is most tried in the early part of the winter; for during the summer the moose, as well as other animals, are so much tormented by musquitoes, that they become regardless of the approach of man. In the winter the hunter tracks the moose by its foot-marks in the snow, and it is necessary that he should keep constantly to leeward of the chase, and make his advances with the utmost caution, for the rustling of a withered leaf or the cracking of a rotten twig is sufficient to alarm the watchful beast. The difficulty of approach is increased by a habit which the moose-deer has of making daily a sharp turn in its route, and choosing a place of repose so near some part of its path that it can hear the least noise made by one that attempts to track it. To avoid this, the judicious hunter, instead of walking in the animal's footsteps, forms his judgment from the appearance of the country, of the direction it is likely to have taken, and makes a circuit to leeward until he again finds the track. This manœuvre is repeated until he discovers by the softness of the snow in the foot-marks and other signs, that he is very near the chase. He then disencumbers himself of everything that might embarrass his motions, and makes his approach in the most cautious manner. If he gets close to the animal's lair without being seen, it is usual for him to break a small twig, which alarming the moose, it instantly starts up; but, not fully aware of the danger, squats on its hams, and voids its urine, preparatory to setting off. In this posture it presents the fairest mark, and the hunter's shot seldom fails to take effect in a mortal part. In the rutting season the bucks lay aside the imidity, and attack every animal that comes in their way, and even conquer their fear of man himself. The hunters hen bring them within gun-shot by scraping on the blade-bone of a deer and by whistling, which, deceiving the male, he blindly hastens to the spot to assail his supposed rival. f the hunter fails in giving it a mortal wound as it approaches, he shelters himself from its fury behind a tree, and I have heard of several instances in which the enraged nimal has completely stripped the bark from the trunk of large tree by striking with its fore feet. In the spring-ime, when the snow is very deep, the hunters frequently un down the moose on snow-shoes. An instance is re-orded in the narrative of Captain Franklin's second ourney, where three hunters pursued a moose-deer for four uccessive days, until the footsteps of the chase were marked with blood, although they had not yet got a view f it. At this period of the pursuit the principal hunter had the misfortune to sprain his ankle, and the two others were tired out; but one of them, having rested for twelve hours, set out again, and succeeded in killing the animal fter a further pursuit of two days' continuance. Notwithtanding the lengthened chase which the moose can sustain when pursued in the snow, Hearne remarks that it is both ender-footed and short-winded; and that, were it found n a country free from underwood, and dry under foot, it would become an easy prey to horsemen and dogs. The ame author informs us that in the summer moose-deer re often killed in the water by the Indians who have the fortune to surprise them while they are crossing rivers or akes, and that at such times they are the most inoffensive of animals, never making any resistance.

'The young ones in particular,' says he, 'are so simple, hat I remember to have seen an Indian paddle his canoe up to one of them, and take it by the poll, without experiencing the least opposition, the poor harmless animal seeming at the same time as contented alongside the canoe as if swimming by the side of its dam, and looking up in our faces with the same fearless innocence that a house-amb would, making use of its fore foot almost every instant o clear its eyes of mosquitoes, which at that time were emarkably numerous. The moose is the easiest to tame and domesticate of any of the deer kind.'

With respect to the food of the moose, the same traveller says, 'Their legs are so long, and their necks so short, that they cannot graze on the level ground like other animals, but are obliged to browse on the tops of large plants and the leaves of trees in the summer, and in winter they always feed on the tops of willows and the small branches of the birch-tree, on which account they are never found during that season but in such places as can afford them a plentiful supply of their favourite food; and although they have no fore-teeth in the upper jaw, yet I have often seen willows and small birch-trees cropped by them in the same manner as if they had been cut by a gardener's shears, though some of them were not smaller than a common pipe-stem; they seem particularly partial to red willows' (*cornus alba*). To the eastward of the Rocky Mountains the evergreen leaves of the *gualtheria shallon* form, according to Lewis and Clark, a favourite part of the food of the moose-deer.

The wooden pipe-stems above alluded to and used in Hudson's Bay, are, says Dr. Richardson, about the thickness of a little finger.

It is generally held by zoologists that the American elk and the European or Scandinavian elk are specifically the same. It was the opinion of Buffon that the European elk was not known to the Greeks, nor does it appear to have been noticed by Aristotle. That it was the Ἄλκη (Alce) of Pausanias, Alce of Cæsar and Pliny, Elch of the Celts, and Ælg or Elg of the northern Europeans, there can be little doubt. Pausanias describes it (ix. 21) as being *ἐλάφου καὶ καμήλου μεταξύ*, 'between a stag and a camel;' and though the accounts of Cæsar and Pliny are mingled with fable, and the former states that his *Alces* are *mutilæ cornibus* (which might arise from the accounts of those who had seen the animal at the period when the horns had exfoliated), the general description and the localities given by both are almost conclusive as to the animal meant to be designated. The 'labrum superius prægrande,' 'huge upper lip,' of Pliny, is very expressive, and the extraordinary development of this part might well recall to a casual observer the general traits of the head of a camel. Whether it was the *ἱππέλαφος* (hippelaphus) of Aristotle is a question which will admit of much discussion. The hippelaphus is described by Aristotle (*Hist.*, lib. ii. c. 1) as having a mane near the springing of the shoulder, but the upper part of the neck from that point to the head without that ornament, a beard under the front of the neck, and the head armed with horns approaching to those of the roe (*δορκάς*). Scaliger confesses that he knows not what this animal is; Caius, as quoted by Gesner, considered it to be the elk, and Gesner himself leans to this opinion, which is adopted by Klein and many others. Buffon relies upon two reasons for not confounding the elk with the hippelaphus; one is the size of the two animals, the other the climates which they inhabit. Aristotle makes the size of the hippelaphus nearly that of a stag, which is inferior in bulk to the elk, and he assigns as its locality, Arachosia, a country of Asia about the 83° of longitude, and the 33° of latitude, according to D'Anville's map; whereas the elk never quits the cold countries of the north. Upon the whole, Buffon thinks that the hippelaphus is no other than the stag of Ardennes (a variety of the common stag, *Cervus Elaphus*), which, he observes, is larger than the common stag, and differs from it only in the skin, which is of a deeper colour, being nearly black, but also in the long hair which it carries on the shoulders and under the neck. M. Camus considers that the difference of climate and locality, amounting to more than 15° of latitude and 50° of longitude, operates strongly against the identity of the stag of Ardennes with the hippelaphus. There can be but small doubt that the hippelaphus of Aristotle is not the elk, but some one of the Asiatic species. M. Frederick Cuvier is of opinion that the Rusa deer is the species meant. The probability is, that though the European elk will not turn out to be specifically different from the American, it will prove to be a variety when the two animals are carefully compared with each other, which does not as yet appear to have been done. La Hontan hints at differences between them, and Colonel Smith remarks that the lower parts of the antlers of the American elk are more often separated into branches than those of the European.

[Alces Americanus.]

Mr. Lloyd (*Field Sports of the North of Europe*, vol. ii.) observes that the elk was at one time numerous in most parts of Sweden and Norway; but owing to the increased population, and other causes, it is now only to be met with in particular districts. In Scania, he adds, the most southern province of Sweden, where elks once abounded, none are now to be found.

M. Nilsson states that the elk cannot endure so cold a climate as the stag, the 64° of latitude being the extreme limit at which it is met with in the Scandinavian peninsula.

Mr. Lloyd says that it is reported that the elk not unfrequently attains to the height of seven or eight feet. 'This,' he continues, 'I can readily believe, as Mr. Wise, the Swedish consul-general, had one in his possession a few years ago, which, though only two years of age, measured nearly nineteen hands, or upwards of six feet at the shoulder. I once took the exact dimensions of a rather large male elk that I shot, but unfortunately I lost the string with which I effected that purpose out of my pocket. Though this animal was not fully grown, it was thought he weighed near one thousand pounds.' The same author states the period of gestation to be about nine months, and that the female brings forth, about the middle of May, from one to three young ones; but it is seldom that she has more than two. At this period the mother retires alone to the wildest recesses of the forest. After a lapse of two or three days, the fawns, which are of a light brown colour, have sufficient strength to follow their dam everywhere; they keep with her until they are in their third year, when she leaves them to shift for themselves.

Mr. Lloyd thus describes the habits and uses of the European elk. 'The elk is a long-lived animal; he does not attain to his full growth until after his fourteenth year. At least so it is to be presumed, as up to that period his horns, which are of a flat form, are annually provided with an additional branch. He sheds his horns about the month of February in each year. The female elk, unlike the reindeer of that sex, has no horns. The horns of the young male elk are perceptible nine months after its birth: for the first year they are cylindrical and short; the second year they are about a foot in length, but not branched; the third year, two points are discernible; the fourth year, three; the fifth, they are full grown in length. From that time forward they yearly increase in breadth, and in the number of branches until there are as many as fourteen on each horn.

'By nature the elk is timorous, and he usually flies at the sight of man. In the rutting season, however, like other animals of the deer kind, he is at times rather dangerous. His weapons are his horns and hoofs; he strikes so forcibly with the latter as to annihilate a wolf, or other large animal, at a single blow. It is said that when the elk is incensed, the hair on his neck bristles up like the mane of a lion, which gives him a wild and frightful appearance.

'The usual pace of the elk is a high shambling trot, and his strides are immense, but I have known him, when frightened, to go at a tremendous gallop. In passing through thick woods he carries his horns horizontally, to prevent them from being entangled in the branches; from the formation of his hoofs he makes a great clattering, like the rein-deer when in rapid motion. In the summer season the elk usually resorts to morasses and low situations; for, like other animals of the deer kind, he frequently takes to the water in warm weather; he is an admirable swimmer. In the winter time he retires to the more sheltered parts of the forest, where willow, ash, &c., are to be found; as, from the small boughs of these trees he obtains his sustenance during that period of the year. In the summer and autumn the elk is often to be met with in small herds, but in the winter there are seldom more than two or three in company. At the latter season, indeed, he is frequently alone.

'The flesh of the elk, whether fresh or smoked, is very excellent: the young are particularly delicious. According to Mr. Nilsson, it resembles in taste that of the stag. The tongue and the nose are thought to be great delicacies in Scandinavia as well as in America. Great virtue was once placed in the hoof of that animal, as parings of it were supposed to be a specific against the falling sickness and other disorders; but this idle notion must, by this time, I should think, be nearly exploded. The skin is convertible to many purposes, and is very valuable. Mr. Greiff says—"It is not long since that a regiment was clothed with waistcoats made from the hides of those animals, which were so thick that a ball could scarcely penetrate them." He adds farther, that "when made into breeches, a pair of them, among the peasantry of former days, went as a legacy for several generations."

'The elk is easily domesticated: several instances have come to my knowledge. I had a fawn in my own possession a year ago, but from want of proper nurture, it died. Formerly these animals were made use of in Sweden to draw sledges, but, owing, as it was said, to their speed frequently accelerating the escape of people who had been guilty of murders, or other crimes, the use of them was prohibited under great penalties. Though I apprehend those ordinances, if not abrogated, are obsolete, I am not aware that the elk is ever made use of in that kingdom at the present day, either to draw a sledge, or for other domestic purposes.

'In Sweden, as I have observed, it is contrary to law at this particular time, to kill the elk at any season of the year: this is not the case in Norway; for in that country, as I have just shown, these animals may be destroyed, with certain limitations as to numbers, from the 1st of July to the 1st of November inclusive. The penalty however for killing an elk out of season, in Norway, is very much heavier than in Sweden; it amounts indeed, including legal expenses, &c., to about 20*l*., which is no inconsiderable sum in that kingdom.' (Lloyd, *Northern Field Sports*, vol. ii. p. 329 et seq.)

Immediately following the passage above quoted there is a very interesting account of the mode of hunting the elk in Scandinavia, upon 'skidor,' or snow skates, interspersed, as most of such narratives are, with notices of the habits of the animal; but as our limits will not permit its insertion, we refer the reader to the work, which is well worthy of his attention.

Sir William Jardine, in 'The Naturalist's Library,' vol. iii. (Ruminantia), speaking of the American elk, says, 'This is the only animal which will rank with the subgenus *Alces*, though to another animal, known only by the horns, the name of *coronatus* has been applied by Cuvier. They are in the Paris Museum, bear sixteen snags, but are scarcely a foot in length: they stand about three inches asunder, and more on the forehead than in the common elk; and Mr. Smith thinks they must have been borne by an animal not larger than the fallow deer, and states his opinion that it may prove to be the *Kistuke*, or little elk, of the Rocky Mountain Indians.'

β.

Horns sessile, more or less divided, provided with basilary and median antlers.

*

Antlers flattened.

THE REIN-DEER.

Description.—The tame rhendeer, or reindeer, of the Laplanders, is, according to Hoffberg (*Amæn. Acad.* vol. iv.), at the end of his back, an ell and a half high, and his length, from horns to tail, is two ells, whilst from the navel to the back-bone he measures three-quarters of an ell. On casting his coat, his hair is at first brownish-yellow, but as the dog-days approach it becomes whiter, till it is at last almost entirely white. Round the eye the colour is always black. The longest hair is under the neck; the mouth, tail, and parts near the latter are white, and the feet, at the insertion of the hoof, are surrounded with a white ring. The hair of the body is so thick that the skin cannot be seen when it is put aside, for it stands erect as in other animals of the same genus, but is much thicker. When the hair is cast it does not come away with the root, but breaks at the base.

The *horns* are cylindrical, with a short branch behind, compressed at the top and palmated with many segments, beginning to curve back in the middle, and an ell and a quarter long. A single branch, sometimes but seldom two, springs from each horn in front, very near the base, frequently equalling the length of the head, compressed at the top and branched. The distance between the tips equals the length.

The *horns* of the *female* are like those of the male, but less, more slender, and not so much branched: she has four true paps and two false ones.

The horns grow in the usual manner, and during the early part of their growth are extremely sensible, and suffer from the clouds of gnats (*Culex pipiens*) that form one of the persecutions of both deer and owner. About autumn, before rutting-time, they are become hard, and the velvet is rubbed off. Towards the end of November the male loses his horns, but the female retains hers till she brings forth: if barren, she drops them in the beginning of November.

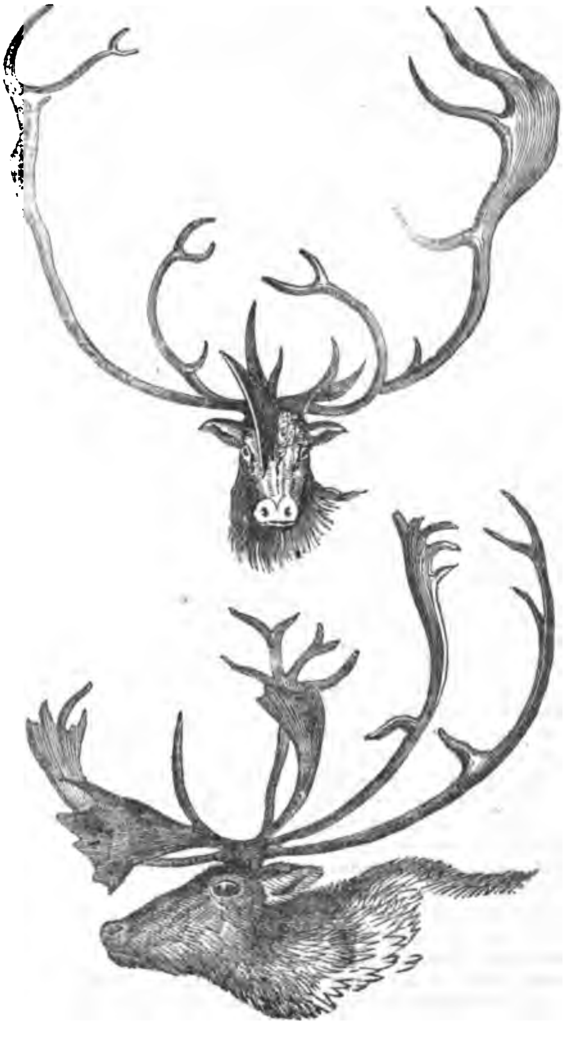
When castrated, the rein-deer seldom sheds his horns till the new year; the strongest shed them soonest, and the longer they keep them the worse they are. If Hoffberg is correct, Scheffer and Hulden, whose assertion he notices, are in error when they state that the castrated reindeer never loses his horns; and as the female, as well as the male, is furnished with them, this species may differ in that respect from others where the possession of these weapons is confined to the male.

The nostrils are oblique and oblong; their hoofs are large in proportion, and the cleft is hollowed internally, so that the parts may touch accurately at the dividing line at the bottom; the tail is about a quarter of an ell, hardly so much.

The wild rein-deer grows to a much larger size than those which are tamed.*

It must be remembered by zoologists, that the horns of different individuals vary so much, that it has been asserted that no two, even of the same age and sex, have those weapons shaped exactly alike. Cuvier in his 'Ossemens Fossiles' has figured a series of the almost endless modifications of these horns from specimens in the Paris Museum; and the conclusion to which he came from these data is, that there is no character common to the whole species, but that of having the horns smooth and compressed in every part, except in the short portion immediately connected with the burr· that great zoologist has thus furnished the information that enables us to strike out several so-called species founded on this variety in the development of the rein-deer's horn.

The rein-deer is also subject to great variety of colour, particularly in a domesticated state, as is the case with most other animals; and spotted or mottled individuals are by no means uncommon in Lapland, and are of still more frequent occurrence in Siberia.



[Heads of two old buck Caribou of the Barren Grounds. From Dr. Richardson's cuts taken from Captain Back's drawings.]

It has been a question with some whether the *Lapland Rein-deer*, and *The Caribou*, or *Rein-deer of America*, and its varieties, are distinct species. Colonel Smith remarks, that a probable distinction, by which some, if not all, the varieties of *Caribou* may be distinguished from the reindeer of the Old Continent is, that their horns are always shorter, less concave, more robust, the palm narrower, and with fewer processes than those of the former. This is another instance of the danger of relying on the form of the horns in this sub-genus as a distinguishing character. have had but little opportunity,' says Dr. Richardson, in his Fauna Boreali-Americana, 'of ascertaining how far these remarks apply to the woodland variety of Caribou; but I can with confidence say, after having seen many thousands of the Barren Ground kind, that the horns of the old males are as much, if not more palmated than any antlers of the European rein-deer to be found in the British museums.' The annexed cuts were made from drawings by Captain Back, of the antlers of two old buck Caribou, killed on the Barren Grounds, in the neighbourhood of Fort Enterprise. It is to be recollected, however, that the antlers of the rein-deer assume an almost infinite number of forms, no two individuals having them alike.

It is, then, the general opinion among zoologists, that the American, European, and Asiatic races of rein-deer, are varieties of one species, of which the following appear to be the

Synonyms.—*Rangifer*, *Reinthier*, and *Tharandthier*, of Gesner and others; *Tarandus*, of Aldrovandus and others; *Cervus mirabilis*, *Cervus palmatus*, *Rangifer*, *Reinthier*, *Tarandus*, *Tarandhthier*, of Jonston; *Caribou*, *ou Asne Sauvage*, of Sagard-Theodat, La Hontan and Charlevoix; *Carré-bœuf*, or *Caribou*, of the French Canadians; *Cervus Tarandus*, of Linnæus, Sabine, Richardson, Ross, Harlan, and James Clark Ross; *Rein-deer* or *Rain-deer*, of Drage, Dobbs, Pennant, Cartwright, Franklin, Godman, and James Clark Ross; *Rein-deer*, or *Caribou*, of Richardson; *Attehk* of the Cree Indians; *Etthin*, of the Chippeways and other Northern Indians; *Tooktoo*, of the Esquimaux (Richardson); *Tukta*, of the Greenlanders (Fabricius); *Rhen*, of the Swedes; *Rhenne*, of the French; *Boetsoi*, of the Laplanders; *Common Deer*, of Hearne, Parry, and Lyon (Richardson); *Rhen-deer* and *Rein-deer*, of the English.

Var. *α*. Arctica. Barren Ground Caribou (Richardson).

Common Deer, of Hearne; *Bedsee-awseh*, of the Copper Indians and Dog-Ribs; *Bedsee-choh* (male), *Tsootai* (female), *Tampeh* (female with a fawn), of the same; *Took-too*, of the Esquimaux, *Took-Took* dual, *Took-Toot* plural (Richardson); *Tukta*, of the Greenlanders (*Pangnek*, male; *Kollowak*, female; *Norak*, young. Fabricius).

Var. *β*. Sylvestris. Woodland Caribou (Richardson).

Caribou, of Theodat, La Hontan, Charlevoix, &c.; *Reindeer*, of Drage, Dobbs, &c.; *Attehk*, of the Cree Indians; *Tantseeah*, of the Copper Indians (Richardson).

Geographical Distribution.—Northern Europe, Asia, and America. Captain James Clark Ross, in the Appendix to Sir John Ross's last voyage says, that although this animal was seen in great numbers on the Isthmus of Boothia, only one individual was killed in the course of their late voyage. It was a fine buck, of larger size than ordinary, and weighed 250 lbs.; the average of those killed at Spitzbergen and Melville Island did not exceed half that weight. The does arrive about the middle of April, the bucks nearly a month later; and herds of several hundreds were seen about the isthmus towards the end of May. Although they migrate towards the middle of September to milder climes, yet stragglers are occasionally seen in the winter. They are, indeed, spread, as Mr. Bennett observes, 'abundantly through all the habitable parts of the Arctic regions and the neighbouring countries, extending in the New Continent to a much lower latitude than in the old, and passing still farther south on all the principal mountain chains. In America, the southern limit of the rein-deer across nearly the whole continent appears to be about the parallel of Quebec; but the animal is most numerous between 63° and 66°. Passing westwards, it is said to be unknown in the islands interposed between America and Asia, but is again abundant in Kamtschatka, throughout nearly the whole of Siberia, in Northern Russia, Sweden, and Norway, and more especially in Finmark and Lapland. In these latter countries the numbers of the few wild herds that still exist are suffering a constant diminution, every art being put in practice by the hardy natives to reclaim and domesticate an animal which constitutes their sole property, the source of all their comforts, and the very means of their existence; without which their land would actually be, as at a first glance it seems, a bleak and uninhabitable desert. According to M. Cuvier, the Baltic forms in Europe its southern limit; in Asia, however, it extends along the Ural chain to the foot of the Caucasus; and we have the authority of a passage in Cæsar's Commentaries, which can scarcely apply to any other animal, for its having existed in his day in the Hercynian Forest. The boundaries of this immense tract of woodland are certainly not very well defined; but this location would imply, at all events, a more southern European habitat than any that is at present known. Again, crossing the ocean, we find the rein-deer at Spitzbergen in Greenland, and in Newfoundland; but it has been said by Pennant, and this has been lately repeated by Dr. Richardson, in his valuable zoology of the fur countries of North America, not to be known in Iceland. This statement, which was scarcely true at the time when Pennant wrote, is not by any means correct, as refers to the present day. About sixty years since, as we learn from Van Troil's Letters on Iceland, thirteen of these animals were imported from Norway, ten of which dying on the passage, only three were landed. These were turned out into the mountains, and have since multiplied to such an extent, in the interior and unfrequented parts of the country, that their progeny was estimated by Count Trampe, the governor, in 1809, the period of Dr. Hooker's visit, at no less than five thousand head. Herds of forty, sixty, or even a hundred individuals are said, both by Dr. Hooker and by Sir George Mackenzie, who visited the island in the following summer, to be not uncommon in the mountains. They are, however, of little use to the inhabitants, who have made no attempts to domesticate them, and are too poor to purchase powder and ball for their destruction. It does not appear indeed that they are much sought after, the cow and the sheep thriving extremely well upon the island, and supplying the place of the deer in almost every respect. We may add that, according to Mr., (now Sir Arthur) Brooke, an importation of six bucks and twenty-four does took place in 1777, about seven years after the period of the first introduction of the animal into Iceland.' (*Gardens and Menagerie of the Zoological Society*, vol. i.)

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* The memoir is supposed to have been published by Linnæus under the name of his pupil.

The size of the rein-deer, widely spread as it is, varies very much according to the accidents of climate; and if authors are to be credited, their weight ranges from 60 to 400 lbs. The latter is probably an exaggeration, but it is evident that the weight increases in proportion to the proximity of the animal to the Pole. According to Dr. Richardson, the bucks of the variety called *The Barren-Ground Caribou* weigh, exclusive of the offal, when in good condition, from 90 to 130 lbs., whilst he describes the *Woodland Caribou* as much larger; and Captain, now Sir John Franklin, makes the weight of the latter from 200 to 240lbs. The buck killed on the Isthmus of Boothia was, as we have seen, 250 lbs.; while the average of three killed at Spitzbergen and Melville Island did not exceed half that weight. The rein-deer of Norway and Sweden are diminutive when compared with those of Finmark and Lapland, which in their turn yield to those of Spitzbergen; and these again fall short of the more Polar races. The sledge-deer of the Laplanders is small, when compared with those reared by the Tungusians of the north of Asia, who ride upon them.

Food, Habits, Chace.—The food of the rein-deer varies with the seasons and the climate. Lapland, says Hoffberg, in the memoir above quoted, is divided into two tracks, called the alpine and woodland country. Those immense mountains, called in Sweden Fjellen, divide that country from Norway, extending towards the White Sea as far as Russia, and are frequently more than twelve miles in breadth. The other, called the woodland division, lies to the east of this, and differs from the neighbouring provinces of Norway by its soil, which is exceedingly stony and barren, being covered with one continued tract of wood, of old pine-trees. This tract has a very singular appearance. The trees above are covered over with great quantities of a black hanging lichen, growing in filaments resembling locks of hair, while the ground beneath appears like snow, being totally covered with white lichens. Between this wood and the Alps lies a region called the Woodland, or Desert Lapmarc, of thirty or forty miles in breadth, of the most savage and horrid appearance, consisting of scattered uncultivated woods, and continued plains of dry barren sand, mixed with vast lakes and mountains. When the mosses on part of this desert tract have been burnt, either by lightning or any accidental fire, the barren soil immediately produces the white lichen which covers the lower parts of the Alps. The rein-deer in summer seek their highest parts, and there dwell amidst their storms and snows, not to fly the heat of the lower regions, but to avoid the gnat and gad-fly. In winter these intensely cold mountains, whose tops reach high into the atmosphere, can no longer support them, and they are obliged to return to the desert and subsist upon the lichens. Of these its principal food is the rein-deer lichen. There are, says Hoffberg, two varieties of this; the first is called *sylvestris*, which is extremely common in the barren deserts of Lapland, and more particularly in its sandy and gravelly fields, which it whitens over like snow; its vast marshes, full of tussocks of turf, and its dry rocks are quite grown over by it. The second variety of this plant, which is less frequent than the former, is named the Alpine; this grows to a greater height, with its branches matted together: it has this name, because when those mountains are cleared of their wood the whole surface of the earth is covered with it; yet it is seldom to be found on their tops. When the woods become too luxuriant the Laplander sets fire to them, as experience has taught him that when the vegetables are thus destroyed, the lichen takes root in the barren soil and multiplies with facility; though it requires an interval of eight or ten years before it comes to a proper height. The Laplander esteems himself opulent who has extensive deserts producing this plant exuberantly: when it whitens over his fields, he is under no necessity of gathering in a crop of hay against the approach of winter, as the rein-deer eats no dried vegetable, unless perhaps the river horsetail (*Equisetum fluviatile*). They root for this lichen under the snow like swine in a pasture; their foreheads, nose, and feet are guarded with a hard skin closely attached to those parts, that they may not be hurt by the icy crust which covers the surface of the snow. The very strong shoes which the Laplander esteems so much are made of these parts of the hide. It sometimes happens (but very rarely) that the winter sets in with great rains, which the frost immediately congeals; the surface of the earth is covered with a coat of ice before the snow falls, and the lichen is entirely encrusted and buried in it: thus the rein-deer is sometimes starved, and a famine attacks the Laplanders. In such an exigence they have no other resource but felling old fir-trees grown over with the hairy liverworts. These afford but a very inadequate supply even for a small herd, but the greater part of a large one, in such a case, is sure to perish with hunger. In the summer, when the rein-deer ranges upon the Alps, a number of plants afford it food. Hagstrom states that it refuses to eat forty-six species, the names of which he gives. Dr. Richardson states that the *Barren-ground Caribou*, which resort to the coast of the Arctic sea in summer, retire in winter to the woods lying between the 63° and the 66° lat., where they feed on the *Usneæ*, *Alectoriæ*, and other lichens which hang from the trees, and on the long grass of the swamps. About the end of April, when the partial melting of the snow has softened the *Cetrariæ*, *Cornicularia* and *Cenomyces*, which clothe the Barren Grounds like a carpet, they make short excursions from the woods, but return to them when the weather is frosty. In May the females proceed towards the sea-coast, and towards the end of June the males are in full march in the same direction. At that period the sun has dried up the lichens on the Barren Grounds, and the caribou frequent the moist pastures which cover the bottoms of the narrow valleys on the coasts and islands of the Arctic sea, where they graze on the sprouting *carices* and on the withered grass or hay of the preceding year, which is at that period still standing and retaining part of its sap. Their spring journey is performed partly on the snow, and partly, after the snow has disappeared, on the ice covering the rivers and lakes, which have in general a northerly direction. Soon after their arrival on the coast the females drop their young; they commence their return to the south in September, and reach the vicinity of the woods towards the end of October, where they are joined by the males. This journey takes place after the snow has fallen, and they scrape it away with their feet to procure the lichens, which are then tender and pulpy, being preserved moist and unfrozen by the heat still remaining in the earth. Except in the rutting season, the bulk of the males and females live separately; the former retire deeper into the woods in the winter, whilst herds of the pregnant does stay on the skirts of the Barren Grounds, and proceed to the coast very early in the spring. Captain (now Sir William) Parry saw deer on Melville peninsula as late as the 23rd of September, and the females with their fawns made their first appearance on the 22nd of April. The males in general do not go so far north as the females. On the coast of Hudson's Bay the *Barren-ground Caribou* migrate further south than those on the Coppermine or Mackenzie Rivers, but none of them go to the southward of Churchill. The lichens on which the Caribou principally feed whilst on the Barren Grounds are *Cornicularia*, *tristis*, *divergens*, and *ochrileuca*, *Cetrariæ*, *nivalis*, *cucullata*, and *Islandica*, and *Cenomyce rangiferina*. (Fauna Boreali-Americana.) In the Isthmus of Boothia the rein-deer does arrived about the middle of April, the bucks nearly a month later; and herds of several hundreds were seen about the isthmus towards the end of May. Numbers of the fawns, which at that period are in a very weak state, are killed by the natives, who hunt them with their dogs; and the does themselves often fall victims to their attachment to their offspring. Captain James Ross states that the rein-deer feeds on the *Usneæ*, *Alectoriæ*, *Cetrariæ*, and other lichens, in the early part of spring; but as the summer advances the young and tender grass fatten it so quickly, that in August they have been killed with several inches thick of fat on their haunches. In this state the meat is equal to the finest English venison, but is most tasteless and insipid when in poor condition. (Appendix to Sir John Ross's *Last Voyage*.)

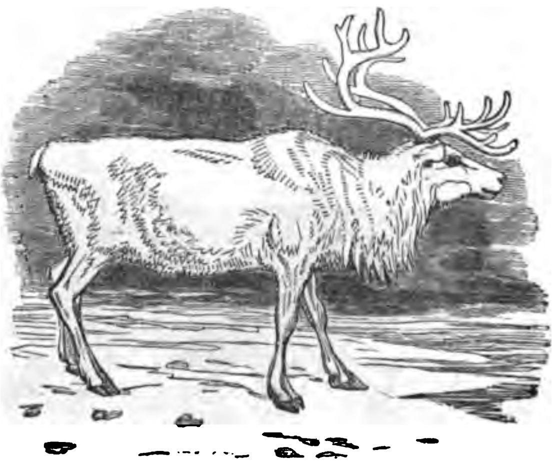
That the lichen is not absolutely necessary as an article of food to the rein-deer, was proved by the length of time during which a female of the white variety lived at the gardens of the Zoological Society of London in the Regent's Park. She lived and throve through two successive winters, and died in 1830. Her food was principally dry provender, for the small quantity of grass which she could have cropped in the same small inclosure wherein she was always kept, must have been very small. The report drawn up by Mr. Yarrell on the morbid appearances, stated inflammation of the brain, lungs, and small intestines, which existed in a small degree in the latter. The mesenteric glands were diseased, but not to the extent that might have been expected in an animal that had been many years in an artificial state. The reporter stated that he had no doubt that the inflammation of the lungs was the primary cause of death.

Whilst on the subject of the food of the rein-deer, we must not omit the propensity (a morbid one probably) attributed by Sir Arthur Brooke to the rein-deer of eating emmings (*Hipudæus Norvegicus*, *Mus Lemmus*, Linn.,) not habitually, but accidentally. The lemmings, it should be remembered, are said to feed on the *rein-deer lichen*. Captain Franklin mentions an analogous propensity in the American rein-deer, which, he says, 'are accustomed to gnaw their fallen antlers, and are said to devour mice.' The gnawing of the fallen antlers may be to correct acidity, as a cow may frequently be seen to gnaw bones for the same purpose.

Our limits will not allow us to detail the different modes of hunting the rein-deer, however interesting the subject may be: suffice it to say that the caribou travel in herds varying in number from eight or ten to two or three hundred; their daily excursions being generally towards the quarter from which the wind blows, and that the Indians kill them with bows and arrows or guns, sometimes approaching by means of a disguise, sometimes taking advantage of rocks or other shelter, and always greatly assisted by the curiosity and unsuspecting nature of the deer themselves. They also take the rein-deer in snares, or spear them as they are crossing rivers or lakes. The Esquimaux take them in traps ingeniously formed of ice and snow. A single family of Indians will sometimes destroy two or three hundred in • few weeks; and in many cases they are killed for the sake of their tongues alone. The reader will find a graphic account of the Esquimaux method of taking them in Captain Lyon's 'Private Journal,' p. 336; and a description of the deer found in use among the Chepewyans (Chippeways), in Hearne. Captain Franklin relates the ingenious methods pursued by the Copper Indians and Dog-Ribs. Captain James Ross remarks that the natives of Boothia seldom hunt the rein-deer in the spring, and then the bow and arrow is the only mode of killing it; but in the autumn, as the animal returns from the north in fine condition, they are destroyed in great numbers by parties of the natives driving them into the water, whilst others in canoes kill them with spears at their leisure. (Appendix to Sir John Ross's *Last Voyage*.)

Utility to Man.—To the Laplander particularly, the rein-deer is all in all. According to Hoffberg, the mountaineer ery often possesses three or four hundred, or even a thousand head; the woodman very rarely above one hundred. As a domestic animal, yielding a quantity of the most delicious food, and occupying the place of the cow and the ox, it is invaluable. As a beast of burthen, its importance is equally great, and its organization is adapted to the icy wastes, over which it forms the Laplander's sole medium of communication, no less than that of the camel is framed for those arid deserts which, without the latter animal, would be impassable. The domestic economy of the Laplanders, as depending on the rein-deer, is a most interesting subject, to which we can here only advert, referring the reader for information on the subject to Hoffberg's interesting paper on the subject above quoted; to Sir Arthur de Capell Brooke's *Winter in Lapland;* and to the 1st vol. of *The Menageries*, published by the Society for the Diffusion of Useful Knowledge, for details. The well-known and beautiful lines of Thomson, ('Seasons—Winter') are no fiction, but a true summary of the benefits of this most useful animal. The weight which it *can* draw when harnessed to a sledge is said to be 300 lbs.: but 240 lbs. form the general limit of the burthen. The tales told of its swiftness, when thus employed, would appear almost incredible if not so well attested as they are. In a race of three deer with light sledges, started by Pictet, who went to the north of Lapland in 1769 to observe the transit of Venus, the first performed 3089 ft. 8 in. and $\frac{26}{100}$ in two minutes, making a rate of nearly 19 English miles an hour; the second went over the same ground in three minutes, and the last in three minutes twenty-six seconds. One is recorded to have drawn an officer with important dispatches in 1699, 800 English miles in forty-eight hours; and the portrait of the poor deer which fell dead at the end of its wonderful journey, is still preserved in the palace of Drotningholm, in Sweden. Journeys of 150 miles in nineteen hours are said not to be uncommon.

To the natives of North America the rein-deer is only known as a beast of chace, but it is a most important one: there is hardly a part of the animal which is not made available to some useful purpose. Clothing made of the skin is, according to Dr. Richardson, so impervious to the cold that, with the addition of a blanket of the same material, any one so clothed may bivouack on the snow with safety in the most intense cold of an Arctic winter's night. The venison, when in high condition, has several inches of fat on the haunches, and is said to equal that of the fallow-deer in our best English parks; the tongue and some of the tripe are reckoned most delicious morsels. *Pemmican* is formed by pouring one-third part of melted fat over the pounded meat and incorporating them well together. The Esquimaux and Greenlanders consider the stomach or paunch, with its contents, a great delicacy, and Captain James Ross says that those contents form the only vegetable food which the natives of Boothia ever taste. For further particulars, and they are many and interesting, we must refer to Dr. Richardson's *Fauna Boreali-Americana*, and the works of our gallant northern voyagers generally.



[Rangifer Tarandus.]

Highly excellent as an article of food, and useful domestically as this animal is, we do not think that it can ever be introduced with much success into the British islands. Not that there would be much difficulty about the food for the deer; it is space that is wanting. A long succession of generations would be required before the migratory habits of the rein-deer could be got rid of, and possessing as we do the best venison, and the finest breed of horned cattle and horses, there seems no very good reason for repeating the experiments which have already been tried and have failed.

* *

Upper antlers alone compressed.

The Fallow-Deer. (*Daims*, of the French.)

Example.—*The common Fallow-deer.* This well-known ornament of our parks is the *Hydd* (Buck), *Hyddes* (Doe), *Elain* (Fawn), of the antient British: *Le Daim* (Buck), *La Daime* (Doe), *Faon* (Fawn), of the French; *Daino* (Buck), *Damma* (Doe), *Cerbietto, Cerbietta* (Fawn), of the Italians; *Gama, Corza* (Buck), *Venadito* (Fawn), of the Spanish; *Corza* (Buck), *Veado* (Fawn), of the Portuguese; *Damhirsch*, of the Germans; *Dqf, Dqf Hjort*, of the Swedes; *Daae, Dijr*, of the Danes; *Dama vulgaris*, of Gesner; *Cervus palmatus*, of Klein; *Cervus platyceros*, of Ray; and *Cervus Dama*, of Linnæus.

It is not certain whether the common fallow-deer is the πρόξ of Aristotle. Buffon and others are of that opinion; but M. Camus, who seems very well disposed to coincide with such opinion if he could, gives good reasons for doubt. Pennant considers the *Platycerata* of Pliny (book xi., c. 37), and the *Eurycerata* of Oppian (*Cyneg.* lib. ii., lin. 293) to have been our fallow-deer.

Pennant, speaking of the two varieties, the spotted and the deep brown, says, on the authority of Collinson, that they were introduced into this country by James I. from Norway, where he passed some time when he visited his intended bride, Anne of Denmark, and he remarks (citing Llywd) that one of the Welsh names of the animal, *Geifr Danys*, or *Danish goat*, implies that it was brought from some of the Danish dominions. James, who observed their hardiness, brought them first into Scotland and thence to Enfield Chace and Epping, to be near his favourite palace, Theobalds. When Pennant wrote, they were, according to him, scarcely known in France, but were sometimes found in the North of Europe. In Spain, he observes, they are extremely large, and that they are met with in Greece, the Holy Land, and in China. For the two latter localities he quotes Hasselquist, who says he saw it in Mount Thabor, and Du Halde. Pennant goes on to state that, in every country except our own, those deer are in a state of nature unconfined by man; but they are, and for some time have been, confined in parks on the continent as they are in England. In Moldavia and Lithuania they are said to be found wild. Cuvier observes that they have become common in all the countries of Europe, and that they appear to have come originally from Barbary. In a note to his last edition of the 'Règne Animal' he states that since the publication of t second edition of his 'Ossemens Fossiles he had recei a wild fallow-deer (*Daim*) which had been killed in t woods to the south of Tunis.

The species is so well known that a lengthened descrip tion of the animal, its habits, &c., would be needlessly occ pying space in a work of general reference. Besides th varieties above mentioned, there are many others, as is gen rally the case with reclaimed or half reclaimed animals one variety is milk-white. Pennant remarks that in the Welsh laws a fallow-deer was valued at the price of a c or, as some say, a he-goat.

[Dama vulgaris.]

γ

Horns sessile, with the antiers, both baslary and medi conical.

The True Stags *

*

Old continent and its islands.

Example.—The *Common Stag*, or *Red Deer; Car* (Stag), *Ewig* (Hind), *Elain* (Young or Calf), of the antien British; *Le Cerf* (Stag), *La Biche* (Hind), *Faon* (Young o Calf), of the French; *Cervio, Cervia*, of the Italians *Ciervo, Cierva*, of the Spanish; *Cervo, Cerva*, of the Portuguese; *Hirtz, Hirsch* (Stag), *Hind* (Hind), *Hinde Ka* (Calf), of the Germans; *Hart* (Stag) and *Hinde*, of the Dutch; *Hjort, Kronhjort* (Stag) and *Hind*, of the Swedes; *Kronhjort, Hind, Kid* or *Hind kalv*, of the Danes.

[Cervus Elaphus.]

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* N.B. Mr. Smith makes a subgenus of the True Stags under the name of Elaphus.

This noble species is doubtless the ἔλαφος of Aristotle, and was well known to the antients generally. It is a native of the forests of the whole of Europe and Asia, where the climate is temperate. In England it is intimately blended with the old oppressive forest laws which valued the life of a man at less than that of a stag, and with some of our legends of deadly feud: Chevy Chace for instance. Of the hunting we could say much, and of the old southern and stag-hounds that were employed in the more dilatory pursuit, and of the gallant grey-hounds, especially those of the north, that were wont to pull it down, nor do we forget the tinchel, identified with rebellion. But we must not indulge in a treatise on the forest-laws or on wood-craft here, and shall only observe that in the south of England his Majesty's pack now stands alone. The stag-hounds that formerly roused the deer on the moors of the west of England, are at present dispersed: and if this noble sport is to be again enjoyed in Somerset and Devon, we fear some time must elapse before a pack can be got up. In Scotland it is the rifle of the deer-stalker principally that now brings the stag down.

The red-deer is so well known that we need not repeat here the description of the animal and its habits, which will be found in most books of natural history. It has canine teeth in the upper jaw. Of the size to which the species sometimes grow the following record will serve as an example: 'When I was at Invercauld,' says Pennant, 'Mr. Farquharson assured me that he knew an instance of one that weighed eighteen stone Scots, or three hundred and fourteen pounds, exclusive of the entrails, head, and skin.' The same author states that in the old Welsh laws a stag was valued at the price of an ox.

* *

New Continent.

Example.—*The Wapiti Stag*, of Pennant, Arctic Zool.; *Wewaskiss*, of Hearne; *Waskeesews*, or *Red-deer*, of Hutchins; *Red-Deer*, of Umfreville; *the Elk*, of Lewis and Clark; *the American Elk*, of Bewick; *Wapiti*, of Barton and Warden; *Le Wapiti*, of F. Cuvier; *the Wapiti* (C. Strongyloceros), of Smith; *Red-deer*, of the Hudson's Bay Traders; *La Biche*, of the Canadian Voyagers; *Wawaskeesho*, *Awaskees*, and *Moostosh*, of the Cree Indians (Richardson). It is also *Le Cerf du Canada*, of Cuvier, who makes it the *Cervus Canadensis*, of Gmelin (Buffon), and *C. Strongyloceros*, of Schreber; and *Cerf Wapiti*, of Lesson, who states it to be *Cervus Wapiti*, of Mitchell, and *Cervus major*, of Ord. It may be also the *Stag of Carolina*, of Lawson, but he describes it as 'not so large as in Europe, but much larger than any fallow-deer,' and he says they are always fat with some delicate herbage that grows on the hills, whereas the modern travellers describe the Wapiti as frequenting the savannahs or the clumps of wood that skirt the plains. There is hardly any doubt that it is the Stag of America (*Cervus major Americanus*) of Catesby. 'This beast,' says the author last named, 'nearest resembles the European red-deer, in colour, shape, and form of the horns, though it is a much larger animal, and of stronger make. Their horns are not palmated, but round, a pair of which weighs upwards of thirty pounds. They usually accompany buffaloes (Bisons), with whom they range in droves in the upper and remote parts of Carolina, where, as well as in our other colonies, they are improperly called elks. The French in America call this beast the *Canada Stag*. In New England it is known by the name of the *Grey Moose*, to distinguish it from the preceding beast (the true Elk), which they call the *Black Moose*.' Dr. Richardson states that it is without doubt the *Canada Stag*, of various authors, but, as M. F. Cuvier has observed, the want of a pale mark on the rump in Perrault's figure is sufficient to excite a doubt of its being the *Cervus Canadensis*, of that author. Indeed he does not think it at all improbable that this figure is that of the *Cervus Macrotis*, which may hereafter prove to be an inhabitant of Upper Canada.

Geographical Distribution.—Dr. Richardson says that this animal does not extend its range farther to the north than the 56th or 57th parallel of latitude, nor is it found to the eastward of a line drawn from the south end of Lake Winipeg to the Saskatchewan in the 103rd degree of longitude, and from thence till it strikes the Elk River in the 111th degree. To the south of Lake Winipeg he thinks it may perhaps exist farther to the eastward. He adds that they are pretty numerous amongst the clumps of wood that skirt the plains of the Saskatchewan, where they live in small families of six or seven individuals, and that they feed on grass, on the young shoots of willows and poplars, and are very fond of the hips of the *rosa blanda*, which forms much of the underwood in the districts which they frequent.

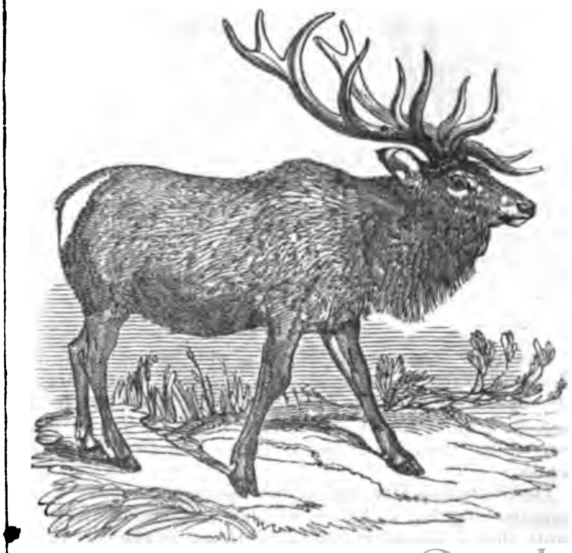
Description.—Height at the shoulders 4½ feet, more than a foot exceeding that of the common stag. All the upper parts and the lower jaw of a somewhat lively yellowish-brown; a black mark from the angle of the mouth along the side of the lower jaw; a brown circle round the eye. The first antlers depressed in the direction of the facial line. Neck, mixed red and black, with coarse black hairs descending from it like a dewlap, deeper in colour than the sides. From the shoulders to the hips French grey; a pale yellowish patch on the buttocks, bounded on the thighs by a black line; tail yellowish, 2½ inches long, whereas it is nearly seven in the European stag. The hair of a mean length on the shoulders, the back, the flanks, the thighs, and the under part of the head; that on the sides and limbs shorter, but the hair is very long on the sides of the head posteriorly and on the neck, particularly below, where they form the kind of dewlap above alluded to. On the posterior and outer aspect of the hind leg there is a brush of tawny hair which surrounds a narrow long horny substance. Ears white within and clothed with tufted hair, externally of the same colour as the neighbouring parts. A naked triangular space round the larger lachrymal sinus near the inner angle of the orbit. Hoofs small. Like the common stag, the wapiti has a muzzle, upper canine teeth, and a soft tongue. The quality of the hair is brittle, and there is a short wool beneath it. Dr. Richardson thinks that the Crees give it the name of 'Stinking Head' on account of the large suborbital opening.

Habits.—Hearne gives them a character for stupidity surpassing that of all the deer kind. He says that they frequently make a shrill whistling and quivering noise, not very unlike the braying of an ass. Mr. Drummond, who saw many in his journeys through the plains of the Saskatchewan, informed Dr. Richardson that it does not *bell* like the English deer. F. Cuvier describes the cry as prolonged and acute, consisting of the successive sounds *a*, *o*, *u*, (French), uttered with so much strength as to offend the ear.

Utility to Man.—Dr. Richardson describes the flesh of the wapiti as coarse, and little prized by the natives, principally on account of the fat being hard like suet. It seemed to Dr. Richardson to want the juiciness of venison, and to resemble dry but small grained beef. Its hide, when made into leather after the Indian fashion, is said not to turn hard in drying after being wet, and in that respect to excel moose or rein-deer leather.

The velvety covering of the horns, according to the same author, shrivels and is rubbed off in the month of October, at the commencement of the rutting season, but the horns themselves do not fall until the month of March or April.

The pair shed by 'Monkey,' (one of the wapiti kept by the Zoological Society of London in the Regent's Park) on the 4th March, 1837, weighed 26½lbs.



[Wapiti.]

That the wapiti will live and thrive well and propagate in Great Britain, there is now no doubt; but grand as the appearance of the animal is, it is not probable that it will be bred here to any great extent on account of the inferior quality of its venison.

δ.

Horns sessile, branched, with a solitary basilary antler, without median antlers, and the upper antler ordinarily simple.

The Axis Deer.

Spotted Species.

Example.—*The spotted Axis*, Ἄξις, of the antients (Ctesias); *Cervus Axis*, of authors; *Axis maculatus*, of Smith.

Description.—Size and general form nearly resembling that of the common fallow-deer. The skin is at all times of a rich fawn colour spotted with white; but, as Mr. Bennet observes, it is only during the summer that any similarity exists in the colours of the two species, for the fallow-deer changes in winter to a uniform brown, while the axis retains its spotted livery throughout the year. Height at the shoulder two feet six or seven inches. The distribution of the spots varies in different individuals. The ground colour changes to nearly black along the back; the under parts are snow white. Flanks, sides, shoulders, hind quarters, and part of the neck, spotted as above mentioned. There is a broad dusky spot on the forehead, and a line of the same colour extends along the middle of the nose. The male has no canine teeth, nor has the female any horns; she is generally less in size than the male, and resembles him much in colour, but may be distinguished, it is said, by a white longitudinal line on the flanks. The young resemble the parents.

Geographical Distribution.—India and the larger islands of the Indian Archipelago; very abundant in Bengal and on the banks of the Ganges.

Habits, &c.—The axis haunts the thick jungles in the vicinity of water, and the British sportsmen hunt it under the name of the *Spotted Hog Deer.* It feeds in the night, and is timid, indolent, and mild, excepting when the females have young, and then the male is bold and fierce.

[Cervus (Axis) Maculatus.]

The axis is easily domesticated, and in England has propagated freely in captivity. The species has been kept with success both in menageries and open parks, to both of which its form and colour make it an elegant ornament.

* *

Spotless species.

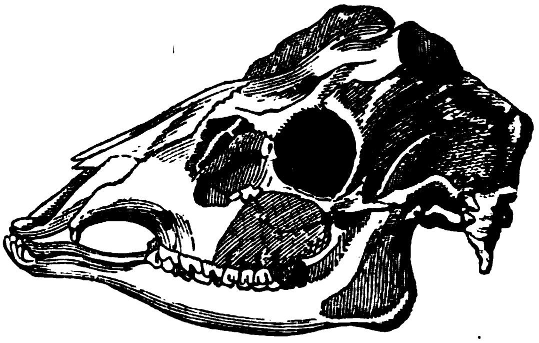
Example.—*Cervus Hippelaphus*, ot Cuvier; *Cerf noir du Bengale, ou Hippelaphe*, of F. Cuvier; *Cerf d'eau, ou Mejanganbanjoe*, of the Malays of Java, according to Duvaucel; *Rusa* or *Roussaitan* (Black Stag), of the Javanese and Sumatrans; *Rusa Hippelaphus, The Great Rusa*, of Smith.

Description.—Size and proportions about those of the common stag, but its hair is rougher and harder, and when adult, that of the upper part of the neck, of the cheeks and of the throat is long, and forms a sort of beard and mane. In winter its colour is of a greyish brown more or less deep; in summer it is of a brighter and more golden brown. The croup is a pale yellow, and the tail is brown terminated by rather long hair.

Locality.—Supposed to be Bengal and Sumatra; probably the islands of the Indian Archipelago.

This is supposed to be the *Hippelaphus* of Aristotle; but G. Cuvier who once was of that opinion, seems in the last edition of his 'Règne Animal' to consider that another species, *Cervus Aristotelis*, Cuv., living in the north of India, is the animal alluded to by the Greek Zoologist.

[Cervus (Rusa) Hippelaphus.]



[Skull of Cervus Hippelaphus.]

ε.

Horns sessile, branched, with a median but no basilary antler.

N. B. A white line bordered with black cutting the end of the muzzle obliquely.

*

Of the Old Continent.

Example.—*The Roe*, or *Roebuck*, probably the Δορκάς, of Aristotle; *Iorcas* and *Dorcas*, of Oppian; *Caprea*, of Pliny (Book xi. c. 37); *Caprea, Capreolus, Dorcas*, of Gesner. *Capreolus*, of Ray and of Sibbald; *Cervus Capreolus*, of Linnæus; *Cervus minimus*, of Klein; *Iwrch* (male), *Iyrch* (female), of the antient British; *Le Chevreuil*, of the French; *Capriolo*, of the Italians; *Zorlito, Cabronzillo montes*, of the Spanish; *Cabra montes*, of the Portuguese; *Rehbock* (male) *Rehgees*, of the Germans; *Radiur, Rabock*, of the Swedes; *Raaedijr Raaebuk*, of the Danes.

Description.—Length about 3 feet 9 inches; height before, about 2 feet 3 inches; behind, 2 feet 7 inches. Weight from about 50 to 60lbs. Length of horns from 8 to 9 inches; they are erect, round, and divided into three branches above; their lower part is deeply furrowed longitudinally. Those of a young buck in its second year are simple; in the third year a branch appears; the head is complete in the fourth year. In the winter the hair on the body is long, the lower part of each hair is ash-coloured, there is a narrow bar of black near the end. and the tip is yellow. On the face the hair is black tipped with yellow. The ears are long, of a pale yellow on the inside, and covered with long hair. In summer the coat is short and smooth, and of a bright reddish colour. The chest, belly, legs, and inside of the thighs, are yellowish white; the rump is pure white, and the tail very short. On the outside of the hind leg, below the joint, is a tuft of long hair.

Geographical Description.—' The Roebuck was formerly very common in Wales, in the north of England, and in Scotland, but at present the species no longer exists in any part of Great Britain, except in the Scottish Highlands.' Such is the locality given by Pennant when he wrote; and he adds, that, according to Dr. Mouffet, it was found in Wales as late as the reign of queen Elizabeth, and in great plenty in the Cheviot hills, according to Leland, in that of Henry the Eighth. That, at one time, the Roe inhabited the southern parts of the kingdom is clear, if the information given to the Editor of the last edition of the *British Zoology* is correct, for that states the discovery of seven or eight horns of the Roe in the peat beds near Romsey, in Hampshire, together with the complete head of a beaver, with the teeth entire. In Ireland, the animal is not known. They are frequent in France, and are found in Italy, Sweden and Norway, and Siberia. Pennant, who gives these localities, says that the first that are met with in Great Britain are in the woods on the south side of Loch Rannoch, in Perthshire; the last in those of Langwal, in Caithness; but that they are most numerous in the beautiful forests of Invercauld, in the midst of the Grampians. They are still comparatively plentiful in Scotland. Sir James Carnegie not long ago had a battue, in which forty were killed. Sir William Jardine states, that, south of the Forth, it is now very rare, one or two wilder parks only possessing a few; but frequent traces of its former abundance are found in the border counties, remains and skeletons being almost yearly disinterred from most of the larger peat mosses: in the rugged woods of Westmoreland and Cumberland it still abounds. The same author speaks of its frequency in many European countries, Germany, Silesia, &c. (*Naturalist's Library*, Mammalia, vol. iii.)

Habits, &c. The Roe does not keep in herds, but only congregates in families in the lower coverts and less wild woods. The female goes with young five months, and produces two fawns at a birth, and these she conceals from the buck. They are said to live twelve or fifteen years, and to be able to reproduce the species at the age of eighteen months. Pennant observes, that it is a tender animal, and quotes Buffon, who says, that in the hard winter of 1709 the breed was almost extinguished in Burgundy, and many years passed before it was restored again. It is generally killed, either in the covert, or by the sportsman, who waits outside while the copse or wood is driven, with shot. It falls very readily, and often without being apparently severely struck: we have heard instances of their being knocked over with comparatively small shot. As soon as it is down the throat is cut, and the animal is hung up by the hind legs on the fork of some tree to bleed.

[Capreolus Dorcas]

Food.—Herbage and tender shoots of underwood in the summer. They are said to be very fond of the *rubus saxatilis*, called in the Highlands the roebuck berry. In winter, when the ground is covered with snow, they browze on the tender branches of the fir and the birch.—(Pennant.)

Utility to Man.—The flesh is delicate food when well-killed, and the horns are used for handles of couteaux, &c.

Pennant states that in the old Welsh laws a roebuck was valued at the same price as a she-goat.

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New Continent.

Examples, the *Guazapuco* deer, *Mazama paludosa* of Smith, *Cervus paludosus* of Desmarest and Lichtenstein, *Güazú-pucú* of D'Azara: and the *Guazuti* of D'Azara, *Mazama campestris* of Smith, *Cervus campestris* of F. Cuvier and Desmarest, *Cervus leucogaster ?* of Schreber. The former is nearly as large as the common stag of Europe, and of a reddish-bay, excepting the inside of the ears, the lower part of the breast, and the inside of the limbs, which are white. A dark-brown stripe runs irregularly down the face on each side of the lips; the eyebrows and cheeks are paler, and the muzzle is large. Locality, the lower districts of Paraguay. The horns of the latter are more slender than those of the former, generally with two snags only, and the animal is much less than the Guazapuco, being hardly more than two feet six inches at the shoulder. It frequents the open plains, and is so swift, that D'Azara says that a horse cannot overtake it. He adds, that the venison of the young deer is delicate, but that the flesh of the old is strong. There is a legend that if the flesh be applied to a wound inflicted by the bite of a poisonous serpent it will cure it. There is nothing remarkable about the colours, which are distributed as in the majority of the *Cervidæ;* but it is said sometimes to vary almost to white.

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Horns sessile, simple, and in form of a stiletto.

THE BROCKETS* (*Les Daguets*) of the French, subgenus *Subulo* of Smith.

Example.—The *Guazu-pita* of D'Azara, *Coassou ? Subulo rufus* (Pita Brochet) of Smith, *Cervus rufus* of F Cuvier and Desmarest.

Description.—Height about twenty-nine inches; general colour reddish-brown; inside of ears (hairs short), space round the lips, lower part of head and tail, hind part of belly, buttocks, and inside of fore-legs to knees, whitish. Females without horns, nearly of the same reddish tint, with a white spot above the nose and on the upper lip.

Locality.—The low moist woods of South America, where it lives in large herds, and as ten females are seen for one male, it is supposed that their appearance gave currency to the report of a form of deer on the New Continent without horns. They are very fleet only for the first burst, for they are soon run down by dogs, and are sometimes captured by the lasso and balls.

[Subulo rufus.]

The *Guazu-bira*, *Cervus nemorivagus* of Lichtenstein, *Bira Roe* of Smith, is another example of this form. D'Azara seems to be the first who noticed it. This delicate little deer is only twenty-six inches in length, and its aspect is said to approach that of the sheep, and to be less deer-like than that of the *Pita Brochet.* The ears are not so pointed at the extremity as those of the latter, and the lacrymal sinus is said to be nearly imperceptible.

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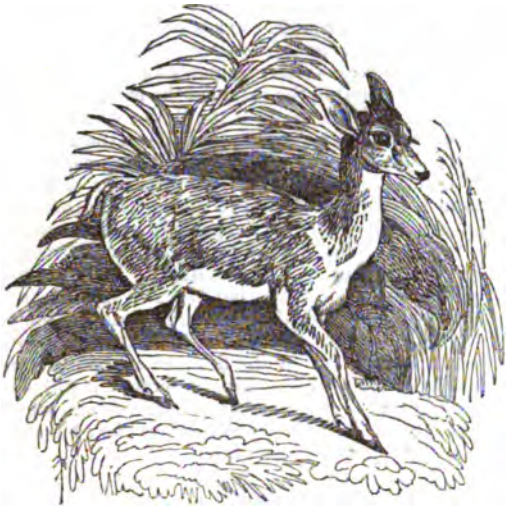
* Brocket, Brochet, and Pricket are the terms applied to a young male deer with its first or simple horns.

Description. Lower part of head and lips whitish. Space round the eyes, inside of fore-legs, and from lower part of breast to buttocks, whitish-cinnamon. Neck and all the other parts brownish, approaching to greyish, each hair being tipped with white. Horns short. *Locality* the same as that of the *Guasu-pita.*



[Subulo nemorivagus.]

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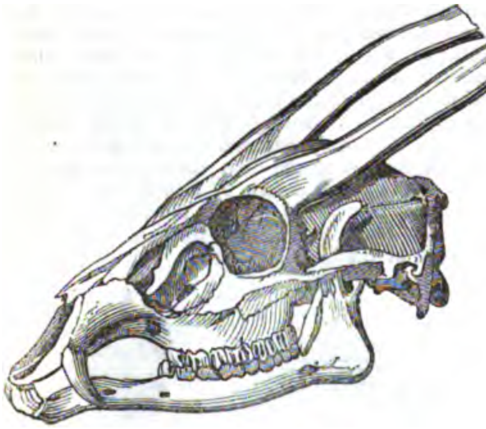
Horns supported on a long osseous pedicle rising from the os frontis.

THE CERVULES (*Cervules* of the French, *Stylocerus* of Smith.)



[Skull of Muntjak.]

Example.—*The Muntjak, Chevreuil des Indes* of Allamand. (Buffon, Dutch edition.)

Dr. Horsfield gives the following as the synonyms of this species. *Cervus Muntjak, der Muntjak,* Zimmerman, Geographische Geschichte des Menschen und der vierfüssigen Thiere,' Leipzig, 1780. (From the communication of Pennant). *Cervus Muntjak, Cervus vaginalis,* Boddaert, 'Elen. Anim.' Rotterdam, 1785. *Cervus Muntjac,* Schreb., Säugthiere., Gmel., Fischer, Zoognos., Shaw, Gen. Zool.; *Cervus moschatus, Cervus subcornutus,* Blainv., 1816, 1822; *Cervus Muntjak?* Raffles's Cat. Linn. Trans.; *Cervus Muntjac, Cervus Moschus,* Desm.

Description.—About one-fifth larger than the *roebuck.* Height at shoulders about two feet two inches; head pointed; eyes large, with lacrymal sinuses; ears rather large; tail short and flattened.

In the living animal there are on the face two rough folds of the skin, considerably distended and elevated, about an inch and a half apart above; and, following the direction of the prominent part of the forehead, they unite below, so as to mark the face with the letter V. In the dried subject the folds are contracted, and three distinct ribs appear, which, observes Dr. Horsfield, suggested to Pennant the name of rib-faced deer. General colour reddish-brown above; belly and front of the thighs pure white. The male has large canines in the upper jaw; the female has none, nor has she horns.

Locality, Habits, Chase, &c.—Dr. Horsfield states that 'the Muntjak selects for its retreat certain districts, to which it forms a peculiar attachment, and which it never voluntarily deserts. Many of these are known as the favourite resort of our animal for several generations. They consist of moderately-elevated grounds, diversified by ridges and valleys, tending towards the acclivities of the more considerable mountains, or approaching the confines of extensive forests. Such districts are by no means uncommon in Java: they are covered with long grass, and shrubs and trees of moderate size, growing in groups or small thickets, and they generally intervene between cultivated tracts and the deep forests. Their vegetation is peculiarly adapted to afford to our animal a very abundant supply of nourishment their surface is covered with long grass, *Saccharum spicatum,* well known to persons who have visited the interior of Java by the name of *Allang-Allang,* and the groves and thickets abound with *Phyllanthus Emblica,* Linn.· these two plants constitute its principal food. They also produce many species of *Hibiscus, Grewia, Urena,* and other malvaceous plants, all which are greedily eaten by the *Kidang.* About the middle of the dry season, in the Javanese winter, just before the foliage is renewed, the shrubs and herbaceous plants covering the plains and small woods are, according to an old and universal custom in Java, set on fire; and thus these tracts are prepared for a new vegetation, which appears shortly before the annual rains, in a period that may be compared with an European spring. After the lapse of a few weeks, the ground and shrubs are covered with fresh verdure, and a most abundant supply of food is ready for the *Kidang.* These districts, being in most cases sparingly supplied with water, do not invite an extensive population the *Kidang* is not molested by a few solitary hamlets, but the leaves of the *Convolvulus Batatus,* and of many leguminous and cucurbitaceous plants, which always surround the dwellings of the natives, afford it an occasional repast. Many of these hamlets might be enumerated, which would afford a pleasant recollection to those persons who have visited the native courts, or the eastern capitals. Jebres, Kayu-urib, and Pring-ombo near Surakarta, and Kaliwungu near Samarang, are among the most favourite. The native inhabitants of the hamlets dispersed through the districts in which the *Kidang* is found, do not possess means to undertake the chase; but it affords amusement both to Europeans and natives of rank, who engage in it in different modes with great ardour. The *Cervus Muntjak* has a strong scent, and is easily tracked by dogs. When pursued, it does not go off, like the stag, in any accidental direction: its flight indeed is very swift at first, but it soon relaxes, and taking a circular course, returns to the spot from which it was started. The natives, acquainted with the character of our animal, describe it as possessing a great portion of craftiness, combined with much indolence. After several circular returns, if the pursuit be continued, the kidang thrusts its head into a thicket, and in this situation remains fixed and motionless, as in a place of security, and regardless of the approach of the sportsmen. If it remains unobserved, it is still unwilling to quit its haunts; and experienced hunters, acquainted with its natural disposition, after an unsuccessful pursuit, return the following day, and in many cases find the kidang near the same spot. The chase of the kidang, by means of dogs, affords occasionally a favourite amusement to the natives of rank in Java. Many of these, especially in the more distant provinces, keep large packs for this purpose, which are regularly trained. The dogs, vulgarly denominated pariahs, are the indigenous breed of the island, in a state of imperfect domestication: there are several varieties: one of these greatly resembles the Sumatran dog, of which a description, accompanied by a figure, is given by General Hardwicke, in the 13th volume of the Transactions of the Linnean Society. the body is lank, and the ears erect: they are ferocious in their disposition, and rarely show any attachment to their masters. The natives of Java, like other Mahommedans, entertain prejudices unfavourable to dogs: they rarely treat them with kindness, or allow them to approach their persons; and it is only in extraordinary instances, or when they contribute to their amusement, that they feed or care or them. generally they are ill-treated, and left to provide for themselves, so that their famishing condition is disgusting to Europeans. Many of these dogs are extremely ardent and courageous in the pursuit of the kidang: when he chase commences, they are led with a line by an attendant to the spot: the peculiar exhalations soon discover the kidang; the dogs are discharged, and commence the pursuit with great ardour, while the sportsman follows more deliberately, and generally finds the dogs at bay with the kidang. The male animal possesses a great share of courage, and with its tusks makes a most vigorous defence: many dogs are wounded in the attack. The sportsmen uniformly are provided with remedies and applications, and by a simple suture attempt to unite those wounds which are not immediately fatal. In this operation they frequently succeed, and preserve their most valuable dogs; but in many cases the kidang makes fatal lacerations in the neck and breast, or lays open the abdomen. But although possessed of great courage, the life of the kidang is not tenacious, and the sportsman, on arriving at the spot, generally despatches it with small shot. The natives of the most distant districts are in the habit of bringing their best dogs to the capitals, on occasion of their half-yearly attendance, to perform the feudal services to the sovereigns, when their sports afford an occasional amusement to the European inhabitants. Other modes of chase are also employed by the natives of rank. One in particular is common in the western parts of the sland: a district is surrounded by a line of hunters, and he kidang is driven in towards a central spot: forty or fifty animals are in this manner often obtained at a single pursuit. Many of the hunters are mounted, and the horses are trained to the chase. The sportsman endeavours to overtake the animal, and to kill it by a stroke with a sword. The inhabitants of Pugar and Blambangan, two provinces at the eastern extremity of Java, possessing a small population, but abounding in extensive plains and acclivities, which afford an ample range and abundant pasture to the kidang, are particularly skilled in this sport. The best horses are trained for it: the sportsman, without a saddle, mounts on the naked back, and carries on the pursuit with a frantic impetuosity at the risk of his limbs and neck. During my visit to these districts, I was frequently entertained by aged natives with narratives of their favourite sport, and of the dangers and accidents they had encountered on many occasions; but these had not diminished their ardour for this amusement. The native stag of Java is pursued in the same manner. In Banka a less arduous, but more destructive method is employed to take the kidang. a long rope of rattan is suspended, at a proper height above the ground, between two trees; numerous nooses, of the same material, hang from this, in a close and continued series, and the kidang, driven towards it, pursued by dogs and blinded by fear, does not perceive the slender rattan, and thrusting his head into a noose, is strangled on the spot. The kidang has other enemies and pursuers besides man: the tiger and leopard also approach its retreat, and many are annually destroyed by them. But in a mild climate a constant and regular supply of food abounds, and no great variation or decrease is observed in their number. The kidang is impatient of confinement, and is not fitted for the same degree of domestication as the stag. It is however occasionally found in the enclosures of natives and Europeans, but requires a considerable range to live comfortably: it is cleanly in its habits, and delicate in its choice of food. The flesh affords an excellent venison, which is often found on the tables of Europeans. The natives eat the males, and always present them in a conspicuous place in their feasts; but in consequence of some peculiarities in the habits of the females, they have an aversion to them as food.'

[Muntjak.]

Fossil Deer.

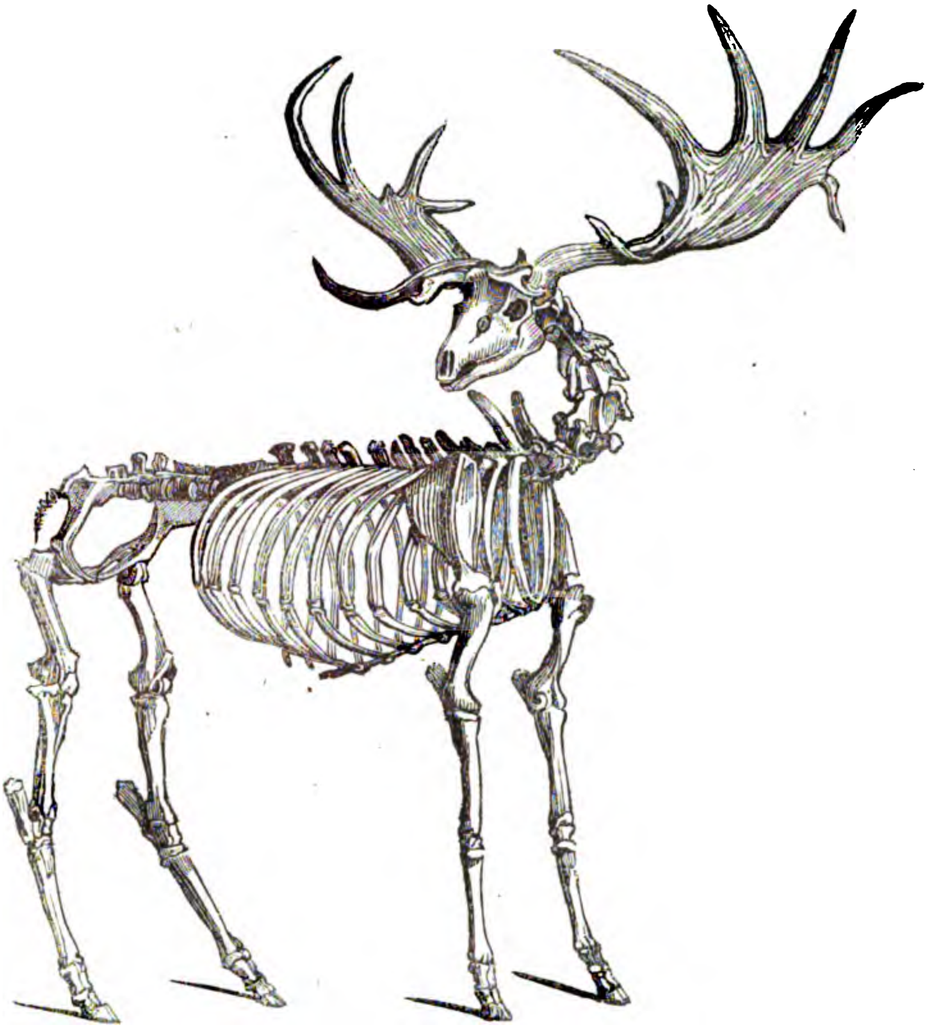
The remains of deer are sufficiently numerous in beds of the third period of the tertiary series, and in caverns. Thus in the cave at Kirkdale Dr. Buckland found evidences of at least three species, the smallest being very nearly of the size and form of a fallow-deer, the largest agreeing in size with, but differing in form from, the elk, and a third of intermediate size, approaching that of a large stag or red-deer. The skeletons of animals found in the recent shell-marls of Scotland, according to Mr. Lyell, all belong to species which now inhabit or are known to have been indigenous in Scotland. Several hundred, he observes, have been procured within the last century from five or six small lakes in Forfarshire, where shell-marl has been worked. Those of the stag (*Cervus Elaphus*) are stated to be the most numerous; and if the others be arranged in the order of their relative abundance, they will follow, according to Mr. Lyell, nearly thus:—Ox, boar, horse, dog, hare, fox, wolf, and cat. The beaver, he adds, seems very rare; but it has been found in the shell-marl of Loch Marlie in Perthshire, and in the parish of Edrom in Berwickshire.

Remains of deer occur in other ossiferous caverns besides Kirkdale, as in Banwell cave, in the Muggendorf caverns, the Grotte d'Echenoz, and that on the banks of the Meuse, at Chockier; as well as in the osseous breccias of Gibraltar, Cette, Nice, Corsica, and Antibes. M. Bertrand de Doue found among the bones entombed in and beneath volcanic matter near St. Privat d'Allier (Velay) a large proportion of remains, referable to at least four undetermined species of *Cervi*, in company with *Rhinoceros leptorhinus* and *Hyæna spelæa;* and M. Robert extracted from the ferruginous beds at Cussac (Haute Loire) the bones of seven species of deer (to two of which he assigns the names of *Cervus Solilhacus*, and *C. Dama Polignacus*,) accompanied by the bones of the antelope, *Bos Urus* and *Bos Velaunus*, two species of horse, *Elephas primigenius*, *Rhinoceros leptorhinus* and *Tapir Arvernensis*. Among the fossil species enumerated we find, under section *a*, *Cervus giganteus*, *Cervus Euryceros*, and *Cervus Americanus;* under section β*, *Cervus Guettardi;* and under β** *Cervus Hibernus*, and *Cervus Somonensis*.

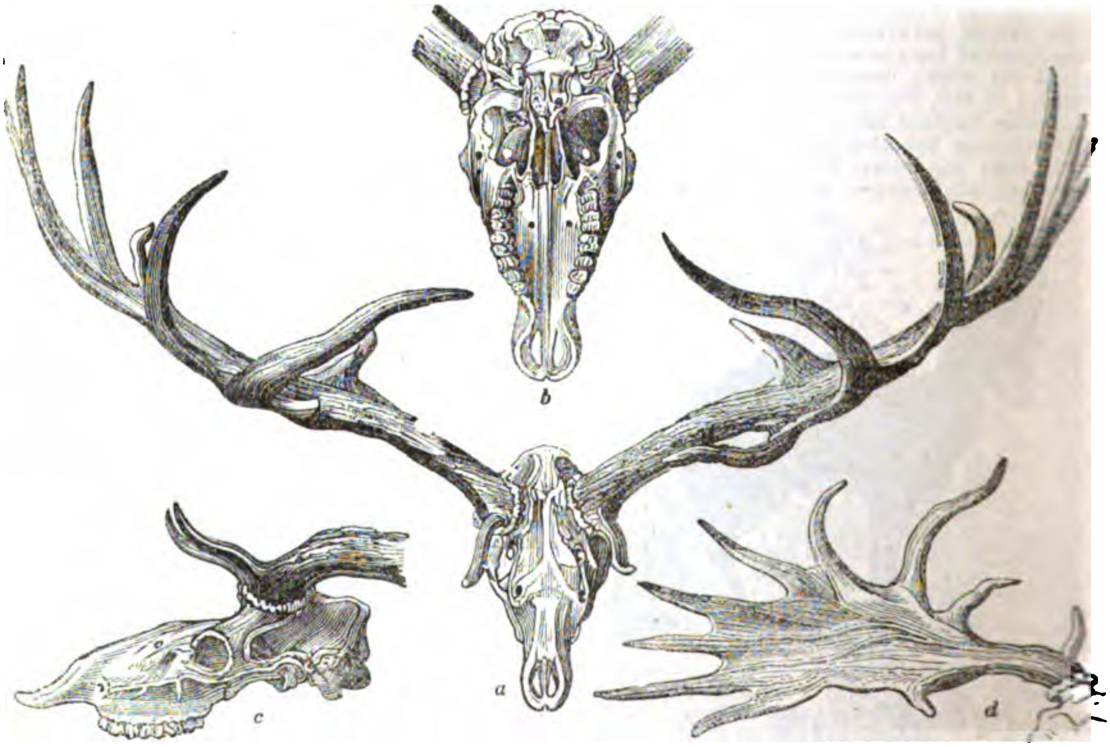
Our limits will only allow us to draw the attention of our readers to this subject, and to the subjoined illustrations of the gigantic fossil elk, or rather stag. The skeleton is taken from that in the collection at Edinburgh, communicated by Professor Jameson to Cuvier. It was found in the Isle of Man, in a marl full of fresh-water shells, at the depth of eighteen feet. The dimensions are 'six feet high, nine feet long, and in height, to the top of the right horn, nine feet seven inches and a half.'

The skull and horns are taken from Cuvier's figure of the noble specimen deposited in the Paris Museum by Colonel Thornton.

Captain Proby Cautley, F.G.S., in his paper 'On the Remains of Mammalia found in the Sewalik Mountains, at the southern foot of the Himalayas, between the Sutluj and the Ganges,' enumerates, among the fine collection of bones found by him, those of the elk, and several varieties of deer. In the district between the Jumna and the Ganges he obtained the remains of more species of deer than one in the marl or clay conglomerate, described as consisting of fragments of indurated clay, cemented by clay, sand, and carbonate of lime. Professor Kaup discovered the bones of the following deer, *Cervi anocerus*, *trigonocerus*, *dicranocerus*, and *curtocerus*, in the sand resting upon the calcaire grossier in Rhenish Hesse, in company with *Dinotherium*, &c. &c. Deer therefore may be considered to have existed in the second and third tertiary periods, viz. the Miocene and Pliocene periods of Lyell.



Gigantic fossil Deer.]



[Skull and horns of the same.]

a, front view of the whole head; *b*, the skull seen from below *c*, profile of the same; *d*, horn, on a less scale, seen perpendicularly to its posterior surfa

The remains of this extinct animal have been found in peat and marl in various parts of England and Ireland, in France, on the Rhine, in Silesia, and in Lombardy.

We have confined ourselves to a mere outline of this interesting and extensive family, and the student should consult for the species the works of G. and F. Cuvier, especially the 'Ossemens fossiles' of the former; of Mr. Hamilton Smith, in Griffith's Cuvier; of Lichtenstein (Saugethiere); and of Richardson (*Fauna Boreali-Americana*). He should also refer to the Proceedings of the Zoological Society of London; for, numerous as the species already are, new ones are daily occurring. Other works will occur to the learned, and we ought not to forget the Ruminantia, by Sir William Jardine (*Naturalist's Library*, 'Mammalia,' vol. iii., 1835), where much valuable information, ably illustrated, will be found.

DEFAMATION; the speaking slanderous words of another. The injured party may bring an action to recover damages, but to enable him to succeed, it is absolutely necessary that the words should contain an express imputation of some crime or misdemeanor which would make him liable to punishment; or, if the words are not actionable in themselves, some special damage should be proved to have resulted from them to the plaintiff. There are certain cases, however, where words are spoken of a tradesman or professional person in the way of his trade or profession, as that a tradesman is insolvent, or that an attorney deserves to be struck off the roll, in which the plaintiff, by reason of the character he fills, may recover damages. Of the first class a recent case affords an illustration. A churchwarden was accused by the defendant of having stolen one of the church bell-ropes: it was held that, as the property of the bell-ropes was vested in the churchwarden, the words did not impute a crime to the plaintiff for which he was punishable, and consequently that the action could not be maintained. In former times, actions for slander were very rare; and though it has been frequently said that actions for words spoken in heat or anger, suddenly and without deliberation, ought not to be encouraged, yet it has been truly observed (by Wray, Ch. Just.) that unless the party injured by false and malicious scandal had a remedy at law, it would lead to personal violence, and the consequences might be fatal. In most cases, malice in law may be inferred, but in actions for slander *primâ facie* excusable on account of the cause of publishing the slanderous matter, malice in fact must be proved; it is scarcely necessary to observe, that where special damage is proved, the existence of malice is immaterial. Defamation is also punishable in certain cases by indictment and criminal information. Where the slanderous matter is spoken of a peer, the offence is termed scandalum magnatum, and is made punishable by various statutes: this mode of proceeding however may be said to have become obsolete.

The ecclesiastical courts have power to punish for defamation relating simply to spiritual affairs; as an imputation that the complainant is a heretic: but these courts can only inflict punishment by way of penance; they cannot award damages. An action may also be maintained for slander of title to an estate or property; but in this case the plaintiff must prove malice express or implied: it is not sufficient that the defendant should allege title in himself, or make objections to the title of the plaintiff if he had reasonable grounds for so doing. (Cowel; M'Culloch; Selwyn, *N.P.*) [Libel; Slander.]

DEFEAZANCE (from the French verb défaire, to make void), is an instrument which defeats the force or operation of some other deed, estate, or interest, upon the performance of certain prescribed conditions. Defeazances are of two kinds, the one applicable to freehold estates; the other, to terms of years and executory estates, and to recognizances, bonds, and other executory interests. The former must be a collateral deed made at the same time with that to be defeated, and forming part of the same transaction. In this manner mortgages were formerly made, the mortgagor enfeoffing the mortgagee, and at the same time executing a deed of defeazance. Defeazances have been discountenanced by the courts, as affording opportunities for fraud, and they are now rarely used as applicable to titles, it being far better to make the conditions apparent on the deed itself. (See lord Talbot's *Remarks in Ca. Temp. Talb.*, p. 64.)

The latter kind of defeazances may be made either at the time of the original transaction, or at any subsequent period: it has been said that every defeazance must be made by deed; but other authorities have laid down that it need only be by means as high and solemn as the instrument to be defeated.

By the stat. 3 Geo. IV., cap. 39, defeazances to warrants of attorney and cognovits must be written upon the same paper or parchment as the instruments themselves. (Bl. *Com.*; Sheppard's *Touchstone*; Co. Litt.)

DEFERENT, a circle or oval curve on which the centre of another oval moves, while a planet is supposed to move round the latter. The term is one of the Ptolemaic Hypothesis. Thus the earth's orbit, to choose an example out of the modern system, is a deferent on which the moon's orbit is carried. But to make this example perfectly represent the sense in which the word was used by Ptolemy, we must suppose the system of Tycho Brahé to be the real one, and a spectator in the sun assuming the Copernican system.

DEFFAND, MARIE DE VICHY, MARQUISE DU, daughter of Gaspard de Vichy, Count of Champ Rond, was born in 1696. She was brought up to figure in the world, according to the received expression; that is to say, to shine in the saloons of the capital. She had natural parts, wit, playfulness, and taste, which her education tended to stimulate, rather than to form her heart. In 1718 she married the Marquis du Deffand, a colonel, and afterwards general, in the French service. Having some time after separated from her husband, she had her own establishment, her parties, her admirers, and her petits soupers. She lived like many other ladies of rank and fashion of the times of the Regency and of Louis XV., and her correspondence throws much light on the manners of that age. She numbered among her friends and correspondents some of the most distinguished men of France, such as President Hénault, Montesquieu, Marmontel, D'Alembert, Voltaire, &c. After the death of her husband, in 1750, in order to accommodate herself to her reduced income, she gave up her establishment, and took apartments in the external or extra-claustral part of the Convent of St. Joseph, in the Rue St. Dominique, where she spent the remaining thirty years of her life. She continued, however, her evening parties, which were in great repute for wit, pleasantry, and bon ton, and to which most foreigners of distinction who resorted to Paris were introduced. Being afflicted with blindness, she took as a companion and reader an unprotected young person, Mlle. de l'Espinasse; but she afterwards became jealous of her, and they parted; on which occasion Madame du Deffand quarrelled with D'Alembert also. She continued, though blind, to correspond with her friends, and especially with Voltaire and Horace Walpole, to a very advanced age. She died at St. Joseph, in September, 1780, in her 84th year. Madame du Deffand possessed some very valuable qualities: she had real wit and taste without affectation, and much tact and sound judgment whenever caprice or prejudice did not lead her astray. She had a quick perception of merit of every kind, and her house was always open to it: she had a horror of dogmatism, exaggeration, and pedantry: although a free-thinker, she never partook of that absurd fanaticism against religion which characterized some of the philosophic writers of the eighteenth century. Her judgment was too calm and sober not to perceive the inconsistency of philosophical intolerance; she even gave some good advice to Voltaire on this subject, and was one of the very few who spoke frankly to him. In her correspondence with Walpole she judges Voltaire rather severely. 'Correspondance de Madame du Deffand avec M. Walpole de 1766 à 1780, suivie de ses Lettres à M. de Voltaire de 1759 à 1775,' 4 vols. 8vo., Paris, 1810; and also 'Correspondance inédite de Madame du Deffand avec D'Alembert, Montesquieu, le Président Hénault, &c., suivie des Lettres de M. de Voltaire à Madame du Deffand,' 2 vols. 8vo., Paris, 1809, with a biographical notice.

DEFILADING, is that part of fortification the object of which is to determine (when the intended work would be commanded by eminences within the range of fire-arms), the directions or heights of the lines of rampart or parapet, so that the interior of the work may not be incommoded by a fire directed to it from such eminences.

If it be required, with a given height of parapet, to approach obliquely as near as possible to an eminence, the following process is adopted, the situation of the rampart or parapet at that extremity of the intended line which is farthest from the eminence being also given. A line is supposed to be drawn from the commanding eminence, or rather from a point about eight feet above it, through another point which represents the crest or summit of the intended parapet at the given place, and to be continued till it intersects the natural ground in rear of that part of the line of parapet. This crest is considered as the vertex of a cone whose base is a circle, on the ground, having for its radius a line equal to the distance from the parapet to the rear extremity of the ground to be protected (which distance, however, must always be less than that of the intersection above mentioned). Then a line being drawn on the plan, from the point vertically under the given crest, parallel to a line drawn from the said intersection and touching the circle, will be the direction of the intended rampart or parapet, whose height must be everywhere equal to that which was given. By this construction all the lines of fire from the commanding eminence, and passing closely over the crest of the parapet, will be in a plane meeting the ground on that eminence, and touching the convex surface of the cone.

Again, if it be required, when the plan of the work is determined, to ascertain the heights of a rampart or parapet in different places, so that the interior may be protected from the fire of the enemy on a commanding eminence beyond, the relative heights of the principal inequalities of the ground with respect to some horizontal plane, technically called the plane of comparison, (which generally passes through the highest or the lowest point) must be found by the spirit level. An oblique plane, technically called the plane of site, must be imagined to touch the summit of the eminence in front, to pass above all the intermediate ground, and to meet that in rear of the work; then the relative heights, with respect to the plane of comparison, of the several points in the plane of site which are vertically above the inequalities before mentioned of the natural ground, must be computed, and the differences (which express the heights of the plane of site above the natural ground in such places) being added to the given height which the rampart or parapet is to have above the plane of site, the sums will express the heights to which the works are to be raised above the natural ground at the same places.

When the work is of small importance, the elevations of the parapets above the ground are generally determined by the eye—thus:—Pickets are planted in convenient places, chiefly at the angles of the intended work (the plan of which has been already traced on the ground,) and on the summit of the commanding eminence, the picket in this place being about eight feet high. The visual rays being supposed to proceed from the top of this picket to two or more points, which must be also eight feet above the ground, in rear of the work, the intersections of these rays with the pickets planted on the magistral or ground line of the work, will show the heights to which the parapet is to be raised at those places in order that the interior may be effectually protected.

A similar process is employed when it is required to protect the defenders of any parapet from the fire of the enemy on a commanding eminence in their rear; in which case it is frequently necessary to raise, in the interior of the work, a mass of earth, which is called a traverse or a parados, according to its situation.

DEFILE, in military writings, is a name given to any narrow way. Every piece of ground which, in consequence of local impediments, can be passed by a column only on a narrow front, is called a defile. Such are roads along valleys, between walls or hedges, or over dykes raised across marshes. Sometimes also the term is applied to a street in a village, and to the path over a small bridge.

DEFINITION (*definire*, to mark out a boundary,) is the process of stating the exact meaning of a word, by means of other words. From so boundless a subject, we can only select a very few points, such as have reference to the most common uses of the term. In the first place, it is evident that all definition contains a species of fallacy, if considered as an absolute determination of the meaning of words. *Quis custodiet ipsos custodes?* who shall determine the meaning of the words which make up the definition? The process of definition can never appear satisfactory unless it be considered as a transition from many words to the single term which it is agreed shall stand for their meaning, be that what it may. All attempts at absolute definition must end in confusion of ideas.

But at least, perhaps it may be said, the mathematical sciences are founded upon exactness of definition. Nothing is more common than this assertion coupled with another, namely, that these sciences depend entirely upon definitions. In a certain sense both are true, but that sense is not the most frequent meaning of them. The exactness of mathematical definition is not of arbitrary construction, but a consequence of the exactness of the notions which all men have, or may be made to have, upon the things which the words represent. There is no exactness in the fundamental definitions of mathematics, verbally considered, but only much confusion arising from the attempt to introduce conventional accuracy. The words 'straight line' carry with them their own meaning, and even explain the attempt which is made to explain them; for no one would easily guess what sort of line it is which 'lies evenly between its extreme points,' unless he were aware that it is a 'straight' line which these words attempt to describe.

Definition may be purely nominal, or it may be such a description of the thing defined as amounts to a statement of some one of its fundamental properties. The first we see in the words 'isosceles triangle,' the definition of which is a simple annunciation that we intend to use a Greek term. The second may be seen in the article CONCAVE AND CONVEX, in which the definition is made by means of an absolute mathematical property of the thing defined: the relative position of the spectator, the curve in question, and a straight line, do not enter into the notion which the words immediately suggest. The method of Euclid is to supply a rough and descriptive definition addressed to the common notion of the word, followed by an assumption of a mathematical property under the shape of an axiom. Thus a straight line is 'that which lies evenly between its extreme points;' while the real definition, or distinction between straightness and the contrary is contained in the axiom 'two straight lines cannot enclose a space.' Every attempt at mathematical definition, which does not rest upon the selection of a substantive property of the thing defined, to be the test of its existence, is either the mere substitution of words for words, or an attempt to make that mere substitution effect something more than lies in it to perform.

The conditions of a good definition are, 1, perfect axiomatic evidence that the property which is made the distinguishing test belongs to the object intended to be defined, and to nothing else; 2, entire separation of the part of the property, if any, which admits of being demonstrably connected with the notion defined, from that which contains the assumption; 3, the introduction of the definition in the proper place, namely, when the necessity for a new verbal representation has begun to appear.

DEFLAGRATION is a term employed to denote the sparkling combustion of substances without violent explosion: thus when nitre and sulphuret of antimony are mixed and ignited or thrown into a hot crucible, the combustion which occurs is of the kind termed deflagration.

DEFLECTION. A term applied to the distance by which a curve departs from another curve, or from a straight line; and also to any effect either of curvature or of discontinuous change of direction. It is used where any 'bending off' takes place, which is in fact the etymological meaning of the word.

DE FOE, DANIEL, the son of James Foe, a butcher in the parish of St. Giles, was born in London, in 165 Of his youthful years we have nothing particular to relate. His father, who was a dissenter, sent him to a dissent academy at Newington Green, where he remained f years. As the only education he received was at this time we may conclude that he applied with considerable advantage. Different reasons have been assigned for his prefixing 'De' to the family name of Foe: the true cause of his doing so was probably a desire to conceal the lowness of his origin, and a belief that this addition would effect the object. De Foe first appeared as an author in 16 when he published a political pamphlet on the war that was then carried on between the Austrians and the Turks. Two years afterwards, his aversion to James the Second and his government and his zeal for the maintenance of Protestantism induced him to enlist under the duke of Monmouth, whose rash and ill-concerted conspiracy was the cause of so many executions. Our author had the good fortune to escape the fate that numbers of his companions suffered. De Foe had for some years been engaged trade, first as a hose-factor and wool-dealer (in the prosecution of which latter branch of his business he is said by Wilson, in his 'Life and Times of De Foe,' to have made more than one voyage to Spain); he afterwards established, on the banks of the Thames, in the neighbourhood of Tilbury Fort, a manufactory of brick and pan-tiles, which, until then, had always been imported from Holland. The introduction of this manufacture was doubtless a considerable benefit to this country. De Foe, however, did not profit by it: his lively imagination, his ardent temper, his eager interest in politics, and fondness for literature, disqualified him for commercial matters. His circumstances became involved, and a commission of bankruptcy was taken out against him: his creditors, however, for whose payment he made the most honourable exertions, were all ultimately satisfied.

In January, 1687-8, he was admitted a freeman of the city of London; and in 1695 was appointed accountant to the commissioners for managing the duties on glass; a short-lived occupation, which he unfortunately lost in 1699, when the tax was suppressed. In the beginning of 1700 he published the 'True-born Englishman,' a pamphlet in answer to a libel on King William, which had been written by Tutchin. This defence pleased the king, who not only admitted the author to an audience, but bestowed on him the more substantial reward of a present of money. From the good-will that the king appeared to bear him, he had hopes of again obtaining some public employment; but these expectations were soon destroyed by the death of the king and the accession of Queen Anne. In the new reign he could expect no favours from the government; he had always been obnoxious to the house of Stuart and its adherents. This source of profit then being dried up, without much chance of its re-opening, he betook himself diligently to his pen, to which alone he could safely trust for his subsistence. He wrote with unwearied assiduity; but the loss of his patron, the king, was soon severely felt. By an ironical pamphlet, called 'The shortest Way with the Dissenters,' he gave bitter offence to many powerful bodies in the state. The high-church party resented it as a libel, and offered a reward for the apprehension of the author. The House of Commons (February 25, 1702-3) angrily resolved that this scandalous book should be burnt by the common hangman; and the secretary of state issued the following proclamation:—'Whereas Daniel De Foe, alias De Fooe, s charged with writing a scandalous and seditious pamphlet, entitled "The shortest Way with the Dissenters." He is a middle-sized spare man, about forty years old, of a brown complexion, and dark-brown coloured hair, but wears a wig: a hooked nose, a sharp chin, grey eyes, and a large mole near his mouth. Whoever shall discover the said Daniel De Foe to one of her Majesty's principal secretaries of state, or any of her Majesty's justices of peace, so as he may be apprehended, shall have a reward of 50*l.*: to be paid upon such discovery.' He was shortly after caught, fined, pilloried, and imprisoned. 'Thus,' says he, 'was I a second time ruined; for by this affair I lost above 3500*l.*' (Ballanyne's Mem. of De Foe, in Sir W. Scott's Prose Works, vol. iv.) During the time that he was confined in Newgate he wrote an ode to the pillory, and matured a scheme for 'The Review,' a paper exclusively written by himself, which for more than nine years he continued to publish twice or hree times a week. After he had been a prisoner for more han a year, Harley, who was then secretary of state, interceded with the queen for his release, who at once sent money to his wife, who was in great distress, and, after some delay, paid his fine and set him at liberty. De Foe, once more free, took a house at Bury St. Edmunds, whither he emoved with his wife and children, and recommenced his iterary labours. The renewal of his former pursuits was attentively watched by his numerous enemies. It is stated hat fictitious suits were now commenced against him, and hat a scheme was projected to apprehend him as a vagabond while he was on a journey to Exeter, and to kidnap him for a soldier. In 1706 De Foe was recommended by Lord Godolphin to the queen as a fit and proper person to send to Scotland to promote the Union. This business being entrusted to him, he resided in Edinburgh until the end of 1707, when, returning to London, he wrote an account of the subject with which he had been engaged. For his services during this mission the queen granted him a pension, which political changes not long permitting him to enjoy, he was again compelled to gain his livelihood by writing. The attacks in his political pamphlets now, a second time, got him into difficulties; for two papers, one entitled 'What if the Queen should die?' the other called 'What if the Pretender should come?' he was fined 800*l.*, and, in default of payment, again committed to Newgate. His second was not so long as his first imprisonment; he was liberated by the queen in November, 1713.

After the death of Anne in 1714, his enemies so assailed him from every quarter, that he was compelled in self-defence to draw up an account of his political conduct, and of the sufferings he had endured. The continual attacks of his opponents so weighed upon his mind and depressed his spirits, that his health gave way, and an illness was brought on which terminated in an apoplectic fit. When he recovered, he continued to write, but thought it prudent to desert his old field of political satire and invective, and to enter upon a new one. To afford entertainment by tales of fiction was his present task, and he now put forth the first part of his inimitable 'Adventures of Robinson Crusoe,' which no story has ever exceeded in popularity. The merits of this work have been disparaged on account of its want of originality: 'but really the story of Selkirk, which had been published a few years before, appears to have furnished our author with so little beyond the bare idea of a man living on an uninhabited island, that it seems quite immaterial whether he took his hint from that or any other similar story.' (Walter Scott, *Prose Works*, vol. iv., p. 245.) The great success and profits arising from the first induced him to write a second and third part, each of which had less merit than its predecessor, the last being a mere book-making job. We have not space to enumerate the multitude of pamphlets and books which our author published. 'The Adventures of Captain Singleton,' 'The Fortunes of Moll Flanders,' 'The History of Colonel Jack,' 'The Fortunate Mistress,' 'The Memoirs of a Cavalier,' and 'The History of the Plague,' which were among the most popular of his works that succeeded 'Robinson Crusoe,' form only a small portion of his writings. His biographers, Chalmers and Wilson, have published catalogues of the writings of De Foe, but it is very probable that they are incomplete, and that many of his works which were only of a temporary interest have been lost.

De Foe died at the age of seventy, on the 24th of April, 1731 in the parish of St. Giles's, Cripplegate. He left a widow and several children, among whom was Norton De Foe, the author of 'Memoirs of the Princes of the House of Orange,' who is thus satirised in Pope's Dunciad:—

> Norton from Daniel and Ostræa sprung,
> Bless'd with his father's front and mother's tongue

Sophia, the youngest daughter of Daniel De Foe, published two treatises on the Microscope. She married Henry Baker, a man of considerable learning.

De Foe's powers as a writer are of no ordinary stamp: we speak of his prose works; for his poetry, which scarcely deserves the name, is as such of no value whatsoever.

If he had been in affluent circumstances we have every reason to suppose that he would have written less, and that necessity alone made him a book-maker, and drove him continually to the printing-press. The disputes of the time afforded an inexhaustible fund of topics, and the violence of party spirit was displayed by all factions in pamphlets, which were the weapons of political warfare. To this style of writing De Foe had two reasons for applying himself; first, because it was the surest to meet with a ready sale, and to bring him in a pecuniary return; and secondly, because he was himself an eager politician. As a Whig, he opposed the House of Stuart; as a Protestant, he wrote against Catholicism; and as a dissenter, against the church. His attention, however, was not confined to the hackneyed topics of the succession and the church: he treated of finance, trade, and bankruptcy, as well as of the union with Scotland; and all this, independently of his Review, which contained articles on foreign and domestic intelligence, politics, and commerce. 'The fertility of De Foe,' says Sir Walter Scott, 'was astonishing. He wrote on all occasions, and on all subjects, and seemingly had little time for preparation on the subject in hand, but treated it from the stores which his memory retained of early reading, and such hints as he had caught up in society, not one of which seems to have been lost upon him.' (*Prose Works*, vol. iv. p. 247.) Of his Review, we believe no complete copy is in existence: however great was the interest that it excited during the time of its publication, it did not long survive its author. But it is not for the class of writings that we have been speaking of, although they were of undoubted ability, that De Foe chiefly is and will continue to be celebrated; it is by his popular narratives that his great fame has been obtained. Of these we may reckon three kinds:—1st. The account of remarkable occurrences, as the Journal of the Plague Year, and the Memoirs of a Cavalier; 2nd. The account of mariners, privateers, thieves, swindlers, and robbers, as Robinson Crusoe, the piracies of Captain Singleton, the histories of Colonel Jack, Moll Flanders, and Roxana; 3rd. The descriptions of supernatural appearances, as the Life of Duncan Campbell, a Treatise on Spirits and Apparitions, the very degenerate third part of Robinson Crusoe, and the Apparition of Mrs. Veal.[*] The accuracy of De Foe's nautical knowledge may be attributed both to his residence in Limehouse, a district frequented by sailors, and to his intimacy with Dampier. His acquaintance with low life and the tricks of swindlers and prostitutes must have been gained during his imprisonments. His style is inelegant, but simple and expressive. The remarkable quality of his writings is, the appearance of reality that is given to fiction. By a particularity and minuteness of description which his skill prevents from being tedious, he increases the probability of his story, adds to its interest, and carries forward his reader. No author of imaginary tales has impressed so many persons with the belief that they have been reading a true rather than a fictitious narrative.

DEGREE OF LATITUDE, LONGITUDE, &c., and **DEGREE OF THE MERIDIAN.** [GEODESY.]

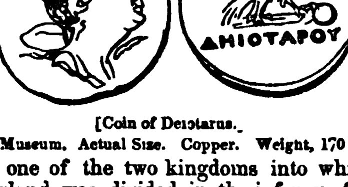
DEGREE OF ANGULAR MEASURE. [ANGLE.]

DEGREE OF AN EQUATION. The degree of an algebraical term is the number of letters which enter into it as factors. Thus x^2y^3 is absolutely of the fifth degree, but of the second degree with respect to x, and of the third with respect to y. The degree of an equation is the degree of its highest term.

DEGREE. [ARTS; UNIVERSITY.]

DEIFICATION. [APOTHEOSIS; CONSECRATION.]

DEIOTARUS, a tetrarch or prince of Galatia, or Gallo-Græcia, was the ally of Rome in the wars against Mithridates, for which he was rewarded by the grant of part of Pontus and Little Armenia, with the title of king given to him by the Roman senate. Cicero, during his government of Cilicia, became acquainted with him, and received assistance from him against the Parthians. In the civil war between Cæsar and Pompey, Deiotarus took part with the latter, and was in consequence deprived by Cæsar of part of his dominions. After Cæsar's return from Spain, Deiotarus was accused by his own grandson, Castor, of having attempted to assassinate Cæsar, while the latter was in Asia. Cicero pleaded before Cæsar in favour of his old friend ('Oratio pro Rege Deiotaro.') After Cæsar's death, Deiotarus recovered possession of his territories; he took part with Brutus against the triumvirs, but afterwards made his peace with the latter, and subsequently favoured Octavius against Anthony in his final struggle for the empire. Deiotarus was then very old, but the precise time of his death is not known. According to Dion (lib. 48), his grandson, Castor, succeeded to his dominions in Gallo-Græcia; according to others, he was succeeded by Amyntas.



[Coin of Deiotarus.]

British Museum. Actual Size. Copper. Weight, 170 grains.

DEIRA, one of the two kingdoms into which that of Northumberland was divided in the infancy of the Saxon government. Deira, whose capital was York, comprehended the country between the Humber and the Tyne. Bernicia, the other division of the kingdom of Northumberland, had its capital at Bamburgh, and comprehended the territory between the Tyne and the Forth. But historians differ greatly in their accounts of the precise limits of these two divisions. Archbishop Usher, in his *Britannicarum Ecclesiarum Antiquitates*, fol., Lond., 1687, p. 212, discusses the different statements of Alured of Beverley, Malmesbury, and other writers, concerning them. The kings of Deira were Alla, or Ælla, 559; Osric, 633; Oswin, 644; Adelwalt, or Ethelwald, 652; Alfred, about 660. The two kingdoms of Deira and Bernicia were united and separated several times during the period comprehended within these dates. Under Edfrid, in 670, they were again and finally united as the kingdom of Northumberland, and so continued till Andred, or Eanred, in 810, submitted to the dominion of Egbert, king of Wessex, by whom the Saxon heptarchy is considered to have been extinguished. (Camd., *Brit.* edit. Gough, 1789, iii., 1, 68, 75; Henry, *Hist. Brit.*, 4to., Edinb., 1774, ii., 221; Rapin, *Hist. Eng.*, fol., 1732, i., 47 and seq.)

DEISM properly means belief in the existence of a God, but is generally applied to all such belief as goes no farther, that is to say, to disbelief of revelation. It is always applied dyslogistically, and frequently merely as a term of reproach. But the identical word, in its Greek form, *theist*, is not a word of disapprobation, and, consistently with established usage, may be appropriately applied as opposed to atheist, when the latter term is correctly used. For it must be observed that the term atheist has been not unfrequently employed in the sense of an unbeliever in Christianity, though at the same time professing theism.

DELAMBRE, JEAN BAPTISTE JOSEPH, was born at Amiens, Sept. 19, 1749. His course of study was at the gymnasium of his native town. His excellent disposition, great perseverance, and extraordinary memory, early attracted the notice of his teacher in the college, the poet l'Abbé Delisle; and the friendship commenced between Delisle and Delambre, while they stood in the relation of preceptor and pupil, was continued unabated during the remaining part of the poet's life; and Delambre used to express his obligations to that eminent man with great feeling to the latest period of his life.

Delambre was desirous of pursuing his studies in Paris, but his pecuniary means were inadequate to the expenses in which he would be necessarily involved by such a course. The influence of Delisle however procured for him an exhibition to one of the colleges which was in the gift of his native town, and which it has been commonly said was first founded by one of Delambre's own family. The time during which he was entitled to hold it having expired, and his family being unable to furnish him the requisite assistance to prolong the period of his studies, he was compelled to adopt some means of supporting himself. After more than a year of disappointment, indecision, and privation, he undertook the occupation of translating foreign works into French; and many such translations from the Latin, Greek, Italian, and English writers were executed by him during the first fifteen years after he left college. In addition to this employment, he gave lessons in languages to private pupils; and, by the combined emoluments of these labours, he was not only able to supply his small personal wants, but to make an excellent collection of the best authors in the several languages which he studied.

The parsimonious views of parents on the subject of education have been witnessed by every one whose life has been devoted to instruction, under circumstances similar to those of Delambre. Their continual importunity to men eminent in some one pursuit, whom they have employed, to undertake others with which they have little or no acquaintance, and this for the sake of diminishing the expense of education, is proverbial. It was this continual application to Delambre, who was distinguished both in the philological and philosophical departments of language, to teach mathematics, which induced him, at the age of twenty-five, to enter upon the study of the exact sciences. Most men would have been soon wearied of a pursuit so undertaken; and this would have been the case with Delambre, had his mental discipline been merely that of exercising the memory, which is unfortunately too much the tendency of the exclusive study of languages. Order and perseverance were distinguishing characters of Delambre's mind; and having, from professional motives, entered on the study of mathematics, and thereby become attached to their pursuit, he determined to pursue a regular course of study in these sciences. He entered the astronomical class of the College of France under Lalande, but not till he had carefully read the works of his master, and made many notes upon them, amounting almost to a commentary.

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[*] For an account of this very ingenious composition and its complete success, we refer our readers to Sir Walter Scott's interesting biography of De Foe, with which the whole history of the Apparition has been reprinted.

On one occasion, shortly after he joined the class, a passage from Aratus was required, which Delambre instantly supplied from memory. Lalande, ever alive to the importance of astronomical history, was immediately interested in Delambre: and it is probable that to this circumstance much of the future fame and labours of Delambre are to be attributed, as Lalande became immediately his friend, and henceforth considered Delambre as his fellow-labourer. Many of the most complicated calculations of Lalande were actually performed by Delambre; but though our author probably entered upon much of this drudgery for pecuniary considerations, he has given ample proof that the labour was far from a disagreeable one to him, by the tables which he himself subsequently published in later life.

During a short residence at Compiègne, which he made while he was a professed teacher of languages, he appears to have paid some attention to plane astronomy; and when he formed a friendship with Lalande, M. Dassy, in whose family Delambre was domiciled as tutor to his sons, was prevailed on by the astronomer to fit up a small observatory for his use. In this Delambre acquired some skill in the manipulation of his instruments, and also in the management of the formulæ which are used in the particular classes of data that the structure of instruments enables us to obtain. He then determined to devote his life to astronomy, and its history. The learning requisite for the history of astronomy he had already obtained, though he had probably at this time read comparatively few of the books, and none of the manuscripts, which so arduous a task entailed upon him; whilst of the incessant labour required by the study of astronomy as a science he had possibly little idea, and of the skill which his future practice gave him his share was also very small. His ardour and perseverance, however, surmounted all the obstacles that opposed his progress; and never did any man more completely illustrate the trite proverb, *labor omnia vincit*, than Delambre.

When in 1781 the discovery of the planet Herschel was exciting the deep attention of astronomers, Delambre undertook the formation of tables of its motion, being probably urged to this by the Academy of Sciences having proposed the determination of its orbit as the prize of the year. That prize was awarded to Delambre. He then undertook the construction of his solar tables, as well as tables of the motions of Jupiter and Saturn. Shortly afterwards he commenced his tables of the eclipses of Jupiter, which occupied him some years. When, at a sitting of the Academy, Laplace communicated to that body the results of his researches on the inequalities of Jupiter and Saturn, he determined on constructing complete tables of the motions of those two planets, founded on those results, but more especially of those of Jupiter. The utility of such tables to the navigator was a strong inducement to this undertaking, which he entered upon with great ardour, and completed in an almost incredibly short period, when we consider the great labour which they involved. His ecliptical tables were presented to the Academy in 1792, as a competing paper for the prize on that subject which had been offered the preceding year; but he had been for several years engaged in their calculation. It is indeed very probable that the prize was offered to induce him to complete them, as it was well known that he was engaged in the preparation of such tables. Such, indeed, is well known to be the general practice of that body; and though it has occasionally done good, in bringing to a completion researches that might not so soon have been completed, it does this mischief,—that it almost cuts off all competition, and inevitably gives the prize to a single candidate, by allowing him the advantage of a long previous preparation for it. We cannot disapprove of the adjudication on this occasion, as Delambre's labours well merited the distinction; but we do not think the general practice calculated on the whole to do other than give *éclat* to the members of the Institute themselves or their immediate friends.

When the project of fixing a standard of length was acceded to by the governments of France and England, Delambre and Méchain were appointed to carry it into execution on the part of the former government, by measuring the arc from Dunkirk to Barcelona. This laborious undertaking was carried on during the horrors of the French Revolution, amidst almost every variety of difficulty and personal danger that can be conceived. Méchain dying during the progress of the work, the completion of it devolved wholly on Delambre. His perseverance, prudence, and zeal, however, eventually overcame all obstacles; and after eight years of unceasing labour and anxiety, he obtained the measurements which constitute the data of the three volumes (1806-10) of his elaborate and invaluable work, *Base du Système Métrique Décimal*. The Institute of France, who had watched over its progress, decreed him the prize for the most valuable work on physical science which had appeared within the preceding ten years; and it is difficult to conceive that a single objection could possibly arise to the propriety of that decision.

Of the continuation of Delambre's arc by Biot and Arago from Barcelona to Formentera, this is not the place to speak at length; but it may be necessary to state that discrepancies which had long been observed in this latter arc have been recently found by Puissant to arise out of actual errors committed by these observers.

Delambre was chosen an associate of almost every learned body in Europe, and was appointed by the French government a member of the Bureau des Longitudes, and Sécretaire Perpetuel de l'Institut de France, and one of the directors of the University of France. During the twenty years that he filled this latter important and responsible post, his attention to its duties was unwavering, and his decisions remarkable for their justice and impartiality. His *éloges* of the deceased savans were indeed at the time considered somewhat strained as to praise; but they were at least kindly meant to the friends of the deceased, and were gratifying to the vanity of the nation. They were remarkable for purity of style and for the researches into the history of the subjects to which the elogized member had devoted himself.

In 1814 Delambre was appointed a member of the council of Public Instruction, but was deprived of it in the following year. He was in Paris when it was taken by the allied armies; and shortly afterwards, writing to one of his friends, he says he worked with perfect tranquillity from eight in the morning till midnight in the continued hearing of the cannonade. Such self-possession for study under that tremendous attack, and such absence of interest in the result of the great struggle, to say nothing of indifference to personal danger, is what we confess ourselves unable to understand. In the midst of active exertion we may be fearless of personal danger; but Delambre was in his study, and professes to have felt not only perfectly calm, but to have been able to pursue his scientific labours for sixteen hours in the very midst of the cannonade. He escaped uninjured.

On the creation of the Legion of Honour, Delambre was constituted a member of that body; and soon after an hereditary chevalier, with a pension, as a reward for his scientific services; and finally, in 1821, he was created an officer of that body. In 1817 he was created a chevalier of the order of St. Michael.

The death of Delambre occurred in 1822, at the age of seventy-two. It was preceded by a total loss of strength and frequent and long-continued fainting fits, with the other symptoms of a constitution worn out by hard mental and bodily labour. He died as he had lived, calmly, and though not without great suffering, yet without a single complaint.

The writings of Delambre are exceedingly numerous. The following is a list of his separate works in the order of their publication:—

1. Tables de Jupiter et de Saturne, 1789.
2. Tables du Soleil, de Jupiter, de Saturne, d'Uranus, et des Satellites de Jupiter, pour servir à la 3me edition de l'Astronomie de Lalande, 1792.
3. Méthodes Analytiques pour la détermination d'un Arc du Méridien, 1799.
4. Tables Trigométriques Décimales, par Borda, revues, augmentées, et publiées par M. Delambre, 1801.
5. Tables du Soleil, publiées par le Bureau des Longitudes, 1806.
6. Base du Système Métrique Décimal, 3 vols., 1806-10.
7. Rapport Historique sur les Progrès des Sciences Mathématiques depuis 1789. 1810.
8. Abrégé d'Astronomie, ou Leçons Elémentaires d'Astronomie Théorique et Pratique.
9. Astronomie Théorique et Pratique, 4to., 3 vols., 1814.
10. Tables Ecliptiques des Satellites de Jupiter, 1817.
11. Histoire de l'Astronomie Ancienne, 2 vols., 4to., 1817
12. Histoire de l'Astronomie du Moyen Age, 1 vol. 4to., 1819

13. Histoire de l'Astronomie Moderne, 2 vols., 4to., 1821.
14. Histoire de l'Astronomie au Dix-huitième Siècle, 1 vol. 4to., 1827, published under the care of Matthieu, and another promised, but not yet, that we are aware, published.

Besides these separate works, Delambre published a considerable number of memoirs in the collections of Petersburg, Turin, Stockholm, and Berlin, independently of those which appeared in the Mémoirs de l'Institut de France. Also twenty-eight memoirs on different subjects, astronomy, geodesy, and astronomical history, in the *Connaissance des Temps* from 1788 to 1820. A list of these may be seen in Coste's indexes to that work for 1807 and 1822.

Any attempt to analyze the writings of Delambre would far exceed the limits which can be allowed in this Cyclopædia. It is sufficient to say they are well worthy of the praise which has been bestowed upon them, as they are not only all excellent in their kind, but throughout marked with an original mind, indicate the most devoted enthusiasm to their several subjects, and prove that their author combined the spirit of scientific inquiry with the feelings and habits of literature in a degree that the history of a single individual has hardly ever before or since exhibited.

DELAWARE, a river in the United States, rises in the State of New York, between 42° and 42° 30′ N. lat., and afterwards forms the boundary-line between New York and New Jersey on one side, and Pennsylvania and Delaware on the other side. It terminates its course of 305 miles about five miles below Newcastle in Delaware, about 39° 30′ N. lat., and 75° 40′ W. long.

The Delaware is formed by two branches, the northern, called the Oquago, the southern, the Papachton, both rising on the western declivity of the Catskill Mountains, at an elevation of at least 1500 feet above the sea, and hardly 30 miles from the tide-water in the Hudson river. Both branches flow in a west-south-west direction for about 50 miles, and unite on the boundary of Pennsylvania, the Oquago turning suddenly to the south-east. In the same direction the river, which is now called Delaware, continues about 60 miles to the junction of the Neversink river. Hence it runs in a south-western and southern direction to the junction of the Lehigh at Easton, 65 miles, where it again turns to the south-east. After a course of 35 miles in that direction to Bordentown, it resumes its south-western course to the place where it enters Delaware Bay, five miles below Newcastle. The tide ascends in this river 120 miles from its mouth to the rapids at Trenton. The frequent changes in its course are caused by four ridges of the Appalachian Mountains, through which the river breaks in an oblique line. Though in its course above Trenton it forms numerous rapids, no cataracts, in the true sense of that term, interrupt the navigation of this river, which at seasons of high water extends by both branches into the State of New York. Ships of the line may ascend to Philadelphia, where the tide rises five or six feet, and sloops as far as Trenton.

The importance of this river has of late been greatly increased by the discovery of extensive coal-beds near the sources of its two largest tributaries, the Lehigh and Schuylkill. The Lehigh joins the Delaware at Easton, and the Schuylkill five miles below Philadelphia. Though both these rivers, whose sources are between 1400 and 1500 feet above the sea, and whose course does not exceed 100 miles, are extremely rapid, a great portion of their course has been rendered navigable by dams and locks, so that the produce of the coal-mines can be brought down to Philadelphia.

The navigation of the Delaware river is united to that of Chesapeake Bay by the Chesapeake and Delaware Canal, which traverses the north-eastern angle of Maryland and the northern district of Delaware, and connects the Elk river with the Delaware, 45 miles below Philadelphia. This canal, which is fourteen miles long, is navigable for small sea vessels. Its profits have never been sufficient to repay the heavy expense of its construction, and have been further diminished by the rail-road from Newcastle in the State of Delaware to Frenchtown in Maryland. By the Union Canal the Schuylkill navigation is connected with that of the Susquehanna. On the east a canal unites the Delaware at Trenton with Amboy Bay, and consequently with the city of New York; another canal is to begin opposite the mouth of the Lehigh, to traverse the northern districts of New Jersey, and to terminate near the city of New York; and the Lehigh canal connects the Delaware with the coal mines of Mauch Chunk on the Lehigh. (Darby; *Maps of the Society for promoting Useful Knowledge.*)

Delaware Bay extends in a north-west direction, between 39° and 39° 30′ N. lat., and 74° 50′ and 75° 40′ W long. Its entrance between Cape May in New Jersey and Cape Henlopen in Delaware is from 15 to 16 miles wide. It afterwards grows wider, forming on the east a wide open bay between Cape May and Egg Island: it then gradually narrows, and is considered to terminate five miles below Newcastle, at the embouchure of the river Delaware. Its whole length is about 56 miles. Its low and sandy shores are without harbours even for small vessels.

DELAWARE, the second smallest state of the United States of North America, extends from 38° 27′ to 39° 50′ N. lat., between 75° 10′ and 75° 40′ W. long. It comprehends the north-eastern portion of the peninsula which lies to the east of Chesapeak Bay, and more than one-third of its surface, having an area of 2100 square miles, or somewhat more than the county of Norfolk.

The watershed of the peninsula runs nearly through its middle, along the western boundary-line of Delaware, but rather within it. In its northern portion Delaware is undulating, but perhaps it nowhere rises more than 100 feet above high-water mark; it gradually becomes more flat towards the Atlantic Ocean. Farther south it is an extensive flat, from which the small rivers ooze rather than flow to the Chesapeak Bay and the Atlantic. Some districts of the country towards the sea are marshy, and subject to inundations. At the southern extremity is the Cypress Swamp, six miles from east to west, and twelve miles from north to south, covered with trees, and containing about 50,000 acres: a part of it belongs to Maryland. The coast is low and sandy, and has no harbour except at the northern extremity along the banks of the river Delaware. Rehoboth Bay, formed by a long and narrow strip of sand, is too shallow to admit even small vessels. A breakwater is now constructing by the general government within Cape Henlopen, which is expected to form a good harbour. It is two-thirds of a mile in length, and twenty-two feet wide at the top. A dike half the length of the breakwater, and parallel to it, will protect it against the ice brought down the river.

The soil is in some places excellent, especially in the northern districts, but it is generally thin and sandy, though everywhere carefully cultivated. The principal articles of export are corn and flour. The forests are not extensive, but the Cypress Swamp and those in the northern district produce lumber. Bog-iron is found not far from the small river Brandywine. Fruits are produced in abundance.

The climate is in general healthy and mild, but much severer in the northern than in the southern district, though the two are hardly more than a degree from one another.

The population amounted according to the census of 1820 to 73,000, and in 1830 to 76,739, of whom 3305 were slaves. On Christiana Creek, towards the northern boundary, and on Brandywine Creek, are several mills for grinding corn, and on the latter river also iron founderies. Vessels are built at Wilmington.

Dover, the capital of the state, has hardly more than 800 inhabitants. Wilmington, at the junction of Christiana Creek and the Brandywine, has a population of 6628, and carries on a considerable trade in corn, flour, and timber. Newcastle has a harbour and 2463 inhabitants.

Delaware is divided into three counties, and sends two senators and one representative to Congress. The State legislature consists of a senate of nine, and of a house of representatives of twenty-one members; the members of the former are chosen for three years, and those of the latter annually, by those inhabitants who pay state taxes. The executive power is in the hands of a governor, who is chosen by the people for three years, but can hold the office only three years in six.

There is a college recently established at Newark; the State has also a school-fund, which produces an annual income of 9000 dollars.

This country was first settled by the Swedes, whom Gustavus Adolphus sent there in 1627. In 1655 it passed into the hands of the Dutch, who ceded it in 1564 to the English. Its name is derived from Lord Delaware, the governor of Virginia. (Darby; Warden, &c.)

DELEGATES, COURT OF, was the great court of appeal in ecclesiastical causes, and from the decisions of the Admiralty Court. It was so called because the judges were delegated or appointed by the king's commission under the great seal; they usually consisted of judges of the courts at Westminster and doctors of the civil law, but lords spiritual and temporal might be joined. This court was established by the statute 25 Henry VIII., c. 19, which was passed in consequence of the practice which still prevailed of appealing to the pope at Rome from the decisions of the English courts in the above-mentioned matters.

By the constitutions made at Clarendon, 11 Henry II., this practice had been condemned; but though frequently checked, it was never thoroughly broken off until the final rupture with the court of Rome, in the reign of Henry VIII. Appeals lay to the court of delegates in three cases —1, where sentence was given in any ecclesiastical cause by the archbishop or his official; 2, where any sentence was given in an ecclesiastical cause in place exempt; 3, where sentence was given in the admiralty, in suits civil and marine, according to the course of the civil law. After sentence by the delegates, the king might grant a commission of review; but the power was rarely exercised, except upon the ground of error in fact or in law, and it was usual to refer the memorial praying for a commission of review to the chancellor, before whom the expediency of granting the prayer was argued.

By statute 2 and 3, William IV., c. 92, the Court of Delegates was abolished, and its powers and functions were transferred to the king in council [PRIVY COUNCIL]; and by the same statute, it is enacted that the decision of the king in council shall be final, and that no commission of review shall in future be granted. (Cowell's *Interpreter;* Bl. *Com.*)

DELFT, a large town in the province of South Holland, on the high road between Rotterdam, the Hague, and Leyden, and about nine miles from Rotterdam. The canal of Schie skirts the road for the greater part of the distance from Rotterdam to the Hague. Delft is an antient and gloomy town; many of the streets are divided by narrow stagnant canals, which are cleaned out by means of sluices: n the centre of the town are two handsome streets with broad canals and shaded with trees. The greater part of the country-houses inhabited by the wealthy merchants of Rotterdam are situated on the banks of the canal near to Delft; the population of the town amounts to 15,000.

Delft was formerly a place of some importance as the eat of the manufacture of a species of pottery, to which it gave its name. The improvements introduced into this manufacture by Wedgwood gave so much advantage to English potteries that those of Holland soon ceased to be f any importance, and in this respect Delft is no longer a lace of note. The learned Grotius was born in this town, nd his remains are deposited in the new church, a large uilding which contains one of the most splendid mauso-ums in Europe, that of William the First, Prince of Orange, who was assassinated in his palace in Delft in 584. The mausoleum consists of a sarcophagus, on which a recumbent statue, in white marble, of the prince, with is faithful dog at his feet. At the four corners are bronze atues representing Liberty, Fortitude, Justice, and Reli-on. Under an arch at the head of the tomb is another atue, in bronze, of the prince in a sitting posture and in ll armour; and at the opposite end is a figure represent-g Fame, with expanded wings. Over the whole is an quisitely-wrought canopy supported by four buttresses of hite marble, and twenty-two columns of black Italian arble. The town-house stands on one side of a large arket-place, and opposite to the new church. It is a very tient building of two stories, with pointed windows, each which has gilded ornaments beneath it; the walls are inted of a brownish yellow colour. The old church is another part of the town, and is remarkable only for ntaining the tombs of Leuwenhoeck and Van Tromp.

At the establishment of the confederation of the United ovinces, Delft was an important town, being one of the places which first sent deputies to the Assembly of the ates. Manufactures of woollen cloths and tobacco-pipes carried on, as well as a considerable trade in butter, the nal by which it is connected with Rotterdam giving to town the advantage of a sea-port.

DELHI, a province of Hindustan, lying between 28° d 31° N. lat., bounded on the north by Lahore, on the t by Oude and northern Hindustan, on the south by meer and Agra, and on the west by Ajmeer and Lahore. extends east to west from the hilly countries to the central desert, a distance of 240 miles, and in breadth, from north to south, about 200 miles. The province is generally level. To the north of the city of Delhi is a ridge of low hills, that joins the mountains between the Sutledge and the Jumna. Except on the banks of the rivers by which it is traversed, the soil of the province is in a high degree arid and unproductive, but great pains have been taken to remedy this disadvantage by means of irrigation. The province is watered by the Ganges, the Jumna, the Caggur, the Chittung, and the Seraswati, which last was formerly of some magnitude, but is now an inconsiderable stream. In addition to these rivers several artificial canals of great extent have been made. The canal of Ali Merdan Khan extends between the city of Delhi and the upper part of the Jumna, which river it joins opposite to Kurnal, 100 miles higher up than the spot upon which the city of Delhi stands. This canal had long been choked up, but was cleared out and repaired by the English at an expense of 35,000*l.*: the work was undertaken in 1817, and finished in 1820. This canal supplies the inhabitants of Delhi with water for domestic purposes, that of the Jumna, below Kurnal, being much impregnated with earthy salts, owing to which circumstance the overflowing of this river is not followed by the same improvement of the soil which results from the deposits left by the waters of the Ganges and other rivers of Hindustan. Before the restoration of Ali Merdan Khan's canal, the country around the city of Delhi had become scarcely habitable through the deleterious effects of the water. The canal of Sultan Feroze Shah commences from Ali Merdan Khan's canal a little below Kurnal, and is carried to the westward through Hurriana to the frontiers of Bicaneer. The object of this canal was the irrigation of the country through which it has been carried, and which was before dependent upon the periodical rains. This work, which was undertaken in the thirteenth century, had become useless from neglect, when, in 1823, its restoration was undertaken by the English. The Great Dooab canal joins the Jumna a few miles below the place where it issues from the northern mountains, and is carried to the same river nearly opposite to Delhi, a distance of 150 miles. The original constructor of this canal is not known: it is called Zabeta Khan's canal, because a Rohilla chief of that name attempted to restore it, but at that time it was an antient work. It passes through Saharunpore, Rampore, Shamlee, and some other towns, and gives fertility to an extensive tract of country. It is matter of tradition, that Sultan Feroze III. constructed various other canals, water-courses, and conduits, which having been neglected in after years, have been completely choked up, and every trace of them lost. Wheat, barley, gram, and other grains are produced in that portion of the province which lies between the Jumna and the Sutledge, but the long-continued droughts in the western part of Delhi are unfavourable to husbandry. During the rainy season, when the rivers overflow their banks, the pasturage is good, but there are large tracts of country which exhibit only a naked sterility, without cultivation and without trees. The Rohilla district, lying between the east bank of the Ganges and the kingdom of Oude, has a fertile soil and a genial climate. The country is there traversed by numerous streams, which rise in the hills of Kumaon, and whose waters are collected in reservoirs. This district produces sugar and wheat abundantly. The many wars which occurred in the last quarter of the eighteenth century caused the land to be in a great degree neglected, and it has been computed that not more than one-half of the surface of the province is at present under cultivation.

The principal subdivisions of the province are the districts of Bareilly, Hurriana, Moradabad, Shahjehanpore, Rampore, Merut, Saharunpore, Sirhind, and the principality of Pattiahlah.

The city of Delhi was taken by Mahmood about the year 1011, and laid under contribution. This province was afterwards the seat of empire under the Guarian or Afghaun monarchs. The Mogul dynasty was founded by Baber in 1525, when the last of the Afghaun monarchs having been slain by him in battle, he ascended the vacant throne, less as a conqueror than as the deliverer of the people, his army having been principally composed of deserters from Ibrahim the Afghaun sovereign. The throne continued in the possession of this monarch and his descendants until the establishment of the English in India. In the reign of Mahomed Shah III., who died in 1749, the kingdom was invaded by Nadir Shah, and the royal treasury was plundered of vast sums in money and jewels; the vice-roys of the different provinces revolted, and gained their independence one after the other, so that the successors of Mahomed Shah possessed only the actual sovereignty of the city of Delhi and a small district around it. Between 1749 and 1760 three monarchs were successively dethroned: in the latter year Shah Allum II. commenced his reign by an attack upon the English in Bengal, but, being defeated, surrendered himself unconditionally. Upon this, Meer Caussim, a creature of the English, was invested by the Mogul with the government, as Soubahdar of Bengal, Bahar, and Orissa, and engaged to pay out of the revenues of those provinces twenty-four lacs of rupees (240,000*l.*) annually to the mogul. This payment was allowed to fall into arrear, and in 1765 the Mogul was induced by his necessities, and in order to secure payment of the annuity in future, to issue a phirmaun granting to the East India Company what is known in history as the Dewannee, empowering them to collect and appropriate the revenues of Bengal, Bahar, and Orissa. In the following year, under a little gentle compulsion, the Mogul was induced, 'by way of inaum, or free gift,' to assign to the English the Northern Circars. From this time the Mogul retained only a nominal sovereignty; he was attacked first by the Maharattas, and next by the Rohillas, who became masters of the imperial city in 1788, and put out his eyes. After this Shah Allum transferred the small remains of his territory to some French officers in the service of the Maha Rajah, and became a prisoner in the hands of the Maharattas. This state of things continued until 1803, when Lord Lake, after defeating Dowlut Rao Scindiah, took possession of the city and territory of Delhi, and assigned lands for the support of the Mogul, thenceforth entitled King of Delhi. These lands are managed by British officers, and out of the revenue which they yield provision is made for the support of the numerous members of the royal family. These payments, including the sum appropriated for the expenses of the king, amount to upwards of thirteen lacs of rupees (130,000*l.*) a year.

The consequences of the immediate administration of the government by the British have been highly favourable to the inhabitants. Owing to the weakness of the former rulers, many of the villages had found it necessary to unite for their mutual protection, and by this means the more powerful were able to set the government at defiance as regarded the payment of taxes, while the burthen fell the more heavily upon the small and less powerful villages. When the English first took possession of the territory there were about 600 villages that had been deserted, the greater part of which were speedily re-peopled, and chiefly by the old inhabitants or their descendants. The restoration of some of the antient canals, as already mentioned, has been of signal benefit to the people. When, in consequence of the clearing out of Ali Merdan Khan's canal, the water was known to be approaching the city of Delhi, the people went out in swarms to hail it, calling down blessings upon those by whose exertions they were thus benefited. The appearance of the inhabitants indicates that their circumstances are easy; the whole population is well clad, which, in a climate where clothing is not of prime necessity as a protection from the elements, is alone evidence of prosperity. The tenure of the land has never been interfered with by the English, as in other provinces of India. Settlements are made with the village proprietors according to immemorial usage, and no sales of land have been rendered necessary by the possessors falling into arrears. The holders of land are divided into five classes, viz. 1. biswadars, or freeholders, generally descendants of the original settlers of villages; 2. hereditary occupants not liable to ejectment, answering to copyholders in England—this class pays certain fixed dues to the biswadar; 3. tenants at will residing in the villages; 4. tenants at will not residing in any village; 5. mortgagees. The rates paid by each of the other classes to the biswadar have not been ascertained, but it is understood that they are not liable to fluctuation. The land-revenue of the province collected by the Company's government in 1829-30 amounted to 70,54,948 rupees (705,495*l.*).

DELHI, the capital of the province, is situated on the west bank of the Jumna, in 28° 41′ N. lat., and 77° 5′ E. long. According to tradition this city was founded 300 years before the Christian æra by Delu. It formerly stood on the left or eastern bank of the Jumna, and is said to have covered a space of twenty square miles. Bernier, whose account was written in 1663, four years after the accession of Aurengzebe, estimated the circumference at no more than three leagues; but this included only the part within the fortifications, and there were several suburbs, which probably were not very thickly covered with buildings. It is known that this capital was greatly extended in the course of the reign of Aurengzebe, and Major Rennell mentions two millions as the number of inhabitants which it was said to contain at the end of the seventeenth century. The extent of the ruins seems to justify in a great degree this estimate. The Emperor Shah Jehan built a new city in 1631 on the right bank of the Jumna, and gave to it the name of Shahjehanabad, which it has not retained. This is the modern Delhi, which is about seven miles in circumference, and surrounded by walls constructed of large blocks of grey granite: several towers and bastions occur in the walls at intervals. The city has seven gates of freestone, and contains the remains of several fine palaces, the former dwellings of the chief omrahs of the empire. These palaces are each of considerable extent, and surrounded by high walls, containing baths, stabling, and numerous out-buildings. There are several beautiful mosques in good preservation; the largest of these, the Jumma Musjeed, was built by Shah Jehan, and completed in six years. It is built of white marble and red sandstone. There are two fine streets, one 90 feet broad and 1500 yards long, the other 120 feet wide and a mile in length. Down the middle of the first of these streets is an aqueduct, supplied with water from Ali Merdan Khan's canal. The other streets are narrow, but contain many good brick houses. The Mogul's palace, built by Shah Jehan, on the west bank of the Jumna, is surrounded on three sides by a wall thirty feet high, and more than a mile in circumference. It is now used as a bazaar. The chief hall of audience is an open quadrangular terrace of white marble, richly ornamented with mosaic work and sculptures in relievo; and the chapel of Aurengzebe, also of white marble, although small, is of beautiful workmanship: altogether the building, even in its present neglected state, attests the magnificence of its former occupants. The gardens, which were formed by Shah Jehan, are said to have cost a crore of rupees—one million sterling. Their original character has long been completely lost, and they now present the appearance of a small neat park, with some charming groves of orange-trees. Among the ruins of the antient city on the eastern side of the river are some splendid mausoleums in good preservation: those of the Emperors Humaioun and Mahomed Shah, and of Jehanara Begum, daughter of Shah Jehan, are the most remarkable. One of the most generally useful works of the Emperor Shah Jehan in this city is the well, excavated by great labour out of the solid rock upon which the Jumma Musjeed is built. The water is raised from a great depth by complicated machinery to a succession of reservoirs, and fills a pond, from which the inhabitants obtain a supply. The principal wheels having been broken, and the whole machinery out of repair, it was restored by the English a few years after they obtained possession of the city.

This city has at various times undergone great vicissitudes, having frequently been taken by hostile powers, and once, as already mentioned, wholly depopulated through the whim of the Sultan Mahomed, who removed the whole of the inhabitants forcibly to Dowlatebad, near the middle of the fourteenth century. At the close of the same century Delhi was captured and plundered by Timur, during the reign of Nassir Ed Din, whence it would appear that its population had returned. In 1739 the city was again taken and plundered, and part of the suburbs burned, by Nadir Shah. Between that period and the occupation by the British, Delhi was taken by the Abdallees, by the Vizir Gazee Ed Din, and twice by the Maharattas.

No census of the inhabitants has been taken, but it is estimated that the city contains a population of 200,[illegible]. This place is well situated for carrying forward the trade between the peninsula of India and the countries to the north and west; the inhabitants consequently exhibit a considerable degree of industry and commercial activity. Cotton-cloths and shawls, for which last the wool is brought from Cashmere, are manufactured in the city, and much indigo is produced in the surrounding country. A considerable trade is also carried on in precious stones, and in black and red carnelians.

From time to time many endowments had been made by benevolent natives for providing instruction for poor children; these endowments had nearly all been diverted from their intended object, and nothing could be more unsatisfactory than the state of education among the poorer, and indeed among all except the most wealthy, inhabitants of Delhi, at the time of the appointment by the English government in India of a General Committee of Public Instruction, which was planned and brought into operation between 1823 and 1825. A college or madrissa was established by this committee, and funds were assigned for its support by the central government, in addition to which a sum equal to 17,000*l.* was presented to the college by Nawaub Islamaid-ood-Dowlah, late minister of the king of Oude. In addition to this establishment, it appears that in June, 1827, there had been opened 247 schools in Delhi and its immediate vicinity for the instruction of poor children. The number of pupils at the college, which in 1829 was 152, had increased in the following year to 257. More recently another school has been instituted, at which the children of the native gentry are taught the English language, and as many as 68 scholars attended in the first year of its establishment.

Delhi is distant from Calcutta, by the Birbhoom road, 56 miles; from Bombay, by Ahmedabad and Ajmeer, 880 miles; from Madras, by Ellichpore, 1275 miles: from Agra, 17 miles; from Benares, 496 miles; from Lahore, 386 miles; from Oude, 364 miles; and from Seringapatam, 321 miles; all travelling distances.

(Rennell's *Memoir of a Map of Hindustan; Mill's History of British India; Reports of Committees of Lords and Commons on the Affairs of India*, 1830, 1831, *and* 1832.)

DELIAN PROBLEM. [DUPLICATION.]

DELILLE, JACQUES, was born at Auvergne in the year 1738, and educated at Paris at the College de Lisieux. Poverty compelled him to accept the office of subordinate teacher at the Collège de Beauvais; but he was soon raised to the rank of professor of humanity in the college of Amiens. While holding this office he commenced a translation of Virgil's Georgics. On his return to Paris he was appointed professor at the Collège de la Marche. He now began to be known as a poet, and several of his pieces attained celebrity, particularly an epistle to M. Laurent. But it was the publication of his Georgics that raised him to distinction, a work to which he was urged by Racine. The public read this translation with enthusiasm, and thought that the French language was capable of representing all the beauties of antiquity. Envy, notwithstanding, appeared here and there; and old forgotten poets were dragged from oblivion, that their works might be lauded at the expense of M. Delille's reputation. In 1774 the author was elected a member of the Académie, and soon after published his celebrated poem 'Les Jardins.' The popularity of this work does not seem to have been equal to that of the Georgics.

Delille accompanied M. de Choiseul Gouffier on his embassy to Constantinople, and took the opportunity of visiting Athens. It was on this tour that he composed his poem 'L'Imagination.' On his return to Paris he became professor of Belles-lettres at the university, and of Latin poetry at the Collège de France. He was unfortunate enough to lose all his property by the Revolution. At the celebration of the Fête de l'Etre Suprême, which took place during the Reign of Terror, Robespierre demanded of Delille an ode for the occasion. The poet, finding refusal was of no use, astonished Robespierre by writing a dithyrambic poem on the immortality of the soul, wherein he warmly supported that doctrine. The troubles of the capital induced him, in 1794, to leave Paris for St. Diez, and subsequently to retire to Switzerland, where the government of Berne made him a citizen. Here he finished his 'Homme des Champs' and 'Les Trois Règnes de la Nature.' He afterwards visited London, where he translated Milton's 'Paradise Lost.' In 1801 he returned to Paris, and died, universally regretted, in 1813.

Delille is one of those poets who will always be honoured by posterity; he reformed the language, and wrote verse with an ease and elegance before unknown. Those who feel pleasure in hearing the Alexandrine verse must be pleased (as far as structure goes) with the didactic poems of Delille. Nothing can be conceived more smooth and easy than the flowing of his lines; and even when he writes in a measure more irregular, as in 'La Conversation,' the same correctness is so carefully attended to, that a person of the slightest ear may read him aloud without once hesitating as to the place where the cæsura lies. To say he was a poet of great imagination would be going too far; but he is entitled to higher praise than that of a mere verse-maker. His images, as well as his lines, are often exceedingly elegant: we may instance an expression in 'Les Jardins,' where, after observing that the beauty of his subject ought to inspire him, he says—

——— 'Comme un rayon pur colore un beau image,
Des couleurs du sujet je teindrai mon langage.'

His 'Conversation' is an amusing poem; it is a kind of Theophrastus in verse, portraying the different sorts of persons who figure in conversation. It has, however, the fault of most works that treat of characteristics—the persons who appear in it are personified abstractions, instead of individuals as they appear in nature.

DELIQUESCENCE, the change of form which certain bodies undergo from solid to fluid by exposure to the air, and absorbing moisture from it.

There are many substances which partake of this property: among the more remarkable are potash, carbonate of potash, chloride of calcium, and nitrate of copper; all these will in a short time attract sufficient water from the air to become fluid in it. Other saline bodies are deliquescent only in moist air, such as common salt and nitrate of ammonia.

Certain deliquescent salts, and more especially chloride of calcium, are employed for the purpose of drying gaseous bodies which are the subject of experiment.

DELISLE, WILLIAM, a French geographer of great celebrity in his own day, was born at Paris, in 1675. His inclination for the pursuit in which he afterwards became so eminent, was displayed at an early age, and he made considerable proficiency in the art of constructing maps before he was nine years old. This taste was induced and carefully cultivated by his father, who appears to have been also much devoted to geographical and astronomical pursuits.

In 1699 he published a map of the world, which, with other maps and dissertations on geography, led to his election as a member of the Academy of Sciences in 1702; and a little afterwards he was appointed geographer to the king, with a pension. Indeed several of his works were written for the use of his royal pupil, in the course of instruction which he condescended to receive from Delisle.

Delisle's celebrity was not only so great in his own country that no work of history or travel was considered complete without his maps, but it extended all over Europe. He had several flattering invitations from the monarchs of other countries to remove to their capitals; and Peter the Great paid him a personal visit at Paris, to attempt to induce him to go to Russia. All these offers he rejected, but he gave Peter an excellent series of maps of his immense dominions. Fontenelle, in his 'Eloge,' says that the geographer knew their limits better than their owner did himself; and it was probably the respect entertained for him by the Czar that led to his brother Joseph being appointed to take charge of the observatory at Petersburg, with a very considerable salary.

In 1726, Delisle died of apoplexy, aged 51. The most valuable of his writings may be seen in the Memoirs of the French Academy; but any list of them is unnecessary here.

DELISLE, JOSEPH NICOLAS, a younger brother of the preceding geographer, was trained in the same school, and became very eminent in the same pursuits. He was born in 1688.

His published labours commenced with an excellent observation of the great total eclipse of the sun in 1706, when he was only 18 years of age; and in 1714 he was admitted a member of the Academy, in the section of astronomy. In 1724 he visited England, and at the recommendation of Newton and Halley, by both of whom he was greatly esteemed, he was elected a Fellow of the Royal Society, on the foreign list. In 1726, the year in which his brother died, he was appointed astronomer to the Czar Peter, a situation which he retained 21 years, when he returned to Paris on account of his health. He was then appointed professor of astronomy in the Royal College of France, which he held many years. Amongst his pupils were Lalande and Messier.

He died in 1768, at the age of 80; having published, besides his 'History of Astronomy' (2 vols. 4to., 1738), no less than 44 papers in the 'Memoirs of the Academy,' and several other dissertations elsewhere.

DELOS (Δῆλος), a small island of the Archipelago, one of the group called Cyclades, lies in the strait between Mycone and Rhenea. According to the poetic tradition, it was originally a floating island. (Strabo, p. 485.) It had several antient names, as Ortygia, Cynthia, and Asteria. It was celebrated from the earliest times as a seat of the worship of Apollo, who was said to have been born there. His temple and that of his mother, Latona, were in the town, which was built on a little plain on the west side of the island, at the foot of a lofty mountain, called Cynthus. (Strabo, p. 485.) The river Inopus ran into the sea to the south of the town; and in the sacred inclosure was a diminutive circular lake, called the *τροχοειδὴς λίμνη*. (Herod. ii., 170; Tournefort, Voyage du Levant, tom. i., p. 290, fol.) Delos was a place of meeting for the Ionians in the time of Homer; and athletic sports, with dancing and singing, were carried on there in honour of Apollo. (Thucydid. iii., 104.) Polycrates, of Samos, consecrated the adjoining island, Rhenea, to the Delian God, and joined it to Delos by a chain. Delos fell into the power of the Athenians in the time of Peisistratus, and then a partial purification of the island took place by the removal of the tombs which were within sight of the temple. In the year 426 B.C. a complete purification of Delos was made by the Athenians; all the tombs there were removed, and it was proclaimed that no one should thenceforth die or be born in the island, but that all persons likely to die or bring forth should be sent over to Rhenea. (Thucyd. i. 8, iii. 104.) The Athenians instituted at Delos a festival, which returned at the beginning of every fifth year, called the Delia, and sent thither annually a sacred vessel, called the Theoris, in commemoration of the delivery of Athens by Theseus from the Cretan tribute. (Plat. *Phædo*, p. 58, A.) The Persians regarded Delos with so much veneration, that when they were sailing to Eubœa, in 490 B.C., they would not land there, but sent to offer a most sumptuous sacrifice to the Delian Apollo. (Herod. vi., 97.) It was probably on account of the respect which all parties paid to this temple that the Athenians selected it as the depository of the tribute which they collected from their allies after the Persian war. (Thucyd. i., 96.) In 422 B.C. the Athenians removed the whole population of Delos to Adramyttium, where they were allowed to settle by the satrap Pharnaces (Thucyd. v., 1), and where many of them were afterwards treacherously massacred by the Persians. (Thucyd. viii., 108.) When Corinth was destroyed by Mummius, Delos succeeded to the commerce of that city, and was for a time very flourishing; but the generals of Mithridates having landed there in the war between that monarch and the Romans, the island was laid waste by them, and remained in a state of great desolation. (Strabo, p. 486.) In the days of their prosperity the Delians carried on a very extensive slave-trade with Cilicia, and thousands of slaves were landed and sold in a single day. (Strabo, p. 668.) The modern names of this little island are Delo, Deli, Dili, and Sdilli. It is little more than a mass of bare rock

[Coin of Delos.]
British Museum. Actual size. Copper. Weight, 55 grains.

DELPHI, now called **CASTRI**, the name of a people and a town of Phocis, celebrated for the oracle of Apollo. Its original name was Pytho; and Homer does not call it by its more modern appellation, which seems to have been derived from the cavern whence the prophetic vapour issued, or from the serpent which Apollo slew there. (Hesych., *Δελφός-μήτρα, καὶ ὁ ἐν Δελφοῖς δρακών.*) From the description which Strabo gives of the cavern (p. 419, *ἄντρον κοῖλον κατὰ βάθους οὐ μαλὰ εὐρύστομον*), and from the fact that Delphi was called the navel of the earth, it should seem that the former derivation is preferable. There was a legend that two eagles, sent by Jupiter from the east and west, met at Delphi; and in the temple was a stone adorned with two golden eagles, and other devices, which was called the navel stone: representations of this may be seen on many antient monuments; as, for instance, in the bas-relief representing the combat between Apollo and Hercules for the Delphic tripod. (Bekker's *Augusteum*, t. i., pl. 5.) The oracles were delivered by a priestess, who sat upon a tripod placed over the mouth of the cavern, and who, having exhaled the vapour, pronounced some prophecy in verse or prose: if in prose, it was afterwards set to verse by the poets attached to the temple. The oracle is said to have been suggested by the effects produced by the vapour upon some goats and the man who attended them. (Pausan. *Phoc.* 5.) The great reputation of the Delphian oracle made it the richest shrine in Greece, as every person who was satisfied with the response he obtained made a point of offering some costly donation to the temple. The first stone temple at Delphi was built by Trophonius and Agamedes: this having been destroyed by fire B.C. 548, a new one was built by the Amphictyons from the proceeds of a voluntary subscription, to which even Amasis, the king of Egypt, largely contributed. The Alcmæonidæ, who contracted to build it, very liberally substituted Parian marble in the front of the building for the common stone of which they had undertaken to construct the edifice. (Herod. ii., 180, v. 62.) The wealth of Delphi naturally attracted plunderers. The Persians under Xerxes made an unsuccessful attempt to get possession of the treasures accumulated there. (Herod. viii., 37.) The Phocian leaders in the sacred war did not hesitate to appropriate them as a fund for the payment of their mercenaries (Strabo, p. 421); and Brennus, the Gallic king, subsequently carried off the greater part of the offerings which remained. (Strabo, p. 188.) [BRENNUS.] There were however still some objects for the rapacity of Nero, who carried off 500 bronze statues at once. (Pausan. *Phoc.* 5.) The city of Delphi, which was the largest in Phocis (Pausan. *Phoc.* 34), was situated on an elevation, sixteen stadia in circumference, at the foot of the south side of Parnassus (Strabo, p. 418); and as the focus of the Dorian religion, and the seat of the most celebrated oracle in Greece, it naturally became populous and wealthy. The population consisted of Dorians, who formed the privileged class, and of the descendants of the bondsmen of the temple. The constitution was originally monarchical (Müller, Dor. iii., 6, § 10); the kings were also called Prytanes. (Müller, iii., 8, § 3.) The Dorian families made an oligarchy, from which the priests, the Pythian court of justice, and a limited senate, were chosen. (Müller, iii., 9, § 17.) Delphi was, from very early times, the rendezvous of an important federal union, or amphictyony, the organization of which is attributed by Strabo, p. 420, to Acrisius. (Thirlwall, *Hist. Greece*, vol. i., p. 376.)

[Coin of Delphi.]
British Museum. Actual Size. Silver. Weight, 22½ grains.

DELPHIA, a vegetable alkali, which exists combined with malic acid, forming malate of delphia in the seeds of the *delphinium staphisagria*, or stavesacre.

The properties of delphia are that it is a crystalline powder, which becomes opaque by drying. It is nearly insoluble in water, but communicates its peculiar taste to it. It dissolves readily in alcohol and æther, and, on the cooling of the solutions, the delphia is deposited in flocks. It is soluble also in the volatile and fixed oils.

With acids it forms neutral salts, which are crystallizable, and have a bitter and acrid taste; they are however but little known, and delphia itself has not been analysed. Like the other alkalis of this class, there can however be no doubt of its being composed of hydrogen, carbon, oxygen, and azote.

DELPHINA'PTERUS. [WHALES.]

DELPHI'NIUM, an extensive genus of the Ranunculaceous order, consisting of annual or perennial herbaceous plants, with irregular spurred flowers, the colours of which are often of the most vivid blue. They are very nearly allied to Aconites, from which they differ merely in their upper sepal being lengthened at the base into a spur instead of at the back into a helmet, and in the petals having no spur at all, but being deformed stalked bodies altogether different in form, and often in colour, from the sepals.

The species abound in the temperate parts of the northern hemisphere, and are often cultivated in gardens under the name of Larkspurs. Among the most showy kinds are

Delphinium Consolida, a hardy annual, of which many varieties are known as Rocket Larkspurs, D. Barlowii, a magnificent double-flowered perennial hybrid, and the Bee Larkspurs, consisting of D. grandiflorum, Sibiricum, Chinense, mesoleucum, and many more. These latter derive their name from a striking resemblance on the part of the petals to the black body of a humble bee covered with yellow hairs; the head and legs of the insect being supposed to be immersed in the cup of the flower.

The only species that has been applied to any useful purpose is stavesacre, D. Staphisagria, an annual inhabiting the warmer countries of the South of Europe. It has an upright branched stem, about two feet high, covered all over with close velvety down, and generally of a greenish purple colour. Its lower leaves are round, on long stalks, heart-shaped at the base, and divided into five, seven, or nine deep lobes of an oval or lanceolate figure; they are sharp-pointed, and either undivided or cut into a few lateral incisions; on the upper side they are deep green and almost smooth; on the under, they are paler and velvety. The flowers are a dull greyish green, arranged in a lax spike at the extremity of the ramifications of the stem; their stalk is short and velvety, and has three linear short bracts. The sepals are green and velvety externally, with a short spur curved downwards. The four petals are separate from each other and smooth; the two upper are oval, and rather long; the two lower have short stalks, and a rounded, irregular, toothletted limb. The fruit is composed of three woolly capsules filled with greyish irregularly-triangular compressed very acrid bitter seeds.

DELPHI'NIUM STAPHISA'GRIA, a biennial plant. Stavesacre seeds are not now used internally: when introduced into the stomach they cause vomiting, purging, and local ulceration of the intestines, and they may even produce serious general effects. When powdered, they are employed externally for the destruction of lice, or they are dissolved in vinegar and made into an ointment, which is employed for the cure of scabies, which it is said to effect in seven or eight days, and which has found favour in the eyes of some persons, as it does not stain the linen, nor has the unpleasant smell of sulphur. Its external application to abraded surfaces is not free from danger. The only case in which its employment is justifiable is, not to remove, but cause revulsion of, the cutaneous eruption, when, by its sudden drying up, the internal organs are oppressed, as, like most ranunculaceous plants, it causes acute inflammation and pustulation of the skin. It contains an alkaloid, delphia, which is soluble in alcohol and æther, and which forms salts with acids.

DELPHINORHYNCHUS. [WHALES.]

DELPHI'NUS. [WHALES.]

DELPHI'NUS (the Dolphin), one of the old Greek constellations, referred to the fable of Amphitrite and to that of Arion. It succeeds Aquila in the heavens, and its principal cluster comes on the meridian about three quarters of an hour later than the principal star (α) of the latter, and nearly in the same declination.

Character.	Number in Catalogue of		Magnitude.
	Flamsteed.	Astron. Society.	
	1	2410	6
ε	2	2416	3
η	3	2419	6
ζ	4	2423	5
ι	5	2429	6
β	6	2428	3
κ	7	2435	6
θ	8	2434	6
α	9	2439	3
	10	2442	6
δ	11	2443	3½
γ	12	2452	3
(λ)	13	2456	5
(χ)	16	2479	6
(μ)	17	2480	6
(ν)	18	2485	6

DELTA, the name of the fourth letter of the Greek alphabet. It was originally given by the Greeks to that part of Lower Egypt which, being comprised between the two main branches of the Nile and the sea, had a triangular form, somewhat resembling the Greek letter Δ. The same name has since been extended to all those alluvial tracts of the mouths of great rivers which, like the Nile, empty themselves into the sea by two or more diverging branches, though the spaces circumscribed by these branches and the sea-line have, in many cases, very little of the triangular form.

Of the different circumstances which contribute to the formation of deltas two are essential: first, the river, in the lower part of its course, must open out or spread sufficiently to have the motion of its waters considerably retarded; and secondly, it must either be habitually or periodically charged with fine detrital matter, which it deposits when its motion is diminished or its progress checked.

The operative process of formation varies in different cases: we shall confine ourselves to the more general.

Whenever, in consequence of heavy rains in tropical countries, or sudden thaws in more northern climes, rivers become greatly and rapidly swelled, their channels can no longer contain them, and they therefore overflow the lowlands at their embouchures to a greater or less extent. The waters thus spread out have their velocity diminished, and hence let fall the fine detrital matter with which they are charged. This detritus, though it covers the whole of the inundated surface, does not form in all parts a stratum of equal thickness. Every deviation from horizontality in the inundated land produces a particular and corresponding current in the moving mass of waters. Every tree, hillock, stone, or other obstruction, causes an eddy, and the natural result of these various currents and eddies is to distribute the sediment unequally over the bottom. When the waters begin to subside, some portions of the land are uncovered before the rest, forming, as it were, a number of islands. The water continuing to run off between these, deepens the hollows still more, so that when the inundation has all run off, the whole space is more uneven than it was before, and intersected by numerous incipient channels. The floods of the succeeding years increase the effect, until, in course of time, the highest parts are so raised, and the intervening channels so deeply excavated, that the latter constitute permanent branches of the river, and a delta is formed.

An inundation however is not always necessary to the formation of a delta. If the mouth of a river be large, a delta may be formed by another process. Thus, when the river is charged with mud or sand, it is found that the middle of the stream is the most loaded, because its rapidity is there greatest; hence, when that rapidity is diminished, as it is of necessity on reaching the wide mouth, or æstuary, a central deposit is formed, which in time rises above the surface and becomes an island, dividing the stream into two branches. Every succeeding flood brings a fresh tribute to the island, which increases seaward; for while the upper end is abraded by the impinging of the main stream, there is a dead water immediately in front of the lower part where fresh detritus continually subsides. Nor does the island increase merely in length: it also acquires breadth, the two branches of the streams diverging more as they advance. Hence the alluvial island acquires something of a triangular form. If the river be large, the lateral branches will be disposed each to form a minor delta upon the same principle as the main stream did. Thus new branches are formed, some of which converge towards the prolongation of the line of the main trunk. The sinuosities of the deltoid branches also drive their currents, in some places, back upon the island, in which, from its loose texture being favourable to abrasion, indentations are easily made, and finally channels cut through, dividing it into two or more. From these operations, simply or combined, the alluvial tract is frequently intersected by a great many deltoidal branches, dividing the whole into what, for the sake of distinction, may be termed *deltoid islands*. Such deltas, however, can hardly be formed upon coasts subject to tides; they almost exclusively occur at the mouths of rivers disemboguing into lakes or tideless seas. The numerous banks at the mouth of the Thames would soon rise into islands, and a delta would be formed, were it not for the effect of the tides.

In some cases, deltas owe their formation almost wholly to the nature and direction of the currents of the ocean, the orm and nature of its bed in the neighbourhood of the mouths of rivers, the prevalent winds and tides, &c. In almost all cases these circumstances greatly modify their form and extent and nature. Some deltas are very extensive: some are sterile, while others are highly fertile, such as the delta of the Nile; some are thickly wooded, such as the delta of the Ganges; some are swampy, as the delta of the Mississipi, &c. With regard to the branches which inclose or intersect them, there is also much variety, both as to their total number, and the number and situation of such among them as are navigable. Sometimes the two outer or deltoid branches of the river are the largest; sometimes one only is navigable, and that may be in the middle or on either side, and sometimes many are navigable; thus the delta of the Wolga has sixty-five channels, eight of which are navigable; the Orinoco fifty, of which seven are navigable. The Danube has five navigable mouths, and the Nile at present only two

Deltas are formed not only at the mouths of rivers which disembogue into the sea, but sometimes at the confluence of tributary streams, with their recipients, as is seen in many rivers of America; such as the Rio Branco and the Rio Jupura, which respectively enter by a great number of branches into the Rio Negro and the Marañon, or river of Amazons. Rivers entering lakes also, as we have already hinted, form deltas at their mouths.

Some deltas are still in progress of formation; others have been obliterated by various causes, and all are, more or less, undergoing different modifications.

The principal deltas of Europe are those of the Rhone, the Danube, and the Po. Many other rivers, however, form deltas, such as the Ebro, the Vistula, the Neva, the Dwina, the Don, &c. The delta of the Rhine has been, as it were, obliterated by the irruption of the Zuydersee, though the whole of Holland is a formation of deltoid islands, created by the anastomosing branches of the Rhine, the Meuse, and the Scheldt. The deltoid form of the mouths of the Petchora is no longer recognizable in the group of islands at its embouchure.

In Asia, the principal deltas are those of the Ganges, the Indus, the Irrawaddy, the Cavery, the Euphrates, the Oural, the Lena, and the Kolima.

The Wolga, before entering the Caspian, is split, as we have said, into innumerable branches; but the space which they inclose, in strictness, bears little resemblance to a delta.

In Africa, the Nile and the Niger; and

In America, the Mississipi and the Orinoco form the principal deltas.

DELU'C, JEAN ANDRE', was born at Geneva, 1727. His father, François Deluc, was a watch manufacturer, not only skilful in his trade but conversant with other branches of knowledge, and a writer upon religious and political matters. His son also took part in the disputes between the négatifs and the représentans, or aristocratic and democratic parties, of his native republic, to the latter of which he belonged, and he was sent, in 1768, by his fellow representatives to Paris to plead their cause with the Duke of Choiseul, the prime minister in France. On his return in 1770 he was made a member of the legislative council, but not long afterwards he left Geneva and its politics for England, to devote himself entirely to scientific pursuits. He had, from an early age, applied to the study of geology, and had made excursions in the Alps, while his brother investigated the mountains of Italy for the same object. His own words best explain his purpose: 'My brother and I entered together upon our geological career, while I yet lived at Geneva, and after a certain period we came to a first conclusion, which from that time has been our guide, namely, that an essential distinction was to be made among the various phenomena which the surface of the earth exhibits, with respect to their causes, by determining as to each of them whether the causes which have produced it are still in action, or have, at some epoch, ceased to act. . . . Continuing our observations, we came at length to a conviction that the formation of our continents, with regard both to their composition and general form, as well as their existence above the level of the sea, should be ascribed to causes no longer in action on our globe, and that the whole of the effects of the still-existing causes have been limited to a modification of that original state. After having quitted Geneva, I continued my observations in various countries, and more particularly on the sea coast; my brother likewise pursued his, and we communicated our remarks to each other. I saw the possibility of determining, by the action of actual causes, what had been the state of our continents at their birth, and also the possibility of determining the time elapsed since that period. I then wrote my first geological work, "Lettres Physiques et Morales sur l'Histoire de la Terre et de l'Homme," 8vo. La Haye, 1778.' These letters were addressed to Queen Charlotte, consort of George III., who appointed Deluc her reader; they relate only to the Alps of Switzerland; but in the following year appeared a continuation of the work, under the same title, including Deluc's travels through Rhenish Germany, Hanover, Friesland, Holland, Belgium, &c., in 5 thick vols. 8vo. These letters are not merely scientific treatises; they are also descriptive of scenery, of the inhabitants, and their manners; they contain statistical and moral observations, and many of them are full of interest even to the general reader. One great conclusion which Deluc came to from all his observations was, that the present continents were left dry by a great and sudden revolution of comparatively recent occurrence, not more than four or five thousand years since, which revolution buried under the sea the countries previously inhabited. This opinion has been also maintained by Saussure, Dolomieu, and Cuvier. Deluc agreed with Saussure in considering that the materials which form our mountains were first deposited in horizontal and continuous strata, and that their present broken and dislocated state is the effect of subsequent catastrophes, which however were previous to that which left them dry. Deluc's whole system concerning the various epochs of the creation corresponding to the six days or rather periods of Genesis, appears in several of his numerous works, and especially in his 'Lettres Géologiques sur l'Histoire de la Terre, addressed to Blumenbach, 1798; in his 'Traité élémentaire de Géologie,' 1808, which was also published in English; and in his 'Geological Travels in the North of Europe and in England,' 3 vols. 8vo., London, 1810. Deluc made also many observations on the atmosphere, and the phenomena of air, heat, and light. He wrote 'Recherches sur les Modifications de l'Atmosphere, contenant l'Histoire critique du Baromètre et du Thermomètre, un traité sur la construction de ces instrumens, des expériences relatives à leurs usages, et principalement à la mesure des hauteurs, et à la correction des réfractions moyennes; avec figures,' 2 vol. 4to. Geneva, 1772. It is perhaps in this branch of experimental philosophy that Deluc rendered the most positive service to science. He made great improvements in the barometer especially as applied to the measurement of heights. [BAROMETER.] He also wrote 'Mémoire sur un Hygromètre comparable presenté à la Societé Royale de Londres.' Among his other works may be mentioned, 'Idées sur la Metéorologie,' 1786; 'Introduction à la Physique Terrestre par les Fluides expansibles,' 1803; 'Traité Elémentaire sur le Fluide Electro-Galvanique,' 1804.

Deluc's earnestness in availing himself of his geological observations to prove the veracity of the Mosaic narrative involved him in controversial correspondence with several of his contemporaries, and particularly with Dr. Teller of Berlin: 'Lettres sur le Christianisme, addressées au Dr. Teller,' 1801; 'Correspondance particulière entre le Docteur Teller et J. A. Deluc,' in French and German, 1803–4; and also with Professor Reimarus of Hamburg, 'Annonce d'un Ouvrage de M. J. A. Reimarus sur la Formation du Globe, par J. A. Deluc,' Hanover, 1803. But though Deluc was earnest in his religious conviction, and in supporting it by arguments, his spirit was far from being intolerant, as he shows in numerous passages of his works, and especially in his 'Discours sur la Tolérance,' in the 1st vol. of the 'Histoire de la Terre et de l'Homme.' He was a great admirer of Bacon, and wrote 'Précis de la Philosophie de Bacon, et des Progrès qu' ont fait les Sciences Naturelles par ses Preceptes et son Example,' 2 vol. 8vo., Paris, 1802. He wrote also on education: 'Lettres sur l'Education Religieuse de l'Enfance, precédées et suivies de détails historiques,' 8vo., 1799; besides many other memoirs, treatises, &c., which appeared in the *Journal des Sçavans*, *Transactions Philosophiques*, and other scientific journals, French, English and German. He was a member of the Royal Societies of London, Dublin, and Göttingen, and correspondent of the academies of Paris, Montpellier, &c. He was appointed in 1798 Professor of philosophy and geology in the University of Göttingen. He passed several years in Germany, at Berlin, Hanover, Brunswick, &c. After the battle of Jena he returned to England, where he passed the remainder of his life, chiefly at Windsor, where his situation of reader to the queen gave him a free access to the royal family, by the members of which he was much respected. He died at Windsor, November, 1817, in his 91st year. His brother and fellow observer Guillaume Antoine Deluc died at Geneva in 1812, and left a rich collection of mineralogy, which has been increased by his son André Deluc, who is the author of an 'Histoire du Passage des Alpes par Annibal,' Geneva, 1818.

DELVI'NO, a livas, or inferior pashalik, of European Turkey, occupying the greater part of the coast of antient Epirus, and especially of the districts of Chaonia and Thesprotia, from the Khimára mountains on the north-west to the river Acheron on the south-east, a length of about 70 miles. It extends inland between 20 and 25 miles. A ridge of mountains divides it to the north-east from the valley of the Voiussa, the antient Aous, in the pashalik of Avlona, and several other groups, among which are the mountains of Paramithia and of Souli, divide it to the south and south-east from the pashalik of Joannina. The river Kalamas, descending from the high lands near Joannina, flows through the country of Delvino, and enters the Adriatic north of the bay of Gomenizza. A great part of the coast of Delvino faces the island of Corfu. Delvino, the head town of the pashalik, said to have about 8,000 inhabitants, is situated inland, about 15 miles north-east of Butrinto, the antient Buthrotum. Farther north, among the mountains, is Gardiki, the population of which was exterminated by Ali Pasha. Parga, formerly a Venetian possession, lies on the south coast of the pashalik of Delvino. Phiates, near the banks of the Kalamas, is inhabited by a tribe of warlike Epirotes. There are no other places of any importance in the pashalik.

DELVI'NO, a town in the interior of Albania (Turkey in Europe), in a rich plain at the foot of the south-western slope of the mountain range of Khimára. In the map prefixed to 'Hobhouse's Travels in Albania' it is placed on a rivulet, the Pistritza, which flows into the sea at Butrinto or Bucintro, (the antient Buthrotum,) opposite Corfu; but in those prefixed to the Rev. T. S. Hughes's and Dr. Holland's Travels it is not so; and such is the present uncertain state of Albanian geography, that even the site of an important town cannot be exactly laid down. Delvino has a population, according to Mr. Hobhouse, of 8000 persons. Upon the conquest of Albania by the Turks, it was made the residence of a Turkish governor, whose sway extended over the accessible part of the surrounding territory. The governor (whom Mr. Hobhouse describes as a pasha of two tails) was one of those reduced to subjection by Ali Pasha. There is a strong castle at Delvino.

DE'MADES, an Athenian orator and demagogue, contemporary with Demosthenes. According to Suidas he was originally a sailor, according to Proclus a fishmonger. He took the part of Philip in the Olynthian affair, and was liberally rewarded by that prince, who received him well when he fell into his hands after the battle of Chæronea. He was mainly instrumental to bringing about the peace between Macedon and Athens, which followed that victory. (Demosth. *de Corona*, p. 320.) When Alexander, in 335 B.C., demanded that the Athenian orators who were opposed to him should be delivered into his hands, Demades induced him to relinquish his claim. (Diod. xvii. 15; Plut. *Dem.*, c. xxiii.) Demades seems to have yielded to the bribery of Harpalus. (Dinarch. c.; Demosth., p. 101.) It appears that he was concerned with Phocion in delivering up Athens to Antipater. (Corn. Nepos, *Phoc. II.*) In 318 B.C. he went on an embassy to Antipater to induce him to remove the garrison from Munychia, and took his son Demeas with him. Unfortunately, a letter which he had written to Perdiccas fell into the hands of Cassander, and in revenge for the offensive terms in which Antipater was alluded to in it, that prince put to death the orator and his son. Cicero (*Brut.* 9) and Quintilian (ii. 17, § 13, xii. 10, § 49) assert that he did not write anything; but a fragment of his speech in defence of his twelve years' administration (*ὑπὲρ τῆς δωδεκαετίας*) is still extant, and Suidas attributes to him a history of Delos, and of the birth of the children of Latona. Pytheas (*in Athen.*, p. 44 F,) describes him as a profligate drunken fellow. He was a great wit, and many of his sallies are recorded.

DEMBEA. [ABYSSINIA; NILE.]

DEMERARA. [GUIANA, BRITISH.]

DEME'TER, CERES, the oldest, and, with a view to the formation of a systematic mythology, by far the most important personage in the Greek polytheism. Her name Demeter (*γῆ*, *earth*, *μήτηρ*, *mother*), or Deo, points to her as a representative of the earth and its productions in the old elementary worship of Greece; and she is invoked by Orpheus (apud Diod. Sic. i. 12) as Mother Earth, the giver of all sorts of riches (*γῆ μήτηρ πάντων Δημήτηρ πλουτοδότειρα*). The title Father is in the same manner given to the air by Lucretius (i. 25),

> Postremo pereunt imbres ubi eos *pater Æther*
> In gremium *matris Terrai* præcipitavit;

and the Greeks considered all vegetable productions as the offspring of a union between these two elements. (See the fragment of the *Danaides* of Æschylus in Hermann's *Opuscula*, vol. ii., p. 334.) The mystic union of these two principles, from which all the other deities sprung up, is an invention of the later philosophers. The most remarkable feature which the worship of this deity presents in Greek mythology is her intimate connexion with Bacchus. [BACCHUS.] Without entering into any of the questions agitated with respect to the origin or nature of the Bacchic rites, it may be as well to offer here a brief explanation of this connexion of the two deities, a connexion which seems to have belonged to all the different modifications of the two worships. In the first place, we may remark, that, in the Roman mythology, as well as in the Greek, we continually find duplicate divinities, male and female, and sometimes deities of a doubtful sex. (Niebuhr's *Rome*, vol. ii., p. 100-101, Eng. Tr.; and *Philolog. Mus.*, vol. i., p. 116-117.) Thus the sun-god and the moon-goddess have always been paired together. Now Demeter is not merely the goddess of the earth, in which form she is the wife of Æther; she is also the moon (Creuzer, *Symbolik*, iv., 188), as the wife of Bacchus, the sun-god, or wine producer (for the terms were convertible), as in the passage of Virgil referred to under BACCHUS; and she is the queen of the lower world as the wife of the same Bacchus considered as the god of Hell in the mystic worship of the Cabiri, where, according to the scholiast on Apollon. Rhod. i. 917, Axiokersa (who was the same as Demeter or Proserpine) is the wife of Axiokersos or Pluto. (See the passage of Herodotus, quoted under BACCHUS, and compare CABIRI.) At Eleusis these two deities were worshipped with peculiar solemnities; the mysterious secrets which were communicated to the initiated have not been divulged to us; and the many ingenious attempts which have been made to explain their purport have, it is to be feared, been attended with very little success; all that can be said of them with any degree of certainty is, that they were probably a slightly modified adaptation of the Samothracian rites, for the deities appear to have been nearly the same. It does not seem right to infer from the similar relation subsisting between Osiris and Isis in Egypt, and Bacchus and Demeter in Greece (Macrob., *Saturnal.*, i. 2, p. 210; Herod. ii. 144; Plutarch *de Iside*, p. 354 F.), that the worship of these deities was derived from Egypt in particular; still less can we adopt Creuzer's theory of the Indian origin of this religion. It seems more reasonable to conclude that the same causes which might contribute to produce such an elementary worship in the East would have the same effect in Greece; for the constitution of the human mind is much the same in all parts of the world.

Demeter is represented in antient monuments with a basket (*κάλαθος*) on her head, with some ears of corn in her hand, and as seated in a chariot drawn by lions, panthers, or elephants. (Winckelmann's Works, vol. ii. 515, iv. 119.) A collection of her names and epithets is given by Creuzer (*Symbolik*, vol. iv., p. 301, fol.) The meaning of her Roman name, Ceres, by which she is generally mentioned in English books on mythology, is not known; it may be derived from *c(e)reare*, *creare*, to produce (Creuzer, *Symbolik*, iv., p. 313); or it is connected with her Cabiric name, Axiokersa, in which case it also signifies the producer; for according to Hesych., *κέρσαι = γαμῆσαι*, *κέρσης = γάμος* and *μίξαι = κέρσαι*. On the mysteries of this goddess the reader may consult, in addition to Ouvaroff and Sainte-Croix, the elaborate work of Lobeck, *Aglaophamus; Regiom.* 1830.

DEME'TRIUS PHALE'REUS, an Athenian, the son of Phanostratus, and a scholar of Theophrastus. His earlier years were devoted to the study of philosophy he first began to take a part in public affairs about 320 B.C. (Diog

Laert., v. 5—75.) He was condemned to death at the same time with Phocion (317 B.C.) for espousing the Macedonian party, but had the good fortune to escape by flight (Plut. *Phoc.* cxxxv.), and was shortly after made governor of Athens by Cassander. He maintained his authority for ten years, and, according to Strabo (p. 398), Athens was never more happy than under his government. In his administration of affairs he was so popular that 360 statues were erected in his honour; but when Demetrius Poliorcetes came to Athens (307 B.C.) and proclaimed the old democracy, he was obliged to fly a second time, and would hardly have escaped had not his enemy ensured him a safe retreat to Thebes. (Diodor. Sic. xx., 45, 46.) After the death of Cassander (296 B.C.) Demetrius retired to the court of Ptolemy Soter, king of Egypt, where he was received with great distinction, and where he probably wrote most of the numerous works attributed to him by Diogenes. (v. 5—80.) Unfortunately, however, he made an unsuccessful attempt to dissuade his patron from altering the succession to his crown in favour of his children by Berenice. When Ptolemy Philadelphus came to the throne in 283 B.C. he had not forgotten the counsel which would, had it been listened to, have deprived him of his father's preference, and banished the author of it to Busiris, where he soon after died from the bite of an asp. A treatise on rhetoric, ascribed to him, has come down to us, and has been edited separately by Schneider, Altenburg, 1779.

DEMETRIUS POLIORCETES (the city-taker) was the son of Antigonus (one of the successors of Alexander the Great) and Stratonice. He appears to have been born about the year 334, for Plutarch tells us (*Dem.* v.) he was 22 when he was defeated by Ptolemy and Seleucus at Gaza (312 B.C.). Demetrius soon wiped out the disgrace which had attended his first feat of arms by a brilliant victory which he gained over Cilles, one of the generals of Ptolemy. (Plut., *Dem.* vi.) In the division of Alexander's empire, which shortly followed, it was determined that Greece should be freed from the dominion of Cassander, and this duty Demetrius willingly took upon himself. Demetrius Phalereus then governed Athens as Cassander's deputy, and had obtained great popularity; but when Demetrius Poliorcetes took Munychia and offered a democratical form of government to the Athenians (307 B.C.), the disciple of Theophrastus was glad to owe a safe retreat to Thebes to the generosity of his namesake. In the following year Demetrius gained a great naval victory over Ptolemy, and conquered the isle of Cyprus, in consequence of which his father Antigonus assumed the title of king. (Plut. *Dem.* xvii., xviii.) In 304 Demetrius laid siege to Rhodes, but, although he showed all the resources of his genius in inventing new and extraordinary machines for taking the city, he was unable to make himself master of it, and, after a year's siege, he formed an alliance with the Rhodians against all persons, with the exception of Ptolemy. (Plut. *Dem.* xxi.) Demetrius then returned to Greece, forced Cassander to raise the siege of Athens, and pursued him to Thermopylæ: after this he took Sicyon by surprise, and then Corinth and Argos, where he married Deidamia, sister of Pyrrhus, king of Epirus. Cassander was willing to make peace, but Antigonus showed so little moderation that the other successors of Alexander were induced, through fear of the consequences of his ambition, to form a coalition against him. Antigonus met his enemies at Ipsus, in Phrygia, and fell in the battle. (Diod. xxi.; Plut. *Dem.* xxviii—xxx.) Demetrius escaped from the defeat with 9000 men to Ephesus, whence he passed over to the Cyclades, and, being excluded from Athens, sailed for the Chersonese. While he was there engaged in laying waste the lands of Lysimachus, Seleucus sent to him to demand his daughter Stratonice in marriage, a proposal to which he readily agreed. In 299 B.C. he laid siege to Athens, which was under the dominion of the tyrant Lachares. The city soon surrendered, and was treated with great kindness by the conqueror. (Plut. *Dem.* xxxiv.) The quarrel of Alexander and Antipater, the two sons of Cassander, gave him an opportunity of getting possession of Macedon, which he easily accomplished after having put to death Alexander, who had called him in to assist him against his brother. (294 B.C.) Although master of the greater part of Greece, he was eager to get possession of the whole, and attacked and took Thebes. But his popularity was now on the wane, and he was easily driven from the throne of Macedon by Pyrrhus the Epirote, in 287 B.C., whose good qualities had become known to the subjects of Demetrius. (Plut. *Dem* xliv.) Shortly afterwards he fell into the hands of Seleucus, whose kingdom he had invaded, and was detained by him in honourable confinement till his death in 283 B.C. This celebrated man was so eminently handsome in his person that sculptors and painters always fell short of his beauty. He was much given to debauchery, and is said to have shortened his life by his excesses.

[Coin of Demetrius Poliorcetes.]

British Museum. Actual Size. Silver. Weight 260$\frac{8}{10}$ grains

DEMETRIUS SOTER, king of Syria, the son of Sele-cus Philopater, passed his youth at Rome as a hostage. He effected his escape, partly through the assistance afforded him by the historian Polybius, and mounted the throne of his ancestors about 161 B.C. He contended in vain with the Maccabees, who then ruled over Judea, and died valiantly fighting against Alexander Balas about B.C. 150.

[Coin of Demetrius Soter.]

British Museum. Actual Size. Silver. Weight 256$\frac{3}{10}$ grains.

DEMETRIUS NICATOR was the son of Soter. Having been sent to Cnidos, towards the end of his father's reign, he did not fall into the hands of the successful usurper Bala, and with the assistance of the king of Egypt, whose daughter Cleopatra he had married, soon possessed himself of his father's throne. As, however, he gave himself up, after a while, to luxury and indolence, and did not attend to the duties of his station, his numerous enemies contrived to expel him from his kingdom, and he remained for some time in the hands of the Parthians, upon whom he had

[Coin of Demetrius Nicator.]

British Museum. Actual Size. Silver. Weight 260[illegible] grains.

ventured to make war. While still in captivity he mar a daughter of Mithridates, the Parthian king; and his former wife Cleopatra formed a union with his brother Antiochus, who became king of Syria in his absence, and fell in battle with the Parthians. Phraates, before this event happened, had released Demetrius, in order that he might divide his brother's party, and he consequently regained his kingdom after the death of Antiochus. But Demetrius governed Syria no better than before his captivity. He was again expelled by another usurper, and was assassinated by the orders of his wife Cleopatra in a temple at Tyre, where he had taken refuge B.C. 126.

DEMETRIUS of Bactria. [BACTRIA.]

DEMI-LUNE. [RAVELIN.]

DEMOCRACY (*δημοκρατία*) a word taken from the Greek language, like aristocracy, oligarchy, monarchy, and other political terms.

The third book of Herodotus (chap. 80—82) contains what we may consider as the views of the oldest extant Greek historian on the merits and defects of the three respective forms of government as they are called, democracy, oligarchy, and monarchy. It would be difficult to extract from the chapters referred to an exact definition of democracy, but still we learn from them what were considered to be essentials; first, complete political equality (*ἰσονομίη*); secondly, the election of magistrates by lot (*πάλῳ*) (which, coupled with the first condition, implies that public offices must be accessible to all); thirdly, responsibility or accountability in public functionaries (*ἀρχὴ ὑπεύθυνος*), which implies a short term of office and liability to be ejected from it; fourthly, the decision by the community at large of all public matters (*τὸ βουλεύματα πάντα ἐς τὸ κοινὸν ἀναφέρειν*).

It is unnecessary to mention the merits and defects of a democracy as pointed out in the above chapters, the defects being only certain consequences supposed to flow from, and the merits certain advantages incident to, a democratical institution, and neither being essentially parts of the fundamental notion of a democracy.

In forming a notion of a democracy as conceived by the Greeks, and indeed in forming any exact notion of a pure democracy, it is necessary to consider a small community, such as a single town with a little territory, and to view such a community as an independent sovereignty. The institutions which in modern times have approached most nearly to the form of a pure democracy are some of the Swiss cantons. The boroughs of England, as existing in their supposed original purity, and as partly restored to that supposed original purity by the late Municipal Corporation Act, may help to explain the notion of a democracy, though they are wanting in the necessary element of possessing sovereignty. Further, to conceive correctly of a Greek democracy and of some of the democracies of the North American Union, it must be remembered that the whole community in such States consisted and consists of two great divisions, freemen and slaves, of whom the latter form no part of the political system.

In most Greek communities we find two marked divisions of the freemen, the 'few' (*ὀλίγοι*) or 'rich' (*δυνατοί, πλούσιοι*), and the 'many' (*οἱ πολλοί, ὁ δῆμος*) or 'not rich' (*ἄποροι*), between whom a fierce contest for political superiority was maintained. This contest would often end in the expulsion of the 'few,' and the division of their lands and property among the many; sometimes in the expulsion of the leaders of the 'many,' and the political subjugation of the rest. Thus the same state would at one time be called a democracy; at another, an oligarchy, according as one or the other party possessed the political superiority; a circumstance which evidently tended to confuse all exact notions of the meaning of the respective terms used to denote the respective kinds of polities. Under the circumstances described, what was called an oligarchy might perhaps be appropriately so called; what was called a democracy was not appropriately so called, even according to the notions entertained by the Greeks themselves of a democracy; for such so-called democracy was only a fraction of the community that had obtained a victory over another fraction of the community, less numerous and individually more wealthy: for the 'few' and the 'rich' were necessarily united in idea; it being, as Aristotle remarks, incident to the 'rich' to be the 'few,' and the rest to be the 'many.'

Aristotle felt the difficulty of defining what a democracy is. He observes (*Politik.* iv. 4) that neither an oligarchy nor a democracy must be defined simply with reference to the number of those composing the respective bodies: if a considerable majority, he says, are rich, and exclude the remaining body of freemen, who are poor, from political rights, this is not a democracy. Nor, on the contrary, if the poor, being few, should exclude the rich, being more numerous, from all political power, would this be an oligarchy. Such a supposition as the latter is impossible in a sovereign community, except during a short period of revolutionary change; but it is not an impossible supposition in a case where a community, not being sovereign, is governed by a constitution or charter granted by the sovereign power. In the borough of Malmsbury (*Report on Municipal Corporations*, vol. i. p. 77), at the time of the Report, a very small number of the population formed the ruling body this body filled up vacancies in their own number, was irresponsible to the inhabitants, and chiefly composed of labourers without education, and of the least instructed class of retail tradesmen. The then alderman, the chief magistrate of the town, was a pig-killer, and scarcely able to write his name. Such an anomalous political constitution requires a new and appropriate name.

Aristotle, after some preliminary remarks, concludes by defining a democracy to be, when the freemen and those not the rich, being the majority, possess the sovereign power; and an oligarchy, when the rich and those of noble birth, being few, are in possession of the sovereign power. This definition of an oligarchy necessarily implies that the majority are excluded from participating in the sovereign power. It might be inferred, on the other hand, that in this definition of a democracy the few are excluded from the sovereign power; and such in this passage should be the meaning of the author, if he is consistent with himself. In another passage (iv., 4), where he is speaking of the different kinds of democracy, he speaks of the first kind as characterised by *equality* (*κατὰ τὸ ἴσον*): and by this equality he understands 'the not rich having no more political power than the rich, neither body being supreme, but both equal, and all participating equally in political power.' Such in fact approaches very near the exact notion of a pure democracy, or at least a democracy as pure as we have any example of; for women, persons of unsound mind, males not adult, and slaves, are excluded from political power even in democracies.

A pure democracy then is where every male citizen, with the exceptions above mentioned, forms an equal and integral part of the sovereign body; or, as Aristotle expresses it, the democracy is 'monarch, one compounded of many.' This is the fundamental notion of a democracy: every other institution incident to or existing in a democracy is either a necessary consequence from this notion or a positive law enacted by the universal sovereign.

Thus it is absolutely necessary, in order that a democracy should exist and continue to exist, that the whole body should recognize the principle that the will of the majority must always bind the minority. It seems also necessary for the whole body to admit the principle that every member of the sovereign power shall express his opinion without fear, control, or any influence, that is, secretly. Every freeman being an equal part of the sovereign, has no responsibility, such as some persons dream of: the many who compose the sovereign are no more responsible than when the sovereign is one, and the notion that the vote of those who possess sovereign power should be open and notorious, on the ground of their being responsible, is inconsistent with the notion of their possessing sovereign power. The only way in which the universal sovereign can be so made responsible to a positive morality (for there is nothing else that such sovereign can be made responsible to) must be by the universal sovereign making such open voting a constitutional rule, which rule the same body that made may repeal when it pleases. Such rule, however, being inconsistent with the free exercise by each individual of his share of sovereignty, would be an act of suicide in the body politic.

If the democracy consider a constitution [CONSTITUTION] to be useful for carrying into effect the will of the sovereign, such constitution, when made by the expressed will of the majority, whatever may be the terms of such constitution, does not affect the principle of the democracy. Such constitution can be altered or destroyed by the same power that made it. If a representative body is necessary for effecting the purposes of the sovereign, such body may be elected and invested with any powers by the sovereign body, always provided that the representative body is responsible to the sovereign whose creature it is. Whatever institutions are created, and whatever powers are delegated by the sovereign many, the principle of pure democracy still exists so long as every individual and every body of individuals who exercise delegated power are responsible to the sovereign body by whom the power is delegated. Hence if property be made a qualification for certain offices, as in one of the forms of democracy mentioned by Aristotle, by the universal sovereign, such requisite qualification does not in itself alter the nature of the democracy, being only a rule or law fixed by the sovereign. It is however a rule or law of that class, the *tendency* of which, where the sovereign power is possessed by the many, is to undermine and ultimately destroy the power that made it.

Experience has shown that even where the universal people are sovereign, if the political community is large and spread over a great surface, every delegation of power, however necessary, is accompanied with danger to the existence of the sovereign power. The more complicated the machinery of administration becomes, and the more numerous are the administering bodies interposed between the sovereign and the accomplishment of the object for which the sovereign delegates part of his power, the greater is the risk of those who have had power delegated to them making themselves the masters of those who have conferred the power. In a democracy the great problem must be to preserve unimpaired and undisputed the vital principle of the sovereign power being in all and in every individual, and to combine with this such a system of delegated powers as shall in their operation always recognize that principle to which they owe their existence.

Of all the forms of government only two seem capable of exact definition, monarchy and democracy, and those two only seem to rest on any clear and intelligible principle. Forms of government which lie between these two have received the various names of aristocracies, oligarchies, &c., but no one has yet succeeded in explaining what an aristocracy is, or to what portion of a community political power must be limited in order to constitute an oligarchy.

DEMO'CRITUS was born at Abdera in Thrace, or, according to some, as we learn from Diogenes Laertius (ix. 34), at Miletus, in the year 460 B.C. He was thus 40 years younger than Anaxagoras, and eight years younger than Socrates. He received his first lessons in astrology and theology from some Magi, who had been left with his father by Xerxes when passing through Abdera to the invasion of Greece; and he is said to have been afterwards a hearer of Leucippus and Anaxagoras. That he heard Anaxagoras is doubtful, but, if he did, it must have been while Anaxagoras was at Lampsacus; for when this philosopher was banished from Athens (450 B.C.) Democritus was only ten years old. Democritus appears to have been a great traveller. He is said to have visited Egypt, that he might learn geometry from the Egyptian priests; to have been in Persis, and with the Gymnosophists in India, and to have penetrated into Ethiopia. He sojourned for some time at Athens; but from contempt of notoriety, as it is said, was known to nobody in that city. It is for this reason that Demetrius Phalereus, as cited by Diogenes Laertius (ix. 37), contended that Democritus had never visited Athens. One result of his extensive travels was, that he expended all his patrimony, which is said to have exceeded 100 talents. Now, it was a law of his country, that any one who spent his whole patrimony should be refused burial in his native land; but Democritus, having read his chief work aloud to his fellow-citizens, so impressed them with an admiration of his learning, that he not merely obtained a special exemption from the above law, but was presented with 500 talents, and was, on his death, buried at the public expense. (Diog. Laert. ix. 39.) A story substantially the same, though varying somewhat in detail, is given in Athæneus (iv. p. 198). He is said to have continued travelling till he was 80 years old. He died in the year 357 B.C. at the age of 104. There is a story of his having protracted his life for three days after death seemed inevitable, by means of the smell of either bread or honey, and in order to gratify his sister, who, had he died when first he seemed likely to die, would have been prevented from attending a festival of Ceres. (Diog. Laert. ix. 43; Athen. ii. 7.)

Democritus loved solitude, and was wholly wrapt up in study. There are several anecdotes illustrative of his devotion to knowledge, and his disregard of everything else. They conflict somewhat with one another in their details; but accuracy of detail is not to be looked for, and, tending all to the same point, they prove, which is all that we can expect to know, what character was traditionally assigned to Democritus. Cicero (*de Fin.* v. 29) speaks of him as, like Anaxagoras, leaving his lands uncultivated, in his undivided care for learning; while, as an instance of how these stories conflict, Diogenes Laertius represents him as having, on the division of the paternal estate with his two brothers, taken his own share entirely in money, as being more convenient than land for a traveller. Valerius Maximus (viii. 7) makes him show his contempt for worldly things by giving almost the whole of his patrimony to his country. He is said too to have put out his eyes, that he might not be diverted from thought; but Plutarch (*de Curiositate*, p. 521, C) rejects this story, and explains how it might have arisen. It was Democritus who, struck with the ingenuity displayed by Protagoras in the tying up of a bundle, raised him from the humble condition of a porter, and gained him for philosophy.

Democritus followed Leucippus at a very short distance of time, and preceded Epicurus by somewhat less than a century, as an expounder of the atomic or corpuscular philosophy. [ATOM.] He viewed all matter as reducible to particles, which are themselves indivisible (hence called *atoms*), and which are similar in form. He included mind under the head of matter, recognizing only matter and empty space as composing the universe, and viewed mind as consisting of round atoms of fire. (Aristot. *de Anim.* 1, 2.) Arguing that nothing could arise out of nothing, and also that nothing could utterly perish and become nothing, he contended for the eternity of the universe, and thus dispensed with a creator. He further explained the difference in material substances (mind, as has been said, being one of them) by a difference in the nature and arrangement of their component atoms, and all material (including mental) phenomena by different motions, progressive or regressive, straight or circular, taking place among these atoms and taking place *of necessity*. Thus the cosmology of Democritus was essentially atheistic.

In psychology he explained sensation, as did Epicurus after him, by supposing particles, *εἴδωλα*, as he called them, or sensible images, to issue from bodies. He also thought to explain men's belief in gods by the supposed existence of large images of human form in the air. In moral philosophy he announced nothing more than that a cheerful state of mind (*εὐεστὼ, εὐθυμία*) was the one thing to be sought after. The manner in which the follies of men affected him, and from which he derived his name of the 'laughing philosopher,' is well known. (Juv. x. 33—55.)

A list of the very numerous writings of Democritus is contained in Diogenes Laertius (ix. 46—49). They are arranged under the five principal heads of ethics, physics, mathematics, general literature, and arts; and there are besides a few of miscellaneous character. The list, classified in the same manner, and enriched with critical remarks, is given in Fabricius (*Bibliotheca Græca*, ed. Harles. vol. ii., p. 634—641). The reader will see in this work a list of the writings wrongly attributed to Democritus, and statements of the grounds on which they are severally pronounced spurious; among them are the writings on magic which are spoken of by Pliny (*Hist. Nat.* xxx. 1), and considered by him as genuine.

For an account of the philosophy of Democritus the reader is referred to Hill, 'De Philosophia Epicurea, Democritea et Theophrastea,' Genev., 1669; Ploucquet, 'De Placitis Democriti Abderitæ,' Tübing. 1767; Cudworth's 'Intellectual System,' chap. i.; and to the common histories of philosophy; and for general information concerning his life to Bayle's 'Dictionary,' and Fabricius' 'Bibliotheca Græca,' ed. Harles. vol. ii. p. 628.

DEMOISELLE. (Zoology.) [GRUIDÆ.]

DEMOIVRE, ABRAHAM, was born at Vitry in Champagne, on the 26th of May, 1667, and was descended of an antient and honourable family of the French Protestant church. The revocation of the edict of Nantes in 1685 compelled him to leave his native country, and, like a great number of the refugees created by that revocation, he settled in England, choosing for the field of his efforts the metropolis.

He appears at the earliest period to which any account of him reaches to have devoted himself to teaching mathematics, as the surest means of obtaining a subsistence. He also, though he was not the first who adopted that plan, read lectures on natural philosophy: but it does not appear that his attempts in this way were very successful, he being neither fluent in the use of the English language, nor a good experimental manipulator.

The popularity, as a book to be talked about, of Newton's great work, compelled Demoivre to enter upon the study of it; and there is no doubt that he was one of the few who at that time were able to follow the illustrious Newton in the course of his investigations. Demoivre's power, however, lay in pure mathematics of the kind now called analytical; for in all his writings there is scarcely a trace either of physical or geometrical investigation to be discerned. His writings on analysis abound with consummate contrivance and skill; and one at least of his investigations has had the effect of completely changing the whole character of trigonometrical science in its higher departments. [TRIGONOMETRY.]

At a comparatively early period of his residence in London he was admitted to the society of Newton and his immediate circle of personal friends; and many instances of the regard with which he was treated are current amongst the traditions which have reached our own time. This of course led to an intimacy with the leading mathematicians of that period; and his great talents soon obtained his election into the Royal Society, as well as, ultimately, those of Paris and Berlin. The estimate formed of his abilities, acquirements, and impartiality, is proved by his being nominated as a fit person to decide on the rival claims of Leibnitz and Newton to the invention of the method of fluxions.

Demoivre lived to the advanced age of more than eighty-seven; but as he outlived most of his early associates and friends, his circumstances became greatly reduced. He is said to have sunk into a state of almost total lethargy, the attacks of which often lasted for several days; and his subsistence was latterly dependent on the solution of questions relative to games of chance and other matters connected with the value of probabilities, which he was in the habit of giving at a tavern or coffee-house in St. Martin's Lane. He died on the 27th of November, 1754.

Demoivre's writings, we have already remarked, are distinguished by considerable originality of character. His separate publications are as follows:—

1. Miscellanea Analytica, de Seriebus et Quadraturis, 1730, 4to. This work contains several very elegant improvements in the then known methods of termination of series, as well as some new methods.

2. The Doctrine of Chances, or the Method of Calculating the Probabilities of Events at Play, 1718, 4to. This work was dedicated to Sir Isaac Newton: it was reprinted in 1738, with considerable alterations and additions. A third edition was afterwards published, differing little in anything of consequence from the second.

3. Annuities on Lives, 1724, 8vo. A work on the same subject, published by the distinguished Thomas Simpson, in 1742, in which some well-deserved compliments to Demoivre were introduced, led our author to publish a second edition of his work; and it is to be regretted that he was induced to insert some harsh reflections on Simpson's work, which were as unfounded as they were uncalled for by the manner in which Simpson had treated his predecessor's first edition. Simpson, however, replied to it in an appendix to his work in the following year, 'containing some remarks on a late book on the subject, with answers to some personal and malignant representations in the preface thereof.' The only excuse that can be urged for Demoivre in this matter is, that he was an old man, that he considered the domain his own, and Simpson as a mere poacher on it, and that he was under the influence of men who wished to crush the rising genius and talents of a man like Simpson, who had not been born to the advantages which enabled him to obtain a regular academical education. Demoivre, notwithstanding his age, had the good sense to see that he had attacked a man with whom he could not cope; but still pride prevented his making any apology to his younger competitor. In 1750 he published a third edition of his work, in which he merely omitted the offensive reflections of his former preface; and here the dispute seems to have terminated. Demoivre also published a considerable number of papers in the 'Philosophical Transactions.' There is not one of these which is not of sterling value on the subjects of which they treat.

DEMOIVRE'S HYPOTHESIS. An hypothesis on the duration of human life, formed by Demoivre, as he informs us in the preface of his Treatise on Annuities, some years after the publication of the first edition of his Treatise on Chances, on the inspection of Halley's Breslaw Tables. Observing that the decrements of life at the middle ages were very nearly uniform, Demoivre made an extension of his law to the whole of life, not thereby intending to assert that any such principle was correct for childhood and old age, but simply that the effect of the error upon the value of annuities at the middle ages of life would be trivial. The hypothesis is as follows:—*of eighty-six persons born, one dies every year, till all are extinct.* The remainder of eighty-six years, at every age, Demoivre called the *complement of life*. The half of the complement of life is the average duration (commonly called the expectation); and the peculiarity of Demoivre's hypothesis is, that, according to it, every person has an even chance of living the average time of people of his age, which is not true of other tables. The Northampton Tables certainly do nearly coincide with this law at the middle periods of life, but the Carlisle and most other tables differ materially from it. Thus at twenty years of age, according to the Carlisle Tables, the *average duration* is to the age of sixty-one and a half, while each individual aged twenty *has an even chance* of living to be about sixty-five years of age.

The following table (left hand) shows the number of persons out of ten thousand who may be expected to die in the year next following their attaining the age marked in the first column, according to this hypothesis, the Northampton and Carlisle Tables, and the Belgian Tables of M. Quetelet:—

Age.	Hypothesis.	Northampton.	Carlisle.	Belgian.
10	132	92	45	88
20	152	140	71	120
30	179	171	101	126
40	217	209	130	144
50	278	284	134	183
60	385	402	335	325
70	625	649	516	680
80	1667	1343	1217	1425

Age.	Hypothesis.	Northampton.	Carlisle.
10	19·9	20·7	23·5
20	18·5	18·6	21·7
30	16·8	16·9	19·6
40	14·8	14·8	17·1
50	12·5	12·4	14·3
60	9·7	9·8	10·5
70	6·4	6·7	7·1
80	2·3	3·8	4·4

The second table shows the values of annuities on lives of the ages in the first column, at three per cent., in years' purchase. Practically speaking, then, the celebrated Northampton Tables agree with Demoivre's hypothesis in their money results, though by no means exhibiting the same physical law of life.

It must be observed of Demoivre's hypothesis, that any one which supposes uniform decrements throughout is entitled to the name, whether the limit of life be eighty-six years or not. Conformably to this view, the modification which best represents the Carlisle Tables would be, that, of 128 persons born, one dies every year; a supposition which would be as much in excess on one side, for old lives, as that of eighty-six is in defect, but which would represent the Carlisle Tables from twenty to fifty years of age as well as the use of eighty-six does the Northampton Tables.

DE'MONA, VAL DI, one of the three old divisions of Sicily, which comprised the north-east part of the island, is now divided into the two intendenza, or provinces of Catania and Messina. A great part of the Val di Demona is occupied by the mass of Ætna. Near the north coast, and parallel with it, is a continuation of mountains, of which Mount Madonia, the antient Nebrodes, near Cefalu, and Mount Dinamari, near Messina, are the highest summits. The Val di Demona is the most woody part of all Sicily. Besides the extensive forests which encircle Ætna, there is near the north coast a large forest, which, under the names of Bosco di Caronia, Bosco di Castro, and Bosco di Cutò, extends more than 20 miles in length from east to west. The boundaries of the Val di Demona were, to the south, the river Giarretta, which divided it from Val di Noto, and, to the west, the small river Della Rouella, which separated it from the Val di Mazzara. The district of Cefalu, which is the most western part of the Val di Demona, forms now part of the intendenza or province of Palermo. [ÆTNA.]

DEMONSTRATION. The old use of this word has been alluded to in the life of COPERNICUS. It meant any manner of *showing* either the connexion of a conclusion with its premises, or that of a phenomenon with the asserted cause. Thus we find it asserted by an early writer that the system of Copernicus, *though false*, gave *truer* demonstrations of the celestial motions than any other: meaning that those motions could be more easily shown to be a necessary consequence of the hypothesis cited than of any other. It is very important, in reading the old English writers, to remember this use of the term.

Demonstration now means only that process by which a result is shown to be a necessary consequence of the premises from which it is asserted to follow, on the supposition that those premises are admitted, either as matter of fact, or of intuitive evidence, or of previous demonstration. Thus the 47th proposition of the first book of Euclid demonstrates a certain property of a right-angled triangle, on the supposition—1, that all the preceding propositions are true; 2, that the axioms used in geometry, whether expressed or implied, are true also. It makes the consequence as certain as the premises, by means of the indubitable character of the connecting process. This strict use of the term demonstration belongs to the science of logic, which is the art of demonstrating from premises, without reference to the truth or falsehood of the premises themselves.

But in common life the word demonstration means any sort of reasoning which the party using the term chooses to call proof. 'I consider it as demonstrated,' means the same thing as 'evidence has been offered which makes it so probable to me that I am willing to act upon that evidence.' Most minds have no idea of a middle state; they either absolutely receive or absolutely reject: so that in fact demonstration comes with any degree of balance of evidence on one side or the other. It is easy to admit that in common life high probability is the ground of assent, and that it never can be otherwise: but there is mischief in the use of the same term both for logical inference and for its mixture with matters of guess or feeling, or unassisted perception. The logician might consent to abandon the word demonstration for popular use, and to adopt another: but it would result, that the new word, whatever it might be, would immediately be seized by those who confound what is commonly called argument with what is actually demonstration. Whatever may be the strongest term in use, it will be adopted by strong assertors: nor will he who has shown probable reason, however great, for the adoption of a result of argument, be satisfied unless his conclusion be received as *certain*. What we have here said refers entirely to the use of the word demonstration: the fallacy to be feared is the placing in the result of it, in one sense, the degree of confidence which is only obtained by confounding that sense with another. Two parties, both convinced that a conclusion has a high degree of evidence, dispute whether the evidence *amounts to demonstration*. To settle this point, they sift the evidence most minutely, and perhaps entirely forget to inquire whether they mean the same thing by the word demonstration.

DEMONSTRATIONS, in military affairs, are operations of any kind which may be performed for the purpose of deceiving the enemy respecting the measures which it is intended to employ against him.

They consist in displaying an apparent activity in forming or repairing a road, or in sending provisions or stores to a particular place, as if preparatory to a march of troops in that direction; in marking out ground as if for an encampment; and in detaching bodies of troops to make false attacks. Such demonstrations are made chiefly with a view of inducing an enemy to divide his forces, and thus weaken his line at points against which the real movement or attack is intended to be directed.

In order to succeed, however, in these demonstrations, they should be made with great precaution, that they may have every appearance of indicating a serious enterprise: even the troops who are to execute them should be unacquainted with the object in view, lest a deficiency of energy should betray the secret to the enemy, who must be supposed to be on his guard against such attempts, and who may consequently take measures to render them useless.

DEMO'STHENES was born probably about B.C. 384, Ol. 99. 1. He was the son of Demosthenes, an Athenian citizen of the demus Pæania, who carried on the trades of cutler and cabinet-maker, and of Cleobule, the daughter of Gylon. This Gylon, who had been governor of Nymphæum, an Athenian settlement in the Tauric Chersonesus, betrayed it to the Scythians, and, afterwards taking refuge with their chief, married a Scythian woman, who was the maternal grandmother of Demosthenes. This impurity of blood and the misconduct of Gylon, his maternal grandfather, formed a theme for the taunts of Æschines. (*Oration against Ctesiphon.*) There is a well-known allusion in Juvenal to the trade of Demosthenes the elder (x. 130)·

> Quem pater ardentis massæ fuligine lippus,
> A carbone et forcipibus gladiosque parante
> Incude et luteo Vulcano ad rhetora misit.'

The point of the satirist is however somewhat lost, when we remember that Plutarch applies to the father a term (καλοκἀγάθος) which expresses all that can be said to the advantage of a man, and that he had two manufactories (ἐργαστήρια) containing on the whole more than 50 slaves. (Creuzer, *View of Slavery in Rome*, note 40, and the *Orations of Demosthenes against Aphobus.*)

Demosthenes the elder died when his son was seven years old, leaving him and a sister, younger than himself, to the care of three guardians, Aphobus and Demophon, his first cousins, and Therippides, a friend. The property left by him amounted to 15 talents, above 3000*l.* in specie, taking silver as the standard. The guardians, however, as we learn from Demosthenes himself, disregarded all his father's injunctions, and, while they neglected to improve the property of which they were trustees, embezzled nearly the whole of it. (*Orations against Aphobus.*) Plutarch states that they also deprived Demosthenes of proper masters. He himself, however, in a passage where it is his object to magnify all that concerns his own history, boasts of the fitting education which he had received. (*Orat. on the Crown*, p. 312.) He is said to have studied philosophy under Plato, and to have been a pupil of Eubulides of Miletus.

Having heard Callistratus plead on one occasion, he was fired by that orator's success with ambition to become an orator himself, and he accordingly received instructions in the rhetorical art from Isæus. Cicero (*De Oratore* ii. 94) mentions Demosthenes as one of those who came forth from the school of Isocrates: Plutarch, on the other hand, expressly states that he was not a pupil of Isocrates, and goes out of his way to invent reasons why Demosthenes should have preferred the instructions of Isæus. We assume however that Isæus was his principal instructor, in accordance with the testimony of the various biographers. (Libanius, Zosimus.) We are told that many suspected the speeches against his guardians to have been written, while others said that they were corrected, by Isæus, partly because Demosthenes was so young when they were delivered, and partly because they bore marks of the style of Isæus. He is said to have taken lessons in action from Aristonicus, a player.

The physical disadvantages under which Demosthenes laboured are well known, and the manner in which he surmounted them is often quoted as an example to encourage others to persevere. It should be observed, however, that the authority for some of these stories is but small, and that they rest on the assertions of writers of late date. He was naturally of a weak constitution: he had a feeble voice, an indistinct articulation, and a shortness of breath. Finding that these defects impaired the effect of his speeches, he set resolutely to work to overcome them. The means which he is said to have taken to remedy these defects look very like the inventions of some writer of the rhetorical school, though Plutarch (*Demosth.* x.) quotes Demetrius the Phalerian as saying that he had from the orator's own mouth what Plutarch has stated in the chapter just referred to. Among these means we hear of climbing up hills with pebbles in his mouth, declaiming on the sea shore, or with a sword hung so as to strike his shoulder when he made an uncouth gesture. He is also said to have shut himself up at times in a cave under ground for study's sake, and this for months together.

Having been emancipated from his guardians, after a minority of ten years, he commenced a prosecution against them to recover his property. Estimating his losses at 30 talents (inclusive of ten years' interest), he sued Aphobus for one-third part, and gained his cause, without however succeeding in obtaining more than a small part of his money. This took place B.C. 364, when he was in his 20th year, or, as he says himself (*Mid.* 539, § 23), when he was quite a boy; but the extant orations against his guardians are evidently not the work of a youth of that age, as a careful perusal of these orations will clearly show. He subsequently adopted the profession of writing and delivering, as a hired advocate, speeches for persons engaged in private and public causes—a practice which was now generally adopted by the Greek orators, and was attended with considerable profit. His first speech on a public occasion was made in 355 B.C., in which year he wrote the speech against Androtion, and wrote and delivered that against Leptines.

Of his speeches relating to public concerns, there are three which have a direct bearing on his personal history: the speech against Midias, that concerning Malversation in the Embassy, and that in behalf of Ctesiphon, or, as it is commonly called, the 'Oration on the Crown.' The two last are briefly noticed under the article Æschines. [ÆSCHINES.] With reference to the first, it should be premised that, in the year 351 B.C., Demosthenes voluntarily undertook the expensive office of Choragus, and that, during the performances at the Dionysia, when discharging his duties, he was insulted and struck by Midias. Demosthenes brought an action against Midias for assaulting him in the performance of what was regarded as a religious duty, and thus Midias was involved in a prosecution for sacrilege. Demosthenes obtained a verdict. The extant oration against Midias was written three years afterwards.

The first speech on a public affair that remains, and probably the first which Demosthenes published, is that on the Symmoriæ, which was delivered B.C. 354. A few words will be necessary to explain the state of parties at the time.

About ten years previous to this oration the power of Sparta had been broken by Thebes, who in her turn sank into inactivity after the death of her great general Epaminondas in the battle of Mantinea, B.C. 362; three years after this time Philip of Macedon began his reign. His first step, after defeating two other claimants to the throne and compelling the Pæonians and Illyrians to submission, was to possess himself of several Greek colonies to the south of Macedonia, and to interfere in a war of succession then going on in Thessaly. Athens, not yet recovered from the effects of the Peloponnesian war, had been engaged from 357 to 355 B.C. in a war with her allies, Rhodes, Chios, Cos, and Byzantium, which ended in their throwing off the yoke under which she had held them, about a year before the delivery of the oration on the Symmoriæ. There were, as usual, two parties in Athens. With one of these, which was headed by Phocion, Philip had an intimate connexion, and this party was not unfavourable to his designs, either through want of energy, or from believing that they would do Greece no injury. The other party, called by Mitford 'the War Party,' was headed by a profligate general named Chares, and was that to which Demosthenes was afterwards attached.

Perhaps the most important event of the time was the war occasioned by the seizure of the temple of Apollo at Delphi by the Phocians. There had been a dispute as to the sacred land, which had long belonged to Phocis, and the Amphictyonic council asserting their claim, Philomelus the Phocian seized the temple, and its treasures were freely used in the war, which continued till 346. It was through this war that Philip contrived to identify his interests with that of the Amphictyons at large, and at last to be elected their leader, and hence we must generally consider the leading parties in the struggle between Philip and Demosthenes to have been the Amphictyonic states and Macedon on the one side, against Athens and occasionally Persia on the other; while we must remember that in Thebes, the principal Amphictyonic state, there was a strong party against Philip, as in Athens there was one equally strong for him.

Under these circumstances, Demosthenes made his oration on the Symmoriæ, which in part relates to a question of finance, but more particularly to a scheme then on foot for sending Chares with an armament into Asia against the Persians; a project utterly preposterous, as Athens had enough to do to hold her ground against the refractory colonies and subject states, without engaging in other undertakings. Against this measure Demosthenes directed his eloquence with success, and this may be considered the beginning of his struggle with Philip, for the Macedonian cause would have gained by any loss which Athens might sustain. About a year after, Philip began to take an active part in the affairs of the Sacred War, as that in Phocis is usually called. He defeated the Phocian alliance, and only retired, as it should seem, to avoid any rupture with Athens, such as might preclude all hope of adding her to the number of his auxiliaries. At this juncture Demosthenes, who had been opposed to the former war, joined Chares, and delivered his first Philippic.

The motive of this apparent change of opinion is evident: on the former occasion, he saw that war would have been the dispersion of strength which was needful for a nearer struggle; now, he saw that the time for that struggle was come, and knew that, to be effectual, Athens must direct it. (*Oration on the Crown*, p. 249.) But Athens, however powerful when roused, had lost much of that spirit of individual bravery which characterized her in the best times of her history. The exhortations of Demosthenes failed in producing the desired effect; nor was it till Philip had defeated Kersobleptes the Thracian, whom it was the interest of the Athenians to support as his rival, that they considered themselves compelled to commence military operations against him.

This was at last done by sending successive expeditions to Olynthus, a maritime town near the isthmus of Pallene, and by an inroad into Eubœa, under the direction of Phocion, by means of which the Macedonian influence was lessened in that island. The former step was however the more important, as Olynthus was a place of strength, and was looked on with great jealousy by Philip.

Olynthus had made alliance with Athens contrary to a compact with Philip, and although well enough supplied with arms and men, it required the assistance of Athenian soldiers. To provide for these expeditions, Demosthenes, in his Olynthiac orations, advised the application of the money appropriated to the public festivals, and in so doing was opposed by Phocion: this has been made a subject of petty attack by Mitford, who believing the oration περὶ Συντάξεως to be genuine, accuses Demosthenes of inconsistency, as in that oration the speaker opposes a similar measure. And yet taking Mitford's own ground, we should rather admire the steadiness of purpose which made him oppose his own friends when he thought it for the public good, and the discrimination which told him that the time and opportunity for effort were now come.

In spite however of the exertions of Demosthenes, Olynthus was taken by Philip in the spring of 347 B.C., and we may here remark, that the frequency of failure in action against an enemy who was constantly outdone in negotiation, is only to be accounted for by the fact, which Mitford notices, of the decline in personal bravery in a nation long used to conquest.

Early in the succeeding year Demosthenes, with Æschines and eight or nine others, went on an embassy to Philip, to treat of peace. According to Æschines, he exhibited great want of self-possession on this occasion. If this were the case, it is surely not too much to attribute it to a consciousness that he had departed through fear of present danger from his one great object of opposition to Philip, who, even during the settlement of preliminaries, seized on several Thracian towns. The motive which urged Demosthenes to agree to a peace is probably that assigned by Schaumann (see also Demosth. *Orat. on the Peace*), that the means of resistance were too small to allow any hope that Athens alone could use them effectually. Be that as it may, Demosthenes never slackened his efforts, and in 343 B. C. we find him accusing Æschines of malversation in the former embassy, and acting as one in a second to counteract Philip's influence in Ambracia and Peloponnesus. Since the cessation of the Phocian war in 346 B. C., this influence appears to have increased, as well by the weakening of Sparta and Thebes, as by his acquisition of two votes in the Amphictyonic council; hence the renewed energy of Demosthenes and the expedition of Diopeithes to the Hellespont, for the purpose of protecting the Athenian corn trade. (*Orat. on the Crown*, p. 254.)

About this time too Demosthenes became in a more decided sense the leader of his party, in the room of Chares, and for the next two years employed himself in supporting and strengthening the anti-Macedonian party in Greece. His principal measures were an embassy to the Persians; the strengthening of the alliance with Byzantium and Perinthus for the purpose of forming alliances; and the relinquishment by Athens of all claim on Eubœa, in which Phocion concurred.

The struggle now began. Philip laid siege to Perinthus, to Selymbria, and afterwards to Byzantium, and fitted out a fleet. At this juncture, Demosthenes delivered his fourth Philippic, in which, among other things, he recommended the restoration of the festival-money to its original use, alleging the scruples felt by some concerning its application to military purposes, and the increase in revenue which rendered that application no longer necessary. In 339 B.C. the siege of Byzantium and Perinthus was raised, and a short peace ensued; but in the succeeding spring Philip was chosen Amphictyonic general. The object of Demosthenes was now somewhat changed. Before, he had to oppose a foreign influence which sought to insinuate itself into the affairs of the Grecian States; now that wish had been gained, and his business became that of arranging party against party in the different sections of the same nation.

From this time to the battle of Chæronea he was engaged in negotiations to detach different states from the Amphictyonic alliance. At Thebes he was completely successful: a strict alliance was concluded between Thebes and Athens, and Demosthenes became almost as much the minister of the one state as of the other. He defeated all the counter efforts of Python, Philip's agent, and procured the preparation of an army and fleet to act against Philip, who had seized and fortified Elatea, a principal town in Phocis. But his hopes were again destroyed at the battle of Chæronea, in the summer of 338 B.C., and Philip remained apparently master of the destinies of Greece; perhaps not unaided in the conflict by a superstition which considered his cause as in some sort identified with that of Apollo, the Delphian god. Under these circumstances, the party of Phocion made some faint attempt at action; but Philip, with his usual remarkable policy, forestalled them by releasing his Athenian prisoners and using his victory with the greatest moderation.

Demosthenes joined in the flight from Chæronea, not without some disgrace, and does not again appear till the funeral ceremony for those who fell, when he pronounced the customary oration (which, however, has been decided not to be that which goes under this name), and resumed his place at the head of the government. He became victual-provider for the city, superintended the repairs of the fortifications, and was proceeding with his usual vigour in prosecuting his political schemes, when news came that Philip had been assassinated, July, 336 B.C. The conduct of Demosthenes on this occasion, as reported by Plutarch and Æschines, has sometimes furnished a subject for strong animadversion. He is said to have appeared in a white robe, although his daughter was just dead; and he or his friends proposed honours to the memory of the assassin of Philip. As to the first of these charges, it may be said in his defence, that it only indicates how completely devoted he was to the cause of his country, even to the exclusion, in a great degree, of private affections.

Mitford has devoted a section to anecdotes of his favourite character, Philip, whose merits no admirer of Demosthenes would wish to depreciate, the chief glory of the great Athenian orator and statesman being, that he made head so successfully against such an opponent. It is the habit of party writers to ascribe unbounded virtues or to withhold all kind of praise, with equal want of reason. The history of the times of Philip and Demosthenes, by Mitford is one of the strongest examples of this habit that we can refer to.

On the accession of Alexander, Demosthenes persevered in his decided opposition to Macedon. Alexander's first employment, after his election as stateholder by the Amphictyonic league, was to quell an insurrection in the northern and western provinces of Macedonia. While he was absent, a report of his death was spread at Thebes, which revolted from the confederacy. Demosthenes (Plutarch) fanned the flame of this insurrection, and, on Alexander's sudden appearance before Thebes, Demosthenes was appointed to confer with him; but he went only to the borders of Attica. As Alexander demanded his person immediately after the destruction of Thebes, together with nine other Athenians, on the pretext of trying them as traitors, it is most probable that, when he was sent on the mission to Thebes, he had reason to fear some act of violence if he put himself in the power of Macedon. Demades, a man as high in point of intellect as he was debased in morals, was the negotiator in his place, and by some means or other contrived to save Demosthenes. If, as Plutarch relates (*Life of Phocion*), a bribe was given to Demades to persuade him to exertion in behalf of Demosthenes, it only reflects shame on the receiver, and does not seem to implicate Demosthenes in any such charge of meanness as Mitford has made against him. (xliv., § 3.)

During Alexander's Persian expedition, Demosthenes had to sustain an attack from his old rival Æschines. He defended himself from the charges brought against him [ÆSCHINES] in the oration called that 'On the Crown.' But we hear little of him as a public man. He probably considered that, at a time when the chief enemy of the liberties of Greece was employed in schemes most likely to conduce to her welfare, from the ruinous effect they promised to produce on the strength of Macedonia, any measures likely to recall Alexander from Asia would only be the means of binding still faster those chains which it had been his own constant aim to loosen.

The only affair of moment in which Demosthenes was at this time engaged was occasioned by the treachery of Harpalus, one of Alexander's generals, who had been left governor of Babylon when Alexander proceeded on his Indian expedition. Harpalus, having grossly abused his trust, fled to Europe on the return of Alexander, accompanied by 6000 Greek soldiers. He came to Athens as a suppliant, and engaged the orators to support him. All but Demosthenes espoused his cause with readiness, and he at last concurred, not without suspicion of bribery (Plutarch.) The Athenians, however, refused to listen to his proposal of organizing a movement against Alexander, and prosecuted Demosthenes for recommending measures not for the good of the state. He was fined 50 talents by the Areopagus, and, being unable or unwilling to pay this sum, retired to Ægina and Trœzene, where he remained from 324 B.C. till the death of Alexander, which occurred in the following year. Immediately on the news of that event, he renewed his opposition to Macedon, even before his recall, which Plutarch says was owing to this conduct.

During the Lamian war he presided at Athens, and when Antipater defeated the confederate Greeks, and marched upon the city, Demosthenes, as the prime mover of the confederacy, judged it prudent to withdraw to Calauria, a little island opposite Trœzene, where he took refuge in a temple of Poseidon. Macedonian messengers were sent to persuade him to accompany them to Antipater, but he resisted all their entreaties. Plutarch, from whom this account is taken, says, that he retired into the inner part of the temple under pretence of writing a letter, and while there took poison, and died before he could get out of the temple. Another and much more probable account, which Plutarch also gives as coming from one of Demosthenes' friends, is, that 'by the singular favour and providence of the gods he was thus rescued from the barbarous cruelty of the Macedonians;' in other words, that he died of some sudden attack brought on by the anxiety and disappointments of the last few weeks of his life.

Demosthenes seems to have been actuated all through his political life by the strongest passion to promote the interests of his native state; and if he only delayed the fate of his country, he did what no one else seems to have attempted. It is the highest praise of his prudence and foresight that all his political predictions were verified; as he distinctly foresaw, it was the influence of Macedon, and not internal dissension, which destroyed the sovereign and independent political communities of Greece. Those who expect to find in his style of oratory the fervid and impassioned language of a man carried away by his feelings to the prejudice of his judgment, will be disappointed. He is said not to have been a ready speaker, and to have required preparation. All his orations bear the marks of an effort to convince the understanding rather than to work on the passions of his hearers. And this is the highest praise. Men may be *persuaded* by splendid imagery, well-chosen words, and appeals to their passions; but to *convince* by a calm and clear address, when the speaker has no unfair advantages of person or of manner, and calls to his aid none of the tricks of rhetoric,—this is what Cicero calls the oratory of Demosthenes, the ideal model of true eloquence. (*Orat.* c. 7.) Most of the speeches of Demosthenes on political affairs, as we now possess them, are laboured compositions, which have evidently been frequently corrected by the author before he brought them into that state in which they now appear. Notwithstanding the easy flow of the language, the art and industry of the orator are visible in almost every line; and in nothing are they more apparent than in the admirable skill by which he makes almost every period produce its effect, and in the well-judged antithesis which gives such force and precision to his expression, that it seems as if no other words and no other order of words could be so appropriate as those which he has chosen. The style of many of the orations on civil matters which were delivered before the courts of justice is very different: there is an air of easy negligence about them, and an absence of that laboured accuracy which characterizes his other compositions. It is not unusual to find sentences that might be called grammatically incorrect. But these orations are invaluable as specimens of what we now call stating a case, and well worth the attentive study of those who would make themselves acquainted with the social condition of Athens at that time.

The orations of Demosthenes may be divided into two great classes, political and judicial, and this last again into those delivered in public and those in private causes.*

Those of the first class which are extant were delivered in the following order:—The oration on the Symmoriæ, B.C. 354; for the Megalopolitans, B.C. 353; the 1st Philippic, B.C. 352; for the Rhodians, B.C. 351; the three Olynthiacs, also called the 2nd, 3rd, and 4th Philippics, B.C. 349; the 5th Philippic (which forms part of the 1st in our present copies), B.C. 347; the 6th Philippic, also called the oration on the Peace, B.C. 346; the 7th Philippic, B.C. 344; the 8th Philippic, also called the oration concerning Halonnesus, B.C. 343; the 9th Philippic, also called the oration on the Chersonesus, the 10th and 11th Philippics (also called the 3rd and 4th), all in B.C. 341; the 12th Philippic, also called the oration against the Letter, B.C. 339; the Funeral oration, B.C. 338; and the oration on the treaty with Alexander, after B.C. 334. Of these, that concerning Halonnesus, the 11th Philippic, also called the 4th, and that against the Letter, are decided to be of doubtful authority, as is also the oration on the Contribution (περὶ συντάξεως), which is of doubtful date, that on the treaty with Alexander, and the Funeral oration.

Of the 1st division in the 2nd class, we find those against Androtion and Leptines, B.C. 355; that against Timocrates, B.C. 353; that against Aristocrates, B.C. 352; that against Midias, B.C. 348; that on Malversation in the Embassy, B.C. 343; that against Neæra, about B.C. 340; that against Theocrines, after B.C. 336; the two against Aristogiton, after B.C. 338; that on the Crown, B.C. 330. Those who are curious respecting the date of the last-mentioned orations, may refer to Clinton (*Fasti Hellen.*, p. 361), from whom these dates are taken.

Of the 2nd division are the three against Aphobus, the two against Onetor, and that against Callippus, all in B.C. 364; those against Polycles, and on the Naval Crown, after B.C. 361; that against Timotheus, before B.C. 351; that against Euergus and Mnesibulus, after B.C. 356; that against Zenothemis, after B.C. 355; those against Bœotus and for Phormio, B.C. 350; the two against Stephanus, before 343 B.C.; that against Bœotus about the dowry B.C. 347; that against Pantænetus, after 347 B.C.; that against Eubulides, after 346 B.C.; that against Conon, after 343 B.C.; that against Olympiodorus, after 343 B.C.; that in the cause of Phormio, after 336 B.C.; that against Dionysodorus, after 331 B.C. To these must be added, that against Apaturius; that in the cause of Lacritus; that against Nausimachus and Xenopithes; those against Spudias, Phænippus, Macartatus, Leochares, Nicostratus, and Callicles. Of these in the second class doubts are entertained regarding the authenticity of those against Neæra, Theocrines, Aristogiton, Onetor, Timotheus, Euergus and Mnesibulus, Stephanus, Eubulides, Phænippus and Nicostratus; but of these Schaumann decides for those against Timotheus and Eubulides.

The orations of Demosthenes were edited ten times in the sixteenth century, and twice in the seventeenth. They have been re-edited by Taylor, Reiske, the Abbé Auger, Schaefer, and Bekker. The text of Bekker, which is now the standard, is founded on a careful collation of the MSS. Those who are admirers of the greatest orator of antiquity, and of the greatest of all ages, ought to feel under obligations to this distinguished philologist for purging the text from the wild conjectures of Reiske and others, and giving us the genuine readings of the best MSS. Of separate orations, F. A. Wolf has given an edition of that against Leptines; Rüdiger of that on the Peace, of the first Philippic, and the three Olynthiacs; Buttmann and Blume of the Midias; and Voemel of the Philippics.

The orations of Demosthenes and Æschines were translated into German with notes, by J. J. Reiske, Lemgo, 1764; a correct, but tasteless version. The political speeches were translated with notes, by Fr. Jacobs, Leipzig, 1805-8; and the eleven Philippics, by Alb. Gerh. Becker, Halle, 1824-26. There are also other German translations of some of the speeches. There is a French translation of Demosthenes and Æschines by Auger. Leland has translated into English all the orations which refer to Philip, including the Philippics and Olynthiacs, with the oration of Æschines against Ctesiphon, and one by Dinarchus, but with no great success. To express the simplicity, perspicuity, and force of the original, would require the translator to possess powers the same in kind as those which Demosthenes himself possessed, and near them in degree.

(Mitford's *Greece;* Schaumann's *Prolegomena to Demosthenes;* Plutarch's *Demosthenes;* *Life* by Zosimus of Ascalon; *Lives of the Ten Orators;* Taylor's *Life of Demosthenes;* Clinton's *Fasti Hellenici, and the Orations of Demosthenes.*)

Bust of Demosthenes, Townley Gallery, British Museum. Height, 1 foot 8¼ inches.

DEMOUSTIER, CHARLES ALBERT, a French writer, born at Villers-Cotterets in the year 1760. He was connected on his father's side with the family of Racine. The work which chiefly brought him into notice was his 'Lettres à Emilie sur la Mythologie.' These letters are written in a pleasing style, and attained that popularity which is usually awarded to works on learned subjects, when written in an amusing manner. Indeed it appears to have gained more than its just meed of applause, and the consequence was, that when this had subsided, a re-action took place, and the work was censured with too much severity. His other works are chiefly theatrical; of these 'Le Conciliateur,' a comedy in verse, was one of the best and most successful; there is not much humour in it, and scarcely any delineation of character, but the plot is excellently constructed, the incidents are striking and uncommon, and the author has acquitted himself well of the difficult task of expressing moral sentiments, without being mawkish. An anecdote is told of Demoustier which proves his excessive good humour. A young man being present at the representation of one of the author's comedies, felt by no means satisfied, and requested the gentleman beside him to lend him a hollow key (whistling with a key being the French mode of expressing disapprobation); the gentleman complied with his request, and was no other than Demoustier himself. He died at the place of his birth in 1801.

DEMULCENTS are medicinal agents which have the property of protecting sensible surfaces from the action of irritating matter, by hindering it from coming in direct contact with them. They are thus distinguished from diluents, of which water may be taken as an example, which often lessen acrimony by diluting or attenuating the fluid in which it exists. When much water is present in any demulcent liquid, the action is partly that of a diluent, but the chief benefit results from the bland nature of the substance, or from its viscidity. Demulcents are either solutions, such as mucilage of gum arabic, or certain substances mechanically diffused through water or milk, such as wax, spermaceti, or suet. Their beneficial effects are greatest over the mucous surfaces with which they come into immediate contact, such as the throat, stomach, and intestinal canal, but by sympathy their soothing action would appear to be extended to the mucous surfaces of the lungs, and of the urino-genital organs. Mucilaginous substances, such as gum, are not easily digested, unless some bitter or astringent principle be taken along with them; so that demulcents pass along the intestinal canal, shielding it from irritating substances throughout its entire length, though less effectually as they proceed, and become mingled with the various secretions in their passage. They thus afford considerable protection to the inner coat of the stomach and intestinal canal against poisonous agents, and for this purpose, milk, gruel, or oil, are frequently employed, though devoid of any power to disarm the substance chemically of its virulence.

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* The distinction between public and private causes is *roughly* that which in English law exists between criminal and civil cases.

DEMURRAGE, the term used in commerce to denote the money payable to the owner of a ship on the part of the shippers or consignees of goods, as compensation for detention beyond the time stipulated for her loading or discharge, as the same is expressed in the charter-party or bills of lading. It is usual to insert in all charter-parties the number of working days allowed for the loading of the ship, and also for her unloading, and likewise the sum *per diem* which may be claimed for delay beyond those periods in either case, in addition to the stipulated freight. Sometimes the number of working days for loading and unloading are stated together, so that any delay in the one case may be compensated by greater speed in the other. When the owners of the ship enter her outwards for any port, to receive such goods as may offer, and consequently where no charter-party exists, there is no stipulation for demurrage in the part of loading, but in this case it is common to insert on the face of the bill of lading a statement of the number of days after her arrival at her destined port in which time the goods must be taken from on board the ship, and also the rate of demurrage chargeable daily for any exceeding that time. No claim for demurrage can be set up where a ship is detained by contrary winds or stress of weather, nor where the government interferes to lay an embargo, nor where the port is blockaded by a hostile force, but the claim on the part of the ship ceases so soon as the goods are shipped and the clearances are passed at the Custom-house.

DEMURRER (*demorari*, to stay) is that pleading by which a question of law is raised between the parties to a suit; the party demurring refuses to proceed with the pleadings towards an issue, and requires the judgment of the court whether, upon his opponent's own showing, sufficient statement has been made to sustain the suit. A demurrer therefore admits the truth of the opponent's allegations. (Stephen; Co. *Litt.*)

DEMUS. [ATTICA.]

DENA'RIUS, a Roman coin of silver, so called from containing ten asses. It answered to the Attic drachma. After the first Punic war, the denarius became the representative of sixteen asses, and though Augustus reduced it to twelve, it continued subsequently at the value of sixteen as low as the time of Gallienus. Pinkerton says it was worth eight-pence of our money. It was the chief silver coin in Rome for 600 years, down to the time of Constantine I.

The earliest denarii are those which have the helmeted head of Rome, the Dioscuri, or the head of Jupiter, upon their obverse. Many of them had chariots, bigæ, or quadrigæ, represented on their reverses; such coins were called *bigati* and *quadrigati*. The half of the denarius was called *quinarius*, as containing five asses; the quarter, *sestertius* as money *semistertius*, containing two asses and a half.

Many of the family Denarii, as those of the Ælian, Æmilian, Calpurnian, Didian, Fulvian, Papinian, Tullian, and numerous other families, were marked on the obverse with the numeral X; others of the same and other family coins have the X crossed by an upright or horizontal bar, sometimes taken for a star or asterisk, but clearly intended to designate the value. The denarii which went for sixteen asses sometimes continued to be marked with X, and sometimes had the numerals XVI. Akerman, in his *Descriptive Catalogue of rare and unedited Roman Coins*, 8vo., Lond., 1834, vol. i., p. 15-19, has given the actual weight of the silver denarii in Troy grains, from Pompeius Magnus to Constantinus Magnus.

The *denarii æris* or *ærei*, of copper, began with th Emperor Valerian, and were at first washed with silver Pinkerton thinks they came in the place of the sestertius, and that six of them went to the silver denarius, as six of the later sestertii did.

The word denarius was also applied to the ordinary gold coin of Rome, the *aureus*, in the same manner as the English writers speak of the gold penny of Henry III. *Aurei denarii* are mentioned by Petronius. The denarius aureus was equivalent to 30 silver denarii. The half-aureus, in the same manner, was termed quinarius. (More *Thesaur. Famil. Roman.*; Greave's *Disc. of the Roman Foot and Denarius*, 8vo. Lond., 1647; Pitisci *Lexic Antiq. Gr. et Rom.*, tom. i., pp. 646, 647; Rasche's *Lexic Universæ Rei Numariæ*, vol. ii., p. i., p. 138; Pinkerton's *Essay on Medals*, vol. i.)

Roman Denarii.

British Museum. Actual Size. Silver. Weight $60\frac{6}{16}$ grains.

British Museum. Actual Size. Silver. Weight $58\frac{5}{16}$ grains.

DENBIGH. [DENBIGHSHIRE.]

DENBIGHSHIRE, a county of North Wales, of ver irregular form. It is bounded on the north by the Iri Sea; on the north-east by the county of Flint; on the east by that of Chester, from which it is separated by the De on the south-east by a detached part of Flintshire, and b Shropshire, from both which it is also separated by the Dee; on the south by Montgomeryshire; on the south-west by Merionethshire; and on the west by Caernarvonshire, from which it is separated by the river Conwy. A sma detached part of the county is included between Salop an Montgomeryshire. Its greatest length is from north-we (Llan Drillo Rhôs, near Little Orme's Head) to south-eas (Llan Gedwyn, on the river Tanat), 41 miles; its greate breadth from the extremity of the county near Eaton H (which is in Cheshire), to the source of the Rhaiadr, wh flows into the Tanat, about 29 miles. The area of the coun is about 633 square miles, and the population in 1831 wa 83,629, giving 132 persons to a square mile. Denbigh, th county town, is on a stream which flows into the Clwyd: i is about 180 miles from London, in a direct line north-we 203 miles by the road through Birmingham, Walsall, New port, Whitchurch, Wrexham, and from thence to Denbi either by Ruthin or Mold; 205 miles by the parliamenta Holyhead road to Llan Gollen, and from thence by Ru to Denbigh; or 209 miles by Shrewsbury, Ellesme Wrexham, and Mold.

Surface, Hydrography, and Communications.—The H raethog hills, which occupy the western side of the coun towards Caernarvonshire, extend from the north-wester extremity of Denbighshire, near Little Orme's Head, in SSE. direction, skirting the valley of the Conwy, to wh they present their steepest side; on the east side seve ridges of hills varying in length from five to nine or te miles, run out laterally from the principal range. T Hiraethog hills, with these lateral branches, form on the most extensive and dreary wastes in the principali Wales, stretching in length from 25 to 30 miles, from t neighbourhood of Little Orme's head to near the tow Corwen (Merionethshire), on the Dee; and in brea according to the extent of the lateral ridges. The gen covering of these hills is heath or ling: the hollows a flats abound with excellent peat for fuel, which is so grained as to exhibit a polished surface when dry and with a sharp-edged tool. The principal summits of Hiraethog range, in the order in which they occur, fr NNW. to SSE., are, Llan Elian mountain, 1110 feet; Mo*

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* 'Mool' signifies bald, crop-eared, or wanting horns: it is applied lofty hill bare of wood.

Cranaw, Modwl Eithin (the highest point of the range), 660 feet; Cader Danad, and Cader Ddimel. In a branch ridge which runs from the neighbourhood of Eglws Fâch, near the Conwy, to the neighbourhood of St. Asaph, are Moel Fre Ucha,* 1234 feet, Moel Fre Issa,* 1037 feet, and Bryn-y-pin. In other branch ridges there are Moel Fodian, or Fodiar, 1260 feet, and Moel Tywysog, or Twysog, 1260 feet, both to the west of Denbigh; Bronhaulog, north-west of Ruthin, and Bronbanog, near the source of the Clwyd, 1572 feet. The eastern side of the county, adjacent to Flintshire, is occupied by part of two parallel ranges of hills, (the western range called the Clwydian hills), which commence on the coast of Flintshire, and entering Denbighshire, run southward more than 20 miles, towards the valley of the Dee, and are united by the hills, which form the northern side of that valley to the Hiraethog range already described. The whole may be considered as forming one range 60 to 65 miles long, in the form of a horse-shoe, or of the letter U, and enclosing the beautiful and fertile vale of Clwyd. The Clwydian hills and the parallel range inclose a valley watered by the river Allen (Alen or Alyn), a tributary of the Dee. The principal summits of the Clwydian range in their order from NNW. to SSE., are Craig† Arthur, Moel Arthur, 1491 feet; Moel Fammau, or Vammau, 1845 feet, and Moel Ciw. Craig Brain or Cyrn Brain, in the range parallel to and east of the Clwydian hills, is 1858 feet; and Moel Enlli, or Venlli, in a small ridge, also parallel to the Clwydian hills, and nearer to the river Clwyd, is 1767 feet. In the hills north of the valley of the Dee there is Moel Morfidd, 1767 feet. The Berwyn hills, which separate the basin of the Dee from that of its tributary, the Ceiriog, and the hills which separate the basin of the Ceiriog from that of the Tanat (whose waters flow, though not immediately, into the Severn,) occupy the southern part of the county. Cefn Ucha, in the Berwyn range south of the town of Llan Gollen, is 1316 feet high.

The waters of Denbighshire find an outlet into the sea chiefly by the Conwy, the Clwyd, and the Dee, not one of which has its æstuary within the county. The Conwy carries off the waters of the western slope of the Hiraethog hills: the Clwyd drains the country inclosed between the Hiraethog and the Clwydian hills, except a small part which is drained by the Alwen, a feeder of the Dee; the Dee receives by several tributaries the waters of the rest of the county. The Conwy is noticed under Caernarvonshire. Its Denbighshire tributaries are all small, for the hills on whose slopes they rise are near the main stream: these tributaries, following the order in which they join the Conwy, are the Serw, which flows from Llyn Serw and joins the Conwy near its source, the Clettwr, the stream from Cyrniogeu (which is perhaps the largest of these affluents, though not more than six or eight miles long), the Afon Hwch, the stream which passes Eglwys Fâch, and many other smaller streams.

The Clwyd rises near the hill Bronbanog. [Clwyd.] The width of the valley of the Clwyd allows the formation of several large affluents.

The Dee touches the border of the county four or five miles below the town of Corwen (Merionethshire), and after separating it from Merionethshire for a mile or two, quits the border and crosses Denbighshire in a winding course from west to east through the vale of Llan Gollen, passing the town of Llan Gollen and Wynnstay, the seat of Sir W. W. Wynn. A little below Wynnstay it reaches the border of the county, and turning first north-east, and then north, divides it from Shropshire, a detached part of Flintshire, and Cheshire, until it finally quits Denbighshire a little above Eaton Hall. That part of the course of the Dee which is upon or within the border of the county, may be estimated at more than forty miles; the river is not navigable till after it leaves Denbighshire. Of those feeders of the Dee which belong to Denbighshire, the Rhaiadr or Moch, the Alwen, the Ceiriog, the river which rises at Minera and passes near Wrexham, and the Alen, or Alyn, are the chief. [Dee.]

The Rhaiadr, or Moch, is a small stream which forms the boundary of Denbighshire and Merionethshire. Its length does not exceed seven or eight miles, but forms in its course the celebrated waterfall of Pistill Rhaiadr. 'It terminates,' says Mr. Pennant, whose account we copy, 'the precipitous end of a very narrow valley, and divides a bold front of the Berwyn mountains. After sliding for some time along a small declivity, it darts down at once two-thirds of the precipice, and falling on a ledge, has, in process of time, worn itself a passage through the rock, and makes a second cataract beneath a noble arch which it has formed, on the slippery summit of which a daring shepherd will sometimes terrify you with standing. The second fall reaches the bottom, and assumes the name of Rhaiadr, or the cascade. The defect of this noble fall is the want of wood.' (*Tour in Wales*, London, 1784, 2 vols. 4to., vol. ii., p. 363.) Mr Pennant does not give the height of the fall, but in the 'Beauties of England and Wales' it is described as being in all about 200 feet.

The southern border of the county is skirted for about five miles by the Tanat, which flows by the Vyrnwy into the Severn. The Ywrch, the Cwmrhiw, and one or two other affluents of the Tanat, belong to Denbighshire, but they are small. Some small streams in the northern part of the county flow directly into the sea between the Conwy and the Clwyd. The Dolwen, the largest of these, has a course of not more than seven or eight miles.

There is in Denbighshire a navigable feeder of the Ellesmere Canal. It is taken from the Dee near Llan Tysilio, in this county, and follows the valley of that river to the neighbourhood of Ruabon (or Rhiw Abon), where there is a short railroad from the canal to Ruabon brook. The canal then turns abruptly, and crossing the river Dee, over which it is carried by the aqueduct bridge of Pont Cysylltee, runs southward to the river Ceiriog, over which it is carried by another aqueduct bridge, and thence into Shropshire. The aqueduct bridge of Pont Cysylltee is a stupendous work: it is supported by nineteen pairs of stone pillars fifty-two feet asunder, and is carried over the river at the height of 125 feet above its bed. The trough through which the vessels pass is entirely composed of cast iron plates, and is 320 feet long, 20 feet wide, and 6 feet deep. There is another large aqueduct bridge over the Ceiriog, built of stone, which is 600 feet in length, and is supported on ten arches at an elevation of sixty-five feet above the river.

Of the roads which cross Denbighshire the most important is the parliamentary mail road from London to Holyhead, the principal channel of communication between the Metropolis and Ireland. It enters Denbighshire near the village of Chirk, and runs northward to near the Dee, where it turns to the west, and passing through Llan Gollen, enters Merionethshire. It afterwards re-enters Denbighshire, which it finally quits by crossing the Conwy at Bettws y Coed. This part of the road has been much improved under the direction of the parliamentary commissioners, by avoiding steep and dangerous hills, and making a direct and commodious passage, by which the necessity of passing through the narrow and crooked streets of Llan Gollen has been avoided. The mail road from London to Holyhead, by Chester, passes through the northern part of this county near the coast: it enters it between St. Asaph and Abergely or Abergelau, and quits it at the bank of the Conwy. Denbigh, the county town, is the centre from which several principal roads run. (*Physical and Political Geography of the British Islands*, in the *Library of Useful Knowledge*; Davies's *General View of the Agriculture, &c. of North Wales*; Paterson's *Roads*, by Mogg; Priestley's *Account of Rivers, Canals, &c., in Great Britain*; Arrowsmith's *large Map of England and Wales*.

Geological character.—In describing the geological character of this county, we shall notice the principal rocks which are found in it in the order of superposition, beginning with the uppermost, the red marle or new red sandstone. This rock occupies part of the coast on the north side of the county, and skirts the Clwyd from its mouth to above Ruthin. It is found also occupying a considerable tract in the eastern part of the county, along the Dee, extending from that river to the town of Wrexham; and again it is found in the valley of the Ceiriog, near the village of Chirk. The coal-measures which underlie the red marle, and which form the coal-field of Flintshire, extend from that country into Denbighshire as far as Wrexham, and again appear in the valley of the Dee, extending from Ruabon to Chirk. Coal is dug both near Wrexham and in the neighbourhood of Ruabon. Common, cannel, and peacock coal are found in these coal-measures. The coal-measures rest on a base of shale and sandstone, answering in position and character to the millstone grit of Derbyshire this base rises to the surface, and occupies a narrow strip of the country extending from Flintshire south-east to Wrexham, and from that town south by west to Chirk; after which it continues into Shropshire, skirting the Flintshire and Ruabon coal-fields. The shale is succeeded by carboniferous limestone or mountain limestone, which extends from the coast, in the neighbourhood of Great and Little Orme's Head (both these promontories consist of this rock), and forms part of the mass of the hills that extend from the Hiraethog hills to the vale of Clwyd. A considerable part of that vale, and the upper part of the valley of the Alen, separated from it by the Clwydian hills, are also occupied by this limestone, which extends south-east from the vale of Clwyd across the vale of Llan Gollen into Shropshire. The older red sandstone, which underlies the mountain limestone, occupies a narrow belt of the surface, skirting the district which has just been described as occupied by the limestone. The Hiraethog hills are formed principally of transition limestone. The rest of the county is occupied by the clay slates and greywacké slates, which are so abundant in Wales. (Conybeare and Phillips's *Outlines of the Geology of England and Wales;* Greenough's *Geological Map of England and Wales;* Walker's *do.*)

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* 'Ucha,' upper; 'Issa,' lower

† Craig, *i. e.*, Crag, rock.

The coal-mines of Wrexham and Ruabon have been already mentioned. There are some old lead-mines near Abergely, on the coast: others in the range of limestone hills which run parallel to the Clwydian Hills on the east, and others again in the neighbourhood of Ruabon. Iron ore is dug at Ruabon and in the neighbourhood of Wrexham. Slate is quarried near Chirk; millstones are procured in the hills which bound the valley of the Ceiriog, and freestone for building in various places, especially near the coal-field.

Divisions, Towns, &c.—Denbighshire, as well as the neighbouring county of Flint, appears to have been comprehended in Y. Perfeddwlad (*i. e.* the middle or inland country), one of the four divisions into which Gwynedd or North Wales was divided. This district of Y. Perfeddwlad contained five cantrefs or larger divisions, which again were subdivided into cwmwds or smaller divisions, as follows:—

Cantrefs	I., Rhyfonioc.	Cwmwds	i., Uwchaled.
"	"	"	ii., Isaled.
"	II., Ystrad	"	iii., Hiraethoc.
"	"	"	iv., Cynmeirch.
"	III., Rhôs	"	v., Uwchdulas.
"	"	"	vi., Isdulas.
"	"	"	vii., Creuddyn.
			(This cwmwd is included in the present Caernarvonshire.)
"	IV., Dyffryn Clwyd	"	viii., Coleigionn.
"	"	"	ix., Llannarch.
"	"	"	x., Dogfeilyn.
"	V., Teygengle	"	xi., Cynsyllt.
	(This last cantref forms part of the present county of Flint.)		
"	"	"	xii., Prestatyn.
"	"	"	xiii., Rhuddlan.

These districts and subdivisions have been superseded by the modern counties and hundreds, which divisions were introduced as late as the reign of Henry VIII. From the time of its coming into the hands of the English until the reign of that monarch, Denbighland was comprised in districts, governed by their own antient laws and usages, and exempt from the laws of England, because all the ordinary administrators of the English laws were the officers of particular counties. By statute however in the 27th year of Henry's reign, four new shires were formed in Wales, of which Denbigh was one: these were subdivided into hundreds; and it was enacted that the English laws should from thenceforth be in force through Wales, all laws, customs, and tenures, inconsistent therewith being for ever abolished. Denbighshire is included in the North Wales circuit.

The present hundreds are six, viz.—Bromfield, comprehending the country between the Dee and the Alyn, and including the towns of Wrexham and Holt; Chirk, comprehending all that part of the country south of the Dee; Isaled, comprehending the south-west part and extending into the centre; Isdulas, extending along the north coast and along the lower part of the valley of the Conwy; Ruthen, comprehending the north-east parts and extending into the centre; and Yale, occupying a narrow strip between the hundreds of Ruthen and Bromfield, and between Ruthin hundred and the county of Flint. The county contains one principal borough and market-town, viz., Denbigh: two market-towns, which are contributary boroughs to Denbigh, viz., Wrexham and Ruthen; one borough which has no market, Holt; and two market-towns, Llan Gollen and Llan Rwst.

Denbigh, from which the county takes its name, is situated near a stream which flows into the Clwyd. Its situation on a rocky eminence, the summit of which is crowned by the ruins of the antient castle, gives it a striking appearance. It consists chiefly of one long street, well-paved and lighted, with a few good houses, leading into a spacious market-place. The market-house and assembly-room are in the market-place. The castle is said to have been erected by Henry Lacy, earl of Lincoln, upon whom Edward I. conferred the lordship of this place upon the overthrow of David, the brother of the last prince of Wales, Llewelyn. The castle walls were of peculiar structure and extraordinary strength: the outer and inner faces were built in the usual way, and the interval was filled with rough stones of all sizes and with a grouting of hot mortar, which, on cooling, formed a mass as hard as stone. The castle was never quite finished: it is said that Earl Lacy's son got his death by falling into the castle well, and that the earl being called away on military service, never afterwards came to finish the structure. In Leland's time it was a large fortress with many towers, wards, and portcullises: over the gate was an effigy of the founder. The grand entrance to the castle, a magnificent pointed archway, with the statue of the founder in a niche over it, in tolerably good preservation, still remains: it was formerly flanked by two large octagonal towers, one of which is nearly demolished, and the other is in a very ruinous state. Earl Lacy is said by some to have walled in a village which previously existed here: by others it has been doubted whether there were any habitations on the hill before he made this inclosure, which was not exactly on the site of the modern town, but higher up the castle hill. The walls, which run round the brow of the hill, inclose a considerable area, partly used for pasture, partly as a bowling-green, and partly occupied by cottages. One of the town gates (the Burgesses Gate), defended by two towers, is tolerably perfect. The original parish church of Denbigh is at Whitchurch, nearly a mile east of the town; it is very antient, and now much dilapidated. The townspeople use as their place of worship a chapel near the castle gate, within the old town walls, once belonging to the garrison of the castle, and dedicated to St. Hilary. There was antiently a priory of the Carmelites or White Friars in the town, some remains of which yet exist.

The population of the borough of Denbigh, which extends far beyond the town, and includes most of the village of Henllan, nearly two miles off, was in 1831, 3786. There are some tanneries, and many shoes are made, which are sent to Liverpool and to the surrounding fairs and markets: but Denbigh is less a place of business than of genteel retirement. The markets are on Wednesday and Saturday, and there are five fairs in the year. There are several dissenting places of worship; two schools partly endowed, two national schools, and one other day school; two boarding schools for girls, four infant schools, and four Sunday schools: the Sunday schools contain in all 1780 children. (*Educat. Returns* for 1833.)

The borough council under the Municipal Reform Act consists of four aldermen and twelve councillors. A mayor is chosen yearly from among the aldermen or councillors. Denbigh, with its contributary boroughs, Ruthen, Holt, and Wrexham, returns one member to parliament. The number of 10*l.* houses within the borough (the boundaries of which were not altered in the Boundary Act) was, in 1831, [illegible] of which 96 had land attached. Denbigh is the chief place of election, and one of the polling stations for the county. The Epiphany and Trinity quarter sessions are held here, the other sessions and the assizes, at Ruthen. The living is a rectory in the diocese of St. Asaph, of the annual value of 445*l.*, in the archdeaconry and diocese of St. Asaph. It is in the patronage of the bishop of St. Asaph

Denbigh was burnt during the war of the Roses by a body of Welshmen under Jasper Tudor, earl of Pembroke, half brother of Henry VI. In the civil war of the seventeenth century Charles I. took refuge here for a short time. The castle was taken by the parliamentary forces under General Mytton, A.D. 1646.

Wrexham is in the hundred of Bromfield, upon a small stream that flows into the Dee, a few miles from the west or left bank of that river, and upon a road leading from London by Birmingham, Walsall, and Whitchurch, to Holyhead. It is 179 miles from London by this road, and about 12 miles S.S.W. of Chester.

Wrexham is advantageously situated in the mining district of Denbighshire, and is one of the most important towns in North Wales. The houses are in general well-built; the streets, which are wide and generally cross each other at right-angles, are paved and lighted with gas. The church is a handsome and spacious Gothic building: it consists of a nave, two aisles, and a chancel, and is adorned with many tombs, and an abundance of grotesque carving, 'in ridicule,' according to Pennant, 'of the regular clergy, and the female religious, abbesses and nuns.' On the outside of the church is a quantity of ludicrous and gross sculpture. The tower of the church has an elevation of 135 feet, and has on three sides rows of saints in richly sculptured niches. The church was built in the room of a previous one destroyed by fire in the fifteenth century; the tower was not finished until early in the sixteenth. The town-hall is a plain brick building: there are a county house of correction, and places of worship for various classes of dissenters. There are several gentlemen's seats in the vicinity.

The town is not the seat of any particular trade or manufacture; but in the parish, which is very extensive, there are quarries, lead-mines, and collieries. The iron works have been long neglected. There are two weekly markets, on Monday and Thursday, and several annual fairs. One fair, held in March, lasts many days, and is one of the most important in North Wales: cattle and horses, Welsh flannels and other woollens, Irish linens, Manchester cotton goods, Yorkshire woollens, and hardwares from Birmingham and Sheffield, are sold at this fair. The parish, which extends into Flintshire, is subdivided into fifteen townships, and contained, in 1831, 11,521 inhabitants. The town is in the townships of Wrexham Abbots and Wrexham Regis (which contain a population of 5484), and in a small part of the township of Esclusam below. By the Reform Act, Wrexham was made a contributary borough to Denbigh. The parliamentary borough comprehends the townships in which the town stands: within the limits, there were at the time of the Boundary Commissioners' Reports, about three hundred and thirty-one 10*l.* houses. Wrexham is one of the polling places for the county, and the petty sessions for the hundreds of Bromfield and Yale are held here. There is a small theatre occasionally opened for dramatic performances, and there are races every year.

The living is a vicarage in the archdeaconry and diocese of St. Asaph, of the annual value of 746*l.*· it is in the gift of the bishop of St. Asaph.

From the education returns, it appears that there were in the parish in 1833 two infant schools, with 131 children; thirty day or boarding and day schools, with 1000 to 1100 children; and nineteen Sunday schools, with above 2000 scholars. Of the thirty day schools, six were wholly or partly supported by gift or endowment, including a grammar school, two national schools, and one on Dr. Williams's foundation.

Ruthen, Ruthin, or Rhuthyn, is eight miles from Denbigh. It is, like Denbigh, situated on the summit and slope of a considerable hill, at the foot of which flows the Clwyd. The town appears to have taken rise from the foundation of the castle, which was built by Roger Grey, to whom Edward I. granted nearly the whole of the vale of Clwyd. This castle got the name of Rhyddin, or the Red Fortress, from the colour of the stone of which it was built. It stood, not on the summit, but on the western slope of the hill, towards the Clwyd. It was so much neglected, that by the time of Henry VIII. it had become roofless, and was falling fast to decay. It appears to have been subsequently repaired, and was garrisoned for King Charles I. during the great civil war; but having been taken by the parliamentary troops under General Mytton, it was ordered to be dismantled. It appears to have been capacious and lofty. A new edifice, which from its style may be considered as a restoration of the antient castle, has been erected on the site, and is now the seat of Mr. West. The summit of the hill is occupied by the market-place, to which the principal streets lead. The county-hall or court-house is the finest building for the purpose in North Wales. The county prison is well built. The church is part (the choir) of a more spacious building, was originally the conventual church of a community of Bonhommes (suppressed A. D. 1310), and afterwards rendered collegiate. There are vestiges of the walls of the nave and a transept. The roof of the present church is admired for its curious workmanship. Part of the cloisters have been converted into a residence for the warden of Christ's Hospital: the groined arches of the entrance and of the two parlours are much admired. The free-school is a good building.

The parish of Ruthen, which is small, contained, in 1831, 1381 inhabitants; but the borough boundaries extend far beyond the town, and comprehend a considerable rural district consisting of parts of the parishes of Llan Fwrog, Llan Rhydd, and Llan Ynys, and, according to the Boundary Reports, part of the parish of Llan Fair Dyffryn Clwyd, but the population returns do not notice this. The gross population of the borough in 1831 was 3376, including the inmates of the county gaol and female prison. The number of 10*l.* houses was about 150. There is no particular trade or manufacture carried on in the town. There are two weekly markets: on Monday for corn, and on Saturday for butchers' meat; and five fairs in the year.

The corporation under the Municipal Reform Act consists of four aldermen and twelve councillors. One of the aldermen or councillors is annually chosen mayor. The elective franchise, before the Reform Act, was in the burgesses resident at the time of the issue of the writ. The assizes for the county are held at Ruthen: the quarter-sessions are held alternately here and at Denbigh. It is one of the polling places for the county.

Dr. Gabriel Goodman, whose monument is in the church, was a great benefactor to the town. He founded an hospital or alms-house for a warden and twelve decayed housekeepers, ten men, and two women. The warden and pensioners are impropriators of the great tithes of the parishes of Ruthen and Llan Rhydd: the warden appoints two curates to do the duty of these two parishes, but is expected occasionally to preach himself. He has the government of the free-school, which was also founded by Dr. Goodman, and endowed with a moiety of the tithes of Llan Elidan, to which parish, as well as Ruthen, it is free. It is accounted one of the best schools in North Wales. It contained, in 1833, forty-seven scholars. A lending library is attached to it. There were at that time in the town four other day schools, containing 141 children; besides a national day and Sunday school of forty boys and forty girls. There were three Sunday schools, containing nearly 400 children. There are meeting-houses for Independents, Wesleyan Methodists, and other Dissenters.

The wardenship of Christ's Hospital is in the gift of the dean and chapter of Westminster; the yearly income of the warden is 263*l.*, with a residence. The parishes of Ruthen and Llan Rhydd are in the diocese of Bangor, and in the peculiar jurisdiction of the bishop. There was once a house or cell of White Friars (Carmelites) here: Ruthen Mill is supposed to have been their cell.

Holt is on the river Dee, which here serves to separate Denbighshire from Cheshire, five or six miles N.E. of Wrexham. Holt took its rise from a castle founded by John, earl of Warren, who had acquired possession of the surrounding district by the murder of his ward, the son or grandson of Gryffydd ap Madog. In the civil war of Charles I. this castle was garrisoned for the king, but seized in 1643 by the Parliamentary troops. Being retaken by the Royalists, it was again besieged (Feb. 1645-6) by the Parliamentarians under Mytton, and after a gallant defence of two months obliged to surrender. There are scarcely any relics of it left, even of its foundations. The town is an irregular assemblage of streets or lanes; the main street leading down to the bridge of ten arches over the Dee, by which Holt is united to the village of Farndon. This bridge was built in 1345; there are relics of a guard-house in the middle. The chapel of Holt is a plain building in the perpendicular English style. The parish of Holt contained in 1831 a population of 1609 inhabitants; of these 1016 were in the township of Holt, which constitutes the parliamentary borough, and comprehends a large rural district round the town. There were in it only about 38 houses of the annual value of 10*l.* or upwards. The population is chiefly engaged in agriculture. There is no market, but there are two cattle fairs in the year. The living is a perpetual curacy (a dependency upon the vicarage of Gresford), in the diocese and archdeaconry of Chester, and in the gift of the dean and chapter of Winchester. It is of the annual value of 101*l.* with a glebe-house. There is a Baptist meeting-house. There were, in 1833, a free school, and three other day schools, in one of which most of the children attended on Sunday also, and a Sunday school connected with the Baptist congregation; there was a school-house building for another Sunday and daily school.

Llan Gollen stands on the right or south bank of the river Dee, and on the parliamentary mail road from London to Holyhead, 184 miles from London. The town does not possess any particular claims to notice, but the vale of Llan Gollen is interesting from its picturesque beauty and its antiquarian remains, and is much resorted to by tourists. The streets are narrow, and the houses are built of a dark shaly stone. The bridge was built by John Trevor, bishop of St. Asaph, who died in 1357; it consists of five arches, the widest not having more than 28 feet span. The river usually runs under only one arch, under which it has worn a deep channel in the hard rock which forms the bed of the river. The view through the arches upwards or downwards is extremely pleasing.

The extensive parish of Llan Gollen contains a population of 4498. Of these a considerable part are engaged in agriculture, and another considerable portion in stone quarries and lime works. Some manufactures are carried on in the parish, as of flannel, cotton goods, and earthenware; there are also iron works and collieries; the town derives considerable advantages from the influx of visiters. The market is on Saturday, and there are five fairs in the year. The Ellesmere canal passes through the parish. Llan Gollen is one of the polling places for the county.

The living is a vicarage in the diocese and archdeaconry of St. Asaph, of the yearly value of 350*l.* with a glebe-house. It is in the gift of the bishop of St. Asaph. There are places of worship for Independents, Baptists, Calvinistic and Wesleyan Methodists, and Wesleyan Methodist Reformers. There were in 1833, in the parish, one boarding and day school, and eight day schools; one of these was partly supported by three small endowments. In these schools, 105 boys and 112 girls (together 217) were taught; there were besides eleven Sunday schools, in which were nearly 1000 scholars.

In the neighbourhood of Llan Gollen are several interesting remains of antiquity. Castell Dinas Brân, whose remains nearly cover the summit of the conical hill on which it is placed, is on the north bank of the Dee just opposite to the town. It was a Welsh castle, built of the coarse stone of the country, with here and there a few freestone mouldings.

Llan Egwest, or Valle Crucis Abbey, is just within the parish of Llan Tysilio, and on the border of that of Llan Gollen. It was founded by Madog ap Gryffydd Maelor, prince of Powys, for monks of the Cistercian order. It had at the suppression a yearly revenue of 214*l.* 3*s.* 5*d.* gross, or 188*l.* 8*s.* clear. There are still some beautiful remains of the church and of a part of the abbey, the latter now converted into a farm house. A short distance from the abbey is the remainder of a round pillar, called the pillar of Eliseg, probably the most antient British inscribed pillar existing.

Llan Rwst is at the border of the county, and on the east or right bank of the Conwy, and to the right of the parliamentary road from London to Holyhead, 218 miles from London. It is situated in a pleasant vale surrounded with well-wooded hills. The houses are irregularly built, and the streets, with the exception of that in which the town-hall stands, are narrow. The church has little architectural beauty, but the interior has some curious carving, said to have been brought from the neighbouring abbey of Maenan, and there is a lateral chapel, 'the Gwydir Chapel,' built in 1633, from a design by Inigo Jones; but it is sadly neglected. (Pennant.) The bridge over the Conwy is also from designs by Inigo Jones: it consists of three arches, of which the middle one has a span of 59 feet. The tide flows up to about a mile and a half from the bridge, and in spring tides brings up boats of twelve tons. (Pennant.) The parish extends into Caernarvonshire; it contains in all a population of 3601, chiefly agricultural. There is no particular manufacture carried on; some Welsh harps were formerly and perhaps are still made here; the corn trade is considerable. The market is on Tuesday, and there are five fairs in the year. Llan Rwst is one of the polling places for the county. The living is a rectory in the diocese and archdeaconry of St. Asaph, and in the gift of the bishop of that see. The annual value is 720*l.* and there is a glebe-house. There is a chapel of ease at Llan Garmon. There were, in 1833, in the whole parish three day schools, in which above 50 children were educated, and seven Sunday schools, in which above 1000 scholars are taught. There are several dissenting places of worship, and a range of almshouses erected in 1610 by Sir John Wynne.

Maenan or Maynan Abbey near Llan Rwst was founded by King Edward I. in 1283: the Cistertian monks of an abbey at Aberconwy were transferred hither. At the dissolution, the yearly revenue of the abbey was 179*l.* 10*s.* 10*d.* gross, or 162*l.* 15*s.* clear.

Ruabon or Rhuabon (or to give the Welsh orthography, Rhiw Ábon) is a village at the junction of the roads from Oswestry and Llan Gollen to Wrexham. The church is spacious, and is adorned by some elegant monuments of the Wynne family, especially one by Rysbrach, to the memory of the first Sir Watkin Williams Wynn, who died in 1747. Wynnstay, the seat of the present Sir W. W. Wynn, is at Ruabon, the entrance to the park being immediately from the village. In the parish is an antient British fortified post: the area is about four acres, and it is defended by two ramparts and two ditches; the inner rampart is a massy wall, on the top of which is a carriage drive. In the vicinity of this post, in 1161 or 62, Owain Cyfeiliog, prince of Powys, defeated the English, and commemorated his victory in a poem called *Hirlas Owain*, 'the drinking horn of Owain.' The population of the whole parish of Ruabon which is divided into four townships, was, in 1831, 8353, of whom above 600 were employed in the collieries and iron-works: the iron ore is partly dug in the adjacent hills, and partly brought from Lancashire. The Ellesmere canal passes through the parish; and there is a railway to Ruabon brook. Although the place does not commonly rank as a market-town, a market is held every Monday. There were in the parish in 1833 four day schools (one endowed, and two partly supported by donations), affording instruction to about 200 children; and five Sunday schools, in which were about 460 or 470 scholars. There are several dissenting meeting-houses in the parish, and two sets of alms-houses. There are three fairs in the year. The living of Ruabon is a vicarage in the diocese and archdeaconry of St. Asaph, of the annual value of 588*l.*, with a glebe-house: it is in the gift of the bishop of St. Asaph.

Chirk is a village near the north bank of the Ceiriog, on the road from Oswestry to Ruabon and Wrexham, about five miles south of Ruabon. A mile and a half north-west of the village is Chirk Castle, the seat of Mrs. Myddleton Biddulph, built by Roger Mortimer in the thirteenth century. It is a large oblong square, built round a quadrangular court, and inclosed by massive walls strengthened by round towers at the corners: there is a fifth tower close to the entrance. The interior is handsomely fitted up, and contains, among other apartments, a gallery 100 feet long, adorned with the portraits of many public characters of the time of Charles II. From the castle grounds, which are very extensive, it is said that seventeen counties may be seen. Chirk Castle is on the site of a former one, called 'Castell Crogen.' The population of Chirk parish in 1831 was 1598: a considerable number of men are employed in coal-pits, stone-quarries, and lime-works. There are several paper-mills in the neighbourhood. There are three fairs in the year. The Ellesmere canal runs by Chirk. There are in the parish two boarding schools and one day school, containing in all 70 to 80 children; two day and Sunday schools, supported by Mrs. Biddulph, containing from 1[illegible] to 130 children; and one Sunday school, containing 3[illegible] 40 children, partly supported by a donation from the family of the same lady. The living of Chirk is a vicarage in the diocese and archdeaconry of St. Asaph, and in the gift of the bishop of that see: the annual value is 466*l.*, with a glebe-house.

Divisions for Ecclesiastical and Legal Purposes.—The county of Denbigh is for the most part comprehended in the diocese and archdeaconry of St. Asaph · a small part is in the diocese and archdeaconry of Bangor, and several parishes are in the peculiar jurisdiction of the bishop of Bangor. A very small part is in the diocese and archdeaconry of Chester. The number of parishes which are partly or wholly within the county, according to the population returns for 1831, is sixty-five, of which however five, viz., St. Asaph, Bangor-Monachorum, Bôd Fary, Erbistock, and Nannerch, rather belong to Flintshire. Of the remaining sixty, ten extend into other counties, viz., Gresford or Croes Ffordd, and Wrexham, into Flintshire; Yspytty Efan, Llan Drillo Rhôs, Llan Rwst, and Eglwys Fâch, into Caernarvonshire; Llanfihangel Glyn y Myfyr, into Merionethshire; Llan Rhaiadr yn Mochnant, into Montgomeryshire; Llan Silyn, into Shropshire; and Llan y Myneich, into Shropshire and Montgomeryshire: fifty are wholly in Denbighshire. The number of benefices is sixty-four,[*] being rather more than the number of parishes, for the parishes of Llan Armon yn Yale and Llan Gwm are sinecure rectories as well as vicarages; the parish of Llan Sannan is divided into two portions, one a vicarage and sinecure rectory, the other a sinecure rectory only; and the united perpetual curacies of Berse or Bersham Drelincourt and Minera, are parts of the parish of Wrexham. Of these sixty-four benefices, twenty-nine are rectories (three of them sinecures); two rectories (one of them a sinecure) united with vicarages; eighteen vicarages; twelve perpetual curacies; one chapelry; one wardenship (Ruthen); and one donative. Classified according to their value, there are six the yearly income of which is under 100*l.*, sixteen under 200*l.*, thirteen under 300*l.*, seventeen under 500*l.*, and seven under 750*l.* · of two the value is not given in the 'Clerical Guide,' our authority in this matter; and three are united with other benefices, viz., the rectory of Llan Dyrnog, with the bishopric of Bangor; the rectory of Llan Rhydd, with the wardenship of Ruthen; and the chapelry of Cyffylliog, with the vicarage of Llan Ynys. The ecclesiastical patronage of the bishop of St. Asaph in this county is very valuable: he has the right of presentation to thirty-six livings, of which twelve are of the yearly value of 300*l.*, and under 500*l.*, and six of the yearly value of from 500*l.* to 750*l.*

Denbighshire is included in the North Wales circuit: the assizes are held at Ruthen; and the quarter-sessions alternately at Ruthen and Denbigh; the Easter and Michaelmas sessions at the former, the Epiphany and Trinity sessions at the latter. Denbigh is the chief place of county election: the polling stations are Denbigh, Wrexham, Llan Rwst, Llan Gollen and Ruthen.

History, Antiquities, &c.—Denbighshire, before the conquest of South Britain by the Romans, was comprehended in the territory of the Ordovices, a powerful tribe, into whose dominions Caractacus in his last struggle against the Romans transferred the seat of war, and whose subjugation was not completed till the time of Agricola. There can be no doubt of the complete conquest of Denbighshire, as well as of the rest of North Wales by the Romans; but no trace of their dominion is found within the county at the present day, unless it be some lead-works, near Llan y Myneich: nor is it clear that any of their roads crossed it, except that which connected their stations of Varæ (Bod-fary in Flintshire), and Conovium (Caer Rhun or Caer Hen, near Aberconwy). In their division of the conquered part of the island, Denbighshire was included in Britannia Secunda. Of monuments of the time preceding the Roman conquest, may be noticed two Kistvaens or stone cells (probably sepulchral) mentioned by Camden: and perhaps the tumuli at Llan Armon yn Yale, the opening of one of which is described by Mr. Pennant. (*Tour in Wales*, London, 1784, vol. i., p. 408.) A pass through the Clwydian hills is supposed to indicate by its name (Bwlch Agricla) the route which Agricola took in his expedition against Mona. At Abergely or Abergeley on the coast, are the remains of a British post, called Coppa yr Wylfa, or the Mount of the Watch Tower; but we know not to what period it is to be referred.

When the Saxons established themselves in Britain, Denbighshire, as being on the frontier towards Mercia, one of the kingdoms of the heptarchy, or rather octarchy, established by that people, became the scene of frequent struggles. To the time of these struggles we may refer some existing monuments, as the pillar of Eliseg, noticed above in our account of Llan Gollen; and the famous dyke or ditch, called Offa's dyke, made by Offa, king of Mercia, as a barrier against the predatory incursions of the Welsh. This ditch is strengthened at intervals by small forts on artificial mounds, which mounds yet remain. The ditch is on the Welsh side of them. The dyke crossed that detached part of the county which is contained in the parish of Llan y Myneich, and entered Denbighshire by the hills on the south side of the valley of the Ceiriog. It ran (though with a somewhat circuitous course) towards the north, passing near Chirk castle and Ruabon, and so into Flintshire, thus inclosing the eastern part of Denbighshire, within the Mercian frontier. Although insufficient as a military work to keep off all ravages from the country which it was designed to protect, it was the recognized boundary of England and Wales; and heavy penalties were denounced against all Welshmen who should be found in arms on the English side. A dyke, called Wat's or Watt's dyke, equal to that of Offa in depth, though not in extent, runs parallel to it through this county. It enters Denbighshire two or three miles to the East of Offa's dyke, crosses the Ceiriog and the Dee, and runs through Wynnstay (once called Wattstay) park, past Wrexham and across the Alyn into Flintshire. It was formerly strengthened in its course by forts; the site of one of these at Erddig, between Ruabon and Wrexham, is marked by earth works and some remains of masonry.

About the year 828, Denbighshire was overrun by Egbert, king of Wessex, who had acquired for that kingdom the permanent supremacy of the Anglo-Saxon kingdoms. The incursions of the Danes prevented the Saxons from entirely subduing the antient Britons; and indeed these seem to have recovered, by the aid of the Northern Britons, the territory appropriated by Offa, whose dominions, as we have seen, included part of Denbighshire. The country thus restored to its original masters was included in Powys or Powysland, one of the subdivisions of Wales. The consolidation of the power of England under the Norman princes again subjected the Welsh to the pressure of a superior hostile power; they struggled gallantly, and the victory which Owen Cyfeiliog, who flourished in the twelfth century, obtained near Ruabon, has been already noticed. Denbighshire fell into the power of Edward I. in 1277, being ceded by Llewelyn, the last prince of North Wales, at the close of his first struggle with the ambitious and politic king of England. In the subsequent revolt of the Welsh prince and his brother David, in 1282, it reverted to its native masters, but the death of Llewelyn and the execution of David as a traitor, again and finally placed it under the English dominion.

In the insurrection of Owen or Owain Glyndwr (a descendant of the Gryffydd ap Madog mentioned above), in the civil war of the Roses, and again in the great civil war of the seventeenth century, Denbighshire became the scene of contest. In 1643 Holt Castle, which has been in the hands of the Crown, was seized for the Parliament by Sir William Brereton and Sir Thomas Myddleton, but was recovered by the Royalists. In 1645 a considerable body of Welsh and Irish Royalists under the command of Sir William Vaughan, marching to the relief of Chester, then besieged by the Parliamentarians, were attacked near Denbigh, by a detachment of the latter (1000 foot and 1400 horse), under General Mytton, and Colonels Jones and Louthian, and entirely routed; 500 horse and 400 foot were taken prisoners, 100 men were killed, and the remainder dispersed. In February 1645-6 the castles of Ruthen and Holt were simultaneously attacked by Mytton, and surrendered after a siege of two months. The conqueror then marched to Denbigh, the castle of which he besieged in July; it held out till November, when it surrendered on honourable terms. In the year 1659 Sir Thomas Myddleton and Sir George Booth made a premature attempt to restore the Stuarts. Denbighshire has not been the scene of any public event of interest since that time.

(Authorities—*Beauties of England and Wales; Boundary Reports; Population Returns and Parliamentary Returns relating to Education; Clerical Guide;* Pennant's *Tour in Wales;* Carlisle's *Topographical Dictionary of Wales, &c. &c.;* Mogg's *Edition of* Paterson's *Roads;* Greenough's *Geological Map of England;* Walker's *do.*, *Physical and Political Geography of the British Isles*, in the *Library of Useful Knowledge;* Conybeare and Phillips's *Outlines of the Geology of England.*)

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[*] This number we give with some hesitation: it is only by a comparison of the population returns with the 'Clerical Guide' that we have been able to ascertain the number.

It is well to observe that the account of Denbighshire in the *Beauties of England and Wales* is a very hasty and confused compilation, especially in the historical part.

Statistics of Denbighshire.—*Population.* Denbighshire is principally an agricultural county. Of 20,120 males, twenty years of age and upwards, residing in 1831 in Denbighshire, 10,353 were engaged in agricultural pursuits, and only 235 in manufactures or in making manufacturing machinery; about 200 of these latter were weavers of woollen goods, half of whom lived at Llangollen and Llan-Saintffraid-Glynn-Ceiriog, the rest were scattered throughout the county.

The following summary of the population, taken at the last census (1831), shows the number of inhabitants and their occupation in each hundred of the county.

HUNDREDS, &c.	HOUSES.				OCCUPATIONS.			PERSONS.			Males twenty years of age.
	Inhabited.	Families.	Building.	Uninhabited.	Families chiefly employed in agriculture.	Families chiefly employed in trade, manufactures, and handicraft.	All other families not comprised in the two preceding classes.	Males.	Females	Total.	
Bromfield . . .	5,281	5,527	48	427	1,807	1,793	1,927	13,162	13,297	26,459	6,246
Chirk	2,221	2,356	3	55	1,079	581	696	6,148	5,900	12,048	2,922
Isaled	2,702	2,779	16	118	1,919	443	417	6,887	6,920	13,807	3,373
Isdulas	2,485	2,590	15	82	1,499	599	492	6,084	6,079	12,163	3,004
Ruthen . . .	2,193	2,345	17	61	1,179	535	631	5,379	5,750	11,129	2,681
Yale	744	767	1	37	393	127	247	2,013	1,837	3,850	995
Denbigh (borough)	742	786	6	52	259	400	127	1,558	2,228	3,786	779
Militia under training	..	..	..	..	..	..	..	387	..	387	..
Totals . . .	16,368	17,150	106	832	8,135	4,478	4,537	41,618	42,011	83,629	20,120

The population of Denbighshire at each of the four enumerations was as follows:—

	Males.	Females	Total.	Inc. per Cent.
1801 .	..	..	60,352	..
1811 .	..	..	64,240	6·44
1821 .	37,785	38,726	76,511	19·10
1831 .	41,618	42,011	83,629	8·69

An increase is here seen between the first and last periods of 23,277 persons, or more than 38½ per cent., which is 18¼ per cent. below the general rate of increase throughout England.

County Expenses, Crime, &c.—The sums expended for the relief of the poor at the three dates of—

1811	were £32,427,	which was	10*s.* 1*d.*	for each inhabitant.
1821	,, 32,658	,, ,,	8*s.* 6*d.*	
1831	,, 35,126	,, ,,	8*s.* 5*d.*	

The sum expended for the same purpose in the year ending March, 1836, was 30,204*l.*; and assuming that the population has increased at the same rate of per-centage since 1831 as in the ten years preceding that period, the above sum gives an average of 6*s.* 10¾*d.* for each inhabitant. All these averages are below those for the whole of England and Wales.

The sum raised in Denbighshire for poor's-rate, county-rate, and other local purposes, in the year ending 25th March, 1833, was 44,668*l.* 4*s.*, and was levied upon the various descriptions of property as follows:—

	£.	s.
On land . . .	39,163	15
,, dwelling-houses . .	4,553	4
,, mills, factories, &c. . .	367	19
,, manorial profits, navigation, &c.	583	6
	44,668	4

The amount expended was:—

For the relief of the poor .	36,815	5
In suits of law, removal of paupers, &c.	1,108	9
For other purposes . .	6,689	1
Total .	£44,612	15

In the returns made up for the subsequent years, the descriptions of property assessed for local purposes are not distinguished. The sums raised in the respective years ending March, 1834, 1835, and 1836, were 41,531*l.* 16*s.*, 41,242*l.* 8*s.*, and 39,461*l.* 19*s.* The expenditure was as follows:—

	1834.		1835.		1836.	
For the relief of the poor	£33,135	15	31,668	0	30,203	11
In suits of law, removal of paupers, &c., .	1,440	5	832	4	857	12
For other purposes .	7,139	0	8,946	15	8,123	0
	£41,715	0	41,446	19	39,184	3

The saving effected in the sums expended for the relief of the poor in 1836, as compared with the expenditure of 1834, is therefore 2,932*l.* 4*s.*, or nearly 19 per cent.: including the other two items the whole amount of saving is reduced to 2,531*l.*, or rather more than 6 per cent.

The number of turnpike trusts in Denbighshire, as ascertained in 1834, was six; the number of miles of road under their charge was 165; the annual income arising from the tolls and parish composition was 4,034*l.* 5*s.* 4*d.*, and the expenditure was 3,906*l.* 1*s.*

The county expenditure in 1834, exclusive of the relief for the poor, was 5,253*l.* 17*s.* 11*d.*, disbursed as follows:—

	£.	s.	d.
Bridges, buildings, and repairs, &c. .	887	16	3
Gaols, houses of correction, &c., and maintaining prisoners, &c. .	677	5	2
Shire halls and courts of justice—building, repairing, &c. .	292	15	0
Prosecutions . . .	1,153	1	11
Clerk of the peace . . .	347	5	8
Conveyance of prisoners before trial.	80	19	2
,, of transports . .	111	19	3
Constables—high and special .	18	2	0
Coroner	92	12	0
Debt, payment of, principal and interest	1,219	12	1
Miscellaneous . . .	372	9	5
Total .	5,253	17	11

The number of persons charged with criminal offences in the three septennial periods ending with 1820, 1827, and 1834, were 141, 150, and 270; making an average of 20 annually in the first period, of 21 in the second period, and of 38 in the third period. The number of persons tried at quarter-sessions in each of the years 1831, 1832, and 1833, in respect to which any costs were paid out of the county rates, were 13, 10, and 12 respectively. Among the persons charged with offences there were committed for—

	1831.	1832.	1833.
Felonies . . .	12	9	11
Misdemeanors . .	1	1	1

The total number of committals in each of the same years was 14, 18, and 13, respectively: of whom

	1831.	1832.	1833.
The number convicted was .	11	15	6
„ acquitted .	3	2	5
Discharged by proclamation	0	1	2

At the assizes and sessions in 1835, 50 persons were charged with crimes in Denbighshire; out of which number 13 had committed offences against the person, 9 of which were common assaults; 6 were charged with offences against property, committed with violence, and 25 for offences against property, committed without violence. Of the remaining 6, there were 3 committed for poaching, 2 for refusing to aid peace-officers, and 1 for sending a threatening letter. Of those committed, 31 were convicted, and 19 acquitted, or no bill found against them. Of those convicted, 3 were transported, 25 were imprisoned, 22 of them for six months or under, 1 was fined, 1 whipped, and 1 discharged on sureties. Of the offenders, 47 were males, and 3 females. Among the whole number, 14 could read and write, 19 could read only, and 16 could neither read nor write; the degree of instruction of 1 was not ascertained. The proportion of the offenders to the population in 1835, was 1 in 1679.

The number of persons qualified to vote for the county members in Denbighshire is 3538, being about 1 in 24 of the whole population, and rather less than 1 in 6 of the male population above 20 years of age, as taken at the census of 1831. The expenses of the last election of county members to parliament were to the inhabitants of the county 107*l.* 18*s.* 10*d.*, and were paid out of the general county rate.

There are two savings-banks in this county. The number of depositors, and amount of deposits on the 20th November, 1832, 1833, 1834, and 1835, respectively, were:—

	1832.	1833.	1834.	1835.
Number of depositors .	331	945	1011	1104
Amount of deposits	£9432	28,919	30,952	32,690

The various sums placed in the savings-banks in 1834 and 1835 were distributed as under:—

		1834.		1835.	
		Depositors.	Deposits.	Depositors.	Deposits.
Not exceeding	£20	510	£3,825	598	£4,389
„	50	318	9,420	311	9,320
„	100	116	7,924	126	8,744
„	150	46	5,720	37	4,341
„	200	15	2,510	26	4,298
Above	200	6	1,553	6	1,598
		1,011	£30,952	1,104	£32,690

Education.—The following particulars are obtained from the parliamentary enquiry on education made in the session of 1835:—

	Schools.	Scholars.	Total.
Infant Schools	8		
Number of infants at such schools; ages from 2 to 7 years:—			
Males . . .		59	
Females . .		72	
Sex not specified		187	
			318
Daily Schools	141		
Number of children at such schools, ages from 4 to 14 years:—			
Males . . .		2355	
Females . .		1909	
Sex not specified		1166	
			5,430
Schools . .	149		
Total of children under daily instruction .			5,748
Sunday Schools	211		
Number of children and others at such schools, ages from 4 to 10 years.—			
Males		4,783	
Females . . .		4,154	
Sex not specified		11,836	
			20,773

Assuming that the population between 2 and 15 years has increased in the same ratio as the whole of the population between 1821 and 1831, and that it has continued to the time (1834) this return was made in the same uniform rate of increase, there must have been living in Denbighshire 23,893 persons between those ages. A very large number of scholars attend both daily and Sunday schools. Twenty-four Sunday schools are at places where no other schools are established, and therefore the scholars attending them, 1756 in number, cannot be supposed to attend any other schools. But at all other places the pupils of the Sunday schools have likewise the opportunity of resorting to the daily schools; of what number duplicate entry is thus made cannot be ascertained. Of fourteen schools, which are both daily and Sunday, and which contain 764 scholars, duplicate entry is known to have been made. Besides this cause of uncertainty as to the exact number of children under instruction, most of the Sunday schools consist of adults and aged persons, as well as children, rendering the number of the latter much less than the total number of scholars as given in the return. We may therefore conclude that not nearly the whole of the children between the ages of 2 and 15 are receiving instruction in this county.

Maintenance of Schools.

Description of Schools.	By endowment.		By subscription.		By payments from scholars.		Subscrip. and payment from scholars.	
	Schls.	Scholars.	Schls.	Scholars.	Schls.	Scholars.	Schls.	Scholars.
Infant Schools	—	—	—	—	7	194	1	124
Daily Schools	23	988	13	889	97	3116	8	437
Sunday Schools	4	219	199	20,129	2	110	6	315
Total.....	27	1207	212	21,018	106	3420	15	876

The schools established by Dissenters, included in the above statement, are:—

	Schools.	Scholars.
Infant Schools	—	—
Daily „	8	302
Sunday „	154	14,411

The schools established since 1818 are:—

Infant and other daily schools	70	2,000
Sunday Schools	174	15,404

Twelve boarding-schools are included in the number of daily schools as given above. No school in this county appears to be confined to members of the established church, or of any other religious denomination, such exclusion being disclaimed in almost every instance, especially in schools established by Dissenters, with whom are here included Wesleyan Methodists. Lending libraries of books are attached to five schools in Denbighshire.

DENDER. A river in Belgium, which takes its rise in the province of Hainault, about five miles north of Mons, and near the small town of Leuze. Its course is first north north-west to Ath, where it turns to north-north-east, and enters the province of East Flanders, near Grammont: it passes through the towns of Ninove and Alost, and unites with the Scheldt at Dendermonde about fifty-two miles from its source. The Dender is navigable as far as Ath, forty miles from its mouth, to effect which object some works have been executed between Alost and Dendermonde.

DENDERAH, the Tentyra of the Greeks and Romans, a ruined town of Upper Egypt, near the left or west bank of the Nile, and nearly opposite Keneh, is celebrated for its temple, which is the best preserved and one of the most splendid in all Egypt. Its remains occupy a vast extent of ground, and consist of various buildings and propyla, besides the temple itself. They are enclosed, with the exception of one propylon, within a square wall, the side of which is 1000 feet, and built of sun-dried bricks. The wall is in some parts 35 feet high and 15 feet thick. Dr. Richardson, who has given a description of this temple, as well as Belzoni, Hamilton, and others, assigns its erection to the period of the Ptolemies. The handsome portico in front is formed of 24 columns ranged in four rows, with quadrangular capitals, having a colossal head of Isis, or, as some say, of Athor, on each side, surmounted by another quadrangular member, each face of which contains a temple doorway with two winged globes above, and other decorations. (*British Museum, Egyptian Antiquities,* in the *Library of Entertaining Knowledge.*) The shafts of the columns are perfectly cylindrical and of equal diameter all through, and the whole height, including the base, the quadrangular capital, and dé above that, is 46.10 English feet. The front is adorned with a beautiful cornice and a frieze covered with figures and hieroglyphics, over the centre of which the winged globe is predominant. On all the walls, columns, architraves, and ceiling, there is no where a space of two feet that is not covered with some figures in basso-relievo of human beings, animals, plants, emblems of agriculture, or of religious ceremonies. The interior chambers of the temple are likewise covered with sculptures, among which the figure of Isis is repeated in numberless instances, as she appears to have been the presiding deity of the place. The light in the chambers comes in through small holes in the wall; the sanctuary itself is quite dark. The ceiling of the portico is occupied by a number of mythological figures, among which the French savans thought they recognised the signs of the zodiac; but Dr. Richardson observes that the number is incomplete, as the Crab is wanting, and he, with other recent travellers and archæologists, is of opinion that it is no zodiac, but a collection of mythological emblems, without any reference to astronomy. On the east side of the temple there are some apartments, both on the ground floor and upper story. On the ceiling of one of the latter, under the roof of the temple, there was another assemblage of mythological figures resembling those on the ceiling of the portico, though fewer in number and differently arranged. This was called a planisphere or zodiac, because in the middle of it figures similar to the signs usually adopted to represent the 12 constellations were observed. 'The ceiling is encompassed with three broad circular lines, and it is only the central space that is occupied with this mythological table, which appears as if supported by twelve figures, four females, one above each angle of the room, and the other eight distributed in pairs between, and having hawks' heads. In the middle of this assemblage of emblems are certain figures, which have been taken for the signs of the zodiac, ranged in a sort of circular order, but without any regularity of distance. The lion, the bull, and the vase-carrier are exactly above three of the female figures that extend from three of the corners of the room to support the tablet with their heads; Scorpio, for the sake of regularity, should have been above the head of the fourth female figure, but it is not, neither is Libra. Capricornus, Sagittarius, Scorpio, and Libra are all crowded without any regularity into one division, and instead of the Crab we have a broad-backed spider.' Richardson (*Travels along the Mediterranean and parts adjacent, in* 1816-17, from which we have just quoted) observes that he compared the figures of the temple of Denderah with the engravings in the French work on Egypt, and found the latter a very incorrect representation. His opinion, with respect to this pretended zodiac, is the same as that concerning the one in the portico, namely, that it is not meant for a zodiac, but is a congregation of gods and goddesses and religious processions.

These zodiacs of Denderah have given rise to a warm discussion connected with the truth of the Mosaic history of the world. Dupuy and other French writers have assumed, from the relative position of these zodiacal signs and their connexion with the precession of the equinoxes, that the astronomical observations upon which these zodiacs were constructed must refer to a date far more antient than that recorded for the Deluge, or even the creation of man; not less, indeed, than 15,000 years, according to some calculations. According to Littrow and others, however, the date would only be 3228 years old. But there is, as we have observed, another opinion, strongly supported by Letronne, Halma, Champollion, and others, discarding altogether the notion of these ceilings of Denderah being intended as representations of the zodiac, or being in any way connected with astronomical observations. Those who may wish to examine the grounds of this controversy may consult the writers already quoted, and especially Letronne, 'Observations sur l'Objet des Représentations Zodiacales qui nous restent de l'Antiquité,' 8vo. Paris, 1824; N. Halma, 'Examen et Explications des Zodiaques Egyptiennes,' 8vo. 1822; and Supplement to do., concerning the Zodiac of Denderah; and also Visconti, Hamilton, Champollion, &c. It is now generally believed that the temple of Denderah, with its zodiacs, is not older than the period of the Ptolemies.

The so-called circular zodiac in the upper chamber of the temple of Denderah, which was sculptured on a kind of sandstone, was cut out of the ceiling by a Frenchman of the name of Lelorrain, with the permission of Mehemet Ali Pasha, and shipped for France in 1821, when it was purchased by the French government and is now in the Museum at Paris.

DENDERMONDE, a town in **East Flanders**, the chief place of an arrondissement of the same name, is built at the confluence of the Dender and the Scheldt, about 14 English miles east from Ghent, and the same distance north-west from Brussels. The town contains 7,238 inhabitants: there are 1,014 houses, 4 churches, 5 chapels, a town-house, an hospital, a lunatic asylum, an orphan house, two convents, 14 schools, and a college. The town, which is fortified and defended by a citadel built in 1584 by the Duke of Parma, is said to have been founded in the eighth century. It was besieged by Louis XIV. in 1667, with 50,000 men, who were obliged to retire by the opening of the sluices on the part of the besieged, whereby the surrounding country was laid under water. In 1745 it fell into the hands of the French.

Dendermonde is the seat of many branches of manufacture, the most important of which are woollen cloths, hats, soap, cordage, and pottery. The surrounding country is fertile and well cultivated, and considerable business is transacted at the weekly market in grain, linseed, hemp, and oil. Many Roman antiquities have been dug up in the nighbourhood.

(Van der Maelen's *Dictionnaire Géographique de la Province de la Flandre Orientale.*)

DENDRO'BIUM, an extensive genus of East Indian epiphytes, found in the whole of the damp tropical parts of Asia, and a little beyond the tropics in Japan and New Holland, but unknown in the rest of the world. About a hundred species are enumerated by systematic writers: D. Pierardi, cucullatum, chrysanthum, aureum, fimbriatum, moschatum, densiflorum, pulchellum, nobile, and a few more, are known in the collections of this country; but a large proportion of the remainder requires to be better described and more carefully examined.

DENDROCITTA. [Corvidæ, vol. viii., p. 69.]

DENDROCOLAPTES. [Creeper, vol. viii., p. 148.]

DENDRO'COPUS. [Creeper, vol. viii., p. 148.]

DENDRO'DOA (Zool.), Mr. W. S. Mac Leay's name for a subgenus of Ascidians belonging to the aberrant group, or those which have a branchial pouch with only eight folds, the tentacula simple, and no liver.

Subgeneric Character.—(External). *Body* subcylindrical, with both orifices exceedingly minute, and situated on the apex. (Anatomical). *Branchial pouch* marked with only eight folds, and having the reticulation continuous. *Orifices* terminal. *Tentacula* simple. *Liver* none. *Ovary* unique, branched, situated beneath the mantle and the branchial pouch. (W. S. Mac Leay.)

Example.—*Dendrodoa glandaria.* The following is Mr. Mac Leay's description. *Body* subcylindrical, with a round summit. *Envelope* whitish, subpellucid, coriaceous, and smooth, having its base rough with agglutinated pebbles; internally it has a pearly lustre, and is thickest towards the base. *Orifices* so little prominent as to be scarcely perceptible without a lens; separate from each other, and opening with four indistinct rays. *Mantle* muscular, but of uniform substance.

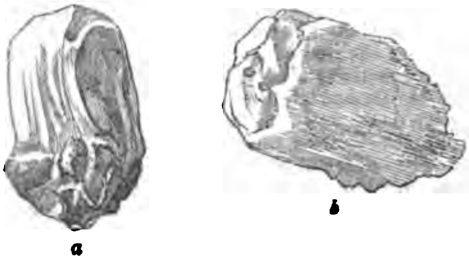
Tentacula about twenty-six, simple, subulate, alternately long and short.

Anterior nervous tubercle with many spirals.

Branchial cavity occupying the whole length of the animal.

Pharynx situated at the bottom of the cavity of the body. *Œsophagus* descending, and turning short round near the cardia into a cylindrical horizontal stomach, which is situated internally, and occupies with the pylorus (which turns round and lies parallel to it) the whole of the bottom of the cavity. *Intestine* very long. *Rectum* ascending, almost vertical, terminated by an anus margined.

Ovary one, situated on the left side, between the branchial pouch and the tunic. It consists of a trifurcated cylindrical stem, having at the base on one side a forked branch, on the other a simple one, all of the same thickness. Mr. Mac Leay remarks that the organs of digestion have great affinity in external structure and position to those of *Cystopantex* of Savigny, except that the stomach and intestine are horizontal, and the anus simply margined, and that different as this species is in external appearance from other *Ascidiæ*, internally it agrees with the *Pandocia* in almost every essential respect but the ovary. He observes that this singular animal completes the circle of the simple *Ascidia* in the most beautiful manner. It agrees with the first subgenus, *Cynthia*, in the nature of its branchial ulation and of its digestive apparatus; but *Cynthia* has wo ovaries, the right one contained in the intestinal loop, nd the left one coating the tunic. The first of these, or he right ovary, is the only one possessed by *Pandocia*, and he left is the only one possessed by *Dendrodoa*. Mr. Mac eay concludes by stating that the distinction between the berrant groups of *Ascidia* depends thus upon the nature of heir system of generation, as that which exists between he two normal groups depends on their system of respiration.



a, Dendrodoa glandaria, natural size seen on the right side. The base ncrusted with pebbles, has the appearance of the cup of an acorn. *b*, The same seen obliquely, so as to show the top, which is a little compressed, and xhibits four points. The two lowest and largest are false orifices; the two smallest (which are so small as to be almost invisible to the naked eye) are he real orifices, the highest being the anal, and the other the branchial orifice. 'Anatomical Observations on the Natural Group of Tunicata, &c.,' by William Sharp Mac Leay, Esq., A.M., F.L.S., &c.; 'Linn. Trans.,' vol. xiv., p. 547, to which the reader is referred for the magnified anatomical figures and details.)

DE'NDROMUS (Zoology), a genus of rodent quadrupeds, established by Dr. A. Smith in his 'Contributions to the Natural History of South Africa,' with the following characters:—

$$\text{Dental formula, } \frac{2}{2}\text{: molars, } \frac{3-3}{3-3} = 16.$$

The upper incisors with a longitudinal furrow on their anterior face; the lower long, slender, with the cutting edge cuneated.

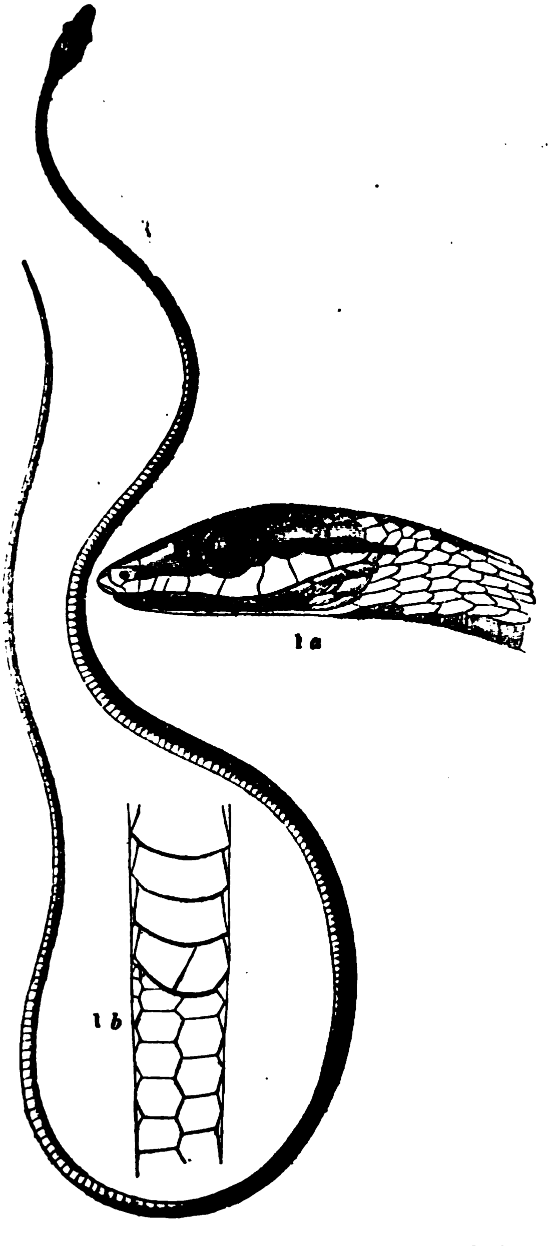
The *upper* first molar with six tubercles in a double row, and two indistinct ones besides, of which one is at the anterior part of the crown of the tooth, the other near another tubercle of the internal series, behind the transverse incisorial lamina; the second molar with two or three longitudinal incisorial laminæ by the external margin of the crown, in the middle of which lie three or four obtuse transverse tubercles disposed in a row; the third molar has two transverse incisorial laminæ with an interjacent furrow. *Below*, the first molar has six tubercles disposed in a double series; the second, four obtuse tubercles arranged in the same order; the third is very small, with some transverse laminæ and furrows intermingled. No canines. Rostrum acute. Lip slit. Ears oblong, rather naked, and, internally, near the skull, with two transverse membranaceous valvules, of which the lower lies over the external auditory meatus. Tail elongated, annulated, with scattered hairs. Feet divided, ambulatory; the anterior with three toes and a wart in lieu of hallux; the posterior five-toed: claws falcular.

Example.—*Dendromus Typus*. Above, brown, passing to ferrugineous; beneath, reddish white; whiskers long, partly black and partly white; upper lip white; ears without and within slightly covered with a fine short white reddish fur; extremities the same; tail pointed, considerably longer than the body, and of a faint grayish brown colour; along the centre of the back, particularly towards the tail, an indistinct black line. Length from point of nose to root of tail, 3½ inches; length of tail, 4½ inches.

Locality.—South Africa, upon the branches of trees, &c., in which situations it constructs its nest and brings forth its young. Dr. Smith observes that the position of this little animal among the family of mice is not well determined; but that perhaps its place is after *the Mouse*. (*Zool. Journ.*, vol. iv. p. 438.)

DENDRONESSA. [DUCKS.]

DE'NDROPHIS, (Fitzinger), a subgenus of serpents placed by Cuvier under the great genus *Coluber*, and stated by him to be the *Ahætulla* of Gray. The species of this genus have, like the *Dipsas* of Laurenti, a line of wider scales along the back, and narrower scales along the flanks, but their head is not larger than their body, which is very slender and elongated. Their muzzle is not elongated, and they are not venomous. *Locality*, India and Africa. [LEPTOPHIS.]



1, Dendrophis Ahætulla, one fourth of the natural size. 1 *a*, head. 1 *b*, Disposition of the scales above and below the vent. (Iconog.)

DENDROPHY'LLIA. [MADREPHYLLIÆA.]

DE'NDROPLEX, a genus of birds established by Mr Swainson, and placed by him in the family *Certhiadæ* (Creepers), and sub-family *Certhiana*, which have the tail graduated and rigid.

Generic Character.—*Bill* very straight. *Wings* moderate, rounded; third, fourth, and fifth *quills* longest.

Mr. Swainson observes that he knows not whether the type of this genus has been described, and states that the living bird has all the manner of a *Picus*. Except in its perfectly straight bill, he adds, it differs not from *Dendrocolaptes*. (*Zool. Journ.*, vol. iii., p. 354.)

DENEB, an Arabic word, signifying the tail: it generally means the bright star (β) in the tail of the Lion. [LEO.]

DENHAM, SIR JOHN, born at Dublin in the year 1615, was son of Sir John Denham, who was some time chief baron of the Court of Exchequer in Ireland. His father being afterwards made a baron of the Exchequer in England, he was brought to London in 1617, where he received his grammatical education. In the year 1631 he became a gentleman commoner of Trinity College, Oxford, where, after studying for three years, he took the degree of bachelor of arts. He subsequently entered himself at Lincoln's Inn, studied the law pretty closely, and might have done well, had not an immoderate passion for gaming exhausted his money, and drawn on him the displeasure of his father. He however abandoned the mischievous pursuit, and wrote an essay against gaming, by which he regained his father's favour, though his reformation appears to have been somewhat feigned, as immediately after his father's death his fondness for play returned. In 1641 he gained great celebrity by his tragedy of 'The Sophy,' which was acted at Blackfriars with much applause; and his fame was increased by his 'Cooper's Hill,' written in 1643, almost the only one of his poems that is now read. In the year 1647 he performed many secret and important services for Charles I., when prisoner in the hands of the army, which being discovered, he was forced to escape to France. In 1652 he returned to England, and resided at the earl of Pembroke's; and at the restoration of Charles II. he was appointed surveyor-general of his Majesty's buildings, and created knight of the Bath. He died in the year 1688, his understanding having been for some time impaired by domestic grievances.

The admirers of Denham usually limit their praises to 'Cooper's Hill,' and some lines on the earl of Strafford; while others confine their commendations to two lines in the former poem, wherein he describes the Thames:

> 'Tho' deep, yet clear; tho' gentle, yet not dull,
> Strong without rage, without o'erflowing full.'

This is a most happy combination of words; the bringing into contrast expressions which only vary in shades of meaning is highly ingenious. The whole passage relating to the Thames is written with much spirit, and striking lines might be selected from other parts; yet, taken as a whole, the poem is heavy and purposeless, and though short, is very tedious.

Readers of the present day, on perusing the poems of Denham, will doubtless wonder what could be the cause of the high commendations bestowed on him by his contemporaries; but to look at him from a fair point of view, and to assign him his due portion of merit, it will be necessary to consider him as one of the reformers of English verse. At the beginning of the seventeenth century the art of versification was in a very imperfect state, as may be seen from reading the prologues to our early dramas; and hence a poem of the length of 'Cooper's Hill,' written with tolerable smoothness, was something remarkable. At the present day, even the versification of Denham appears faulty, as he frequently allows a sentence to run from one line into another, a practice which, though effective in blank verse, is intolerable in rhyming couplets; and indeed he has made some words rhyme in a manner that we wonder was endured by any age; for example, in one instance he makes 'sprung' rhyme with 'Rome.' Those who wish to observe the progress of their own language will find the reading of such authors as Denham not unprofitable; and Johnson's Lives of the Poets form a good running commentary.

DENHAM. [Africa.]

DENIER, from the Latin *denarius*, a French coin, originally of silver. It continued in use, through different modifications, as long as the old system of coinage in France lasted; that is, till 1795. Up to that time, accounts were kept in France in livres of 20 sous or 240 deniers: they have been since kept in francs of 10 decimes, or 100 centimes.

Under the kings of the first race the denier weighed twenty-one grains; under the second race, and in the time of Charlemagne, twenty-eight, and sometimes thirty grains; and under Charles the Bald thirty-two. At the commencement of the third race of French kings the denier weighed twenty-three or twenty four grains of fine silver. Philip I. began the practice of mixing copper with the silver; and it is in his time that we find the distinction first made between *deniers Tournois* and *deniers Parisis*, the latter being worth a fourth part more than the former. By the time of St. Louis, 1226, the denier had become so debased as to contain not more than six grains and a half of silver; which was probably the occasion of that monarch's issuing a larger class of coins called *gros deniers d'argent*. The term denier was likewise afterwards applied to the gold money of France, in the same manner as the gold first issued by our Henry III. was termed the gold penny.

There were formerly current in France several little copper pieces, which, having no proper name, were distinguished only by their value in deniers; such were the pieces of 36, 30, 24, 18, 12, 6, 4, and 2 deniers. The pieces of 4 and 2 deniers were coined at Strasburg, for currency in the province of Alsace, pursuant to a declaration of the 6th September, 1695. Those of 6 deniers were coined in the mints of Aix, Montpelier, Rochelle, Bourdeaux, and Nantes, by an edict issued in the month of October 1709.

The deniers coined toward the end of Louis XIII. were the work of the famous Varin, and are much admired for their execution.

(Le Blanc, *Traité Historique des Monnoyes de France*, 4to. *Paris*, 1690; Furetière, *Diction. Universel*, *v. Denier*; Postlethwayt's *Dict. of Commerce*, fol. Lond. edit. 1774.)

DENIS, SAINT, a town in France, in the department of Seine, in a plain not far from the right bank of the Seine, and on the streamlets the Cloud and the Rouillon, which flow into that river: it is about 5 miles from Paris, in 48° 56′ N. lat., and 2° 21′ or 22′ E. long.

This town dates its rise from the foundation of a church erected over the tomb of the saint and martyr whose name it bears. The church of St. Denis (Dionysius) was founded, or perhaps only enriched, by King Dagobert, in the seventh century. It had been preceded by a chapel built over the tomb of St. Denis, and rendered celebrated by reported miracles. Crowds of pilgrims resorted to the chapel, and afterwards to the church, and in the course of time a village rose round the sacred edifice, which increased to a considerable town. Dagobert founded also an abbey, which he richly endowed, and on which he conferred great immunities. Upon his death he was buried in the church of St. Denis: his successors in many instances followed his example, and the church became in time the customary burial-place of the kings of France. In 832 the monks had become so corrupt that the Abbot Hilduin had to introduce a thorough reform. The abbacy was soon after put in commendam by Charles le Chauve (who reigned from A.D. 840 to A.D. 877), and was subsequently held by many laymen; but Hugues Capet (who reigned A.D. 987 to A.D. 996) restored to the monks the right of choosing their abbot. During this interval the abbey was pillaged by the Northmen. One of the subsequent abbots, Suger, served the kings Louis VI. le Gros (who reigned from A.D. 1108 to A.D. 1137) and Louis VII. le Jeune (who reigned A.D. 1137 to A.D. 1180), both as a warrior and a statesman; and the oriflamme, previously the standard borne by the abbots in their private wars, became the standard of the royal forces. Suger vastly improved the possessions of the abbey, founded many priories, which he filled with monks of St. Denis, and rebuilt almost the whole of the church in a more magnificent style than heretofore. Part of the present edifice dates from this epoch. Mathieu de Vendôme, a subsequent abbot, administered the affairs of state during the second absence of Louis IX. (St. Louis) beyond sea: the rebuilding of a portion of the church which some of his predecessors had begun, was finished by him. The first monks of St. Denis were Benedictines; but they had so many privileges and prerogatives peculiar to themselves, that they may almost be regarded as the heads of a distinct order, having many subordinate priories in different parts of France: they were besides subject to no other superior than the pope himself. They have sometimes been called Dionysians. They had the keeping of the crown, sceptre, and other ornaments used at the consecration and coronation of the kings of France. About the time of Louis XIV. the grandeur of this establishment was much impaired. It was reduced to the ordinary rank of a Benedictine abbey, its revenues were partly applied to the support of the establishment of St. Cyr [Cyr, St.], and the ecclesiastical jurisdiction which the abbot had exercised over the territory of St. Denis was replaced, except as to the abbey itself, by that of the archbishop of Paris. The abbey was finally suppressed in 1792.

The present abbey-church, built at various epochs, presents great variety of style. The western front is divided by buttresses into three compartments, which are crowned by a range of battlements. In each compartment is a wide semicircular arched doorway, the ascent to which is by a flight of steps running along the whole front. Over the centre doorway are three pointed arches as though designed for windows, but only one is used for that purpose: over the side doors two tiers of arches, chiefly pointed, but of smaller dimensions; some of them are used as windows, or have in them smaller openings for windows. The upper part of the centre compartment is occupied by the clock. The two outer compartments are surmounted by towers which differ in their architecture; both however have windows, with pointed arches, and that at the northern extremity is crowned by a tall spire. The other is crowned by something between a spire and a high ridged roof. The doors are covered with grotesque bronze figures in low relief: they were formerly gilt in or-molu.

The choir of this church contained the tombs of most of the kings of France, and of several other individuals eminent for their rank or ability, as Bertrand du Guesclin, Turenne, Montesquieu, and others. In 1793 a decree passed the convention for the destruction of the tombs of St. Denis; but it was so far moderated that a commission was appointed to preserve those monuments which should be deemed worthy of such a favour. The tombs of the kings were opened, and the bodies deposited in a common grave. The tomb of Turenne, who was buried here, was subsequently transported by order of the Directory to the Musée des Monumens François; and ultimately by Bonaparte to the church of the Hôtel des Invalides.

In 1794 it was in agitation to destroy the church of St. Denis altogether, but nothing further was done than to strip the lead off the roof. The roof was subsequently half covered with tiles in 1796; but in 1797 this reparation was stopped, and the project of destruction again agitated, but without being carried into effect. In 1799 the stained glass windows were removed. Under the consulate and the empire the church was restored; and in 1806 Napoleon issued a decree that St. Denis should be the place of sepulture of the emperors of his dynasty; that a chapter of ten canons, retired bishops, should be established, and that four chapels should be erected, three over the place where the tombs of the kings of the three races had stood, the fourth in the place destined for the burial of the emperors. In the chapels of the kings tablets of marble were to be put up, with the names of the kings whose tombs had previously occupied places in the church. Many of the royal tombs have been since replaced, and the abbey church is also adorned with paintings of historical events connected with the church, and with the statues of some of the earlier kings of France.

Next to the abbey, the most interesting object at St. Denis is the 'Institution Royale,' a school for the daughters of the members of the Legion of Honour, established in the buildings of the abbey. After the suppression of monastic institutions in France, these buildings were converted into a military hospital. Napoleon made it the place of one of the schools subsidiary to the establishment which he had formed at Ecouen, after the battle of Austerlitz, for the daughters of the members of the Legion of Honour. Upon the restoration of the Bourbons, Louis XVIII. united the institution of Ecouen to that of St. Denis, and placed them under the charge of the nuns of the 'Congrégation de la Mère de Dieu,' and fixed the number of pupils at 400. The establishment is under the direction of a lady superintendent, who has under her as assistants 37 ladies.

The trade of St. Denis is considerable. Printed calicoes and other cotton goods are manufactured: there are several establishments for washing wool and preparing it for the weaver; and others for bleaching linens, casting sheet lead, and making saltpetre, soda, and other chemical articles. There are also several flour-mills for the supply of Paris. The chief articles of trade, beside those manufactured in the place, are agricultural; corn, wine, vinegar, wood, wool, and cattle. There are several fairs in the year; three of them are held for eight or nine consecutive days, and there is one, called La Foire du Lendit, which occupies fifteen days. At these several fairs it is calculated that woollen cloths are sold to the value of 1,500,000 francs (62,000*l.* or 63,000*l.*), other woollen goods to the value of 200,000 francs (8000*l.*), linens to the value of 300,000 francs (12,000*l.* or 13,000*l.*), and cotton goods to the value of 800,000 francs (33,000*l.*). At the fair of Lendit 80,000 or 90,000 sheep are sold, which are brought from various departments, and some even from Würtemburg and other parts of Germany. The canal which communicates between the canal of the Ourcq and the river Seine joins the latter near St. Denis. There is hourly communication with Paris by voitures or carriages.

St. Denis had in 1832 a population of 9686. It is the capital of an arrondissement, containing 4 cantons, 36 communes or parishes, and (in 1832) 87,282 inhabitants. (Dulaure, *Histoire des Environs de Paris*, Malte Brun.)

DENIZEN. Denizen seems originally to have signified a natural-born subject. But now a denizen is an alien born, who has been constituted an English subject by letters of denization: he is in a kind of middle state between an alien and a natural-born subject. He may take lands by purchase, which an alien cannot; but he cannot take by inheritance, for his parent, through whom he must claim being an alien, had no inheritable blood. The issue of a denizen born before denization cannot inherit to him, but the issue born after may. A denizen cannot be a member of the privy council, or sit in either house of parliament, or hold any office of trust, civil or military, or be capable of any grant of lands, &c., from the crown. [ALIEN.]

DENMARK, or DANMARK (the land or Mark of the Dane), also termed the Danske Stat (the States of Denmark), is a kingdom lying, independently of its colonial possessions, between 53° and 58° N. lat., and 7° and 13° E. long. Its boundaries are, on the north, the Skager Rack, a gulf of the North Sea; on the north-east, the Cattegat, another gulf of the North Sea, which, with the Sound, separates Denmark from Sweden; on the south-east, the Ost-See, or Baltic; on the south, parts of the free states of Lübeck and Hamburg, the grand-duchy of Mecklenburg-Schwerin, and kingdom of Hanover; and on the west, the North Sea. Its colonial possessions consist of—Iceland, in the Atlantic; the Färoe islands (Faeroerne), in the North Sea; Greenland, in North America; five forts and their dependencies, on the coast of Guinea, in Western Africa; the islands of St. Croix, St. Thomas, and St. John, in the West Indies; the settlements of Tranquebar, on the Coromandel coast; the fort of Fredericsnagore, and town of Belasore, in Bengal; and the Nicobar group of islands at the entrance into the bay of Bengal.

The table in the following page presents a comprehensive view of the component parts, area, population, and principal towns of the Danish monarchy.

The subsequent details refer only to the European dominions of the Danish crown, viz., the insular portion, North Jütland, South Jütland or Schleswig, Holstein, and Lauenburg.

Continental Denmark, which may be designated the north-western peninsula of Germany, in its greatest length from north to south is about 304 miles; in its breadth it varies from about 33 to 106, the average being about 66. Its length of coast on the North Sea and Skager Rack is about 460 miles, and along the Cattegat, Little Belt, and Baltic, about 650; the whole extent of coast is accordingly not less than 1110 miles. Many parts of this long coast line are almost useless, in consequence either of the want of deep water, or of the numberless banks, bars, and islands which line it. The shores too of the islands that lie next the Baltic are so flat and irregular as to be unapproachable in most quarters by vessels which draw much water.

The surface of Denmark presents an almost uniform plain, elevated only a few feet above the level of the sea, but occasionally relieved by some small groups of hills, whose wooded summits break the monotony of the landscape, and, in combination with numerous inlets of the sea and small lakes, give the country a very pleasing appearance. The upper soil consists of a dense layer of clay or sand in most parts, mixed with gravel in some places; the subsoil is a dark blue clay (blaalaer), entirely destitute of earthy matter, but partially intersected by a fine yellow sand. In some of the islands this clay is of a reddish tint. Remains of vegetable substances, but none of any large land-animals, are found in these clays. In North Jütland, the most sterile region in Denmark, the soil lies immediately upon a bed of bog-turf covered by sand from one to three feet in depth. Sands and heaths are the characteristic features in continental Denmark; and drift-sand renders a considerable portion of the western coasts almost uninhabitable. Together with extensive tracts of moors and swamps, the inland parts of Jütland and the islands are characterized by a rich marshy loam, of which bituminous marl is the chief constituent. The surface of the islands presents partial tracts of moor, heath, and woodland; but in general the soil is fertile, and well-suited to cultivation. The component parts of the 21,472 square miles of surface of which Denmark consists, are thus subdivided:—9850 square miles of sand capable of arable cultivation, 2830 of heath, 2660 of black rich earth, 1990 of loam and marl, 1050 of meadows and swamps, 902 of marshes, 940 of woods and forests, 735 of grazing grounds, 257 of drift-sand, and 258 of lakes and streams.

Denmark possesses no mountains, but a range of hills traverses the whole peninsula from south to north, keeping

Subdivisions, &c. Circles.			sq. m.	Population	Chief Towns.
Denmark Proper.—1. Seeland, or Sjeelland, including the islands of Samsøe, Moen, &c.		Islands.	4,935	697,900	Copenhagen (119,290), Helsingoer, or Elsineur (7100). Roeskilde (2900), Rottum (3000).
2. Fyen, or Fünen; Islands, Langeland, Fyen, &c.					Odensee (8750), Nyeborg (2900), Assens (2330). Svenborg (3400).
3. Lolland, or Laaland; island, Falster					St. Nakskow (2200).
4. Aalberg; islands, Goel, Oeland, &c.		N. Jütland.	9,408	525,900	Aalborg (7100).
5. Viborg; islands, Lessoe and Fuur					Viborg (3450).
6. Aarhuus; island, Anholt					Aarhuus (6800), Randers (6450).
7. Ribe; island, Fanoe					Ribe (2400), Kolding (2330), Fredericia (4200). Horsens (3800).
			14,343	1,223,800	
Duchy of **Schleswig**, or **Sleswig**.—1, Hadersleben; 2, Apenrade; 3, Tondern; 4, Nordburg; 5, Flensburg, 6, Gottorff; 7, Hülten; 8, Husum; 9, Femern; including the islands of Fohr, Aeroe, Als, Nordstrand, and Femern.		S. Jütland. German Prov.	3,444	340,500	Schleswig (11,000), Flensburg (16,500). Apenrade (3200), Haderslaben (3500). Tondern (3600), Husum (4500). Eckernförde (3500), Tönningen (2200). Friedrichstadt (2800), Sonderburg (3200).
Duchy of **Holstein**, or **Holsteen**.—1, Rendsburg; 2, Bordesholm, Kiel, and Cronshagen; 3, Ploen; 4, Cismar; 5, Neumünster; 6, Steinburg; 7, Segeberg; 8, Traventhal; 9, Reinbeck. Also the districts of North and South Ditmarsk, Ranzau, Herzhorn, and Pinneberg, and equestrian districts, Itzehoe, Kiel, Preetz, &c.			8,223	439,900	Kiel (10,500), Rendsburg (7600). Oldesloe (1700), Plön (2000). Glückstadt (5400), Itzehoe (5000). Wandsbeck (2000), Blankänese (2500). Altona (25,200), Barmstedt (1600). Elmshorn (2500).
Duchy of **Lauenburg**.—Ratzeburg, Lauenburg, Schwarzenbeck, and Steinhorst, with the equestrian districts.			469	85,900	Ratzeburg (2300), Lauenburg (3400), Möllen (1750)
			21,472	2,040,000	
Colonies. European. Iceland. Distr., North, South, & West	37,800			50,800	Reikiavig (500).
Faeroe Islands	490			6,600	Thorshavn (570).
American. Greenland	4,550			4,700	
West Indies—St. Croix St. Thomas St. John's .	174			47,800	Christianstadt (St. Croix), St. Thomas (3000), St. John's.
Africa—Coast of Guinea, 5 forts and dependencies Asia.—East Indies. Tranquebar, Fredericsnagore, Balasore, and island of Nicobar . .	546			28,000	Tranquebar (20,000), Balasore.
			43,560		
			65,032	2,188,700	

in general near to the eastern coasts, and terminating with Cape Skagen (Skagens-Odde), the extreme point of North Jütland. Its loftiest points are the Himmelsberg, in the bailiwick of Skanderburg, North Jütland, which is 1200 feet high according to some, and 1800 feet according to others; the Dagbierg-Daas, 700 feet, in the bailiwick of Viborg, and the Askehoy, 690 feet. There is also a range of hills, called the Fyen Alps, in the island of Fyen, or Fünen, which runs from the north-easternmost point to the south-easternmost at Svenborg, bending always towards the south-western coast: its highest summit does not exceed 400 feet. The chief mass of the Seeland hills inclines towards the eastern coast, and extends from the northern mouth of the Sound to the southernmost extremity of the island: the most elevated point is the Mangelberg, near Hirschholm, to the north-west of Copenhagen, which is 560 feet in height.

The western coasts of Jütland and Holstein are quite flat, and protected from the North Sea, or West Sea as it is termed by the Danes, in contradistinction to the Ost-See (East Sea, or Baltic), by sand-hills and dykes in South Jütland, or Schleswig. The eastern coasts of Jütland, as well as the island-coasts, are abrupt and precipitous, formed of chalk or limestone, and called Klinte by the natives: the Moens-klint, on the eastern side of the island of Moens, which stretches above ten miles out into the sea, is remarkable for its fossils and numerous waterfalls. The north-eastern shores of Seeland are separated from Sweden by the Sound or Ear-Sound, (Ore-Sund, so denominated from the resemblance of its form to the human ear), the well-known entrance into the Baltic, which is about 70 miles in length from the Swedish point of Kullen-Cattegat to Falsterboe, and 1½ mile (7986 feet) in breadth between Helsingör (Elseneur) and Helsingborg, where it is narrowest: in mid-channel it varies from 10 to 19 fathoms in depth. Between the western side of Seeland and the north-eastern side of the island of Fünen lies a second entrance into the Baltic, called The Great Belt, which is about 9 miles wide at its narrowest point between Nyeborg and Korsoer, and varies from five to twenty-five fathoms in depth, but, on account of sandbanks and rocks, is difficult of navigation for large ships. Between the western coast of Fünen and eastern coast of Jütland and the island of Alsen, or Als, is a third entrance, called The Little Belt, which is not more than three quarters of a mile, or 4100 feet wide, next Middelfahrt, where it is most confined; it is about 46 miles in length, is hazardous to navigate, and just above Middelfahrt is commanded by the fortress of Fredericia, in North Jutland.

The coast of Denmark is indented in several parts with bays and inlets, here called Fiords, or Vügen, the latter name being applied to the smaller bays. The largest of these fiords are the Ise-Fiord, on the northern side of the island of Seeland, which is connected with the Roeskilder-Fiord on the east, and the Liim-Fiord on the west: it is about 74 miles in its greatest length, and contains several islands. The Liim-Fiord, which intersects North Jütland, occupies nearly 252 square miles; the Kingköpings Fiord is to the south of the last mentioned bay; and the Apenrade, Flensburg, and Eckenförd Fiords, on the eastern coast of South Jütland.

Denmark abounds in small lakes, the most considerable of which are—the Mos See (about 5 miles long and 1½ broad), the Viborg, Skanderborg, Garboel, and Langesee, in Jütland; the Arresee, Esrumsee (celebrated for its fish, and united by a canal with the Great Belt), the Tüssee, and Loroesee, in Seeland; the Arreskoesee in Fünen; the Marienboersee in Laaland; the Ploener and Selentersee in Holstein; and the Ratzeburgersee in Lauenburg.

As no inland point in Denmark is more than 35 or 40 miles from the sea, the country has no large rivers. The Elbe forms the southern boundary of Lauenburg, from the town of Lauenburg to the Hamburgese district of the Vierlande, and the south-western boundary of Holstein, from Altona to the Mas-Queller, where it discharges itself into the North Sea. The Danish streams which flow into it are the Delvenau, Bille, Alster, and Stoer. The largest of the navigable rivers of Denmark is the Eyder, which was considered the north-western boundary of the empire of the Franks in the days of Charlemagne, and of the German empire in after-times; it flows out of an inland sheet of water near Bördeshiolm in Holstein, passes westward through Rendsburg, and skirts Friedrichstadt, dividing Holstein from Schleswig, is navigable along nearly the whole of its course of about 105 miles, and enters the North Sea at Tönningen, at the south-western extremity of Schleswig, where it is 800 feet in width. The Trave, a Holstein river also, rises near Giselrade, flows southward through the Lauenburg and Lübeck territories, is navigable throughout the greater portion of its course of about 6 miles, receives the Steckenitz, and winding north of Lübeck falls into the Baltic at Travemünde. The other streams which water Denmark and the adjacent islands, and to which the Danes give the name of Aae, scarcely deserve the name of rivers; the largest of them are the Gudenaae in North Jütland, which rises in the Tyrrild Heide, in North Jütland, flows through several lakes, and enters the Cattegat near Randers; the Nipsaae, in Schleswig, which enters the North Sea at Ribe; the Schol, Wid, and Bredeaae, in the same duchy; and the Susaae, in Seeland, which flows into the sea at Nestwed.

Denmark contains four large canals. The Schleswig and Holstein or Eyder Canal, which connects the North Sea with the Baltic, was formed by rendering the Eyder navigable from Rendsburg to Kluvensik, whence the canal takes an easterly direction through the northern extremity of Lake Flembude, there crosses the range of hills which traverse the peninsula of Jütland and Schleswig from north to south, and terminates in the Kieler Föhrde, a bay of the Baltic between Kiel and Friedrichsort. Its greatest elevation above the level of the Baltic is 27 feet; its length from Rendsburg to its termination is about 27 miles; it has seven bridges and as many sluices; is 100 feet broad at the surface, and 24 at the bottom; it is 10 feet deep, and capable of receiving vessels of 150 tons burthen. Its supply of water is derived from the Flembude lake. The Steckenitz Canal in Lauenburg, which unites the Elbe with the Baltic by connecting the Delvenau with the Möllner-See, Steckenitz, and Trave, was constructed in 1390, and establishes a communication between Lauenburg on the Elbe and Lübeck on the Trave. The Daneskiold Canal, on the island of Seeland, which was constructed by Count Daneskiold Samsoe, between the years 1810 and 1812, gives access from the south-eastern waters of the Great Belt to that quarter of the island which is richest in grain and timber; it begins at Noesdybroe, near Ringstedt, and is carried for about 23 miles to Nestwed, near the Baltic shore. The Odensee Canal connects Odensee, the capital of Fünen, with the sea.

Mineral waters have been brought into use at Glücksburg in Schleswig, and at Bramstede, in Holstein; and there are saline springs near Oldeslohe, in the same duchy.

The proximity of the sea renders the climate of Denmark temperate, considering its latitude. The cold is greatest in North Jütland, and least in the adjoining islands. The weather is in general very variable; rains and fogs are of constant occurrence; storms are frequent; the winter cold is not severe, but the summer heats are at times overpowering. The humidity of the atmosphere is a great advantage to a country whose soil is of so sandy a nature. The thermometer seldom ranges above 20° Reaumur (77° Fahrenheit). The barometer varies from 28¼° to 28° 6′.

The people of Denmark, with the exception of a few thousand Jews, resident in Copenhagen, Altona, and other towns, are of German descent, but of four distinct races. The Danes, who inhabit Seeland and the circumjacent islands, North Jütland, and a small portion of Schleswig, were the Normans of former times: they use a dialect of the German, and are estimated at 1,350,000: the pure Germans, who inhabit the duchies of Holstein and Lauenburg and the greater part of Schleswig, and whose numbers are computed at 650,000: the Frieslanders, who dwell along the western coasts of Schleswig and on the small islands in the North Sea: the Angles, who live between the Bight of Flensburg and the Schley on the Baltic, whose united numbers are estimated at about 70,000; and the Normans, who people Iceland and the Faeroe islands. The present population of Denmark, its duchies, and the adjacent islands, is about 2,040,000. In 1820, it was 1,662,000; in 1827, 1,932,153; and in 1833, about 2,000,000. The earliest census we possess is that of the year 1769 for Denmark Proper, which includes Jütland and the neighbouring islands: the then population was 786,000; in 1787 it had increased to 840,000; in 1801, to 926,000; in 1830, to 1,190,512; and in 1834 to 1,223,800. The duchy of Schleswig, at the beginning of 1803, contained 325,743 inhabitants, and, at the beginning of 1835, 430,258. In the same years, and at the same periods, the duchy of Holstein contained 278,341, and 332,866 respectively.

The Dane is of a strong, well-knit, muscular make; his features regular, eyes blue, and hair commonly light. 'The gift of the Dane,' says Rothe, a native writer, 'is strength, where others have inherited liberty. He is susceptible of high, strong, and enduring feelings, but he is not easily roused; he has more common sense than wit, and, being of a patient disposition, looks at every side of a question, and requires much time for deliberation.'

The population of Denmark is collected in 98 towns, 45 market-towns (all in the three duchies), and 4985 villages, besides isolated farms and dwellings. It was thus classified in the year 1834—the number assigned to each class includes children, servants, and others dependent on the principals—clergymen, schoolmasters, and other teachers, 25,549; civil officers and clerks in public offices, 30,018; scientific and literary men, artists, and students, 5,029; officers in the army and military departments, 3,783; naval officers, 937; under-officers and soldiers, 10,075; sailors in the navy, 6,036; seamen otherwise employed, 34,103; employed in agriculture, 598,558; manufacturers and handicraftsmen, 221,957; traders, 43,342; capitalists and persons living on their property, 47,568; day-labourers, 139,957; professors, 43,576; criminals, 1,470; persons whose occupations are not described, 11,742· total, 1,223,800. This return applies to Denmark and the duchies of Schleswig and Holstein only; and it is estimated that 1,100,000 of the whole of their then population were more or less dependent upon agriculture for their subsistence." The proportion of births to living individuals is 1 in 32; and of deaths to living individuals 1 in 40. The proportion of marriages to the population in the 10 years ending in 1834 was 1 to 123. On an average the issue of each marriage was $2\frac{60}{100}$ children. In the same year the town population consisted of 295,212, and the rural population of 1,234,983.

Denmark is pre-eminently an agricultural state. The most fertile parts are the islands of Laaland and Falster, and next to them Seeland and Fünen; but agriculture is not so skilfully or actively pursued in these parts as in Holstein and Lauenburg, particularly in the Northern and Southern Ditmarshes of Holstein on the Baltic coast, where the most perfect tillage in Denmark prevails. Jütland has the least productive soil of any part of the kingdom, a considerable portion of its western districts, as well as those of Schleswig and Holstein, from the Eyder to the Liimfiord, being wholly unavailable for agricultural purposes. The Danes, as agriculturists, are deficient in energy, intelligence, and thriftiness. Their backwardness in this respect arises from a variety of causes, of which the chief are, as Olufsen, one of their countrymen, remarks, that the cultivator is rarely proprietor of the soil, that he is overburthened with dues and services, that there is too great an extent of common lands, that his capital is too small, and that property is too much subdivided.

Denmark and the adjacent islands contain an area of about 21,472 square miles, or 13,742,080 acres. Of this area there have been applied to useful purposes about 16,266 square miles, or 10,410,240 acres; being nearly 76 in every 100 acres. This quantity is composed of about 8,633,600 acres of arable land; 604,800 of meadows; 470,400 of pastures, &c.; and 537,600 in woods and forests; besides about 107,520 of arable and meadow or pasture land, and 56,320 of woods, forests, &c., in the duchy of Lauenburg The average yearly produce of the cultivated soil is estimated at 300,000 quarters of wheat, 1,400,000 of rye, 4,450,000 of oats, 2,000,000 of barley, 115,000 of buckwheat, 245,000 of peas and beans, 250,000 of rapeseed, 2,200,000 tons of potatoes, 2500 cwts. of hops, and 448,000 pounds of tobacco. It is stated by Nathanson that the yearly exports of this produce, on an average of ten years (1821 to 1830), were from 900,000 to 950,000 quarters; namely, wheat, 130,000 quarters; rye, 185,000; barley, 315,000; oats, 200,000; buckwheat, 17,000; peas and beans, 14,000; and rapeseed, 70,000; besides 20,000 quarters of malt and 16,500 of meal and flour. By a return laid before parliament, the average exports of corn for the four years 1831-1834 were—wheat, 103,302 quarters; rye, 100,829; barley, 366,969; and oats, 171,954. Of the grain exported, above four-sevenths, and of the rapeseed more than four-fifths, are from the Danish duchies. As a proof that agriculture, though comparatively backward, has made considerable advances, not only in the latter provinces, but in the northern parts and islands, it may be observed that Jütland and the islands did not produce sufficient grain for their own consumption in the last century, whereas they now afford a surplus of at least 50,000 quarters for foreign markets. Much flax and hemp is also raised, but little of superior quality, and in the whole scarcely enough for domestic purposes. Denmark produces the usual kinds of vegetables; but horticulture is not carried to any extent, excepting in the vicinity of the towns, especially Copenhagen, Altona, and Glückstadt. With respect to fruit, large crops of the commoner descriptions are produced; but attention is paid rather to quantity than quality. The value of landed property in Denmark Proper (Jütland and the islands) is estimated at 316,000,000 of banco dollars (about 25,675,000*l.*)

The rearing of horses and cattle is an object of great attention. The light Danish and heavy Holstein breeds of horses are equally valuable in their way, the one for cavalry purposes and the other for draught. The Jütland breed is similar in figure and extraction to the Holstein, but has not so fine a head. The king has two large studs at Friedrichsburg and Jägerpreiss; and numerous establishments of this kind are kept up by individuals, particularly in Fünen. The whole stock in Denmark and the duchies is estimated at 550,000; and the exportations, on a ten years' average, are about 7600 annually. In 1831, as many as 12,350 were sent abroad. The rearing of horned cattle is on an extensive scale, chiefly with a view to the making of butter and cheese and salted beef. The stock of all ages is estimated at 1,607,000; and the number exported averages yearly about 23,800 oxen, 6800 cows, and 5760 calves. Of butter alone upwards of eleven millions of pounds' weight have been the annual average export of the last ten years. Cheese (about 9200 cwt. exported), lard, salt meat, hides, and skins are likewise exported in great quantities. Large flocks of sheep are kept: the best native breeds are the Eyderstedt and Frisian in Schleswig, and the Jütland race; but they are reared rather for the sake of their flesh and milk, from which last cheese is made, than for their wool. The stock is estimated at about 1,900,000, of which about 20,000 have been improved by crossing with the Merino breed. The quantity of wool annually obtained is said to be about 4,880,000 pounds' weight, and the quantity exported is about 1,080,000. Of swine, Denmark possesses three species, the best of which is the Jütland sort; their numbers are about 450,000; the annual consumption about 250,000; and the yearly export about 20,000. Poultry of all kinds are raised, particularly geese, of which about two millions are annually killed. Much honey and wax is made in Fünen, Falster, and Bornholm. and also from the bees on the heaths in the duchies of Schleswig and Holstein; but neither the one nor the other is adequate to the domestic consumption.

The fisheries form a very essential branch of national industry: the bays and inlets, and the mouths of the Danish rivers being well stocked with fish, afford abundant and profitable employment to the inhabitants in almost every part of the long line of coast. The fishing grounds of the Liimfiord, and indeed of the whole north-eastern coast of Jütland, are the most important with regard not only to the herring trade, but other descriptions of fish, such as mackerel, cod, salmon, eels, flat-fish, shell-fish, &c.: they employ upwards of 250 boats, and 1000 men belonging to the adjacent coast, besides a great number of vessels from other parts, among which are above 100 large barks, here called Quasen, which resort here from Seeland, Fünen, and Bornholm. The average annual produce of salted herrings in this quarter alone is from 40,000 to 50,000 tons, of which between 15,000 and 20,000 are exported; in some years, indeed, the catch has proved so abundant, that the export has amounted to 40,000. The herring fishery in the Great Belt gives occupation to more than 100 vessels. Oysters are in Holstein a crown monopoly, which is let for about 1200*l.* per annum. Seals are taken on the Jütland coast about Eyderstedt, and their fat is converted into oil. There is an association for the herring fishery at Altona, who are the proprietors of twenty or thirty vessels. The Danes also take an active part in the cod-fishery of the North Sea and the whale-fishery off the shores of Greenland.

The fine forests which once enriched the Danish soil have gone to decay from want of care and from wasteful consumption. This has especially been the case in Denmark Proper and the duchy of Schleswig; and Olufsen himself does not estimate their present area at more than about 840 square miles. One fourth of them is crown property. The woods stretch northward from the Schley, along the eastern coast of Jütland to the Liimfiord; there are long tracts of them also in the south-western parts of Fünen, from Bogense to Svenborg. The woods of Seeland, Falster, and Laaland are of low growth. The pine is the prevalent tree, intermixed with the beech, oak, and birch. Denmark is dependent for her supplies of timber on Norway, Prussia, Russia, and other countries, and the inhabitants are compelled, in many parts, from the positive absence of wood, to resort to any substitute, such as manure, straw, haulm, &c. for fuel. There is little inland game but what is found in the royal and other forests; but great numbers of wild waterfowl are killed on the islands along the Schleswig coasts and in other parts.

Denmark possesses no mines or metals whatever; nor any minerals of importance, except coals, freestone, and salt: the coal-pits in Bornholm have been abandoned, and there is but one saltwork, that at Oldeslohe in Holstein, which yields about 5000 tons annually. The supply of salt is drawn from Portugal, Lüneburg, &c. Amber is collected on the Hitze, a sandbank on the western coast of Jütland; it is both of the white and deep yellow kinds. Potters' and porcelain earths are also obtained. Peat is got wherever there are swamps, and every village in those parts has bog-land assigned for its supply.

In a country where agricultural pursuits create a greater demand for labour than what the population is competent to furnish, any great development of manufacturing industry cannot reasonably be looked for. In fact, out of a population of upwards of two millions, we are told that there are not above 85,000 hands engaged in large manufactures, and in mechanical employments altogether about 300,000. The Danish capital is the chief seat of manufacture, and we refer to the article COPENHAGEN for the details. Altona is next in importance: its principal productions are silk, woollen, and cotton goods, leather, soap, refined sugar, and tobacco. Lace is made on a very extensive scale in and about Tondern; and some is so fine as to be worth thirty or forty shillings a yard. There are large tobacco manufactures, but they are said not to produce more than one-eighth of the quantity consumed. The woollen manufactures, which are estimated to produce about 350,000 yards of coarse and middling cloths, are chiefly in Copenhagen, Fredericia, and other parts of Denmark Proper, and the cotton in the same capital, Altona, Roskilde, Christianfelde, and Hanerau. There are 24 paper mills in the kingdom, whose annual produce is about 1,200,000 reams; Randers is the principal seat of the glove manufacture; and Friedrichsvärk, Lyngby, and Haraldskjaer, of the manufacture of ironwares, next to the metropolis. Linens are made at Kiong and Holsteinborg, and in most parts constitute the occasional employment of the cottagers for the purpose of supplying their own wants. Straw hats, sailcloth, glass, soap, leather, saltpetre, gunpowder, and arms, plated goods, china and earthenware, beer and spirits, thread, refined sugar, soda, and potashes, are among the productions of Danish industry. The brandy distilleries exceed 3000 in number; and there are upwards of 4000 hands employed in making wooden shoes in various parts of Jütland. The peasants' families make their own woollen clothing in general, which is composed of a coarse stuff termed wadmel, and indeed there are few articles of domestic use, whether utensils or for apparel, which are not made by their own hands.

There is probably no country in Europe better adapted or more favourably situated in many respects for commerce than Denmark. It is the key of the Baltic, and possesses peculiar advantages for a ready and cheap intercourse with all the maritime nations of Europe. Copenhagen is the central point of the Danish foreign trade, which has been greatly favoured by the neutral policy which the government has endeavoured to pursue during the last hundred years and more. Navigation, in which above 50,000 hands are employed, is a great source of profit to the country, for the Danes navigate their vessels on cheaper terms than many of their competitors, and are excellent mariners, on which account they are the carriers for other countries, particularly to the Mediterranean and Levant. This branch of commerce is on the increase: in 1825, Denmark had 3876 vessels of the total burthen of 118,393 tons; in 1829, 3691, burthen 128,084 tons; and at present their number is estimated at upwards of 3700, in burthen 143,800 tons. In the first three years of the present century the average arrivals of Danish and Norwegian ships in foreign ports were annually 3933, of the total burthen of 401,351 tons, of which the Norwegian constituted one half at least; in 1834, they had increased to 4029 of 236,650 tons burthen, for Denmark alone. This increase will appear the greater, when it is recollected that between the years 1807 and 1810, as many as 900 vessels were lost or captured, by which the trading ships of Denmark were in 1814 reduced to so small a number, that their united burthen did not exceed 74,520 tons. In 1831, the tonnage of the British vessels which arrived in the Danish ports was 16,5[illegible] (vessels 96); and in 1835, 22,249 (vessels 120). The trade between the mother country and the West and East India colonies is quite free; the busiest traffic is carried on with the island of St. Thomas; and the value of the native produce and manufactures annually exported to all parts is about 15,000,000 dollars or 2,340,000*l.* The trade with Norway, which takes much grain, tallow, soap, &c. from Denmark, employs 200 or 300 Danish ships, and that with Iceland, Greenland, and the Faeroe Islands is of some importance. In a preceding page we have given some account of the export of grain; among the other articles of exportation are butter, cheese, brandy (about 3800 pipes), salted and smoked meat (about 3,400,000lbs.), horned cattle (about 31,000 head horses, skins and hides, whale and train oils, eyder-down, woollens, fish, tallow, bristles, &c. Denmark, on the other hand, imports wines, salt, silk, wools, and cotton, cotton manufactures, timber, coals, colonial produce, brandies, and spirits, glass, flax and hemp, drugs, &c. to the extent of about 14,000,000 dollars, or 2,270,000*l.* yearly. The public trading associations consist of the Royal Asiatic Company, which has 10 vessels employed in the China and East India trade, and the privileged Baltic Company, which carries on an extensive trade with the Baltic ports: both of them are established in Copenhagen. There is a brisk intercourse by sea between the several ports. The chief places of trade are Copenhagen, Altona, Kiel, Koersoer, Helsingör, Odensee, Viborg, Randers, Flensburg, Schleswig, Aalborg, Rendsburg, Tondern, Aarhuus, Glückstadt, Neustedt, and Itzehoe. At Copenhagen there are a Board of Internal Economy and Commerce, a National Bank, an Exchange and Loan Bank, and a Marine Insurance Company; and at Altona, an Exchange, Loan, and Discount Bank. By the royal decree of May, 1817, no individual can carry on trade who has not attained his majority and taken up his citizenship. Foreigners are allowed to make purchases in the wholesale way, but not to sell goods. None can become wholesale dealers in towns but such as are owners of vessels, or parts of vessels, to the extent of 26 tons at the least, and have deposited the requisite sum in the treasury. No clerk can be employed who is under 18 years of age. The Schleswig and Holstein canal has greatly facilitated the commercial intercourse between Denmark and the Baltic: in 1807, 1597 vessels passed through it; in 1814, 2060; in 1823, 2468; and in 1830, 2999.

Denmark is an absolute and hereditary monarchy, founded on three fundamental laws; the Act of Sovereignty of 1661, the King's Law (*Konge Lowen*) of 1665, solemnly ratified by the whole nation, and the Native Subjects' Law (*Ind fotts retten*) of 1776. As duke of Holstein and Lauenburg, the king is a member of the German Confederation, holds the tenth rank in point of precedency, has three votes in the full assemblies of the diet, pays a yearly quota of 2000 florins (about 90*l.*) towards the expenses of the confederation, and furnishes a contingent of 3900 men to the tenth corps of the confederate army. The sovereign must be of the Augsburg confession of faith, and must uphold its ascendancy in his dominions. He attains his majority on reaching his fourteenth year: descendants in the male succeed to the crown in preference to those in the female line. The sovereign fixes the allowances to be made to the members of the royal family of his own free will: all legislative and administrative acts proceed from his own will and pleasure. The orders of knighthood are the order of the Elephant, instituted in 1458: the Danebrog order, founded in 1219, and now bestowed for eminent services, and the order 'De l'Union Parfaite,' founded by the consort of Christian VI. in 1732, and admitting both of male and female knights. The nobility consist of one duke, nineteen counts, and twelve barons. In Holstein and Schleswig there is an equestrian community of about twenty seignorial families, who enjoy the rents and profits of all the sequestrated monastic estates, to the amount of several millions of dollars per annum, and exclude the remaining moiety of the noble landholders in these provinces from all participation in that revenue. By a decree of the 15th of May, 1834, the kingdom was divided into four electoral districts, each of which has at present its provincial assembly: these districts are the Danish Islands, which choose from sixty-six to seventy representatives; Jütland, from fifty-one to fifty-five; Schleswig, forty-four; and Holstein, forty-eight. The states of Lauenburg are of antient date: they consist of the nobility, hierarchy, and representatives of towns, but seldom meet in full assembly, their affairs being despatched by a deputation who hold annual councils under the presidency of a marshal. The four provincial assemblies must be called together at least once in two years: their consent is necessary to all alterations in laws affecting persons or properties, public imposts, or requisitions for the national service; and they are allowed to propose laws for the sovereign's adoption, and to lodge complaints against any of the public authorities.

The privy council is, by the rescript of May, 1814, the highest board in domestic affairs: it is composed of the king, as president, a vice-president, and six members. The ministry consists of a minister for the land revenues, &c., for taxes and trade, for foreign affairs, for justice and police, in Denmark Proper, for the same departments in Schleswig and Holstein, for the war department, and for naval affairs. The supreme court of justice is in Copenhagen. There is a governor for Schleswig and Holstein; and the West Indian Islands, the African possessions, and the East Indian settlements, have each of them a governor also. A Land-vogt, or lieutenant, governs the Faeroe Islands, and a Stifts-amt mann, or high bailiff, is at the head of the public authorities in Iceland.

The Danish Budget, showing the probable Receipt and Expenditure of the public Income of the kingdom of Denmark, for the year 1835:—

INCOME.

	Amount for Denmark Proper.	Amount for Schleswig and Holstein.	Total Amount.
I. Ordinary Revenues and Receipts.	Sterling.	Sterling.	Sterling.
1. Land Tax	£224,666	£136,445	£361,111
2. House Tax	35,777	14,333	50,110
3. Customs and Excise . .	311,111	79,111	390,222
4. Tax on Rank, and Salaries of Civil Officers . .	5,555	44,888	50,443
5. Stamps	29,111	15,000	44,111
6. Tax on Property inherited or transferred . .	11,888	10,333	22,221
7. Fees of Justice Courts and other Public Offices . .	18,000	3,666	21,666
8. Woods and Forests, and other Crown Lands . .	17,110	148,445	165,555
9. Lottery	28,888	17,223	46,111
10. Miscellaneous . . .	6,227	1,333	7,560
	£688,333	£470,777	£1,159,110
II. Other Receipts.			
1. Surplus of Revenues derived from the Duchy of Lauenburg			£21,112
2. Interest on Property belonging to the Crown . .			48,888
3. Monies received on account of Property disposed of .			114,444
4. Revenues of the West India Islands . . .			5,555
5. Proceeds of the Sound Toll			200,335
Total of probable Receipts . .			£1,549,444

EXPENDITURE.

	Sterling.	Sterling.
I. The Royal Establishment	. .	£130,442
II. Public Departments . . .	. .	154,556
III. The Army	. .	294,666
IV. The Navy	. .	134,777
V. The Colonies	. .	15,555
VI. Pensions and Allowances . . .	. .	60,888
VII. Public Works	. .	57,110
VIII. Industry and Trade . . .	. .	6,333
IX. Arts and Sciences.		
For the University of Kiel, including Miscellaneous Expenses for the Promotion of Arts and Science	£20,222	27,444
Travelling Expenses of Young Artists and Literary Men . . .	1,666	
Expense of the Theatre at Copenhagen .	5,556	
X. Charitable Institutions and Donations .	. .	21,221
XI. Miscellaneous	. .	44,788
XII. Public Debt.		
Interest upon the Public Debt . .	530,555	673,332
Payment to the Commissioners of the Sinking Fund	106,777	
Total of probable Expenditure .	. .	£1,585,111

Income in 1835	£1,549,444
Expenditure	1,585,111
Deficiency . . .	£ 35,667

The Lutheran is the predominant religion, but every other is tolerated. The affairs of the national church are under the superintendence of the eight bishops of Seeland, Laaland, Fünen, Ribe, Aarhuus, Viborg, Als, and Aalborg, a general-superintendent, sixty-two provosts, and 1488 ministers. The bishoprics are in the gift of the crown. A decree of the 5th December, 1806, attached a provost to every district (*amt*), who is appointed by the sovereign, and relieves the bishop from certain duties, particularly those relating to the supervision of scholastic institutions. The ecclesiastical concerns of the Faeroe Islands are conducted by a provost and seven ministers; those of Iceland by a bishop, resident at Skalholt, and 182 clergymen; those of the duchy of Schleswig by eleven general superintendents, who have each of them a certain number of provostships under them, amounting to 165 in all, besides sixty-eight parishes; those of Holstein by thirteen superintendents, under whom are 135 provostships and five parishes. There are twelve religious communities in Denmark Proper and the duchies; a missionary college at Copenhagen, called the 'Collegium de cursu evangelii promovendo,' founded in

1714, and a seminary for approved candidates in divinity in the same city. Out of a population of 2,040,000 souls there are about 1300 Reformed Lutherans, 2100 Roman Catholics, 900 Mennonites, 1500 Herrnhuthers, and 1700 Jews; the remainder are Lutherans. The number of parishes is 1907.

Much has been done for the education of all classes in Denmark. There are thirteen seminaries for educating teachers, upwards of 2500 primary schools, and 2000 others on the Lancasterian plan; thirty gymnasia or grammar-schools, of which eighteen are in Denmark Proper, four in Schleswig, six in Holstein, one in Lauenburg, and one in Iceland; and two universities, one in Copenhagen, and the other in Kiel; the first founded in 1479, and attended by about 600 students, and the other, founded in 1665, and attended by about 300. (For the Schools for the Deaf and Dumb, see that article, vol. viii., p. 335.) Among the public libraries are three in Copenhagen and one in Kiel. The designations of the eleven societies for scientific and national purposes which are established in Denmark are given under the head of Copenhagen. The number of new publications varies from 200 to 250 annually; but the number of periodical journals, &c., which amounts to between seventy and eighty, is large indeed, when compared with the population. No work which does not contain more than twenty-four pages can be published without the previous sanction of the director of police; and any offensive reflections or libels upon foreign potentates, whether original or extracted from other publications, are punishable as misdemeanours. In Iceland there prevails so ardent a thirst for knowledge, that manuscript copies supply the want of printed books, and there is scarcely one in a hundred individuals, above the ages of 12 or 14, who cannot read and write.

The numerical strength of the Danish army does not exceed 6000 men at present, independently of the troops employed in the colonies; but on the peace footing it nominally consists of—the engineers, nineteen officers and thirteen privates; the artillery, 4498 officers and privates; the cavalry, 3302 officers and privates; and the infantry, 31,026 officers and privates; besides a corps of 110 cadets, and a rocket-corps, 132, the total numbers being 39,099. A sufficient number of officers and others always remain at the disposal of the crown to call a force of 25,000 men at any time into active service. The heads of the army in 1836 consisted of a field-marshal, two generals, three lieutenant-generals, twelve major-generals, and seven brevet major-generals, together with an adjutant-general and a quartermaster-general, &c. Every soldier's engagement is for eight years, of which he is not at present required to pass more than two in active service. The militia, when called out, musters 59,000 rank and file.

On the 1st of January, 1836, the navy was composed of seven ships of the line, mounting 544 guns; eight frigates, 350 guns; and five sloops, five brigs, three schooners, and three cutters, mounting 200 guns: in all thirty-one vessels and 1094 guns. To these must be added fifty-six gun-boats and six bomb-vessels, &c. The chief officers consisted of one admiral, two vice-admirals, two rear-admirals, six commanders, eleven lieutenant-commanders, two captains, twenty-five lieutenant-captains, forty-one first-lieutenants, and thirty-three second-lieutenants.

The fortresses and fortified ports of Denmark are Copenhagen, Cronburg Castle, Korsoer, Fredericia, Friedrichsort, Friedrichshaven, Rendsburg, Christiansoe near Bornholm, Nyborg, and Glückstadt. The chief military and naval establishments are the Cadet Academy, Copenhagen; the Arsenal and Archive of Charts, in the same city; a cannon and ball foundry at Friedrichsvaerk; an invalid hospital at Eckernförde; and arsenals at Rendsburg and Randers.

History.—The oldest history of Denmark is pure tradition, derived from the suspicious source of the Icelandic Legends or Saga. The first fact of which we can speak is that the Cimbri, a branch of the Normans or Scandinavians, were the earliest known inhabitants of the peninsula of Jütland and Schleswig, which was thence called The Cimbrian Chersonesus. They first became known to the Romans from their taking part with the Teutones, about 100 years before the Christian æra, in the invasion of Gaul and Italy, in the times of Marius. About A.D. 250, the Goths overran the Scandinavian territories under Odin or Wodun, and imposed rulers of their own on Sweden, Denmark, and Norway. Skiold, Odin's son, is the first name which has descended to us as sovereign of Denmark; but we possess no record of his time beyond numerous legendary fragments. Denmark appears however to have been divided into a variety of petty states, of which Skiold's descendants assumed the lordship for many centuries, and to have been inhabited by a warlike race of men, whose principal occupation was piracy. The Normans, or Angles, under which designation the Swede and Norwegian as well as the Dane were included, during the eighth and ninth centuries, established their dominion in parts of England, which they distracted by their inroads until the middle of the eleventh century: they also made themselves masters of Normandy under Rollo, colonised the Orkneys and Hebrides, the Isle of Man, Iceland, and part of Ireland, and pushed their settlements as far south as Spain, Italy, and Sicily. The first Danish monarch with respect to whom we are enabled to speak with certainty was Gorm, or Worm, the Old, a Skioldinger, who brought Jütland under his sway in 863, and succeeded between that date and the year 900 in uniting every state in Denmark to his dominion. His son, Harold II. the Blue-Tooth, introduced Christianity about the year 972. In 1000, Sven, his grandson, subjugated part of Norway, and in 1014 the greater part of England, where he soon after died; in 1016, his grandson Knud the Second, or Canute the Great, possessed himself of the whole of England and part of Scotland; and in 1030, of the remainder of Norway. To this monarch Denmark was indebted for her greatness, laws, and internal organization, and the establishment of Christianity as the religion of the country. His successors, however, were not endowed with capacity enough to preserve his dominion in its integrity. England threw off their yoke in 1034, and Norway two years afterwards. A new dynasty out of the female line of Canute's descendants mounted the throne in 1047, in the person of Sven Magnus Estritson the Third, and held the sceptre for four hundred years afterwards; but the feudal system erected by Sven and Canute stripped the sovereign of his authority, rendered the Danish king dependent upon the voice of the prelates and nobles, levelled the peasant to the condition of a serf, reduced agriculture to the lowest ebb, and surrendered commerce into the hands of the German Hanse Towns. The sovereigns were forced, by the assembly called the Handfaestningar, to recognise the states of the kingdom as their own electors, and to consent to the controul of a council. The male descendants of Magnus Sven became extinct with Waldemar the Third in 1375; and Olaf the Fourth, of the female line, Waldemar's grandson, dying in 1387, his mother, Margaretta, styled the Northern Semiramis, ascended the throne of Denmark. She acquired Norway by inheritance, and having subdued Sweden by force of arms, united the three northern kingdoms under one crown by the Calmar union in 1397. The Swedes, however, could never be brought to endure the league, and after a long series of contests, ultimately renounced the union in 1523. These contests undermined the prosperity of the Danish monarchy no less than the perpetual broils between the sovereign and his nobles on the one hand, and the nobility and clergy on the other; the population decreased greatly, and the adjacent seas swarmed with Danish pirates, while trade and navigation dwindled to insignificance. Margaretta's line having forfeited the throne in 1439, and Erick the Seventh having been deposed, the Danish States elected Christian Count of Oldenburg king. Christian founded the university of Copenhagen in 1478. The sway of his descendants was however but of brief duration, for his grandson Christian the Second, surnamed 'the Wicked,' having become obnoxious to all parties, the crown was transferred to his uncle Frederic the First, duke of Schleswig and Holstein, who received the crown of Denmark and Norway in 1523. This monarch was the mere slave of the aristocracy, which established abject servitude among the labouring classes as part of the law of the land. His son Christian the Third united the duchies of Schleswig and Holstein in perpetuity to the crown of Denmark in 1533, and brought the turbulent Norwegians to recognise the Danish kings as their sovereigns 'for ever.' In his reign the Reformation was established throughout the united kingdoms, and a code of laws, entitled the 'Recess of Kolding,' was promulgated. The struggles arising out of his partition of the greater part of Schleswig and Holstein between his brothers, became a source of much subsequent mischief to Denmark, and was not terminated until 1773, when the alienated territory was recovered by the cession of Oldenburg and Delmenhorst to its then possessor, the grand-duke of Russia

The wars which his son Christian the Fourth waged with Sweden entailed so many disasters upon him, that he was compelled, by the treaty of Brocmsebroo, in 1645, to cede to Sweden the provinces of Jempteland and Herjedalen, together with the islands of Gottland and Oesel. His son and successor, Frederic the Third, renewed the hostilities with Sweden, whose sovereign, Charles Gustavus, invaded and overran his dominions, and at length wrested from him, by the terms of the treaty of Copenhagen in 1660, the extensive districts of Schonen, Halland, Blekingen, and Bähus, in Sweden. In the same year the three estates of the realm acknowledged Frederic and his successors as absolute sovereigns of Denmark, in solemn diet at Copenhagen: and they confirmed the surrender of their rights by presenting him with the 'Arfve-Enevolds-Regierungs-Akt.' This gave occasion to the promulgation of his 'Konge-Lov,' in 1665; the fundamental law of settlement which prevails in Denmark at the present day. He was succeeded by his son, Christian the Fifth, who established the Danish West India Company in 1671, acquired the islands of St. Thomas, St. Croix, and St. John, and founded a settlement at Tranquebar. War between Denmark and Sweden was rekindled by Frederic the Fourth, his son, and was brought to a successful close by the peace of Friedrichsburg in 1720, in which Sweden ceded the right of receiving the Sound dues to the Danes, and the long-disputed claim of Denmark to the sovereignty of Schleswig was fully recognised. The subsequent hundred years were a period of continued tranquillity, during which the state rose, and enjoyed prosperity: the happiest fruits of this interval of peace were, the abolition of servitude among the peasantry, begun by Christian the Seventh in 1767, the extinction of the negro slave trade, and the establishment of greater liberty of the press. During the wars of the French Revolution, Denmark observed a strict neutrality; but in contesting the right of search as to her mercantile shipping, insisted upon by England, which led her into a defensive alliance with Russia, Prussia, and Sweden, she brought upon herself the loss of her East and West India colonies, and suffered severely in the naval fight off Copenhagen in 1801. The treaty which ensued restored those colonies to her. The peace of Tilsit, in 1807, in which there were secret articles stipulating that the whole Danish navy should be delivered over to the French emperor, occasioned however a fresh rupture with England, which commenced with the appearance of a formidable force under Earl Cathcart and Lord Gambier on the coast of Seeland, and was carried to open hostilities upon the refusal of the Danish government to surrender their fleet, consisting of 15 ships of the line, 14 frigates, and 3 brigs, as well as their timber and the naval stores then in the yards and arsenal of Copenhagen. Upon this refusal, Lord Gambier bombarded the Danish metropolis, from the 2nd to the 5th of September, forced it to capitulate after a considerable part of the town had been burnt, and carried away the fleet to England. In November following a formal declaration of war was issued by the English government, and Denmark, whom the outrage at Copenhagen had effectually thrown into the arms of France, was again stripped of her colonial possessions, and not only lost the islands of Anholt and Heligoland, but the whole of her foreign commerce. Even after the destruction of Napoleon's armies in Russia, and in spite of the efforts of the allied powers in 1813, she could not be induced to renounce her alliance with France, and the summons to surrender Norway to Sweden impelled her still more strongly to persist in that alliance. The consequence was that the Crown Prince of Sweden entered Holstein and Schleswig, and by his successful progress terrified Frederic the Sixth into signing the treaty of Kiel on the 14th of January, 1814. In virtue of its terms, Denmark accepted Pomerania in exchange for Norway. This province was in 1815 ceded by her to Prussia, in consideration of her receiving the duchy of Lauenburg and a large sum of money. In making peace with England, she recovered her colonial dominions, but with the loss of her fleet and the island of Heligoland.

DENNIS, JOHN, was the son of a saddler of London, where he was born in 1657. Having been put to school at Harrow, he was sent thence in 1675 to Caius College, Cambridge. In 1679 he removed to Trinity Hall, in the same university, and in 1683 took his degree of A.M. There appears to be no foundation for the story told in Baker's 'Biographia Dramatica,' that he was expelled from college for attempting to stab a person in the dark. On leaving the university he spent some time in travelling through France and Italy. Returning home from the continent, full of dislike to the manners of the people, and especially to the modes of government he had seen there, and finding himself in possession of a small fortune, the bequest of an uncle, he set up for a flaming whig, and formed connexions with several of the leading political and literary characters of that party. As a man of letters, however, he did not confine his acquaintance within the limits of his political partialities; Dryden and Wycherley, for instance, as well as Halifax and Congreve, are enumerated among his friends. In the idle and expensive life which he now led he soon dissipated what property he had, and for the rest of his life he was obliged to depend for subsistence upon his pen, and the still more precarious resource of private patronage. No experience however seems to have cured his improvidence. In his difficulties the duke of Marlborough procured for him the place of a waiter at the Custom House, a sinecure worth 120*l.* a year; but he was not long in selling this appointment, and it was only the kind interference of lord Halifax that induced him to reserve out of it a small annuity for a certain term of years. This term he was unfortunate enough to outlive, and, to add to his miseries, he became blind in his last days, so that he was in the end reduced to solicit the charity of the public by having a play acted for his benefit, which some of his old friends, and some also whom he had made his enemies, interested themselves in getting up. Dennis died in 1734. Throughout his life the violence and suspiciousness of his temper had at times approached to insanity, and were the constant curse of his unhappy existence, making him at once miserable and ridiculous. Owing to this disease he quarrelled with everybody, and rarely made a friend or an acquaintance in whom his distempered vision did not soon discover an enemy in disguise. Yet Dennis wanted neither talents nor acquirements. Many of his literary productions show much acuteness and good sense, as well as considerable learning. He began to publish occasional pieces in verse, mostly of a satirical cast, about 1690, and from that time till near his death his name was constantly before the public as a small poet, a political and critical pamphleteer, and a writer for the theatres. His poems and plays were sufficiently worthless; but one or two of the latter obtained some notoriety chiefly from the fuel they administered to certain popular prejudices that happened to rage at the time. His 'Liberty Asserted,' in particular, was acted with great applause in the Lincoln's Inn Fields theatre in 1704, in consequence of the violent strain of its Anti-Gallicism, a sentiment with which the audience, in the excitement of the war with France, was then peculiarly disposed to sympathise. Connected with this play are the two well-known stories about Dennis, during the negociations that preceded the peace of Utrecht, going to the duke of Marlborough and asking his Grace to get an article inserted in the treaty to protect his person from the French king; and about his afterwards running away from the house of a friend with whom he was staying on the Sussex coast, because he thought that a vessel he saw approaching was coming to seize him. Another of his dramatic attempts, his 'Appius and Virginia,' acted and damned at Drury-lane in 1709, is famous for the new kind of thunder introduced in it, and which the author, when a few nights after he found the players making use of the contrivance in Macbeth, rose in the pit and claimed with an oath as his thunder. Dennis's thunder is said to be that still used at the theatres.

Among the ablest of his critical disquisitions were his attacks upon Addison's 'Cato,' and Pope's 'Essay on Man.' Addison had been among the number of his friends, but Dennis supposing that something in the second and third numbers of the 'Spectator' was intended as an offensive allusion to him, took the opportunity of avenging himself when 'Cato' appeared. Much of his criticism nevertheless has generally been deemed by no means the product of mere spite. It was upon this occasion that Pope, in conjunction with Swift, wrote 'The Narrative of Dr. Robert Norris, concerning the strange and deplorable Frenzy of Mr. John Dennis, an Officer in the Custom House.' Pope also stuck Dennis in his 'Essay on Criticism,' and afterwards gibbeted him much more conspicuously in the 'Dunciad.' The life of Dennis has been written with prodigious expansion by Dr. Kippis in the 'Biographia Britannia,' his article extending to fourteen long folio pages. He has also furnished the subject of an amusing paper in Mr. D'Israeli's 'Calamities of Authors,' entitled 'Influence of a Bad Temper in Criticism.'

DENOMINATOR, the number of parts into which a unit is divided in any fraction; thus, in 7-10ths of a unit, 10 is the denominator. [Fraction.]

DENS CANIS. [Erythonium.]

DENSITY. This term is absolutely of the same practical meaning as its measure, Specific Gravity, implying that relation of one mass of matter to another, which is suggested by our knowing that a given bulk of the first weighs more than the same of the second. The term has no absolute meaning: gold is more dense than air, but neither is absolutely dense, nor can we assign any meaning to the latter term. It were perhaps to be wished that the shorter term, density, should be employed instead of the longer one, specific gravity; but as custom has referred to the latter term all mathematical considerations connected with the former, we do not here pursue the subject further. [Specific Gravity.]

DENTA'LIUM, a genus of testaceous mollusks, whose place in the animal series was first satisfactorily determined by Mr. G. P. Deshayes. Rondelet considered the Dentalia as marine shell-worms (vermisseaux de mer), though he noticed them as worthy of particular attention; Lister introduced them at the end of the limpets (Patellæ); Lang followed in nearly the same steps, separating, after the Patellæ a section wherein he arranged, together with the Dentalia, all the calcareous tubes of Annelids then known. Breyne placed his genus *Tubulus*, containing the Dentalia, &c., at the head of his *Monothalamous shells*, the first of the two grand orders, *the Monothalamous* and *the Polythalamous*, into which he divided the testaceans. In this position Dentalium was separated from the Patellæ by all the other univalve shells comprised in the *Cochlidia*, as well as by the Polythalamous series; in short, by the entire interval of the univalve testaceans, Breyne, as M. Deshayes observes, having probably considered the Patellæ as the passage from the univalves to the bivalves; for he places them immediately before the latter. Tournefort gave the Patellæ a position at the head of the univalve shells, and at the end, before the bivalves, he placed the *Dentalia*, *Entalia*, and the other marine testaceous tubes. D'Argenville, in his 'Zoomorphose,' appears to be the first who attempted to give any notion at all approaching to reality of the animal, the result of a note and drawing which had been sent to him from India. Though the materials were too incomplete to furnish secure data for fixing its position, they gave information which former authors had not enjoyed, and there was certainly enough to prevent D'Argenville from placing it in the heterogeneous third division of his system, denominated by him the Multivalves. Linnæus arranged it immediately after *Patella*, and before *Serpula*, stating the animal to be a *Terebella*, and the shell to be univalve, tubular, straight (*rectâ*), monothalamous, and pervious at each extremity. Bruguière gave it nearly the same position: but if both these zoologists were right in making Dentalium follow Patella, they were as far wrong in placing it by the side of *Serpula*, *Teredo*, *Sabella*, and above all, *Aspergillum*. Lamarck, in his 'Système des Animaux sans Vertebres,' (1801,) arranged Dentalium with *Terebella*, and other genera analogous in appearance. In the 'Philosophie Zoologique' he separated the class of worms of the *Système* into two other classes, and formed the 'annelids,' with the section of external worms (vers extérieurs). He elevated, observes M. Deshayes, this division sufficiently in the series of *Invertebrata*, the presence of a heart and a circulation making it approximate to the mollusks; whilst the 'worms,' very inferior in organization, remained between the soft *Radiata* and the *Insects*. In this new class, adds M. Deshayes, we find the Dentalia in the same section with *Serpula*, *Spirorbis*, and *Siliquaria*. This arrangement was not altered in 'L'Extrait du Cours,' published in 1811. But, in the great work of the 'Animaux sans Vertèbres,' Lamarck, assisted by the labours of Savigny, and deceived, moreover, by the communications of M. Fleuriau de Bellevue, considered *Dentalium* as approximated to *Clymene*, and placed it in the family of *Maldanians* of M. Savigny. Systematic authors, generally, not knowing more than Lamarck did, that knowledge being confined to the tube, followed Lamarck's opinion. Cuvier, in the first edition, placed it among the *Annélides Tubicoles*, between *Aspergillum* (*Penicillus*, Lam.) and *Siliquaria*. Savigny, in his 'Système des Annélides,' gave a summary description of the animal, but it was too incomplete to decide the question finally, though sufficient to overthrow the observations of M. Fleuriau de Bellevue. The *Dentalium Entalis*, which was sent to Savigny by our countryman Leach, gave sufficient information to that celebrated zoologist to enable him to say that the animal had no trace of rings, that it had no hairs (*soies*) on the lateral parts of the body, that it was essentially muscular, and that it could no longer remain among the *Chætopods*.

Dentalium Entalis was the species on which M. Deshayes made his observations; and in a very interesting and elaborate paper read before the Society of Natural History of Paris, on the 18th of March, 1825, he gave the facts which led him to the conclusion stated at the commencement of this article. The following is a summary of his description: but we must premise that M. Deshayes's specimens were forwarded to him in spirit, and were, consequently, a good deal contracted.

External Parts. *Animal* conical and elongated, like the shelly investing tube; (*dorsal surface* corresponding with the convexity of the shell; *ventral surface* corresponding with the concavity;) smooth and truncated obliquely at the anterior end, the centre of the truncation with a small pyramidal process, which is the extremity of the foot. The posterior parts are less muscular, and the termination is usually a funnel-shaped expansion, variously developed in different individuals; for in some it is firm and well developed, and in others it is scarcely perceptible. This expansion is separated from the rest of the body by a strongly defined contraction. There is a muscular ring, broader on the ventral than on the dorsal surface, above this contraction, and by that ring the animal is attached to the shell, which on its inner surface presents, at about one-fifth of its length from the posterior extremity, a corresponding impression in the shape of a horseshoe, the interrupted portion being on the concave side. On the dorsal surface a small elevation is perceptible, at about one-third of its length from the anterior end, indicating the place of the head. The whole extent below this is occupied by two muscles on each side, distinctly observable through the abdominal parietes. These muscles are symmetrical, flattened, and directed obliquely from the sides of the foot towards the dorsal surface and the posterior extremity of the animal, giving rise to, and becoming commingled with, the muscle of attachment. On the abdominal surface, likewise, there are on each side, at about one-third of its length from the anterior end, two symmetrical organs deeply jagged, and of a dark brown colour: these form the liver. Below this point, nearly the whole of the abdomen is visible through its transparent parietes filled by granulations contained in the very large ovary, and by the straight descending intestine which terminates at the expanded extremity in a mesial vent. The whole of the anterior part of the animal is invested by a fine membrane, which is fixed posteriorly to the origin of the foot, and is free in front, where its circumference is thickened. It is perforated in its centre, and M. Deshayes considers this to be the mantle. The thickened portion is produced by a circular sphincter, which, when contracted, wrinkles the skin, closely embraces in its opening the extremity of the foot, and thus cuts off any external communication. M. D'Orbigny, jun., who furnished a drawing of the living animal in an expanded state, makes the dilated lobes of the foot resemble a flower, whose undulated and small corolla supports in its centre a pistil thickened towards the middle, and pointed at its free end.

On slitting the mantle down the middle of its dorsal surface, separating it from its insertion to the right and left, and turning it downwards and to the right, the foot, the head, and the branchiæ appear.

The *foot* is elongated, subcylindrical, slightly conical, and flattened from above downwards, fleshy throughout, and situated at the interior and anterior part of the head, having its upper and under surfaces slightly grooved in the middle. The anterior extremity is largest, and its centre is occupied by a sort of conical nipple, broader at its base, being there partly covered by two small notched lateral lobes, the notches corresponding with the grooves of the foot. The posterior extremity has a bifurcated appearance, owing to the attachment there of the retractor muscles: the middle portion projects a little into the abdominal cavity, giving support to the stomach and the other principal viscera.

Organs of Digestion. The *head* consists only of a mouth, and is situated superiorly at the hinder extremity of the foot. It is bell-shaped, and flattened from before backwards. Two black points on its sides might be mistaken for eyes, but these are the *jaws* situated within the mouth and visible through the thin substance of which it is composed: they are spherical, horny, rough on their outer surface, cleft in the middle, and bearing a considerable resemblance to a small bivalve shell. There are two *lips* deeply cleft at the margin, or, more properly speaking, furnished each of them with three pair of labial tentacles, those of the posterior lip, the middle pair especially, being much larger than those of the anterior. There is a naked space in the centre of the anterior lip indicating the aperture of the mouth, which is contracted into a short fleshy *œsophagus*, terminating rapidly in a thick pear-shaped *stomach*, supported by and closely adhering to the extremity of the foot, and containing within, near the cardiac opening, a rather complicated tooth-like apparatus. By a distinct vessel from each of the symmetrical lobes of the liver its secretion is poured into the stomach, which terminates below in a slender, transparent, straight, mesial intestine opening, as before observed, at the dilated posterior extremity.

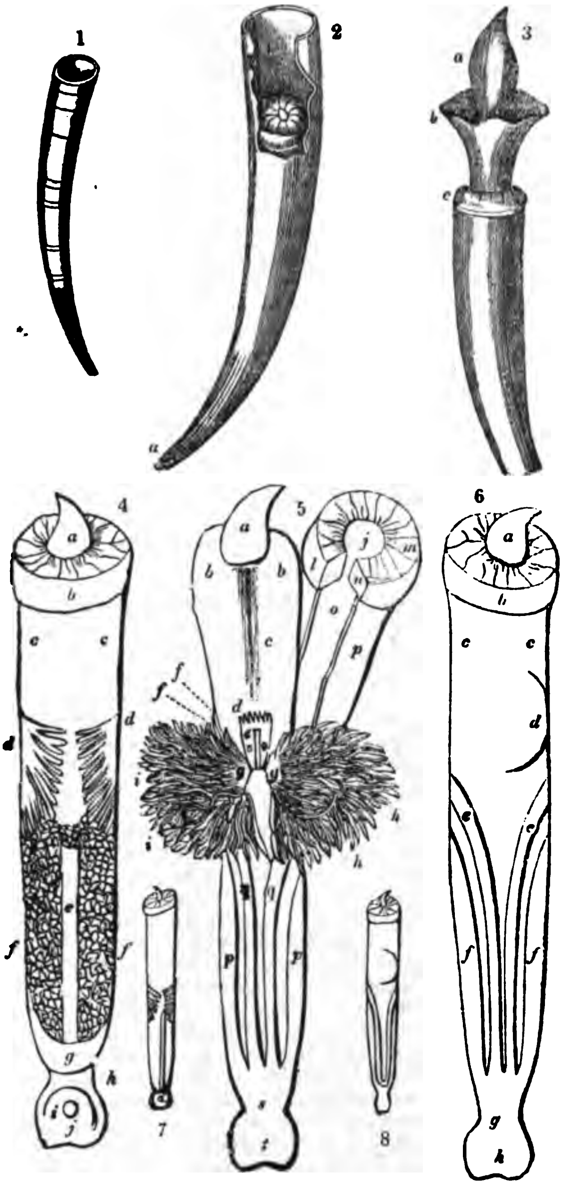
Organs of Generation. Imperfectly known. No male organ discovered. The external opening of the large ovary not yet detected.

Circulating System. Heart symmetrical, situated above the stomach, and contained in a pear-shaped pericardium. A vascular trunk issues from the anterior extremity of this sac, passes in the direction of the neck, and divides into two large branches, one being distributed to each of the *branchiæ*.

Respiratory System. Branchiæ two, symmetrically situated on the lateral and posterior parts of the neck, and supported on a divided pedicle or branchiferous membrane, formed of many very fine, soft, flexible, tentacular filaments with club-shaped terminations, and appearing from heir position to be equally adapted for directing nourishment towards the mouth, and for fulfilling their important office of aerating the blood.

Nervous System. Apparently ganglionic; the cerebral ganglion, the only one yet detected, is small, quadrilateral, considerably elongated, and placed longitudinally on the middle of the posterior surface of the head. Two very minute filaments issue from its inferior angles and pass to he œsophagus; they have not been traced beyond it.

M. de Blainville (*Malacologie*, 1825) agrees with M. Deshayes in the conclusion to which the latter came, viz. that Dentalium is a true mollusk, and he makes it the type of his first order *Cirrhobranchiata*, of his first section of his hird subclass, *Paracephalophora Hermaphrodita*, placing t next to *Patella*. M. Rang (1829) follows De Blainville n referring it to his order Cirrhobranchiata, of which Rang makes it the only family, as does De Blainville, and he gives it a situation between *Fissurella* and *Patella*. Cuvier, n the last edition of the Règne Animal (1830), still retains *Dentalium* among the *Annelids*, placing it immediately fter *Siphostoma* of Otto; but he adds, that the recent obervations of Savigny, and above all those of Deshayes, ender such a classification very doubtful. The animal, he bserves, does not appear to possess any sensible articulation, nor any lateral hairs (*soies*), but it has anteriorly (en avant) membranous tube, in the interior of which is a sort of foot, r fleshy and conical operculum, which closes its orifice. On the base of this foot, he adds, is a small and flattened head, and on the nape are to be seen the plumose branchiæ. f, he continues, the operculum recals to mind the foot f the *Vermeti* and *Siliquariæ*, which have already been ransferred to the class of mollusks, the branchiæ remind us of *Amphitrite* and *Terebellum;* and he concludes by emarking that ulterior observations on their anatomy, and principally on their nervous and vascular systems, will esolve this problem. Mr. Gray, who has compared the description of the animal given by M. Deshayes with specimens in the British Museum, is, he informs us, satisfied with the correctness of that description, and he considers hat the most natural situation of *Dentalium* is nearest he *Fissurellæ*, but still far from them. The apices of he British species, he observes, often appear to be either broken off, or to have fallen off of themselves, like the tips of decollated shells; and he adds, that when the tip is broken, the animal forms a slight tube within, which is more or less produced beyond the tip; and that the late Dr. Turton described a specimen in this state as a species under the name of *Dentalium labiatum*. Mr. Gray thinks that there is only one species found on our coasts, the other so-called species being mere varieties depending either on the worn or broken state of the specimens. In his 'Spicilegia Zoologica' he has described a *Siphunculus* which inhabits these shells, and which, he believes, has been considered by some authors to be the real inhabitant of the shell.



1. Shell of *Dentalium Entalis*, nat. size. 2. Shell magnified, broken longitudinally, showing the animal in a contracted state; *a*, the posterior extremity prolonging itself into a small accidental tube. 3. Magnified, representing the animal at the moment of its advancing out of the shell; *a*, *b*, the foot, the lobes of which are developed in the form of a corolla; *c*, a part of the collar. 4. The animal magnified, abdominal aspect; *a*, extremity of the foot; *b*, the collar; *c*, *c*, the mantle; *d*, *d*, the liver; *e*, the intestine; *f*, the ovary; *g*, the muscle of insertion; *j*, *h*, the *pavillon* and its neck; *i*, the vent. 6. Magnified, dorsal aspect; *a*, extremity of the foot; *b*, the collar; *c*, *c*, the mantle; *d*, slight projection produced by the head and the branchiæ; *e*, *e*, internal retractile muscles; *f*, *f*, external retractile muscle; *g*, neck of the *pavillon*; *h*, the *pavillon*. 5. Magnified. The mantle has been slit in the dorsal and mesial line, detached in part from its posterior insertion, and turned aside showing, *a*, the extremity of the foot which closes the aperture *j*, of the collar *l*, *m*, of the mantle *n*, *o*, *p*; *b*, *b*, lobes of the foot; *c*, the foot itself, presenting a depression or channel running its whole length; *d*, the head; *e*, the cerebral ganglion; *f*, *f*, the two buccal jaws; *g*, *g*, the pedicles or branchiferous membranes; *h*, *h*, *i*, *i*, the branchiæ; *p*, *p*, *q*, *q*, the retractor muscles; *s*, the muscle of insertion; *t*, the neck of the *pavillon*. 7. fig. 4 nat. size. 8. fig. 6. nat. size. (Deshayes.)

Generic character. Animal (see above.) *Shell* regular, symmetrical, in form of a very elongated cone truncated at the summit, slightly curved, open at each extremity by a rounded orifice.

Geographical Distribution, very much extended: few seas are without some of the genus, which varies much in size.

They are found sometimes in deep water, frequently near the shore.

The species are numerous. M. Deshayes in the monograph which follows the anatomical part of his memoir above abridged, gives forty-two recent and fossil. Mr. G. B. Sowerby in his 'Observations on Mr. Deshayes's Monograph' (Zool. Journ. vol. iv. p. 195), proposes some corrections with regard to several of the species given in the monograph, and adds two to those recorded by Deshayes, and in the Proceedings of the Zoological Society (1832) describes four new species brought home from America by Mr. Cuming.

M. Deshayes separates his forty-two species into four groups, one of which is rejected by M. Rang, because it is occupied by *Dentalium coarctatum* of Lamarck, which M. Rang regards as belonging to his (M. Rang's) subgenus *Cresis* belonging to the genus *Cleodora*.

1.

Shell not slit at its posterior extremity.

a. Longitudinal striæ.

Example, *Dentalium Elephantinum.*

b. No longitudinal striæ.

Example. *Dentalium Entalis.*

2.

Shell slit at its posterior extremity

a. Longitudinal striæ.

Example. *Dentalium striatum.*

b. No longitudinal striæ.

Example. *Dentalium eburneum.*

3.

Shell having a marginal rim; not slit at its posterior extremity.

Example. *Dentalium strangulatum.*

Fossil Dentalia.

'Of fossil species,' says Mr. G. B. Sowerby, 'there are many, particularly in the marine beds of the tertiary formations; the London clay and the Calcaire Grossier swarm with several sorts not easily distinguishable from the recent species, among which we may particularly remark the fossil species from Piacenza, which so nearly resembles *D. elephantinum* that Brocchi has not hesitated to refer it to that species, and the *eburneum* of Lamarck, which he says inhabits India, and is found fossil at Grignon. Deshayes, in his tables gives the number of living species as twenty-three, of the fossil (tertiary) thirty-four, and the following, *Dentalia elephantinum*, *dentalis*, *novem costatum*, *entalis*, *eburneum*, *fissura*, and *strangulatum* as both living and fossil. Mr. Mantell in his tabular arrangement of the organic remains of the county of Sussex (Geol. Trans. vol. iii. second series, 1829), notes a species, which he does not name, in the blue clay of Bracklesham; *Dentalium planum*, in the arenaceous limestone or sandstone of Bognor; *Dentalium cylindricum*, in the sand on Emsworth Common; *Dentalia striatum*, *ellipticum* and *decussatum*, in the Gault or Folkstone marl; and one or more, unnamed, in the Shanklin sand (Lower Green sand). Dr. Fitton figures one species, *Dentalium medium*, from the green sand of Blackdown in his interesting 'Observations on some of the strata between the chalk and Oxford Oolite, in the south-east of England.' (Geol. Trans. vol. iv. second series, 1836.) And he notes *D. ellipticum* in the Gault at Copt Point, on the authority of the Rev. G. E. Smith. In his 'Systematic and Stratigraphical List of Fossils' (Appendix B. to the same memoir) four named species, including *D. ellipticum* and *D. medium*, and an uncertain species, are noted from the Gault of Kent, South Wilts, and Cambridge, and the sands of Blackdown. Mr. Lea in his 'Contributions to Geology,' (1833,) describes two new species, *Dentalium alternatum* and *D. turritum* from the tertiary beds of Claiborne, Alabama, and gives the following summary. 'In Great Britain fourteen species have been obtained from the Lias to the Crag. M. Deshayes's tables give thirty-four, of which thirteen are from the Paris basin, the Eocene period. In this country (America) Dr. Morton has observed casts in the upper green sand of New Jersey and Delaware, and Mr. Say, one species, the *attenuatum*, in the tertiary of Maryland.' Mr. Murchison informs us that he knows of no *Dentalia* in the Silurian or underlying systems of rock.

DENTA'TUS, the surname of the Roman consul Curius, who defeated king Pyrrhus near Tarentum. He is said by Pliny to have been born with teeth, and to have received the name Dentatus from this circumstance. He gained several victories over the Samnites, Sabines, and others and was remarkable for his great frugality. When the ambassadors of the Samnites went with a quantity of gold to attempt to bribe him, they found him cooking some vegetables on his fire, and were dismissed with the reply, that he preferred ruling the rich to being rich, and that he who could not be conquered in battle was not to be corrupted by gold. (Horat. *Od.* i. 12, 41; Florus, i. 15.)

DENTA'TUS, LU'CIUS SICI'NIUS, a Roman tribune, who distinguished himself in battle chiefly against the Æqui and the Sabines. Livy calls him Lucius Siccius (iii. 43). According to Valerius Maximus (iii. 2), he had been in 120 engagements, had forty-five wounds in the breast, and had received an accumulation of honours almost incredible. Through the jealousy and treachery of Appius Claudius he was murdered by the soldiers whom he was appointed to command. He no sooner perceived their design than he stood with his back to a rock, and drawing his sword, killed fifteen of his assailants, and wounded thirty more: at length they ascended the rock, and overwhelmed him with stones from above. On their return to their camp they gave out that they had engaged with the enemy, and that Sicinius had fallen in the battle. (Dionys. Halicarnassensis x.; Livius iii. 43.)

DENTILS. [Column.]

DENTIPORA. [Madrephyllœa.]

DENTIROSTRES. [Birds, vol. iv., p. 431; Laniadæ.]

DENTITION, the formation and evolution of the teeth. The varied processes by which the teeth are formed, developed, and arranged, are among the most curious and complicated operations of the animal economy. The different stages of dentition, in the human being, mark distinct epochs of human life, in which many important changes occur in the physical frame, simultaneously with which new mental powers are developed.

The teeth differ in their organization in several important respects from all other organs of the body. They are of a bony structure, and are placed in the arches of the upper and lower maxillary or jaw-bones. They consist of two sets, of which the one is intended to last only for a short time, while the other is destined to last during the whole term of life. The first are called the temporary and the second the permanent teeth. The temporary teeth, twenty in number, are in general considerably smaller than the permanent, have a less firm and solid texture, and their characteristic forms and prominences are much less strongly marked. The permanent teeth, thirty-two in number, are arranged in perfect uniformity, eight on each side of each jaw, those of the one side exactly corresponding with those of the opposite. They are divided into four distinct classes, which present specific differences in size, form, development, articulation, and use; namely, on each side of each jaw, two incisores, one cuspidatus, two bicuspides, and three molares. There are no phenomena in the human economy more wonderful than those by which these teeth assume their ultimate form, position, and relations.

Preparation is made for the production of the teeth long before the period of birth. If the jaws be carefully examined about two months after conception, an extremely soft jelly-like substance is found lying along the edge of each maxillary arch. At the third month this has assumed a somewhat firmer consistence, and is contained within a shallow groove of bone, which constitutes the first step towards the formation of the osseous plates between which the teeth are to be ultimately included. The pulpy substance now begins to be partially divided into distinct portions. At the same time filaments of bone shoot across from one side of the groove of bone to the other, and thus define the divisions of the alveoli or sockets, in which the teeth are to be contained. The separate pulps formed by the division of the pulpy substance constitute the rudiments or bases upon which the teeth are formed. As yet they lie upon the vessels and nerves which run along the bottom of the bony groove. They are extremely soft, gelatinous, and semitransparent. Each is partially enclosed in a membrane or sac.

If this sac be opened at the fourth month, a small point of ossification may be distinctly seen deposited upon certain of the pulps. This is the commencement of the formation of the bony substance of the tooth. The ossific matter is formed not by the pulp itself, but is secreted from the blood and deposited upon the pulp by an extremely delicate, thin ascular membrane, which covers its surface, and which is losely attached to it by vessels. This membrane, termed he proper membrane of the pulp, is conjectured to be a roduction of the membrane which covers the bony substance of the jaw, and which is called its periosteum.

The sac which envelopes the whole is thick in its texure, and consists of two layers, which are easily separable fter a short maceration, and both of which are vascular. The enveloping sac which loosely surrounds the pulp is ttached to the pulp only at its base where the vessels enter, ut it is intimately and inseparably connected with the gum, rom which it is supplied with its blood-vessels and nerves.

The bony matter is first deposited on the points of the eeth; as the deposition increases, the bone assumes by degrees the appearance of a thin osseous shell spread over the ulp and its proper membrane, which retire as the bone coninues to be deposited, so that this bony shell is interposed etween the pulp with its membrane and the investing sac.

Almost from its first origin the form of the pulp is nearly he same as that which the crown of the tooth is destined o assume. It is observed that ossification commences on s many points as the future tooth will have eminences on ts surface, and that accordingly the incisores and cuspidati ommence with one point, and the molares with several.

As the shell of bone increases, the alveoli, or sockets for he reception of the teeth, deepen and separate more completely the one from the other. When the osseous shell has xtended so far as nearly to cover the original form of the ulp, the pulp elongates at its base. This elongation of the ulp forms the basis of the root of the tooth. In those teeth which have only one root, a conical shell of bone is formed round the elongated portion of the pulp, which continues o extend in length as the ossification advances. On the ther hand, in those teeth which have several roots, the pulp, the point where it begins to elongate, divides into a number of processes, corresponding to the number of roots proper to the tooth; and from the osseous shell a process of bone is sent across from one side of the shell to the other, between the divided processes of pulp, and the ossification is then continued around each respectively.

From the whole then it appears, that an outer lamina of bone is first formed and completed, and that then succeeding laminæ are deposited one within another, the pulp receding as the osseous matter increases, until at length there remains only the permanent cavity of the tooth, lined with its proper membrane, and filled with the remaining portion of the pulp, which now serves as the bed upon which blood-vessels and nerves ramify previously to their entering the substance of the teeth.

Such is the mode in which the osseous matter is formed and deposited; but now a new process takes place. When the bony shell has extended as far as the neck of the tooth, the investing sac attaches itself closely to this point, though it continues to envelop the body of the tooth only loosely. And now a remarkable alteration takes place in the substance of the enveloping membrane, which becomes thickened and much more vascular, particularly the inner layer, over the whole internal surface of which the blood-vessels may be seen obviously enlarged, and capable therefore of receiving a much greater supply of blood. The object of this change in the condition of the membrane is to fit it for a new function which it is destined to perform. From the whole of the internal surface, thus furnished with a greatly-increased supply of blood, a thickish fluid is poured out. This fluid is speedily converted into a dark, solid, chalky substance, which afterwards, by a more perfect crystallization, becomes white and exceedingly hard. This is the enamel, which, first deposited on the points at which ossification had commenced, by degrees covers in one continuous layer the whole crown of the tooth. Thus the office of the investing membrane, which, it has been already stated, is connected with the gum, is the secretion of an inorganic substance, the enamel, and after it has accomplished this office the sac is absorbed; but the tooth itself is the production of a substance independent of the gum, and immediately connected by its vessels, as well as by its secreting membrane, with the bone of the jaw.

Such are the curious phenomena connected with the formation of the teeth. But this account relates only to the formation of the temporary teeth. The rudiments of the permanent teeth are not original and independent, like those of the temporary. The permanent teeth are derived from the temporary, and they remain for a considerable time attached to and intimately connected with their parents.

At an early period in the formation of the temporary teeth the investing sac gives off a small process or bud, containing a portion of the essential rudiments; namely, the pulp covered by its proper membrane. This constitutes the rudiment of the permanent tooth. It commences in a small thickening on one side of the parent sac, which gradually becomes more and more circumscribed, and at length assumes a distinct form, though still connected with it by a peduncle. For a time the new rudiment is contained within the same alveolus or socket with its parent, the socket being excavated by the absorbents for its reception by a process unparalleled among the phenomena of physiology. 'It is not,' says Mr. Thomas Bell, whose researches have shed new light on the structure of the teeth, and of whose excellent work we have largely availed ourselves in this account, 'it is not, as has been believed, in consequence of the pressure of the new rudiment upon the bone, that this absorption is produced, but by a true process of anticipation; for I have seen, both in the human subject, and more evidently still in the foal, the commencement of this excavation before the new sac was formed, and consequently before any pressure could have taken place on the parietes of the socket. The absorption does not in fact commence in the smooth surface of the alveolus, but in the cancelli of the bone immediately behind it, where no pressure could operate; and it is only by carefully removing the parietes of the socket, where the excavation is intended to be formed, that the very commencement of the process can be observed. By degrees a small recess is thus formed in the parietes of the alveolus, in which the new rudiment is lodged, and this excavation continues to increase with the increasing size of the rudiment, whilst at the same time the maxillary bone becomes enlarged, and the temporary tooth, advancing in its formation, rises in the socket. The new cell is thus gradually separated from the former one, both by being itself more and more deeply excavated in the substance of the bone, and also by the deposition of a bony partition between them; and the rudiment of the permanent tooth is at length shut up in its proper socket. There is not however, even now, a total disunion between the two teeth, for as the temporary one grows and rises in the jaw, the connecting cord or peduncle elongates; and although the sac from which it is derived by degrees becomes absorbed, it still remains attached to the neck of the temporary tooth, even long after the latter has pierced the gum; and this connexion between the temporary tooth, the permanent rudiment, and the gum, is thus kept up by means of the cord, through a small opening in the top of the new alveolus, which is seen perforating the alveolar process immediately behind each temporary tooth.

'The situation of each permanent rudiment, when its corresponding temporary tooth has made its appearance through the gum, is beneath and a little behind the latter, and rather farther from the centre of the jaw. From the preceding statement then it will be readily understood, that the upper part of the new sac, being by means of the cord connected with the gum, assumes by-and-by the same relation to that substance as that which the temporary rudiment, as before described, had originally sustained; whilst, from its substance being deeply imbedded in the jaw, the vessels and nerves which had entered into the composition of the new process of pulp in its first production, probably become so enlarged and modified in their structure as ultimately to form the true dental branches. This is much more probable than to suppose that a new set of nerves and vessels are given off from the maxillary branches to join the pulps at a distance, through an intervening layer of bone of an indefinite thickness, to supply every new tooth.

'We now therefore find the new rudiment in a state nearly analogous to that in which the parent tooth was originally placed, and with similar relations to the surrounding parts; the sac above attached to the gum, and the pulp beneath covered with its proper membrane, connected by its vessels, &c. with the jaws. The foregoing account will convey an accurate idea, according to my views of this curious subject, of the mode in which the permanent teeth are produced.'

The ossification of the temporary teeth commences, as has been stated, at about the fourth month after conception. At this period the pulps of the whole of the temporary teeth may be observed. There are also distinguishable the pulps of the first permanent molares; but the latter are not yet very distinct. At the fifth month, or rather earlier, may be distinguished the pulps of the permanent central incisores, though extremely small, and still closely attached to the parent sacs.

At birth the alveoli of the temporary incisores and cuspidati are formed with some distinctness; and partially also the alveoli of the molares. Ossification has advanced on all the temporary pulps, so as to form shells of bone, reaching some way over their crowns. It has also commenced in a minute point on the first permanent molares. The sacs of the permanent incisores and cuspidati may also be distinctly perceived lying in contact with the temporary ones, immediately behind them, and exhibiting in a very beautiful manner the peculiar connexion between them which has been described.

As ossification proceeds, the roots of the teeth continue to elongate, until first those of the incisores, and subsequently the others, can no longer be retained within the alveoli; preparation is now made to facilitate their passage through the gums by absorption of the containing parts.

When the tooth has arrived at this stage it presses upon the gum, a portion of the sac being still interposed. As this membrane has already secreted the enamel, it becomes absorbed at the point where pressure is first made, and the gradual removal of the sac and gum is the consequence. It is not improbable that when the membrane has fulfilled its office, it becomes removed by the spontaneous action of the absorbents, independent of pressure.

The age at which the teeth first make their appearance varies considerably; frequently without any apparent reference to the constitutional powers of the child. Instances are not wanting in which children have been born with two or more teeth. In many other cases the teeth have not come through the gum until fourteen or sixteen months, or even as late as two or three years. In general however dentition may be said to commence at the age of from five to eight months. It usually proceeds in the following order, the teeth of the inferior jaw almost always preceding those of the superior for a longer or shorter time.

From	5 to 8	months,	the four central incisores.
„	7 to 10	„	„ „ lateral incisores.
„	12 to 16	„	„ „ anterior molares.
„	14 to 20	„	„ „ cuspidati.
„	18 to 36	„	„ „ posterior molares.

These periods are however only given as a general rule, liable to continual exceptions, not only in the time at which the different teeth appear, but also in the relative order of their precedence.

According to Dr. Ashburner, who has paid great attention to this subject, and who has had ample opportunities of observation, the teeth of the first dentition commonly cut in couples; the two anterior incisores of the lower-jaw appear first; then, in perhaps from fifteen to twenty days, the two anterior incisores of the upper-jaw come through; to these succeed the lateral couple of incisores of the lower-jaw; then come those of the upper-jaw. After these the two molar teeth nearest to the lateral incisors of the lower-jaw appear; then the first molars of the upper-jaw; after which come the lower two canine; then the upper canine; then the two second molar of the lower-jaw, and afterwards the corresponding molar of the upper-jaw. The period occupied in the process is about two years from the appearance of the first tooth.

The first formed of the permanent teeth are the anterior molares, on which the first point of ossification may be seen at birth. At about the age of twelve months the ossification on these teeth has proceeded to a considerable extent; also on the permanent incisors, and it has commenced on the lower cuspidati, the upper ones being generally two or three months later. About the time when all the temporary teeth have made their appearance, ossification is found on the points of the bicuspides, and the bony shells of the teeth before mentioned have acquired considerable size.

Most of the permanent teeth are larger than those which precede them. They are placed during their progress a little behind them; hence they are confined within the segment of a smaller circle; consequently, as they approach more and more nearly to their ultimate size, they must become very much crowded in the jaw. 'The examination of the maxillary bone of a child of about five years old,' observes Mr. Bell, 'will show this fact in a very striking manner. At this period the jaws being considerably deepened by the development of the alveolar processes, the sockets in which the permanent teeth are lodged will be found placed beneath those of the temporary, some higher than others, and the bony shells are closely packed in such a manner as to occupy the least possible space. Thus, in the upper-jaw, the central incisors are situated immediately beneath the nose, the lateral incisores thrown back behind the points of the cuspidati, and the bases of the latter scarcely a quarter of an inch below the orbit: in the lower jaw the cuspidati are placed at the very base of the bone, with only a thin layer beneath them; but the crowding is much less considerable than in the upper jaw, from the smaller comparative size of the incisores.

'At from six to seven years of age the whole of the permanent teeth are more or less ossified, excepting the dentes sapientiæ; so that, previously to the shedding of any of the temporary teeth, there are at this time no less than forty-eight teeth in the two jaws; namely, twenty deciduous, the whole of which are perfected, and twenty-eight permanent, in different degrees of development, within the bones.'

At a particular epoch of human life, the temporary teeth are exchanged for a more numerous set, of a stronger and more durable structure, and of increased power of mastication. The original teeth become loose in their sockets: their roots are eaten away; their crown crumbles and recedes from the gums, and at last they fall out. This change takes place in the temporary teeth exactly in the order in which they were originally formed, and in which they cut through the gums. Thus the central incisores of the lower jaw fall away first, then those of the upper jaw, then go the interior lateral incisores, and so on.

The mode in which this change is effected, which constitutes the shedding of the teeth, is by a process of absorption. The anterior parietes of the cavities in which the permanent teeth are contained are removed by the absorbent vessels, in consequence of which the teeth are allowed to advance next the sockets, then the roots, and lastly the crowns, of the temporary teeth are absorbed. This absorption cannot be solely the effect of pressure produced by the advancing permanent teeth; for the process goes on when such pressure cannot possibly have existed; it is, in part at least, like the preparation of the cell for the reception of the permanent pulp, a true process of anticipation. Neither do the advancing permanent teeth displace the receding deciduous teeth; but the jaw grows and enlarges consentaneously with the increasing bulk and number of the teeth which it is destined to receive.

The change of the temporary for the permanent teeth commences, in the majority of instances, at about seven years of age, 'though,' says Mr. Bell, 'I have occasionally known it to occur as early as five, and as late as eight years and a half. The first permanent molares usually pierce the gum before the loss of the temporary central incisores, and their appearance may be considered as indicative of the approaching change. The following are about the medium periods at which the different permanent teeth are generally cut, but so irregular are they in this respect, that comparatively little dependence can be placed on such a statement. Those of the lower are here indicated, and they most commonly precede the upper by about two or three months.

Anterior molares . .	6½ years
Central incizores . . .	7 „
Lateral incisores . .	8 „
Anterior bicuspides . . .	9 „
Posterior bicuspides . .	10 „
Cuspidati	11-12 „
Second molares . . .	12-13 „
Third molares, or dentes sapientiæ .	17-19 „

Such are the main phenomena which relate to the process of dentition when this operation is performed in a perfectly natural and healthy manner. But this process is exceedingly apt to become deranged, producing evils in the system often most serious, and even fatal, and the preceding account of the natural process will enable us readily to understand the nature, extent, and causes of the diseases which so often result from the morbid progress of the function.

(Bell *on the Anatomy, Physiology, and Diseases of the Teeth*; Ashburner *on Dentition, and some co-incident disorders*; Meckel, *Man. d'Anat.*; Serres, *Nouvelle Théorie de la Dentition*; De la Barre, *Seconde Dentition*.)

DENTITION, ANORMAL, DIFFICULT, DISEASES OF. (*Difficult Teething.*) Every infant, at the period of birth, is imperfectly organized. There is no structure and scarcely any tissue of its body which has attained its due consistence and firmness. Several of the most important organs are entirely rudimentary, and there is not one that is perfect either in structure or function. Development is the great process unceasingly carried on at every point of the system. The capillary arteries, the immediate agents by which this process is effected, are the masons and architects by which the various structures are built up; the modellers, by which the due form and the relative bulk of the different organs are communicated and preserved, are the absorbent vessels; and the regulators and controllers of these agents, and of every other power concerned in carrying on the processes of nutrition and growth, are the nerves, and the great central masses in connexion with the nerves, the spinal cord and brain. Hence the sanguiferous system in all the varied states in which it is ministering to the function of secretion is in incessant activity, and the absorbent and nervous systems must necessarily be in a proportionate state of activity. It is indispensable to the due progression of the formative processes that there be maintained a perfect balance between all these varied and complex actions: a failure or a diminution in the action of one system, or a disproportionate energy in the action of either, will at once disturb that balance, and produce the most serious evils in the economy. At the age of infancy such a disturbance the more readily occurs, on account of the imperfect condition of every portion of the organism, no part having yet acquired the firmness of maturity, nor the power of resistance which belongs to mature and perfect structures.

Among the organs the first to be developed after birth are the teeth, and the jaws which are to contain the teeth. These organs are agents indispensably necessary to the performance of a primary and essential function, that of nutrition. Before birth there are no teeth, the nutrition of the fœtus being carried on by nutritive matter derived from the mother. For a considerable period after birth there are no teeth, the nutritive matter by which the infant is to be nourished being still formed for it by the mother. But the infant is ultimately to acquire an existence wholly independent of the mother, and from the moment of its birth, nay, long before the period of birth, processes of preparation are going on in its system which have for their object the formation of an apparatus destined to enable it to prepare and digest food independently of its parent.

This apparatus, from its most rudimentary state, possesses a highly organized and delicate structure; and it is placed in a position in which its progressive development is attended with peculiar difficulties, which at first view would appear insurmountable. A bony structure has to be formed and to make its way through the dense substance of the gums; at the same time the jaws have to attain a bulk fitted to receive these structures when duly prepared and evolved. The too hasty evolution of the eeth, or the too tardy growth of the jaws, produces grievous evils in the system, by the disturbance of that balance which has been already stated to be indispensable to the orderly and safe progress of the developmental actions.

Supposing the formation of the teeth in the jaws to have proceeded quite naturally up to the time proper for their evolution, at that period they are included in a firm membranous envelope, and are covered by the thick and dense gum. When the process of dentition proceeds in a natural manner, the membrane and the gum are absorbed in order o make way for the passage of the teeth. This absorption s accomplished by a stimulus communicated to the aborbent vessels, either by the mere presence of the tooth without direct pressure, or by a moderate and gradual pressure produced by the advancing tooth.

This process, even when accomplished in a perfectly naural manner, is almost always attended with some degree f local inflammation. The gum itself is manifestly red nd swollen, and is apparently painful and itching, indiated as well by the obvious occasional uneasiness of the infant, as by the constant desire it evinces to press against he gum everything it can lay hold of. The irritation of he gum extends to the salivary apparatus placed in the mouth and its neighbourhood, as is proved by the increased low of saliva, which is commonly more or less altered in quality, as well as increased in quantity, being thicker and more tenacious than the natural secretion. These symptoms of local irritation are usually accompanied by a slight degree of constitutional disturbance, the skin being commonly hotter and dryer, the face occasionally flushed, the bowels more relaxed, and the infant itself more restless and fretful than natural. The irritation of the gum when restricted within a moderate limit seems to be the necessary consequence of the developmental process that is going on. The effect of the local irritation, namely, a determination of blood to the salivary apparatus, occasioning an increased flow of saliva, and that of the constitutional disturbance, namely, a determination of blood to the mucous membrane of the intestines, occasioning diarrhœa, appear to be remedial rather than morbid,—to be evacuations established by nature for the purpose of relieving over-distended vessels and over-excited nerves.

When the infant is in a state of sound health, and when the process of dentition proceeds in a natural manner, the local and constitutional evils attending the evolution of teeth amount to no more than have now been described; but when the infant is in a state either of congenital or acquired disease, or when the natural course of the process of dentition is disturbed, evils result always serious and often fatal.

Suppose that the formative proceeds faster than the absorbing process; that the teeth grow with a rapidity with which the action of the absorbents is not commensurate, the necessary consequences are, that the tooth is forced against the gum, that the investing membrane is compressed between them, and that this pressure is communicated to the delicate and soft pulp on which the organization of the tooth is still proceeding. The effects of the irritation thence induced will vary according to the degree of pressure, the sensibility, and irritability of the individual, and the predisposition of its natural or acquired constitution to disease. In some it may produce only a slight aggravation of the local and constitutional ailments already described; in others it may produce every form of disease to which infancy is subject, attended with every symptom appertaining to such diseases.

In the infant, the mucous membrane which lines the alimentary canal, from its commencement in the mouth to its very termination, is highly sensitive and irritable; the membrane which covers the external surface of the body, the skin, which possesses essentially the same structure as the internal lining membrane, and between which there is the most intimate sympathy, is alike sensitive and irritable; the mucous membrane which lines the air-passages, and which forms the air-vesicles of the lungs, is scarcely less sensitive and irritable. Morbid irritation excited in any of these extended and most important surfaces is readily propagated to the great nervous centres, the spinal cord and brain, in which are induced, often with extreme rapidity, some of the most formidable diseases to which the human body is subject; and from diseases established in the spinal cord and brain disease is reflected back upon the muscles. Thus the most prominent diseases produced by anormal (irregular) dentition have their seat in the stomach, the intestines, and all the organs which form a part of the digestive apparatus; in the external skin, in the air-passages and lungs, in the spinal cord and brain, and in the muscles of voluntary motion.

The irritation attendant on anormal dentition commences in a portion of the mucous surface of the digestive apparatus, and from its source in the mouth it is readily propagated to the stomach, intestines, and liver, producing in the stomach pain, nausea, vomiting, flatulence, acid eructations, &c.; in the intestines, griping pain, flatulence, diarrhœa; in the liver, disordered secretion of bile, in consequence of which the fæcal evacuations are greatly altered in quantity and quality, being at one time too scanty, and at another time too copious, sometimes light or clay-coloured, and at other times dark-green, spinach-like, and preternaturally fœtid, mixed with large quantities of unhealthy viscid mucus. There is also a great proneness to diseased action of the pancreas, owing to its intimate connexion with the salivary apparatus; and there is reason to believe that several states of diarrhœa, so common at the period of dentition, are dependent on a morbid secretion of the pancreatic juice. The urine at the same time is often scanty and turbid, and there is a purulent discharge from the urethra, attended with difficulty and excruciating pain in passing the water.

The external skin sympathizing with the irritation set up in the internal mucous surface, is constantly affected with eruptions of various names and natures, sometimes attacking the scalp, sometimes surrounding the lips and extending over the face, and at other times covering the whole body.

The irritation is propagated from the mucous membrane of the mouth and fauces to that of the air passages and air vesicles, inducing hurried, difficult, and painful respiration, frequent cough, and all the symptoms of inflammation of the lungs, ending frequently in the development of tubercles, and the production of other organic and fatal diseases of the lungs.

There is the closest possible connexion between the skin, the digestive surface, the respiratory surface, and the great nervous centres, the spinal cord and brain. Any irritation excited in the former is readily propagated to the latter. There is a direct route by which the intercourse is established. The nerves proceeding from all these surfaces take a direct course to the spinal cord and brain, where they communicate the irritation which they receive, and excite, among other diseases, more especially that which constitutes hydrocephalus acutus, or water in the head. This disease, among the most formidable to which infancy is subject, and the most common cause of which is anormal dentition, is preceded by the start in sleep, the slight chill, hardly amounting to rigor; the flushed face; the sudden, darting, transient pain in the head; the unusual drowsiness; and then come the sudden start from that deep sleep, with a loud scream; the injected eye, the dilated pupil, followed by the constant rolling of the head upon the pillow, the loss of sight, and the progressively increasing insensibility, and coma. The irritation thus produced in the spinal cord and brain is quickly reflected back upon those muscles the action of which depends upon an influence derived from these great nervous centres—the muscles of volition, which are affected with twitchings, spasms, convulsions, sometimes passing into chorea, epilepsy, catalepsy, and tetanus.

When the acute symptoms induced by inflammation of the brain, followed by effusion, pass away without immediately destroying life, it is often only to leave a state of permanent idiotcy far worse than death.

Besides all these evils produced by anormal dentition, there is one specific disease that results from it of a most formidable nature, and often fatal. This affection may be termed the disease of development; it is commonly called infantile remittent fever. The accession of this disease is denoted by languor, lassitude, chilliness, shivering, succeeded by heat of skin, perspiration, and accelerated pulse. The little patient is spiritless, discontented, and fretful. Yawning, sighing, marked increase of irritability, unusual mutability of temper, loss of appetite, perhaps alternating with importunate desire for food, which when given often cannot be eaten, some peculiarity of respiration, and at last impatience of light and sound, accompany or quickly follow a distinct febrile attack. The feverish symptoms disappear or remit soon to recur or exacerbate; and these remissions and exacerbations are characteristic marks of the disease. The colour of health is gone, and the colour often changes. A flush of the countenance, preceding slight rigor and paleness of face, is succeeded by slight headache. There is a remarkable desire to pick, principally the nose, sometimes the lips and fingers, often other objects; frequently the breath is offensive, and cough, headache, and griping pains in the bowels are present, with more or less of sickness, faintness, sighing, starting, more particularly in sleep, moaning in sleep, grating the teeth, sleeping with the eyes half open, and a relaxed or on the contrary an exceedingly constipated state of the bowels. Occasionally the pupils suddenly dilate, perhaps only one pupil, and then as suddenly contract. 'Perspiration is a part of fever, and this is sometimes observed night after night succeeding to no very remarkable heat of skin, but to a great drowsiness, which in itself is a proof of exacerbation, though the accelerated pulse of fever may be wanting. The moaning, picking, or starting, with any of these conditions, constitutes part and parcel of this disorder. Sometimes the ailment is slight in degree, or it may assume an acute form with all the fire and anger of a hot fever. Sometimes it is typhoid in its type. Whatever character may be assumed by this disorder, it is coincident with an irregular course of the development of some organ of the body; and commonly the irregular development is in the nutrient organs, and of these most commonly the teeth and jaws.'

Fatal disease may arise from anormal dentition long before the usual period of cutting the teeth. A turgid condition of the vessels about the soft and delicate pulp, and in the membrane that envelops the whole rudimentary tooth, may compress the dental and even the maxillary nerves; and pressure on these nervous tendrils may, under certain conditions, be tantamount to pressure applied directly to certain parts of the brain; hence irregularity in the course of growth, at the earlier period of teething, may produce a sufficient degree of pressure to excite a high degree of irritation in the brain, producing even fatal convulsions. Many striking cases of this kind are on record, of which the following brief history may serve as an example. A fine healthy-looking child, of a strong healthy mother, died, at thirteen weeks of age, of a convulsive fit. The cause of death was ascertained, at the earnest wish of the mother, by a careful examination of the body after death. The internal organs, for the most part, were healthy; the stomach contained only a little milk; the mucous surfaces of the intestines were free from disease; the contents of the thorax were healthy. In the head the membranes that envelop the brain, and more especially the pia mater, were more tinged with blood than natural, but the brain itself was healthy. The jaws were carefully examined. 'The capsules of the incisor teeth were large and very vascular, much more advanced than usual. With a lancet, the cartilaginous rim of the lower jaw was attempted to be removed, with a view of exposing the capsules of the molar teeth; but these were so unusually distended with fluid, that the instrument cut into them and let it out. This was an example of development proceeding too hastily.'

It is common for the symptoms of irritation which attend on the evolution of the teeth to appear about the third or fourth month; they usually precede the appearance of the teeth by several weeks, and they occasionally subside and then re-appear a short time before the tooth makes its way through the gum.

Disease arising from anormal dentition is not confined to the period of infancy. In children of irritable constitutions in whom the maxillæ are imperfectly developed, the irruption of the second or permanent teeth is sometimes attended with serious and even fatal disorders. Nay, even the period of adolescence is by no means free from severe diseases produced by this same cause: for in consequence of the development of some of the teeth having been preternaturally delayed, or in consequence of an imperfect development of the jaws, at the period when the dentes sapientiæ are about to appear, delicate, nervous, and irritable subjects are not unfrequently affected with swelling of the parotid and submaxillary glands, painful and sometimes periodical affections of the ear and face, slight or recurring ophthalmia, irregular convulsions, epilepsy, and chorea; which affections have disappeared at once upon the irruption of the teeth or the removal of the local irritation.

Animals are not afflicted with these or any analogous evils from the evolution of their teeth, and they are produced in the human species altogether by the unnatural circumstances in which the infant is placed in the present artificial state of society. The chief causes of these grievous evils are—1. Food, unnatural in quality and too great in quantity. It is seldom that an infant lives solely upon its natural food (human milk) during the early months of its existence. If it take other food, that food is either digested or it is not. If it be not digested numerous ailments are produced; if it be digested the system is too highly nourished, and becomes too full of blood, from which it is easy to see that any one or any number of the diseases which have been described may result. 2. The practice too common in this country of keeping the heads of infants and young children very warm by clothing, by their wearing flannel caps, and by having their heads almost constantly wrapped in a warm woollen shawl, from the dread of their catching cold. The naturally great determination of blood to the head is too much favoured by this practice, which co-operates more powerfully than may at first view be apparent with the other circumstances that conspire to produce disordered dentition. 3. The confinement of infants in close and heated apartments, in the impure air of large towns and cities without exercise. Such children in whom all the evils of dentition are most frequently produced in the severest forms, are deprived of the natural stimulus afforded to the varied processes of growth by pure air and active exercise.

The treatment of the various and formidable diseases produced by anormal dentition can never be judiciously conducted without a constant reference to the causes on which they depend. Without a proper regulation of the diet, clothing, air, exercise, and the state of the bowels, nothing can be effectually done to prevent the occurrence of the most formidable of these evils. When they are actually present no remedy can be other than palliative which does not aim at two things; first, the entire correction of every thing ascertained to be faulty in the diet, clothing, &c. &c.; secondly, the removal of pressure upon the nerves, produced by the advancing and unliberated tooth, which occasions all the mischief. 'As soon therefore as any of the affections now described, or any others which can possibly be supposed to arise from this cause, make their appearance, the gums should be carefully examined, and wherever there is any unusual redness or turgescence, and especially if it occur over the part where the next tooth is expected to appear, the including parts should be freely and effectually divided. It is not sufficient that the incision should merely pass through the gum, the lancet must be carried down to the rising tooth itself, and only stopt when the resistance of its point is felt against the edge of the instrument. The form of the gum-lancet should be broad and somewhat rounded, and its edge extremely sharp. The only precaution necessary in its use is so to direct it in making the incision that the cord of connexion between the temporary and permanent tooth shall be carefully avoided, which is readily insured by directing the edge rather towards the outer part of the gum.

'The prejudices of former times against this simple and most efficacious operation are fast yielding to the frequent evidence of its harmlessness and utility. It is impossible for the most prejudiced to witness the effects which continually result from it without becoming a convert to its use. In the midst of the most imminent danger, when death has almost been anticipated as the only relief from severe and hopeless suffering, this simple and trifling operation has, in innumerable instances, restored the little sufferers to their parents in a state of ease and safety, and in so short a space of time as would scarcely have appeared credible.'

There are few cases in the management of disease which require more prompt decision in the application of remedies or more judicious selection of remedial agents than some of the sympathetic affections which have been now adverted to. Life will often depend on the choice of the remedy which is made, and the cautious boldness with which it is administered. It is not possible here to pursue the discussion of this subject further than merely to add that the bowels should be constantly kept in a somewhat loose state; that if a slight degree of diarrhœa be naturally established, nothing whatever should be done to check it; that even when the purging becomes considerable, it should be only moderated, not stopped; and that the most extreme caution should be exercised in meddling with any eruptions upon the skin. (Bell *on the Teeth;* Dr. Ashburner *on Dentition;* Dr. John Clarke's *Commentaries on the Diseases of Children;* and Copland's *Dictionary of Practical Medicine in loc.*)

DEODAND (Deo dandum, given to God). By deodand s understood whatever personal chattel occasions the death f a man without the default of another, and also the intrument with which murder is committed. In England deodands are forfeited to the king, to be applied to pious uses and distributed in alms by his high almoner; but he crown most frequently granted the right to deodands, within certain limits, either to individuals for an estate of nheritance or as annexed to lands, in virtue of which rants they are now claimed.

Blackstone supposes 'that the custom was originally deigned in the blind days of popery as an expiation for the ouls of such as were snatched away by sudden death, and or that purpose ought properly to have been given to holy hurch, in the same manner as the apparel of a stranger who was found dead was applied to purchase masses for his soul.' But it is perhaps more reasonable to imagine hat it was a civil institution intended to produce care and caution on the part of the owners of cattle and goods, and hat the subsequent application of the things forfeited has been mistaken for the origin of the law itself. The custom was also a part of the Mosaic Law. (*Exod.* xxi. 28.) In England it has prevailed from the earliest period, and there is no trace of the deodands having been applied to pious uses. The custom is thus mentioned by Bracton, one of the earliest writers on English law, who lived in the reign of Henry III. 'Omnia quæ movent ad mortem sunt deodanda,' which is Englished in the 'Termes de la Ley,'

> What moves to death, or kill'd the dead,
> Is deodand, and forfeited.

A different rule prevails when the thing occasioning accidental death is at rest, and is composed of several parts, and when it is in motion. For instance, if a man, in climbing up the wheel of a cart, falls and is killed, the wheel only is forfeited; but if the cart is driven against the man, and the wheel goes over and kills him, not only the wheel but the cart and its loading are forfeited. In cases of homicide, the instrument of death is forfeited, even if it belongs to an innocent party, for which reason, in all indictments for homicide, a value is placed on the weapon used in killing, that the king or his grantee may claim the deodand, for it is no deodand unless it be presented by a jury of twelve men. In modern times juries have taken upon themselves to mitigate these forfeitures, and it is common for the coroner's juries to award a given amount as a deodand, less than the value of the chattel; and though it is said that this finding is hardly warrantable by law, yet the court of King's Bench has usually refused to interfere on behalf of the lord of the franchise to assist so inequitable a claim.

DEOGHUR, a district in the province of Gundwana, forming part of the dominions of the Rajah of Nagpore, and lying principally between 20° and 21° North latitude. It is separated into two divisions, designated Deoghur above the Ghauts and Deoghur below the Ghauts. The division above the Ghauts is an elevated tract of country having the valley of the Nerbudda to the north, and the plains of Nagpore to the south. Its surface is undulating, hills and dales occurring in regular succession; the general direction of the hills is east and west. The division below the Ghauts lies to the south; it is crossed by several ranges of hills branching off from the Vindhyan chain. In other parts, situated between the Wurda and the Wyne Gunga, the country is open and undulating, and watered by numerous streams.

In the time of Aurengzebe, this country was in a very wild and unsettled condition; the Rajah was little more than the nominal head of numerous petty chiefs, and was tributary to the throne of Delhi. Shortly after that time, the Bhoonsla family obtained the chief power in this part of India, and Deoghur became the central part of their dominions. The title of rajah, with a small part of the revenue, was still allowed to the Goond princes, and the show of sovereignty, but without any of its power, is still given to the ancient royal family. The number of towns and villages in the upper division was 1241 in the year 1824, and in the lower division 2075 in 1825; the population of the two divisions was in these years 145,363 and 572,972 respectively, and the revenue amounted to 19,04,828 rupees, or 190,483*l.*

Deoghur, the capital, is in 21° 43′ North lat. and 78° 35′ East long. It was formerly a place of some consequence, but has long fallen into decay.

DEOGHUR or BAIDYANATH, a place of great sanctity in the district of Birbhoom in the north-western extremity of Bengal, in 24° 32′ North latitude and 86° 40′ East longitude. At a particular season of the year, the roads leading to this place are covered with pilgrims of all ages, both male and female, each bearing a basket, containing the pilgrim's baggage and several small bottles filled with the waters of the Ganges, intended to be poured over the principal idol of the temple which they are about to visit. Some of the pilgrims take with them a larger stock of the sacred water than they require to satisfy their own devotional feelings; this surplus is made a subject of traffic with those who, coming from other parts of the country, have not been able to provide themselves with water from either of the Prayagas. The government imposes a small tax on each pilgrim, the exacting of which is justified, on the ground of its gratifying the natives, as an evidence of toleration on the part of their foreign rulers.

(*Report of Committee of Commons on Affairs of India,* 1832.)

DEOGHUR. [DOWLUTABAD.]

DEPARCIEUX, ANTOINE (often written, but erroneously, De Parcieux), an able mathematician, was born in 1703 at the village of Cessoux near Nismes. His father was an humble peasant, and unable to afford him the least education; but the display of his precocious talents induced an opulent gentleman in his neighbourhood to place him in the College of Lyons, where his progress in his studies was rapid and striking, especially in the mathematical branches of science. After finishing his course in this institution, he repaired to Paris, without money and without friends; but he turned his talents to account by drawing sun-dials, and engaging in other employment of this kind, by which he was able to obtain a subsistence. His accuracy in these drawings being remarkable, he at length acquired an attachment to the pursuit, and obtained ample employment to secure him a comfortable livelihood. He afterwards appears to have turned his attention to machinery; and probably his talents were extensively employed in civil engineering and other collateral subjects. He died September 2nd, 1768, aged 65.

His publications were as follows:—

1. Tables Astronomiques, 4to. 1740.
2. Traité de Trigonometries Rectiligne et Sphérique, avec Traité de Gnomonique et des Tables de Logarithmes, 4to. 1741.
3. Essai sur les Probabilités de la Durée de la Vie Humaine, 4to. 1746.
4. Réponse aux Objections contre l'Essai (the last work), 4to. 1746.
5. Additions à l'Essai, &c. 4to. 1760.
6. Mémoires sur la Possibilité et la Facilité d'amener auprès d'Estrapade à Paris les eaux de la rivière d'Ivette, 4to. 1765.

Besides these separate works, he published sixteen memoirs amongst those of the Paris Academy, between the years 1735 and 1768.

Déparcieux was created Royal censor and member of the Academy of Sciences in Paris. He was also a member of the Academies of Berlin, Stockholm, Metz, Lyons, and Montpellier.

DEPARTMENT (or in French **DÉPARTEMENT**), a territorial division of France, introduced by the States General in the latter part of the reign of Louis XVI. We shall take this opportunity to give some account of the territorial divisions of France as they exist at present.

A commune is the smallest territorial division in the present system of France. In the rural districts and in the smaller towns a commune may be considered as equivalent in area and population to our ordinary parishes, or to the townships into which our more extensive parishes are divided. It is only in respect of area and population that we compare the communes of France with our own parishes: the two divisions were made for different purposes, the parish being an ecclesiastical division, which existed in France as well as in England, while the commune was for civil or military purposes. There is moreover this difference, that while our larger towns and cities (especially those whose extent and importance are of an antient date, such as Norwich, Exeter, Bristol, or York) consist of several parishes, the larger towns of France, with the exception of Paris, form but one commune. The term commune, which is nearly equivalent to corporation, is of antient date. When Louis VI. (le Gros) sought to raise from the towns of the royal domain a burgher militia as a substitute for the troops of his rebellious and disorderly vassals, and in order to form an alliance between the crown and the commons by sheltering the latter against feudal oppression, he formed the freemen inhabiting the towns into communautés (in the Latin of the middle ages communitates) or corporations, gave them power to raise troops from among themselves, and conferred upon a municipal body, constituted for the purpose, an authority over these troops similar to that which had been exercised over the baronial levies by the great lords themselves, and by their subordinates, the counts, or governors of towns, the viscounts, castellans, &c. These are not to be regarded as the first municipal corporations which had existed in France. Under the Roman dominion there were many; but during the distracted reigns of the later Carlovingian princes, these corporations had mostly, if not entirely, become extinct. The militia of the towns was designated in the Latin of the middle ages communiæ (communes), communitates parochiarum (the commonalties of the parishes), or burgenses (the burghers or burgesses). Where the town consisted of several parishes the troops were formed into smaller bodies according to their parishes, and marched into the field in those divisions. the parochial clergy accompanying their respective parishioners, not to join in the conflict, but to discharge their spiritual duties of preaching to them, confessing them, and administering religious rites to the dying. Some communes consisted of a number of small towns united under one corporation charter. In process of time the greater barons followed the example of the king, in order to become independent of their vassals, among whom the like insubordination existed as among the vassals of the king.

The municipal officers were generally designated Scabini or Echevins, and the principal of them had the title of Major or Maire (Mayor). The communes enjoyed many rights and exemptions; they fortified their respective towns, and were, in fact, so many municipal republics scattered over the kingdom, constituting the most substantial bulwark both of the public liberty and the rights of the crown against the encroachments of the nobility. As however the regal power gained strength, the influence and importance of the communes declined. Their militia came into disuse when the kings of the race of Valois began to form a standing army; and upon various causes or pretexts many of the incorporated towns lost their charters, and returned under the jurisdiction of their feudal lords. Under the present system, the whole of France, the country as well as the towns, is divided into communes, and the local administration and the management of the revenues of each are placed under a municipal officer, who may be compared perhaps with our constable or headborough, but who bears the same title, that of Maire, which was borne by the head of the antient communes. He is appointed by the king, or the prefect of the department, and is assisted by a communal council, the members of which are chosen by the communal electors, who are those inhabitants who pay most direct taxes, in the proportion of one-tenth to the whole population. (*Loi sur l'Organisation Municipale*, 21 *Mars*, 1831.) As the plan in France has been to assimilate the divisions for civil and ecclesiastical purposes, we believe that the communes may in the rural districts and the smaller towns be regarded as ecclesiastically equivalent to our parishes. Each has its church and its curé or clergyman. Some have also succursales or chapels of ease. The larger towns have several churches.

A canton is a division consisting of several communes, over which a judicial officer entitled justice de paix (justice of the peace) is appointed. These functionaries receive a small salary; they decide civil suits if the amount in question is small: and all suits whatever must be heard by one of them (in order that he may if possible bring the parties to an agreement) before the cause is carried into a higher court. The cantons into which the arrondissements of St. Denis and Sceaux (comprehending the metropolitan department of the Seine, beyond the limits of Paris) are divided, contain from six to thirteen communes each, or upon the average nearly ten each; but the cantons which are farther from the capital contain a greater number: the average of France is nearly fifteen communes to a canton.

An arrondissement (circle) comprehends several cantons, seven on the average of France: the two arrondissements of the department of the Seine above-mentioned have each four cantons. The municipal officers of the arrondissements will be noticed presently.

A department consists of several arrondissements, usually four or five: some departments have only three arrondissements; others have as many as six. The substance of the following account of the departmental administration we take from the *Dictionnaire Universel de la France*. Although it immediately applies to the early part of the reign of Bonaparte, it is (in the leading points at least), we believe, applicable to the present state of France. There are at present in France eighty-six departments.

At the head of each department is an officer entitled préfet (prefect), who has alone the administration of the local government. His usual residence is at the departmental capital; but he makes every year a circuit of inspection through his department, and gives an account of the result of his circuit to the proper officer of the central government at Paris. He is not allowed to be absent from his department without the permission of the government, which he obtains through the ministre de l'intérieur (

nister of the interior or home secretary). He is assisted in some of his duties by a conseil général de département (general departmental council), composed of sixteen, twenty, or twenty-four members, from different parts of the department, elected by the assemblies of arrondissements, which consist of the highest taxed inhabitants, in the proportion of 1 to 1000. This council assembles annually at a time fixed by the government, nominates one of its members president, and another secretary, and proceeds to its business, which must not occupy a session of more than fifteen days. The business of the council is to apportion between the arrondissements the direct taxes which are required by the general government; to hear and determine upon appeals made by the councils of arrondissements against this assessment; to levy, within certain limits fixed by law, an additional tax, destined, like our county rates, to meet the expenses of the local administration; to audit the account yearly rendered by the prefect of the expenditure of this local revenue; and to express, in a report addressed to the minister of the interior, an opinion upon the condition and wants of the department. The prefect is further assisted by a conseil de préfecture (prefectorial council), consisting of three, four, or five members, which decides upon individual appeals for an entire exemption or a reduction of the direct taxes; and upon questions arising from the execution of public works, whether arising between the government and the contractors as to the particulars of the contract, or between the contractors and parties who complain of injuries sustained at their hands, and upon the indemnity due to individuals whose possessions have been required for carrying on public works. The prefect when present at the sittings of this council acts as chairman, and in case of an equal division has a casting vote.

The arrondissements are under the administration of a sous-préfet (sub-prefect), subordinate to the prefect of the department, to whom he addresses a memorial on anything of importance to the arrondissement, assigning the reasons on which his opinions are founded. He receives and settles the accounts of the maires of the several communes. He is assisted by a conseil d'arrondissement (council of the arrondissement), consisting of eleven members, elected by the cantonal assemblies, consisting of the highest taxed inhabitants, in the proportion of 1 to 100. This council, like that of the department, meets at a time fixed by the government, and has a session limited to fifteen days: it has a president and secretary appointed by and from itself: its duties are—to apportion between the several towns and villages the direct taxes to which the arrondissement has been assessed by the departmental council; to give an opinion, with the reasons subjoined, upon appeals of towns and villages against the proportions levied upon them; and to audit the sub-prefect's account of the expenditure of that part of the departmental revenue assigned to meet the expenses of his administration; and to make a report to the prefect of the wants and condition of the arrondissement similar to that which the departmental council addresses to the minister of the interior.

As the capital of the department is also the chief place of an arrondissement, the prefect, and the prefectorial (not the departmental) council discharge in that arrondissement the duties which in the other arrondissements are assigned to their respective sub-prefects and councils.

The departments and arrondissements are electoral divisions. The members of the Chamber of Deputies are chosen for the departments, not for single towns, however important or populous; so that the deputies are all, according to our phrase, county members. The electors of each department are divided into collèges electoraux: each arrondissement has one of these, and each electoral college elects one deputy. There are 459 deputies for all France, and the number of electors is about 200,000 in all. Some departments have only between 300 and 400 electors, and return two deputies; that of the Seine reckons above 15,000, and returns 14 deputies. Most of the others have between one and two thousand, and return from four to six deputies each. The property qualification for an elector is the annual payment of 200 francs of direct taxes, and that for a deputy 500 francs. An elector must be above 25 years of age, and a deputy above 30. (*Loi relative aux Elections, 19 Avril*, 1831.) The elections are direct, and not graduated, as those under the constitution of the year viii., or of the present Spanish Cortes.

Each arrondissement has a court of justice, entitled tribunal de première instance, which, except in a very few cases, has its sittings at the capital of the arrondissement. These courts commonly consist of three or four ordinary and two or three supplementary judges: a few arrondissements which include large towns, such as Marseille or Bordeaux, have a considerably greater number of judges, who are divided into two or more sections. To each court there is a procureur du roi, or attorney general; and where the court consists of two or more sections, there are deputy attorneys. Each department has a tribunal criminel (criminal court), or cour d'assize (assize court), consisting of a president, who is a counsellor of the cour royale, to the jurisdiction of which the department is subject, two ordinary and two supplementary judges: to each court is attached a procureur du roi, or attorney general, and a greffier, or registrar. These courts, except in a few instances, have their seat at the capital of the department. Besides these courts, there are in different parts of France twenty-seven higher tribunals, called cours royales, consisting of from twelve to thirty-three salaried judges. Each of these courts has under its jurisdiction several departments. There is an appeal from these courts on questions of law, not of fact, to the supreme court, cour de cassation, at Paris. The departments are also formed into nineteen divisions militaires, or military districts: the head-quarters of these districts are fixed at some important town, usually at the capital of one of the included departments.

A department usually constitutes an ecclesiastical diocese. In a few instances two departments are comprehended in one diocese; and in one or two cases, a department is divided between two dioceses. The dioceses of France amount to eighty, of which fourteen are archbishoprics, and sixty-six bishoprics.

The instruction of youth in France being under the surveillance of government, has occasioned an arrangement of territory with a view to this object. Twenty-six districts, coincident with those respectively subject to the cours royales (except that the Island of Corsica is united to the departments subject to the cour royale of Aix), are under the direction, in matters relative to education, of as many local administrations or academies, which administrations are subject to the control of the great central body, the University of France, which has its seat in Paris. Each academical district is under the superintendence of a rector and an academical counsel, who inspects the schools of the district, and report thereon to the central administrative body. This body consists of a grand-master, who bears the title of minister of public instruction, and has a seat in the cabinet, and of a council composed of ten members. The province of the council is to superintend the business of instruction through the country generally, to judge and remove incompetent teachers, &c. The rector has the appointment of the teachers in the public collèges, or high schools, throughout France, upon the recommendation of the local authorities, and after strict examinations instituted by them.

In extent, the departments of France, with the exception of the metropolitan department of Seine, are more uniform than the counties of England. The department of Gironde, which is the largest, comprehends an area of 3954 square miles, about equal to the English counties of Devon and Cornwall. The department of the Seine comprehends an area of 183 square miles, not much greater than the area of Rutlandshire, and not much above two-thirds of that of Middlesex. The department of Tarn and Garonne, the smallest except that of Seine, comprehends an area of 871 square miles, and is rather larger than the counties of Cambridge, Hereford, Nottingham, or Leicester. The average extent of a department is 2380 square miles, rather greater than the area of Devonshire, but rather less than that of Lincolnshire. A great part of the French departments take their names from the mountains or rivers or parts of rivers which are within their limits.

The subdivisions of a department may, for their relative size, be compared with those of the county of Kent, the French arrondissements corresponding to the Kentish lathes the cantons to the hundreds and liberties, and the communes to the parishes. The hundreds are however smaller in proportion and more numerous than the cantons. For the origin of the communes, see Raynouard, *Histoire du Droit Municipal en France*, 1829.

DEPARTURE, a nautical term for the number of miles which a ship has sailed east or west. Thus, supposing a ship's course to be oblique to the meridian, there is a right-angled triangle, of which the hypothenuse is the course sailed over; one side on the meridian is the difference of latitudes of the beginning and end of the course (reduced to miles), and the other side, perpendicular to the meridian, is the *departure* (so called). Its use is to get a rough notion of the quantity by which the ship's longitude has changed, supposing the whole course so small that the portion of the sphere which contains the triangle may be considered as a plane. For the number of miles in the course multiplied by the sine of the angle which it makes with the meridian gives the departure in miles, which can be turned into minutes and seconds of longitude by dividing by the cosine of the latitude, and counting 69½ miles to a degree in the result. But the rough purposes which this process answers are sufficiently well consulted by the tables which are to be found in all works of navigation.

DEPLOY, to extend in a line of small depth, an army, a division, or a battalion which has been previously formed in one or more columns: this may be done either for a review or preparatory to making a charge upon the enemy.

DEPORTATION. (Civil Law.) [BANISHMENT.]

DEPOSITION in its extended sense means the act of giving public testimony, but as applicable to English law the word is used to signify the testimony of a witness in a judicial proceeding reduced to writing. Informations upon oath and the evidence of witnesses before magistrates and coroners are reduced into writing in the very words used by the witnesses, or as near as possible thereto. Evidence in the Court of Chancery is taken in written answers to interrogatories, which are also in writing, either by commissioners appointed by the court for that purpose in the particular cause, if the witness resides at a greater distance from London than 20 miles, or if he resides nearer or is otherwise willing to appear, before the examiners of the Court of Chancery. The course of the Ecclesiastical Court following the practice under the civil law, is also by written interrogatory and answer. The Court of Chancery has power to grant a commission for the examination of witnesses residing abroad; and by the 1 Wm. IV., c. 22, extending the provisions of the 13 Geo. III., c. 63, the courts of law at Westminster, in actions pending before them, have power to order the examination of witnesses residing in any of his majesty's foreign dominions. When a witness is above the age of 70, or very infirm, or about to go abroad, so that his testimony may be lost before the regular period for his examination arrives, the Court of Chancery will order him to be examined *de bene esse*, as it is termed; that is, his examination is received for the present, and will be accepted as evidence when the proper time for taking the other evidence in the cause arrives, if the witness cannot be then produced. Courts of law do not possess similar power without the consent of both parties, but in order to enforce consent they will put off the trial at the instance of a defendant, if the plaintiff will not consent; and if the defendant refuse, will not give him judgment in case of nonsuit.

The Court of Chancery will also, upon bill filed by a person in the actual and undisturbed possession of property, and who has therefore no means of making his title the subject of judicial investigation, but which nevertheless may be materially affected by the evidence of living witnesses, allow the witnesses to be examined in *perpetuam rei memoriam*, that is, to perpetuate testimony. This is done in order that if any of the witnesses should die before the title to the property is disputed, their evidence may be preserved, otherwise a claimant might lie by until all the evidence against him was lost.

Depositions are not admitted as evidence in courts of law, unless the witness is either dead, or from some cause beyond the control of the party seeking to read the deposition, cannot be produced, or against any other persons than the parties to the proceeding in which they were taken, or claimants under them, and who had the opportunity of cross-examining the witness. In cases however relating to a custom, prescription, or pedigree, where mere reputation would be good evidence, a deposition may be received as against a stranger.

Depositions taken in Chancery *de bene esse* before answer put in, unless the defendant is in contempt for refusing to answer, are not admissible as evidence in a court of law, because until the defendant has answered he could not have an opportunity of cross-examining the witness; but the Court of Chancery will sometimes direct such depositions to be read. Such order however, while it concludes the parties, is not binding upon the court of law; of course, however, if the depositions be not read and the decision should be contrary to justice, the Court of Chancery would interfere as between the parties. [EQUITY, EVIDENCE.]

DEPRESSION (Algebra), the reduction of an equation to a lower degree, by dividing both sides of it by a common factor. Thus $x^3-x-6=0$ having been found to have 2 as one of its roots, is *depressed* to an equation of the second degree by dividing by $x-2$, which gives $x^2+2x+3=0$: that is, the two roots of the latter equation are the two remaining roots of the former.

DEPRESSION, ANGLE OF, is the angle by which a line drawn from the eye to any object dips below the horizon. [ELEVATION, ANGLE OF.]

DEPTFORD. [GREENWICH.]

DERBEND, a town in the Russian government of Georgia, on the Caspian Sea, about 42° 12′ N. lat. and 43° 20′ E. long. A branch of Mount Caucasus, which runs eastward to the Caspian Sea, terminates about a mile from its shores. As the mountain ridges in no other place come so close to the sea, the extremity of this steep and nearly inaccessible ridge offered a very advantageous point for erecting fortifications to command the road along the coast. The town is built on the declivity with which the range terminates, and forms a parallelogram about fifteen miles in length, but only 400 yards across. The walls which include it on the north and south are continuous to the sea. There are two large gates in these walls, through which the road passes, and which may be shut at pleasure. Hence the town derives its name, which signifies *the shut-up gates*. The walls, which are of great antiquity and very strong, are built of hewn stones, and not less than ten yards high, and in many places ten feet thick. They are fortified with round and square towers. To the west of the town is the citadel, on a more elevated eminence, which is also well fortified. Derbend contains about 4000 inhabitants, but some travellers make its population 12,000. Many coarse stuffs of silk and wool are made here. Its commerce by the Caspian Sea is not considerable, the harbour being so shallow that only boats can land, and vessels remain at a distance of nearly a mile from the shore. (Bieberstein and Reineggs.)

DERBY, the capital of the county to which it gives name, is in the hundred of Morleston and Litchurch, on the right or west bank of the Derwent, a feeder of the Trent, 114 or 115 miles NNW. of London, in a straight line, or 126 miles by the road through St. Albans, Dunstable, Stoney Stratford, Northampton, Market Harborough, Leicester, Mount Sorrel, and Loughborough: in 52° 55′ N. lat., and 1° 29′ W. long.

The municipal and parliamentary limits of the borough of Derby coincide, and comprehend the whole of the two parishes of All Saints and St. Werburgh, and portions of the parishes of St. Michael, St. Alkmund, and St. Peter. All that can properly be considered as the town of Derby is within the borough limits, which enclose an area of 1660 statute acres. (*Boundary Reports and Municipal Corporation Reports.*)

We may consider Derby as having risen from the ruins of the Roman station, Derventio, which was on the site of Little Chester, a hamlet just out of the boundary of the borough and on the opposite side of the river; or as having been a British town upon the British road, the Rykneld or Icknield-street. Of this Roman station, Dr. Stukely was able to trace the wall quite round: the inclosure was oblong, and contained five or six acres; streets or roads were visible in the fields near it, which he supposed to be the suburbs. Coins of brass, silver, and gold, with antiquities of every kind, have been found, and the foundations of buildings are still sometimes discovered. There are the foundations of a Roman bridge over the Derwent at Little Chester, which may be seen when the water is clear, or felt with an oar. (Hutton, *Hist. of Derby.*)

In the time of the Saxons Derby was called Northworthige; the name of Deoraby (Derby) is said to have been given it by the Danes, by whom it had been captured. The etymology of this name has been much disputed: we think that the names of the town, of the neighbouring village of Darley, of the Roman station, Derventio, and of the river (the Derwent) all contain the same British or Celtic root, 'dwr,' water. Skinner (*Etymologicon Linguæ Anglicanæ*) derives Derwent from the above root, and gwen' or gwin, clear or bright; and the name of the town from that of the river, with the addition of the Anglo-Saxon termination 'bye,' a habitation. Derby was recovered from the Danes by Ethelfleda, countess of Mercia, and daughter of king Alfred, who took the castle by storm, A.D. 917 or 918. It was again taken by the Danes, and recovered from them by king Edmund I. A.D. 942.

In the time of Edward the Confessor, Derby was a royal burgh with 243 burgesses, besides 41 who occupied land adjoining to the town; but at the time of the Norman survey the town was greatly reduced, having only 140 burgesses, 40 of whom were of inferior degree: 103 dwellings were waste and empty which had formerly paid taxes. The castle probably went to ruin about the same time: its site is still called the castle-hill and the castle-field. The last remains of the building are said to have disappeared about 250 years since. Hutton traced one of the mounds of it 40 yards long. From the time of the Conquest no historical event of interest is connected with Derby for several centuries. King Charles I. marched through Derby soon after he set up his standard at Nottingham; but in the same year the town was garrisoned by the parliamentarians under Sir John Gell, and appears to have remained in the hands of that party through the war; the garrison however was removed in 1645. In December, 1745, the young Pretender, with his army, entered the town, but staid only two days, retreating into Scotland on the approach of the duke of Cumberland. (Pilkington, *Present State of Derbyshire;* Lysons' *Magna Britannia.*)

The town of Derby has received many charters; one each from John, Henry VI., Edward VI., James I., and Charles I., and two from Charles II. The last charter of Charles II. was, up to the passing of the late Municipal Reform Act, the governing charter; but Derby claimed to be a borough by prescription. Under the new Act, Derby is divided into six wards, and has twelve aldermen and thirty-six councillors.

Derby is situated in a luxuriant and well cultivated vale, surrounded with beautiful scenery. The streets in the older parts of the town are narrow and winding. The houses are mostly of red brick, the public buildings of stone. The market-place is not large, but commodious; a new market, adjacent to the old one, and communicating with it by a passage under the new town-hall, was several years since built by the corporation. The churches of Derby are six, one for each of the parishes mentioned above, and another erected within the last few years. All Saints (antiently and still popularly Allhallows church) is on the east side of the town not far from the river: the body of the church is a Roman Doric edifice by Gibbs, opened for divine service in 1725; the tower, erected about the time of Henry VIII., is in the perpendicular English style and of peculiar beauty; its general arrangement and details are very fine. It is 178 feet high (Hutton), and its situation adds to the effect of its elevation and its fine architecture. This church was formerly collegiate. The new church, St. John's, is a handsome Gothic building, but in a bad situation. Another handsome new church (that of Trinity), on the London road, has been paid for by public subscription. The new town-hall, between the old and new markets, is a handsome building with an Ionic portico on an elevated basement through which is the communication between the old and new markets. The county-hall is a large but heavy building of freestone, erected in 1660; new buildings have been erected behind the county-hall for holding the assizes and quarter-sessions. The borough jail is a plain, substantial, and convenient building; it was formerly the county prison, but not admitting the classification of prisoners required by the recent act, it was sold by the county to the corporation, and a new county prison, with every convenience for classing the prisoners, has been erected.

Derby has a theatre and an assembly-room. There are places of worship for different classes of dissenters, one each for Presbyterians, Independents, Particular Baptists, Quakers, Roman Catholics, and Swedenborgians; two for the General Baptists and five for different classes of Methodists. There is a stone bridge of three arches, a wooden bridge and a towing bridge over the Derwent, and three stone bridges across the Markeaton brook, which flows through the town into the Derwent. Derby is lighted with gas, and supplied with water from the Derwent.

The principal manufactures are of silk and cotton goods, porcelain, jewellery, and ornamental articles made of the various kinds of spar found in the county, red and white lead, lead-pipe, sheet-lead, cast-iron, ribbed stockings, bobbin-net, and other lace. There is a considerable printing and publishing establishment and several printing offices.

In the early part of the eighteenth century the Italians exclusively possessed the art of spinning, or, as it is technically called, 'throwing' silk, and the British weaver had to import thrown silk at an exorbitant price. In 1702 a Mr. Crotchet erected a small silk-mill; but his capital and machinery were insufficient, and he failed. In 1717 Mr. John Lombe, who had in disguise and by bribing the workmen, obtained access to the machinery of the silk-throwsters of Piedmont in Italy, agreed with the corporation of Derby to rent, on a long lease, for 8*l.* a year, an island or swamp in the river Derwent, 500 feet long and 52 wide. Here he erected, at a cost of 30,000*l.*, an immense silk-mill, now the property of the corporation, the lease having expired. The foundation was formed with oaken piles 16 to 20 feet long, and over this mass of timber was laid a foundation of stone on which were turned stone arches that support the walls. In 1718 Lombe took out a patent, and was proceeding successfully in his business when he died, cut off, as it was thought, by poison, through the agency of an Italian woman, employed by the Italian manufacturers whose business he had drawn away to himself. He was succeeded in his mill by his brother William, and afterwards by his cousin Sir Thomas Lombe. The accounts of the machinery of this immense mill have been much exaggerated: the wheels have been said to amount to 26,000; Hutton's authority is the best, for he served an apprenticeship of seven years in the mill, and he reduces these wheels to 13,384 The whole was moved by one water-wheel. Many throwing-mills have since been erected at Derby, and this branch of industry may be regarded as the staple of the town. The cotton manufacture is of later introduction and of smaller extent. The manufacture of porcelain was introduced nearly a century ago; and the articles, both in design and execution, have been carried to a high pitch of excellence: the making of figures and ornaments in what is termed 'biscuit ware,' was for some time peculiar to this town, and we believe is so still. The spars of the county, especially the fluor spar or 'blue John,' are wrought into vases and other ornaments, and the black marble of Ashford into vases, columns, chimney-pieces, &c. These spar and marble-works were for some time carried on in the building erected by Crotchet in the year 1702 for a silk throwing-mill; the turning-lathes were set in motion by a water-wheel.

The population of Derby amounted in 1831 to 23,627, of whom 11,269 were males and 12,358 females. Of 5780 males upwards of 20 years of age, 140 were engaged in agricultural pursuits, 953 in manufactures or making machinery, 2714 in retail trade or handicrafts, 1172 in miscellaneous labour, and 85 were servants. The number of capitalists, bankers, and professional or other educated men was 427, and the occupation of 289 was not stated. The population had increased very much in forty years—in 1792 it was 8563; in 1801, 10,832; in 1811, 13,043, and in 1821, 17,428. As, since 1831 many new buildings have been erected, and the place is said (*Report of Commiss. on Municip. Corporations*) to be flourishing, we shall not be far wrong in estimating the present population at 28,000.

Derby returns two members to parliament. It returned burgesses to parliament, 26 Edward I., and has continued to do so ever since. The number of parliamentary electors registered in 1832 was 1384, viz.: 372 freemen and 1012 ten-pound occupiers. Derby is also the chief place of election, and one of the polling stations for the southern division of Derbyshire. The assizes for the county are held here, also the Epiphany, Easter, and Michaelmas sessions; the Midsummer sessions are held at Chesterfield. The borough sessions of the peace are held quarterly before the Recorder; a petty sessions is held daily. There are Courts of Record and of Requests for the borough. The principal market is on Friday. A cattle-market is held once a fortnight on Tuesday. There are nine fairs in the year for cattle, cheese, pedlery, &c., which are, for the most part, well attended. The river Derwent was, several years since, made navigable from the town of Derby to its junction with the Trent, but, since the opening of the Derby canal, the navigation has been disused. This canal branches from the Trent and Mersey (or Grand Trunk) canal at Swarkestone, a few miles south of Derby, runs northward, and intersects the

Derwent at Derby, a towing-bridge being thrown across that river. From Derby the course of the canal is eastward until it joins the Erewash canal at Sandiacre. Over the Markeaton brook, which runs through Derby, the canal is carried in a cast-iron trough or aqueduct. From Derby a short branch of this canal extends to Little Eaton, three or four miles north of Derby, with two arms to the quarries on Little Eaton common. The Derby canal is 44 feet wide at top and 24 feet wide at bottom, and 5 feet deep. Derby is supplied by this canal with coals, building-stone, gypsum, and other things.

There were formerly four religious houses at or close to Derby; an abbey (St. Helen's) of Augustin canons, a nunnery of Benedictines, and houses of Dominicans and Cluniacs. St. Helen's Abbey was founded by Robert de Ferrariis, or de Ferrers, second Earl Ferrers. This abbey appears to have been first established in Derby town, and afterwards removed to a site about a mile north of Derby, where has subsequently risen the village of Darley or Darley Abbey. Its yearly revenue at the suppression was 285*l.* 9*s.* 6*d.* gross, or 258*l.* 13*s.* 5*d.* clear. The Benedictine nunnery, founded by one of the abbots of St. Helen's, had, at the dissolution, a yearly revenue of 21*l.* 18*s.* 8*d.* gross, or 18*l.* 6*s.* 2*d.* clear. There was one hospital, or perhaps two, for leprous persons.

There are several alms-houses at Derby: those founded by the countess of Shrewsbury, in 1599, for eight men and four women; those founded by Robert Wilmot, in 1638, for six poor men and four women, now for four poor men and four women; Large's Hospital, founded by Edward Large, in 1709, for five clergymen's widows, and enriched by subsequent donations. The countess of Shrewsbury's almshouses were rebuilt by the late duke of Devonshire, about 1777, in a style of architecture which has been considered too ornate for a charitable foundation of so humble a character. Thirteen neat and substantial almshouses have been lately erected from the funds of a charity bequeathed 300 years ago by Mr. Robert Liversage to the parish of St. Peter. There is a county infirmary equal to the accommodation of eighty patients besides those who have infectious disorders. The building is plain and neat in its architectural character, built of hard whitish stone. The internal arrangements, which are exceedingly convenient, were chiefly planned by the late William Strutt, Esq. There are also in the town 'a self-supporting charitable and parochial dispensary,' a ladies' charity for the assistance of poor women during their confinement, and many friendly societies, or benefit clubs.

There were in Derby, in 1833, one boarding-school containing 20 girls, and twenty-five day-schools, of all kinds, in which instruction was given to nearly 800 boys, 300 girls, and between 200 and 300 children whose sex is not discriminated in the returns. The grammar-school, one of the twenty-five mentioned above, is supposed to be one of the most antient endowments of the kind in England. It was formerly very flourishing, and enjoyed a high reputation, but at the time of the return had only one or two scholars. At present (1837) we are informed that it is again getting into repute. Two of the day-schools are on the 'national' system, and one on the Lancasterian system, and three are infant-schools. The number of Sunday-schools was twenty-four, and in these were instructed 3198 children, viz.: 1152 boys, 1326 girls, and 720 whose sex is not mentioned. In some of the Sunday-schools the children are taught writing and arithmetic on an evening in the week; to some schools lending-libraries are attached.

Of institutions for literary and scientific purposes there are—The Philosophical Society (originally held at the house of Dr. Darwin), with a good library, a collection of fossils, and mathematical and philosophical apparatus; the Permanent Library, which has lately been much enlarged, and has a public news-room and museum attached to it; and the Mechanics' Institution, the members of which have lately erected a handsome and spacious room for their meetings. Two weekly newspapers are published at Derby.

(Hutton's *History of Derby*; Glover's *History of Derbyshire*; *Report of Commissioners of Municipal Corporations and other Parliamentary Papers*; *Communication from Derby*.)

DERBYSHIRE, a midland county of England, bounded on the north-east by Yorkshire, from which it is partly separated by the rivers Derwent, Rother, and Sheaf; on the north-west by Cheshire, from which it is in this quarter separated by the river Etherow; on the west by Cheshire, from which it is here separated by the river Goyt, and Staffordshire, which latter county bounds it also on the south-west (the Dove separates Staffordshire from Derbyshire on the west, and the Dove and the Trent on the south-west); on the south-east by Leicestershire, from which it is partly separated by the Trent; and on the east by Nottinghamshire, from which it is separated by the Erewash. Its form is irregular; the greatest length is from north (from the point where the three counties of Derby, Chester, and York meet) to south (near Lullington on the Mease, a feeder of the Trent) 56 miles; the greatest breadth is from east (Holm Car Farm near Worksop, Notts) to west (near Chapel-en-le-Frith) 34 miles. The area of the county is estimated at 1010 square miles by Arrowsmith, 1028 square miles according to the statement subjoined to the *Abstract of the Answers and Returns* made in 1831 under the Population Act, or 1036 by taking the area of the different parishes. The population in 1831 was 237,170, or about 235,231, or 229 to a square mile, according to the computation of the area which we adopt. Derby, the county town, is on the Derwent, a feeder of the Trent, 114 or 115 miles N.N.W. of London in a straight line, or 126 miles by the road through St. Albans, &c. [Derby.]

The county is comprehended between 52° 41′ and 53° 30′ N. lat. and 1° 10′ and 2° 4′ W. long.; the county town is in 52° 55′ N. lat. and 1° 29′ W. long. Besides the main part of the county bounded and situated as above, there is a small detached portion near the southern extremity, inclosed between the counties of Warwick, Leicester, and Stafford. It contains the villages and parishes of Measham, Stretton-in-the-Fields, and Wilsley, and the village and chapelry of Chilcote.*

Surface, Hydrography, and Communications.—The southern and south-eastern parts may be considered as on the whole flat, yet they have an easy ascent towards the north-western portion, which comprehends one of the most elevated and rugged districts in England. This part (which is commonly known by the name of the Peak) is occupied by a part of that range of high lands, which some geographers have designated the Penine chain, which separates the waters which flow into the sea on the eastern side of the island from those on the west side. This chain of mountains enters the county at or near its northern extremity, and the principal ridge runs in an irregular line S.S.W. till it enters Staffordshire a few miles S.W. of Buxton. Along this ridge are the following heights: Dean Head Stones, 539 feet high; Blakelow Stones, which Farey considers to be the highest point of the ridge and of the county generally; Kinderscout, which Farey considers to be inferior in height only to Blakelow Stones, and which is stated, we presume, in round numbers, to be 1800 feet high (*Phys. and Pol. Geog. of the Brit. Isles*, in *Lib. of Usef. Kn.*); and the northern and middle peaks of Axe Edge Hill, the southern peak being in Staffordshire. The northern or great summit of Axe Edge Hill has been stated to be 1875 feet above the level of the sea (Farey), but later observations have reduced it to 1751 feet; Lord's Seat, to the east of the principal ridge of the Penine chain, is 1751 feet high. This ridge divides the basin of the Mersey from that of the Trent, one of that large system of rivers which has the Humber for its æstuary. From this, the principal ridge of the chain, lateral ridges proceed, which bound the subordinate basins of the various affluents of the greater rivers mentioned already. One of these lateral ridges, branching from the principal ridge near Axe Edge Hill and running south-east, separates the basin of the Derwent from that of the Dove. The length of this ridge, following its windings, is estimated at 46 miles; but the length of a direct line between its extremities is not estimated at more than 35½ miles. The ridge, which forms the eastern boundary of the basin of the Derwent, and which extends in a winding course about 67 miles, does not wholly belong to Derbyshire. It branches off from the Penine chain, in Yorkshire, and approaching the border of that county towards Derbyshire, runs along the boundary, then enters Derbyshire, and proceeds in a south-eastern direction across the east moors of the county into Nottinghamshire.

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* We give the above dimensions and the latitude and longitude of the extreme points from Arrowsmith's map. The length and breadth, as given in Farey's *Agricultural Survey* (where the detached portion of the county is included), are nearly the same as we have given; but the county is said to be comprehended between 52° 38′ and 53° 27′ N. lat., and between 1° 13′ and 2° 1′ W. long

The first part of this ridge separates the waters of the Derwent from those of the Don, the part nearest to Nottinghamshire from those of the Rother, a feeder of the Don. In this ridge is the hill called Ox Stones, 1377 feet high, between Sheffield (Yorkshire) and Hathersage. Alport or Orpit hill, south-east of Wirksworth, is 980 feet high. It is aid that from this eminence the Wrekin hill, near Shrewsbury, which is 50 miles distant, may be seen.

The Derbyshire highlands are intersected by narrow valleys or dales abounding with the most striking and picturesque cenery. We subjoin the following observations from Rhodes's *Peak Scenery* (8vo. edit., Lond., 1824). 'A more marked and obvious contrast in form and feature is scarcely to be met with in any part of the kingdom than the county of Derby presents. The more southern districts, though richly cultivated, are generally flat and monotonous in outline; to the picturesque traveller they are therefore comparatively of but little value: approaching its northern boundary it wears a more dignified aspect; here the hills, gradually assuming a wilder, a bolder, and a more majestic appearance, swell nto mountains which, extending to the most elevated parts of the Peak, mingle their summits with the thin white clouds that often float around them.

'That part of Derbyshire, known by the name of the High Peak, is everywhere composed of a succession of hills, of a greater or lesser elevation, and intervening dales which play nto each other in various directions. Throughout the whole the same general character prevails. A thin mossy verdure, often intermingled with grey barren rock, adorns their sides; and sometimes the interference of what Mr. Farey has denominated "indestructible limestone rubble" disfigures their steep acclivities. Yet even then a little brushwood occasionally breaks in to enliven and diversify the otherwise sterile scene. These remarks particularly apply to the minor dales of Derbyshire. Those which form the channels of the principal rivers are of a more elevated description, and possess, in an eminent degree, that variety of object, form, and colour, which is essential to picturesque beauty, sometimes united with a magnitude of parts where grandeur and sublimity preside in solitary stillness.

'Travellers, accustomed to well-wooded and highly cultivated scenes only, have frequently expressed a feeling bordering on disgust at the bleak and barren appearance of the mountains in the Peak of Derbyshire; but to the man whose taste is unsophisticated by a fondness for artificial adornments, they possess superior interest and impart more pleasing sensations. Remotely seen they are often beautiful. Many of their forms, even when near, are decidedly good; and in distance the features of rudeness, by which they are occasionally marked, are softened down into general and harmonious masses. The graceful and long-continued outline which they present, the breadth of light and shadow that spreads over their extended surfaces, and the delightful colouring with which they are sometimes invested, never fail to attract the attention of the picturesque traveller.' . . . 'Such are the appearances that often occur amongst the mountains of Derbyshire. Descending into the dales, especially those through which the Derwent, the Dove, and the Wye meander, the eye is enchanted with brilliant streams, well-cultivated meadows, luxuriant foliage, steep heathy hills, and craggy rocks, which administer to the delight of the traveller, and alternately soothe or elevate his mind as he moves along.'

The broadest and the deepest valleys are in the higher parts of the Peak. The picturesque beauty of the valleys is increased by the frequently precipitous character of the hills or rocks which bound them. The faces of these rocks rise up almost perpendicularly from the sides of the valleys, as may be observed near Castleton in the centre of the Peak, and near Stoney Middleton in the valley of the Derwent, where the Castle Rock rises to a vast height, and obtains its name from the singular and turret-like form which its craggy projections and points assume. Matlock High Tor, and other rocks in Matlock Dale, and the rocks which skirt some parts of the valley of the Dove, are of this precipitous character. In the smaller and narrower dales the projections of one side have corresponding recesses on the other.

The rivers of Derbyshire rise, for the most part, in the north-western and more elevated part of the county, and have a course toward the south or south-east. This is the case with the Derwent and its principal affluent the Wye, with the Dove, which is the boundary river of Staffordshire and Derbyshire, and those of its tributaries which belong to the latter county. In the eastern part of the county about Chesterfield, which is separated from the other parts by the ridge of high land which bounds on the east side the valley of the Derwent, the direction of the stream that drains it (the Rother) is north-east. In the extreme north-west there are a few streams that flow westward into the Etherow or Goyt and so into the Mersey.

The Derwent rises in a place called 'the Trough,' on the border of Yorkshire and Derbyshire, where the principal ridge of the Penine chain enters the latter county, and has a S.S.E. course. Four or five miles from its source it receives a stream (the Westend river) of about the same length as itself, and about nine or ten miles from its source it is joined by the Ashop river, into which the Alport brook flows; and three miles lower down it receives the Noe or Now, from Hope Dale: all these tributaries join it on the west or right bank. From the junction of the Now the Derwent flows on through Chatsworth Park, twelve or thirteen miles, until it meets the Wye at Great Rowsley, not receiving in the way any accessions worth notice, except the brooks Burbadge and Barbrook, which fall into it on the left bank. The Wye rises near the Axe Edge Hill in the principal ridge of the Penine chain, and flows to the south-east through Miller's Dale and Monsal Dale and past the town of Bakewell into the Derwent: its whole course is more than twenty miles. From the junction of the Wye the Derwent flows on in the same direction (S.S.E.) as hitherto to Derby, and receives in its way the River Amber, about fourteen miles long, which joins it on the left bank above Belper, and the Ecclesburn from Wirksworth, about ten miles long, which joins it on the right bank. From the junction of the Wye to Derby is about twenty-five miles. Below Derby the river runs south-east with a sinuous course of about twelve miles into the Trent: this part of the river was made navigable some years since, but the navigation of it has been superseded by the cutting of the Derby canal. Its whole course is about sixty to sixty-five miles. 'In the space of forty miles, which includes the whole course of this river from the highest and wildest parts of the Peak to the town of Derby, scenery more richly diversified with beauty can hardly anywhere be found. Generally its banks are luxuriantly wooded: the oak, the elm, the alder, and the ash, flourish abundantly along its course; beneath the shade of whose united branches the Derwent is sometimes secluded from the eye of the traveller and becomes a companion for the ear alone; then, suddenly emerging into day, it spreads through a more open valley, or winding round some huge mountain or rocky precipice reflects their dark sides as it glides beneath. Sometimes this ever-varying and ever-pleasing stream precipitates its foaming waters over the rugged projections and rocky fragments that interrupt its way: again the ruffled waves subside and the current steals smoothly and gently through the vale, clear and almost imperceptible in motion.' (Rhodes's *Peak Scenery*.) The course of the Wye is generally through narrow dells with precipitous sides: it receives a small tributary, the Lathkill, just before it falls into the Derwent. The current of the Derwent is rapid, and its waters are said to be of a higher temperature than ordinary; in the summer season it is said the thermometer will stand in them at 66° Fahrenheit, and in severe weather it has been observed that the Derwent has not been frozen so early as the Trent, and has become open nearly a month earlier. (Pilkington's *Derbyshire*.)

The Dove rises on the border of Staffordshire and Derbyshire, in the slope of the Axe Edge hill, and is, throughout its course, the boundary between the counties. Its course is S.S.E., with little variation for about twenty miles, to Hanging Bridge by Ashbourne, just above and below which bridge it receives its first two Derbyshire tributaries of any consequence, viz., a stream which comes from the village of Parwick, about nine miles long, and the Schoo, which rises near Wirksworth, and flows by Ashbourne into the Dove, after a course of about ten miles. The Dove, in the upper part of its course, 'is one of the most beautiful streams that ever gave a charm to landscape: and while passing through the first and least picturesque division of the Dale (Dove Dale), the ear is soothed by its murmurings, and the eye delighted with the brilliancy of its waters—in some places it flows smoothly and solemnly along, but never slowly, in others its motion is rapid, impetuous, and even turbulent. The ash, the hazel, the slender osier, and the graceful birch hung with honeysuckles and wild roses, dip their pensile branches in the stream and break its surface into beauteous ripples. Huge fragments of stone, toppled from the rocks above, and partly covered with moss and plants that haunt and love the water, divide the stream into many currents; round these it bubbles in limpid rills that circle into innumerable eddies, which by their activity give life and motion to a numerous variety of aquatic plants and flowers that grow in the bed of the river: these wave their slender stems under the surface of the water, which, flowing over them like the transparent varnish of a picture, brings forth the most vivid colouring. Occasionally large stones are thrown across the stream, and interrupt its progress: over and amongst these it rushes rapidly into the pool below, forming in its frequent falls a series of fairy cascades, about which it foams and sparkles with a beauty and brilliancy peculiar to this lively and romantic river.' (Rhodes's *Peak Scenery.*) Below its junction with the Schoo, the Dove flows south-west for about three or four miles; then south for about seven more, receiving by the way the Churnet, its largest Staffordshire tributary; it then flows in a winding course E.S.E. for twelve or fourteen miles and falls into the Trent, just below Burton, receiving several streams, the longest of which rises near Atlow, between Ashbourn and Belper, and has a course of above fifteen miles. The whole course of the Dove may be estimated at from forty to forty-five miles. The waters of this river have a clear blue tint, deepening through various shades to a dark purple. It frequently overflows its banks in the spring; and the fertilizing effect of these floods has given rise to the distich—

> 'In April, Dove's flood
> Is worth a king's good.'

Sometimes, however, the waters rise with such rapidity and violence as to be very destructive.

The Erewash rises in Nottinghamshire, near the village of Kirkby, and flowing W.S.W. for about three miles reaches the border of Derbyshire, and then flows, first S.W. and then S. by E., along the boundary of the two counties into the Trent. Its whole course is about twenty miles.

The Mease rises in Leicestershire, near Ashby de la Zouch, and flows first S.S.W., then W., and then N.N.W., into the Trent. Its course, which is about eighteen or twenty miles, is, for a short distance, in the detached portion of Derbyshire, partly on the border of the county, and partly beyond the border, in the counties of Leicester and Stafford.

These four rivers fall into the Trent, which crosses Derbyshire in a direction nearly north-east. It touches the border five or six miles north-east of Lichfield, just at the point where the Mease falls into it, and flows about ten miles N.N.W. along the border of Derbyshire and Staffordshire, past Burton upon Trent, in Staffordshire, until its junction with the Dove, after which it quits the border, runs nearly due east through Derbyshire for about eleven miles to the border of Leicestershire. It then turns E.N.E. and runs for about ten miles along the border separating Derbyshire from Leicestershire and Nottinghamshire, till its junction with the Erewash, after which it quits Derbyshire altogether. The Derwent falls into it about five miles above the junction of the Erewash. About thirty-one miles of the course of the Trent are thus upon or within the Derbyshire border. It is calculated (Farey, *Agricultural Survey of Derbyshire*) that it receives the drainage of ten-thirteenths of the county, exclusive of the streams in the eastern part which flow into the Idle, one of the tributaries which joins the Trent in the lower part of its course. The Trent is navigable from Burton-upon-Trent, but in 1805 the navigation was given up by agreement with the proprietors of the Trent and Mersey canal, which runs by its side, and the navigation of the river now commences just at the junction of the Derwent.

The Goyt rises near Axe Edge, and flows N.N.W. along the border of Derbyshire and Cheshire, about fourteen miles, till its junction with the Etherow, which has a south-west course of about fifteen or sixteen miles chiefly on the border of the same two counties. The springs of the Etherow are in Yorkshire and Cheshire. The united stream of these two rivers flows into the Mersey at Stockport. They receive many small streams from the adjacent part (the High Peak) of Derbyshire.

The Rother rises in the East-Moor, a mile or two east of Chatsworth Park, and flows eastward about eight miles to Chesterfield, where it turns to the north-east and flows into Yorkshire. About twenty-two or three miles of its course belong to Derbyshire. It joins the Don at Rotherham in Yorkshire. The Dawley (ten miles long) is its only Derbyshire tributary that requires notice. This rises on the Nottinghamshire border and flows north past Bolsover.

The Sheaf, which joins the Don at Sheffield, the Wallin, the Poulter, and the Ryton, whose waters flow directly or ultimately into the Idle, rise in Derbyshire.

Derbyshire has several navigable canals and railroads. The canals are, 1, Grand Trunk, or the Trent and Mersey canal; 2, the Erewash canal; 3, the Derby canal; 4, the Cromford canal; 5, the Nutbrook canal; and 6, the Chesterfield canal. The Peak Forest and the Ashby-de-la Zouch canals have a small portion of their extent just within the county, but rather belong, the former to Cheshire and the latter to Leicestershire. We shall not therefore notice them here.

1. The Trent and Mersey canal belongs to Derbyshire from its commencement in the river Trent, at Wilden Ferry (at the junction of the Derwent), to Monk's Bridge, where the canal is carried for a mile and a quarter over the flat meadows of the Dove valley on an embankment thirteen feet high, with aqueduct bridges over the Dove and one or two other streams, containing twenty-three arches of from twelve to fifteen feet span: twelve of these arches are over the main branch of the Dove. This canal was begun in 1766, and its whole extent is ninety-three miles. It extends through Derbyshire, Staffordshire, and Cheshire. Until the year 1785, men were employed in large gangs to draw the boats; now horses are universally used.

2. The Erewash canal commences in the Trent, midway between the junction of the Derwent and that of the Erewash river, and runs northward along the valley of the Erewash, first on the west and then on the east side of that river, and terminates in the Cromford canal at Langley Bridge: that part of its course which is on the east side of the Erewash belongs to Nottinghamshire. Its whole length is nearly eleven miles. It has aqueduct arches over the Nut brook and the Erewash river. It serves for the importation of corn, malt, and timber, and for the export of coal, limestone, iron, lead, and marble and other stone.

3. The Derby canal is described under the town of Derby. [DERBY.]

4. The Cromford canal commences in the Erewash canal at Langley Bridge, and runs northward to the Codnor Park Iron Works, following the valley of the Erewash, and having the first part of its course on the east side of that river in Nottinghamshire, and the latter part on the west side in Derbyshire. From Codnor it sends off a branch two miles and a half or three miles long, along the valley of the Erewash, on the west or Derbyshire side of that river, to the village of Pinxton, while the main line of the canal turns westward to the valley of the Derwent, crossing the river Amber in its way; it then turns to the north-west and follows the valley of the Derwent, first on the east and then on the west side of that river, to Cromford Bridge, where it terminates: the length of the canal is fifteen miles nearly. Between the valley of the Erewash and that of the Derwent this canal is carried through the higher ground by a tunnel more than a mile and a half long. The width of the canal in the tunnel is nine feet at the surface of the water; the crown of the arch is eight feet above the water. The tunnel is lined with brick, except where the perforated rock appeared capable of supporting itself. There are three aqueduct bridges on the line of this canal. One is over the Erewash; one, Bull Bridge aqueduct, which is over the Amber, is six hundred feet long and fifty feet high: the third aqueduct is over the Derwent, at Wigwell, and is six hundred feet long and thirty feet high; the span of the river arch is eighty feet. This canal is chiefly used for the conveyance of coals and coke; but lime and limestone, gritstone, ironstone, iron, lead, slate, timber, corn, &c., are carried on it. Besides the Pinxton cut already noticed, there is another small cut near the Derwent aqueduct, and there are several short railways which enable the coal-works, &c., on its line to communicate with the canal. A railway from Mansfield communicates with the Pinxton branch, and the Cromford and Hign Peak railway communicates with the main line of the canal near its termination at Cromford Bridge.

5. The Nutbrook canal commences at the collieries at Shipley, on the right of the road from Derby to Mansfield and runs S.S.E. four miles and a half into the Erewash canal. Several railroads lead from the neighbouring col-

ieries to the Nutbrook canal, the conveyance of coal being its chief object.

6. The Chesterfield canal commences in the tideway of the Trent, below Gainsborough, and has the greater part of its course in Nottinghamshire, and a small part in Yorkshire. It enters Derbyshire from the latter county near the village of Kilmarsh, in the valley of the Rother, and runs S. S. W. along that valley to Chesterfield. Its whole length s forty-six miles, of which about twelve are in Derbyshire. In the Derbyshire part of the canal are two aqueduct bridges, one over a brook at Renishaw furnace, and one over the Doolee or Dawley, a branch of the Rother, near Stavely: many railways communicate with it, and are intended to convey coal and iron from the collieries and iron works thereabout. This canal was opened A. D. 1777: its object s the exportation of coal, lime, lead, and iron; and the importation of corn, timber, &c.

The principal railroad is the Cromford and High Peak railroad. The others are of less importance; they are chiefly private property, and are designed to convey the produce of mines, collieries, and iron works to the various canals.

The Cromford and High Peak railroad commences at the Cromford canal, near its termination at Cromford, and runs in an irregular line north-west to the Peak Forest canal, which it joins at Whaley Bridge, three or four miles west of Chapel-en-le Frith. It passes near Wirksworth and Buxton. Its length is thirty-four miles nearly, and it has six inclined planes. The Act of Parliament for it was obtained in 1825: we are not aware whether the railroad is yet completed.

The great road from London to Manchester, Carlisle, and Glasgow, passes through this county. It enters Derbyshire at Cavendish Bridge, over the Trent, just above its junction with the Derwent, runs north-west through Derby and Ashbourne, and quits the county at Hanging Bridge, over the Dove. Two other roads to Manchester branch off from that just described; one at Ashbourne, which runs N. N. W. through Buxton, and quits the county at Whaley Bridge; another at Derby, which runs through Matlock, Bakewell, and Chapel-en-le-Frith. The road which connects Bristol and Birmingham with Sheffield and Leeds enters Derbyshire at Monk's Bridge, over the Dove, and runs northward by Derby, Chesterfield, and Dronfield, into Yorkshire. The road from London to Sheffield and Leeds enters the eastern side of the county from Nottinghamshire, and runs to Chesterfield, where it unites with the road just mentioned. A road from Sheffield to Manchester crosses the Peak through Hathersage, Castleton, and Chapel-en-le-Frith. The other roads are too numerous for us to notice.

Geology and Mineralogy.—That part of Derbyshire which lies south of a line drawn through Ashbourne, Duffield, and Sandiacre, is almost entirely occupied by the red marl or new red sandstone, a formation which overspreads so large a portion of the midland counties. There are indeed a few spots in which the magnesian limestone, which ordinarily underlies it, rises to the surface; and just on the Leicestershire border, near Ashby-de-la-Zouch, the coal-measures emerge from beneath it, and form one or two small detached coal-fields. In many parts, and especially along the valleys of the lower Derwent and the Trent, the red marl is covered by beds of gravel, and upon the gravel alluvial flats of loam or sandy loam, of from one to several feet in thickness, and without stones, are occasionally found. The strata of the red marl present considerable variety: among them are some micaceous gritstone beds, producing a good freestone; other strata are not concreted, but appear as sand, red, white, and yellow; others are more clayey, and from them bricks and tiles are made. The strata of the red marl formation are generally horizontal or nearly so. Several deposits of gypsum are found in this formation, and are quarried in several places, as at Darley Abbey [DERBY], in the tongue of land formed by the Derwent and the Trent, and in the southern extremity of the country. That gypsum, which is quite white, or only faintly streaked with red, is used by the potters of Staffordshire (as Plaster of Paris) for their moulds; some fine blocks are selected for the turners of alabaster ornaments, and the inferior sort is used by plasterers for ordinary purposes or for making the plaster floors often seen in this county. Some of the best land in or near Derbyshire lies on the red marl; in general however it is inclined to be too tenacious and cold. This formation also occupies a very small portion of the county at its eastern extremity.

The newer magnesian or conglomerate limestone, which crops out from under the red marl of Nottinghamshire and skirts it on its western border, extends into the eastern part of Derbyshire, where it occupies the part east of a line drawn north and south through Bolsover. The thickness of this formation is probably 300 feet. The general colour is yellow, of various shades, from a bright gamboge to a light straw colour or white. Many of the beds have a granular texture, and cannot be calcined; they have generally passed with the inhabitants for gritstone rather than limestone. This limestone is quarried for building, also for flooring and staircases. Towards the bottom of the series are several beds of compact blue limestone, imbedded in blue clay, and abounding with shells. This blue limestone yields excellent lime: it is quarried at Bolsover, where also pipe clay is obtained: the pipe clay separates the limestone beds. The strata of the magnesian limestone form a better subsoil for arable than for grass land.

The coal-measures underlie the magnesian limestone and crop out from beneath it on the west. These coal-measures form part of that important coal-field which occupies a considerable part of the west riding of Yorkshire, and extends into Nottinghamshire and Derbyshire, being bounded on the east by the magnesian limestone, and on the south by the red marl. The strata range from north to south, and dip to the east. The Derbyshire portion of this coal-field is east of a line drawn from between Hathersage and Sheffield to Little Eaton, near Derby. There are twenty gritstone-beds, some of them of great thickness, and numerous strata of slate-clay, as shale, bind, and clunch: some of the shale-beds contain rounded or ovate masses, and even thin strata of argillaceous ironstone, with impressions of mussel shells, and coaly impressions of vegetables. A hard argillaceous rock called crowstone forms in some places the floor of the coal-beds. The number or order of the coal-seams is probably about thirty, varying in thickness from six inches to eleven feet: their aggregate thickness is about eighty feet: these dimensions can only be considered as approximate. Every variety of coal seems to be found in this field, hard stone coal, cannel, peacock, and caking coal. The coal-pits in Derbyshire are dispersed over the coal-field, and are very numerous, especially about Chesterfield and Alfreton, and in the district south and west of the Cromford and Erewash canals. There are coal-pits also in the small detached coal-fields on the Leicestershire border, noticed in speaking of the red marl, and coal is obtained between Ashbourne and Derby apparently by working through the red marl to the coal-measures which lie underneath them. The beds which lie between the seams of coal are worked for various purposes. The workings of the ironstone are generally begun at the surface, and pursued until they become dangerous from the loose nature of the stratum in which they lie: that ironstone which is marked with impressions of mussel shells (called the mussel band) is worked as an ornamental marble. From the gritstone-beds are quarried grindstones for cutlers: the binds, where they are hard and black, are used as black chalk; others, when decomposed, make good brick earth: the clunch is sometimes of that kind which is used for fire-bricks; where it crops out to the surface it becomes soft clay. Potters' clay, of various colours and qualities, occurs in this coal-field.

Millstone-grit and shale form a series of strata, having an aggregate thickness of about 870 feet; the millstone-grit, 360 feet thick, forming the upper part, and the shale and its associated rocks, 510 feet, the lower part of the formation. The millstone-grit ranges on three sides (viz., the east, north, and west,) of the carboniferous limestone, which we shall have presently to notice as occupying the central part of the county north of Ashbourne and Duffield: it occupies a tract between Duffield, Belper, and Wirksworth, on the west side of the Derwent, and forms the heights that bound the valley of that river on the east side up to its source. It occupies also the northern and western borders of the High Peak, and extends southward to Buxton, near which it passes into Staffordshire. The hills formed by it usually present a bold escarpment, crowned by rude piles of crags, exhibiting some of the wildest rock scenery of the district. The shale occupies a lower district between this and the carboniferous limestone, but in this lower tract are occasional insulated mountains, crowned with a cap of millstone-grit. Kinderscout is one of these. The shale contains some alternating beds of fine-grained siliceous grit and nodules of ironstone; and it has some subjacent and apparently local beds of shale limestone, which afford a beautiful black marble.

Carboniferous or mountain limestone occupies the tract bounded on the south by the red marl, and on all other sides by the millstone-grit and shale just described. This limestone district is entirely comprehended in Derbyshire, except on the north-east, where it just passes over the Yorkshire boundary, and on the south-west, where it enters Staffordshire. There are one or two places in the southern part of the county where the limestone crops out. On the eastern side of the county the strata dip under the shale; but on the western side, by a great fault, the lowest bed of the limestone is elevated and brought into contact on the same level with the shale. The limestone is divided into four beds by three intervening beds of toadstone. The respective thickness of these limestone-beds (reckoning from the uppermost) is as follows:—first bed, 150 feet; second bed, 150 feet; third bed, 210 feet; fourth bed, at least 250 feet; aggregate at least 760, but in fact the thickness of the lower bed is not ascertained: it is only known that it extends 250 feet. In each bed of this limestone thin beds of clay are found, with imbedded masses of toadstone, and various organic remains. The lowest bed, which is the most esteemed by the lime-burners, has very few dark coloured strata; but in the three upper beds these are more common, and the second bed contains some very fine black strata, which are quarried as black marble. The upper bed is also quarried as marble, and contains white chert or china-stone, which is extensively used in the Staffordshire potteries. The beautiful fluor spar called 'Blue John,' from which vases and other ornaments are made, is found in a mountain of limestone.

The outcrop of the carboniferous limestone forms the lead district of Derbyshire. Numerous veins have been worked in it, chiefly for lead; but ores of zinc, iron, manganese, and copper, also occur. Lead ore is found occasionally in the toadstone which intervenes between the limestone-beds, but commonly the veins are cut off by the toadstone-beds. The veins which contain lead have generally a direction east and west; some of them approach the perpendicular (rake veins); others are nearly horizontal (pipe veins), and are rather beds of spar and ore, lying between the strata of limestone, and in most cases connected with the surface by a rake vein.

The limestone strata of Derbyshire are subject to very remarkable derangements or faults. They are characterized also by numerous caverns, and by the frequent engulphment of the streams by subterraneous courses termed swallow holes. The caverns appear to have been excavated wholly or chiefly by the agency of water.

The three toadstone-beds have an average thickness of 60 feet for the upper, and 75 feet for each of the lower, giving an aggregate of 210 feet; in parts however the thickness of the three amounts to above 250 feet. There are several varieties of the toadstone, which sometimes passes into ordinary basalt: among the substances inclosed are the quartz crystals locally termed Derbyshire diamonds.

Of the limestone caverns, the most remarkable is that now generally known as Peak's Hole, or the Devil's Cave, near Castleton. It is situated at the extremity of a deep and narrow rocky chasm in the valley in which Castleton stands, where craggy projections hide it from the traveller until he approaches pretty near. The entrance is a tolerably regular arch of about 40 feet high and above 100 wide, extending in length nearly 300 feet. This part is inhabited by poor people engaged in making twine and pack-thread, who have built their habitations and carry on their work under this natural shelter. At the end of this vestibule, as it may be termed, the arch contracts, and the visiter is obliged to stoop until he emerges into a spacious vault, called 'the bell house. A second contraction, where the rock closes almost down upon the surface of a stream of water which occupies the passage, conducts to a third cavern, said to be 200 feet wide, and in some parts 120 feet high: this is succeeded by a series of cavernous chambers, at the extremity of the farthest of which the rocks close down upon the stream of water in such a way as to preclude all access to the caverns which are supposed to lie beyond. The water which thus obstructs farther progress is a stream engulphed at a spot called Perry-foot, three miles from Castleton, on the Manchester road; it reappears at the innermost recess of the cavern, through the successive chambers of which it flows, and emerges into daylight at the entrance. After heavy rains this stream is so much swelled as to render it impossible to reach the farther part of the cavern. The whole length of Peak's Hole is variously estimated. Pilkington estimated it at 2250 feet, beside an additional chamber nearly 500 feet long. Elden Hole is a perpendicular chasm in a limestone rock near Castleton, more than 180 feet deep, with a sloping passage to an interior cavern or series of caverns. It is supposed that a second chasm of unknown depth descends from the bottom of this cavern. Another series of grottoes (Bagshaw Grottoes), extending about 2000 feet, adorned with stalactites, was first explored about the commencement of the present century. [For Pool's Hole, see BUXTON.] There are several other caverns in the Peak.

The mineral springs of Derbyshire are numerous and important. The most celebrated warm springs are those at Buxton [BUXTON] and Matlock. There are warm springs at Stoney Middleton, where it is supposed that the Romans established a bath. The temperature of the Middleton waters is 2° higher than that of the warmest springs at Matlock. The most celebrated of the sulphureous waters is at Kedleston Park, three miles north-west of Derby. They are valued for their antiscorbutic qualities. There are several chalybeate springs. For the ebbing and flowing well on the road from Buxton to Castleton, see BUXTON.

Agriculture.—On the high hills and moors of Derbyshire the cultivation is not extended as it might be; and there are great tracts of rough pasture of no great value in their present state, which, with a moderate outlay, might be improved or converted into arable land, as has been done in similar situations in Scotland. In the valleys, or on the less abrupt hills, a very fertile red marly loam is frequently met with, which is productive of every kind of grain without any extraordinary tillage. Of this kind are the lands about Barton, Blount, and Ash, and in several places in the southern and eastern part of the county. The soil on the surface naturally partakes of the nature of the rocks which are found immediately below it; and where any particular stratum rises to the surface, or crops out, as it is called, the soil is chiefly made up of the same earthy substances, which have been more or less decomposed by the action of the air and mixed with vegetable matter. An account of the different soils is given in the Agricultural Report of the county, by Farey, of which the following table forms an epitome, distinguishing the strata from which they are formed and the number of acres in extent.

Gravelly soils	77,000	acres.
Red marl soil	81,000	
Yellow limestone soil . . .	21,580	
Coal measure, upper part . .	30,000	
„ lower part . .	60,000	
Grit stone and shale soils . .	160,500	
Mineral limestone and toadstone soils	51,500	
Fourth limestone soil . . .	40,500	
Total surface . .	522,080	acres.

Most of these soils may be ranked among the clays and loams of various degrees of fertility, there being but a very small proportion of sandy soils in Derbyshire. Where these occur, they are mostly alluvial, apparently washed out of the loam and brought together by currents, or the decomposition of the grit and micaceous sandstone in the grit or limestone shale.

The climate of Derbyshire varies according to the situation and height of the land above the level of the sea. The quantity of rain that falls in the mountainous parts is much greater than that in the low country: at Chatsworth, for instance, the annual fall of rain is about 28·411, and at Derby 24·77 inches. In the valleys it differs little from the surrounding counties. The time of harvest is rather late in exposed situations, and is frequently much protracted by abundant rains in the month of October; it is therefore of great importance to sow as early as the season will permit, so as to have the corn ripe in time to gather it in before the autumnal rains.

The manner in which the soil is cultivated varies as much as its nature. Rich proprietors who have experienced bailiffs adopt all the new improvements, and their farms are well managed. There are also a few farmers who have some capital and manage their land well; but the majority are small farmers, who follow the routine of their forefathers, and have not the means, if they had the inclination, to make permanent improvements. A great many farms might be doubled in value by judicious draining, and lands made to produce turnips which now are thought too heavy and wet for this useful root. The pastures also might, in many places, be greatly improved by underdraining, and rendered much better adapted to feed sheep. A common obstacle to improvement is the want of leases; for although tenants are seldom removed if they pay their rents, and it is not unusual for a tenant from year to year, when he dies, to give possession of the farm to his widow or one of his children by a testamentary bequest, which is generally respected by the landlord, the rent may be raised, if the estate comes into other hands, and the money laid out on improvements by the tenant may be the cause of this rise. Tenants from year to year are therefore satisfied with a bare livelihood, and have no motive to improve their farms. Many farms are so small that they are scarcely superior to cottage tenures, and the occupiers have other means of gaining a livelihood besides their land. In the neighbourhood of Derby and other manufacturing towns, as also near the most productive mines, some small portions of land are neatly cultivated, in a great measure by the spade, and are consequently very productive. They are let at higher rents than the quality of the soil would otherwise warrant.

The course of cultivation on the best loams is generally that which begins with a summer fallow manured with lime for wheat, and succeeded by spring corn with or without clover or grass seeds. Some farmers have adopted the improved convertible system, and find the superiority of it in point of profit, uniting the advantages of a dairy with those of an arable farm. Spring wheat has been introduced instead of barley on the best soils, and the land is laid down with grass seeds in the first crop after the fallow, or the turnips, where these are introduced.

The wheat produced on the red land is good and heavy. On the poorer soils oats and barley are more certain and profitable crops. When the wheat has failed during the winter, and looks poor and thin in spring, it used to be a common practice to sow barley amongst it; the mixed produce was called *blend*, and ground to a coarse meal of which bread was made for the labourers. Spring wheat has been found a better substitute, and blend is now seldom met with. Haver cake made of oatmeal is still a common bread of the labourers, although wheaten bread is now very generally preferred.

Potatoes are raised in considerable quantities, both in garden plots, and in the fields, where they are planted in rows and moulded up with the plough. The produce on good loams well manured, especially on land ploughed up from grass, is very great. Six hundred bushels per acre is not thought a very extraordinary crop in very superior soils. They are given to cattle, as well as used for human food.

A large proportion of the lands is in permanent pastures, of which some are very rich. Derbyshire cheese is noted as of a good quality, and the best is often sold for Cheshire or Gloucester when made of the shape and colour of these cheeses. The common Derbyshire cheese is not generally coloured. It resembles some kinds of Dutch cheeses, and keeps well.

There are some very highly productive meadows along the course of the rivers in this county, but an improved system of embankment and irrigation is still wanting in many favourable situations. The meadows along the Dove and other rivers are from their situation very subject to sudden floods, which endanger the safety of the cattle grazing in them. To obviate this mounds of earth have been raised in many places, to which the cattle may fly for refuge; but a judicious embankment would be much more useful, by keeping the waters within proper channels, and would allow the admission of the water by flood-gates, when it is advantageous to the land.

When the upland pastures are mown for hay, they are also called meadows. Some of these are very rich, and will fatten the heaviest oxen; but the generality of the hilly pastures are below the medium quality of pastures in England. They might be much improved by draining and weeding, which is seldom attended to.

There are many woods and coppices scattered through the country. There being no great demand for fire wood in a country abounding with coal, the coppices are allowed to grow for twenty or twenty-five years before they are cut, in order that the poles may acquire a considerable size, and be proper for supporting the roofs and sides of excavations in mines and coal-pits, or fit to make ladders of. A good coppice of twenty-five years' growth may be worth from 25*l.* to 50*l.* per acre to cut for the above purposes, leaving a sufficient number of trees and poles at each cutting to keep up the timber growing, which when felled will be worth as much as the underwood. Many young plantations have been made of late years, and are in a thriving state.

The horned cattle of Derbyshire have no peculiar character. The various improved breeds are met with in the richer pastures, and hardier animals on the mountains. The same may be said of the sheep. The sheep on the hills are similar to those found on the Cheviot Hills; in the valleys the Leicester and South Down breeds, and various crosses are generally preferred by the best farmers· but the quantity fatted is not so great as would be the case were the land better adapted for turnips.

The Derbyshire breed of horses is good, and many are bred in this county which are fitted for the carriage and the saddle, as well as for the farm, and form an important article in the profits of some of the larger farms.

There are numerous fairs in the county, as well as weekly markets: the principal fairs are the following:—Alfreton, July 31; November 22 (for horses and horned cattle). Ashburne, first Tuesday in January; February 13 (for horses and cattle); April 3; May 21; July 5 (do. and wool); August 16 (horses and cattle); October 10 (do.); St. Andrew's eve, or Saturday before (a considerable horse fair). *Ashover, April 25 and October 15 (cattle and sheep). Bakewell, Easter Monday; Whit Monday; August 26; Monday after October 10; and Monday after November 22. Belper, May 12; October 31 (cattle and sheep). Bolsover, Easter Monday. Chapel-en-le-Frith, Thursday before February 13; March 24 and 29; Thursday before Easter; April 30; Holy Thursday and three weeks after (cattle); July 7 (wool); Thursday before August 24 (sheep and cheese); Thursday after September 29; Thursday before November 11 (cattle). Chesterfield, January 25 or Saturday before (cattle); February 28 or Saturday before; first Saturday in April; May 4; July 5 (horses and cattle); September 25 (cheese, onions, &c.); last Saturday in November (cattle, sheep). Crich, Old Lady Day; Old Michaelmas Day. *Cubley, November 30 (fat hogs). *Darley Flash, May 13; October 27 (cattle and sheep). Derby, January 25; March 21 and 22 (cheese); Friday in Easter week (cattle); Friday after May day; Friday in Whitsun week; July 25 (cattle); September 27, 28, 29 (cheese); Friday before Old Michaelmas (cattle); October 18 (cheese). Dronfield, April 25 (cattle and cheese); August 11. *Duffield, March 1 (cattle). Higham, first Wednesday in the year. *Hope, May 12 and September 29 (cattle). *Matlock, February 25; May 9; July 16; October 24 (cattle and sheep). *Newhaven, September 11; October 30 (horses, cattle, and sheep, and a great holiday fair). *Plesley, May 6; October 29 (horses, cattle and sheep). *Ripley, Wednesday in Easter week; October 23 (horses and cattle). *Sawley, November 12 or Saturday before (foals). Tideswell, May 3 (cattle); second Wednesday in September; October 29 (cattle and sheep). Winster, Easter Monday. Wirksworth, Shrove Tuesday; May 12; September 8; October 4 and 5 (cattle).

Those places which are marked (*) have no weekly markets. Buxton and Cromford have a market, and no fairs.

Divisions, Towns, &c.—The divisions of Derbyshire for civil purposes were antiently called wapentakes; and of these divisions the 'Domesday Survey' mentions five: Scarvedale (Scarsdale), Hamestan (supposed to be what is now called the High Peak Hundred), Morlestan (Morleston), Walecross (supposed to be what is now the hundred of Repton and Gresley), and Apultre (Appletree); beside a district called Peche Fers (Peak Forest). A document of a somewhat later date (the 'Hundred Roll,' A.D. 1273) speaks of the wapentakes of Peck (Peak), Scarvedale, Apeltre, Repindon (Repington or Repton), Greselegh (Gresley), Littlechirch (Litchurch), and Wyrkesworth (Wirksworth). Other records speak of the hundreds of Risley (Gresley?), and Sawley. The present division is as follows. The Wirksworth division is still called wapentake: the others are called hundreds.

I. High Peak (203,190 acres), North and North-West, and Central. Population in 1831, 47,485.

II. Wirksworth (73,880 acres), West and Central. Population in 1831, 23,287.

III. Scarsdale (144,750 acres), East and Central. Population in 1831, 53,582.

IV. Morleston and Litchurch (77,440 acres), South-East. Population in 1831, 61,779.

V. Appletree (108,170 acres), South-West and Central. Population in 1831, 32,483.

VI. Repington or Repton and Gresley (55,750 acres), South. Population in 1831, 18,554.

There is in Derbyshire only one parliamentary borough and market-town, Derby, on the Derwent (population in 1831, 23,627) [Derby]; the other market-towns are sixteen. Of the following an account will be found under their respective articles:—Alfreton, between Derby and Chesterfield (population in 1831, 5691); Ashbourne, near the Dove (pop. 4884); Ashover, near the East Moor (pop. 3179); Bakewell, on the Wye, (pop. 9503); Buxton, near the head of the Wye (pop. 1211); Chapel-en-le-Frith, in the High Peak (pop. 3220); Chesterfield, on the Rother (pop. 10,688); and Wirksworth, between Derby and Matlock (pop. 7754). The population given above is that of the whole parish, except in the cases of Buxton, which is a chapelry of Bakewell parish, and the population of which is included in the statement given of the population of Bakewell, and of Derby, which is a borough containing parts of five parishes. Of the other towns, viz., Belper, Crich, Cromford, Dronfield, Heanor, Ilkeston, Tideswell, and Winster, and of the village of Matlock, we subjoin an account. We observe here, that Messrs. Lysons omit Dronfield from their list of market-towns, stating the market to have been discontinued; and Mr. Farey omits Ashover, Heanor, and Ilkeston. There are several other places which formerly had markets; those at Bolsover [Bolsover], Higham-in-Shirland, Hope, Matlock, Measham, and Sawley appear to have been discontinued within memory.

Belper is on the east bank of the Derwent, eight miles north of Derby. It is a township and chapelry, in the parish of Duffield, in Appletree hundred. The prosperity of Belper is of modern date, and is to be principally ascribed to the establishment of the cotton-works of Messrs. Strutt. It is now one of the most flourishing towns in Derbyshire. The older buildings form a very insignificant portion of the place, which consists chiefly of more modern and better erections. New buildings, with neat exteriors, flower-gardens, orchards, and plantations are fast spreading over the rising grounds about the town; and on the opposite side of the Derwent is Bridge Hill, the seat of G. B. Strutt, Esq. Gritstone, which the neighbourhood furnishes of excellent quality, is much used in building. The antient chapel, dedicated to St. John, being too small for the increased population of the place, a new church has been erected at an expense of nearly 12,000*l*., defrayed partly by subscription and partly by a grant from the commissioners for building new churches. It stands on a bold elevation above the town, and from its situation and architecture, which is of the florid English style, is a great ornament to the place. It will accommodate 1500 persons, besides 300 children; and two-thirds of the sittings are free. The antient chapel is still used for evening lectures and for a school-room. There are places of worship for Unitarians (built in 1782, chiefly at the expense of Messrs. Strutt), Independents, General and Particular Baptists, and Wesleyan and Primitive Methodists. There is a stone bridge of three arches over the Derwent. The population of the chapelry of Belper in 1831 was 7890; half the males above twenty years of age are employed in manufactures. The chief establishments are those of Messrs. Strutt, who have four cotton-mills; and of Messrs. Ward, Brettle, and Ward, the most extensive hosiery manufacturers in the kingdom: they make both silk and cotton hose. The manufacture of nails, though thought to be declining, is still considerable. Seams of coal are worked with advantage about a mile from Belper. The market is on Saturday. Coaches to or from London and Manchester, Birmingham and Sheffield, Nottingham and Manchester, pass through the town daily. Many of the tradesmen hold some land, and many persons, whose principal occupation is in trade or manufacture, are also partially occupied in agriculture.

The living of Belper is a perpetual curacy in the gift of the vicar of Duffield; the yearly value is 158*l*., with a glebe-house. The state of education, according to the parliamentary return of 1833, was as follows:—1 infant school, 50 boys, 30 girls; 21 day-schools, 356 boys, 288 girls, all instructed at the cost of the parents; 7 Sunday-schools, 935 boys, 1027 girls: three of the Sunday-schools have lending libraries attached, and one of them (of above 600 children) is taught on the Lancasterian system. There are two neat almshouses for aged people, with a small endowment.

Crich is a market-town and parish, chiefly in the hundred of Morleston and Litchurch, but extending into the hundred of Scarsdale and the wapentake of Wirksworth. It is between the rivers Amber and Derwent, on the road from Alfreton to Wirksworth, five miles west of Alfreton and five east of Wirksworth, and about twelve miles north from Derby. The town is built on a considerable limestone hill that overlooks all the eminences round it. The church forms a very conspicuous object: it has a very tall spire. On a cliff near the village is a circular tower of modern erection, from which an extensive and beautiful prospect is obtained. The parish of Crich is divided into three parts: Crich township, 3770 acres, 2115 inhabitants, Litchurch and Morleston hundred; Wessington township, 1260 acres, 465 inhabitants, Scarsdale hundred; Tansley hamlet, 1150 acres, 507 inhabitants, Wirksworth wapentake. Total, 6180 acres, 3087 inhabitants. The inhabitants of the township of Crich, which includes several villages round the town, are chiefly engaged in working the lead-mines round, in getting limestone, which is excellent both for agriculture and building, and burning it to lime, in the manufacture of stockings, and in agriculture. There was antiently a market at Crich; but it had been discontinued. In the middle of the last century an attempt was made to revive it, but the attempt failed; in 1810 it was re-opened, and is still held. It is on Thursday, but is not much resorted to. There are two fairs in the year for cattle, pedlars' wares, &c.

The living of Crich is a vicarage, of the annual value of 98*l*., with a glebe-house, in the gift of Sir Willoughby Dixie. There are places of worship in the parish for Wesleyan and Primitive Methodists and General Baptists.

Crich township contained in 1833 10 day-schools, in which were 115 boys and 112 girls; and 3 Sunday-schools, with 157 boys and 140 girls. In the other divisions of the parish were 1 day-school, with 36 boys in it, and 2 Sunday-schools, containing 137 boys and 92 girls.

Cromford is a market-town, township, and chapelry in the parish and hundred of Wirksworth, chiefly on the north bank of the Derwent. It is in a deep valley, enclosed on the north, south, and west by lofty limestone rocks. Cromford, like Belper, owes its prosperity to the cotton manufacture. The late Sir Richard Arkwright erected here a spacious cotton-mill on the north side of the Derwent; it is now occupied by Messrs. R. and P. Arkwright, who employ in these mills and those at Masson, a little higher up the Derwent, 800 persons. The houses and mills are chiefly built of gritstone. The church is a plain building, begun by the late Sir R. Arkwright and finished by his son; there was a more antient chapel, but it has been demolished many years.

The population of Cromford, in 1831, was 1291. Lead-mines are worked in the neighbourhood; lapis calaminaris is ground and prepared, and red lead manufactured. The Cromford canal terminates here; and the Cromford and High Peak railway joins the canal a short distance south of the town. The land in the township chiefly belongs to R. Arkwright, Esq.; every man employed at the mills capable of purchasing a cow has a piece of land sufficient to maintain it allotted to him. The market is on Saturday, and there are two fairs in the year. The education returns for 1833 give 1 infant school, 10 boys, 12 girls: 2 day-schools, 34 boys, 8 girls: all these are taught at the expense of their parents; 2 day and Sunday-schools, partly supported by P. Arkwright, Esq., 110 boys, 82 girls, who attend daily; 50 boys, 70 girls, who attend on Sundays.

Mr. Arkwright was building in 1833 two new school-rooms. There is a Methodist chapel. There are almshouses for six poor widows.

The living of Cromford is a perpetual curacy, of the annual value of 96*l.*, in the gift of R. Arkwright, Esq.

Dronfield is a market-town in the hundred of Scarsdale, on the road between Chesterfield and Sheffield, about 5¼ miles from the former and 6½ from the latter, and 30 miles from Derby. The parish is extensive, containing 15,580 acres, or more than 24 square miles. It contains, beside Dronfield town (population in 1831, 1653), the townships of Little Barlow (pop. 58), Coal Aston (pop. 300), and Unstone (pop. 586); the chapelries of Holmsfield (pop. 499), and Dore (pop. 527), and the hamlet of Totley (pop. 351); the population of the whole parish was 3974. The parish church is beautifully situated on a hill on one side of the town. It has a fine tower and spire, chiefly in the decorated English style. The chancel has been very fine; it contains three rich stone stalls, the foliage of which is very beautiful; but the large east window has been deprived of its tracery. There are meeting-houses for Quakers, Wesleyans, and Independents.

There are some manufactures carried on at Dronfield, chiefly of iron goods, as cast iron chains and nails, axes, chisels, and other edge tools, common cutlery, and agricultural implements. The market, which Farey states to be much declined and which other authorities state to be discontinued, is on Thursday. There were in 1833 a well-endowed free-school for 60 boys and 20 girls; 3 boarding schools (1 was for day-scholars also), with nearly 100 children; 6 day-schools, with nearly 200 children; 2 Sunday-schools, with 105 boys and 110 girls. The living is a vicarage, in the gift of the Lord Chancellor; yearly value 224*l.*, with a glebe-house.

The dependent districts of the parish have some manufactures similar to those of the town itself. They contained in 1833 6 day-schools, with 203 children: some of these schools have small endowments; 1 day and Sunday-school, with 60 day and 70 Sunday scholars, partly supported by an endowment; and 5 Sunday-schools, with 253 children. *Education Returns for* 1833.) Dore (which appears to include Totley) is a perpetual curacy of the yearly value of 90*l.*, in the gift of Earl Fitzwilliam; Holmsfield is also a perpetual curacy of the yearly value of 97*l.*, with a glebe-house. Beauchief Abbey will be noticed presently.

Heanor is a market-town or village in the hundred of Morleston and Litchurch, on the road from Derby to Mansfield (Notts.), about nine miles from Derby. The parish is extensive, containing 6870 acres (or nearly 11 square miles), and a population (in 1831) of 5380 inhabitants, thus distributed:—Heanor township, 2672; Codnor and Loscow township, 1439; Shipley township, 632; and Codnor Castle and Park Liberty (extra-parochial), 637. Heanor is well situated for trade, the Erewash canal passing through the parish, and the neighbouring district having many coal-pits. There are manufactories for cotton goods, hosiery, and bobbin-net lace. The market, according to Messrs. Lysons, is on Wednesday; it is very small, and some authorities state that it has been discontinued. The living is a vicarage, of the yearly value of 109*l.*, in the gift of the Lord Chancellor. The education returns for 1833 comprehended 12 day-schools, with 234 children, and 5 Sunday-schools, with 824 children. There are Independent, Particular Baptist, and Wesleyan Methodist meeting-houses in the parish.

Ilkeston is in the hundred of Morleston and Litchurch, nine miles from Derby, on one of the roads to Nottingham, in the valley of the Erewash. The parish contains 2290 acres, and a population of 4446, a considerable portion of whom are engaged in manufactures or in the coal-pits in the neighbourhood. The church has a stone screen in the early English style of architecture, and three stalls in the chancel. The principal manufactures are of stockings and lace. A warm mineral spring, the properties of which are said to differ from those of all others in the kingdom, and to resemble those of the Seltzer water, has been lately discovered, and is coming rapidly into repute. The water, taken internally, and the baths, have been found efficacious in many complaints. The Erewash and the Nutbrook canals both pass through the parish. The market is held occasionally on Thursdays for fruit and vegetables. The living is a vicarage, of the annual value of 150*l.*, with a glebe-house, in the gift of the duke of Rutland. The education returns for 1833 gave 17 day-schools (1 with a small endowment), containing 215 boys and 144 girls; and 7 Sunday-schools, with 427 boys and 414 girls, one of which has a lending library attached.

Matlock is in the wapentake of Wirksworth, on the banks of the river Derwent, 18 miles from Derby. The parish of Matlock contains 3960 acres, or more than 6 square miles. The five principal villages in it are Matlock, Matlock Baths, Matlock Bank, Harston or Hearthstone, and Ryber. The village of Matlock is antient, and chiefly inhabited by the persons employed in the neighbouring lead-mines and in the cotton manufacture. Matlock bath is nearly a mile and a half distant from the village, nearer to Derby, and is much resorted to by visiters, as much for the beauty of the situation as for the baths. There are three inns or hotels, several lodging houses, and a museum, containing an excellent and tastefully-arranged collection of minerals, shells, and birds, and some articles of sculpture. There is a bridge over the Derwent at Matlock village. The church is a small edifice in the later English style of Gothic architecture. There are several Dissenting meeting-houses in the parish. The population of Matlock, in 1831, was 3262. The living is a rectory, of the annual value of 320*l.*, with a glebe-house, in the gift of the dear of Lincoln. The market formerly held at Matlock has been discontinued, but the place is well supplied with provisions. The education returns for 1833 comprehended 11 day-schools, 1 of them supported by endowment, and containing 30 boys, the other 10 containing 127 boys and 92 girls; 2 boarding-schools, with 12 boys and 24 girls; and 4 Sunday-schools, with 214 boys and 233 girls.

Matlock village and bath are in a dale which extends for two miles north and south, bounded on each side by steep rocks, whose naked sides rise to the height of nearly 300 feet; the summits are sometimes bare, sometimes covered with wood. Through this dale the Derwent flows, and its banks are lined with trees, except where the rocks approach, and rise almost perpendicularly from the water. Not far from Matlock is Willersley Castle, built by Sir R. Arkwright, and occupied by his descendants. The Matlock waters were brought into notice about 1698, when a bath was paved and built; but the place for a long time presented few conveniences. At later periods other springs were discovered, and new baths formed. The waters have a temperature of about 66° or 68° of Fahrenheit. They are considered to resemble the Bristol waters, and are recommended in bilious disorders, in phthisis, diabetes, and other complaints.

Tideswell is a market-town and parish in the High Peak hundred, about half a mile out of the road from Derby to Manchester by Chapel-en-le-Frith, nearly 35 miles from Derby. It is a small town situated in a bottom amid bleak naked hills: immediately round the town are some well-grown trees. The houses are low, irregularly situated, and ill built, and the general appearance of the place indicates the absence of wealth, comfort, and cleanliness. A rivulet of clear water runs through the town; the ebbing well, which is supposed to have given name to the town, has ceased to flow. The church is a fine building in the form of a cross, built about the middle of the fourteenth century, and principally in the decorated English style. The chancel is lighted by nine richly ornamented Gothic windows, and contains the monument of Robert Pursglove, suffragan bishop of Hull in the reign of Mary, and founder of a free-school and almshouses for twelve poor people at Tideswell. The tower of the church is at the west end: it is embattled, and has eight pinnacles. There was formerly a chapel of higher antiquity than the church, but the ruins were demolished some time since. There is a market on Wednesday. That part of the parish which contains the town had in 1831 a population of 1553, many of them are engaged in spinning and weaving cotton: previous to the introduction of the cotton manufacture, mining was the predominant occupation. The hamlets of Litton and Wheston, and the chapelry of Wormhill, which are comprehended in Tideswell parish, had in 1831 a population of 866, 75, and 313, respectively, making the aggregate population of the parish 2807. The living of Tideswell is a vicarage, in the peculiar jurisdiction of the dean and chapter of Litchfield, in whose gift it is: the annual value is 109*l.*, with a glebe-house the perpetual curacy of Wormhill is of the annual value of 970*l.*, with a glebe-house, and is in the gift of trustees.

In 1833, beside the free-school (which contained 71 boys), there were four day-schools, containing about 60 boys and 100 girls; and two Sunday-schools, one supported by the church people, containing 45 to 50 boys; the other by the Methodists, containing 75 boys and 85 girls. In Wheston, Wormhill, and Litton, were four day-schools (one having a very small endowment), containing 70 to 80 children; and two Sunday-schools, containing about 100 children.

Winster is a market-town and chapelry in the parish of Youlgrave, in the hundred of High Peak. It lies between two roads which lead from Derby to Manchester, one by Wirksworth, the other by Ashbourne: by the former it is 24 miles from Derby, by the latter more than 25. This little town runs along the side of a steep eminence. The houses are built of limestone, and are partly thatched and partly covered with stone: they are intermingled with orchards and gardens. The church is small; it has preserved some features of Norman architecture, but it has been much altered. The market is on Saturday. The population of the chapelry in 1831 was 951: that of the whole parish (which is large, and extends into Wirksworth hundred) was 3681: the inhabitants are chiefly engaged in mining. The living of Youlgrave is a vicarage, in the gift of the duke of Devonshire, of the annual value of 214*l.*, with a glebe-house: the perpetual curacy of Winster is worth 104*l.* a year, and is in the gift of the freeholders. The chapelry contained in 1833 one infant school (with above 40 children); three day-schools (one partially endowed), with more than 120 children, and two Sunday-schools, containing 120 boys and 160 girls. There is a Wesleyan Methodist chapel. In the whole parish there were (beside the above) 9 day-schools (some of them partly supported by donation or endowment), with 233 children, and 7 Sunday-schools, with 524 children.

There are several barrows on the commons in the neighbourhood of Winster; in one which was opened in 1768 several antiquities were found.

Divisions for Ecclesiastical and Legal Purposes.—Derbyshire is in the diocese of Litchfield and Coventry: it constitutes the archdeaconry of Derby, which is subdivided into the six rural deaneries of Ashbourne, Castillar, Chesterfield, Derby, High Peak, and Repington, or Repton. The deanery of High Peak has by some been called the archdeaconry of Derby, as though this were an ecclesiastical subdivision of the county. The number of parishes was given by Camden from Wolsey's list at 106; but later authorities make them more numerous; Pilkington states them at 116, their dependent chapelries at 69, and the extra-parochial chapels at 2: Messrs. Lysons state the parishes at 117; with 67 chapels, in 52 of which (49 parochial, 3 extra-parochial) the rites of marriage and sepulture are performed; many of these are frequently described as parish churches. The population returns contain a list of 140 parishes (beside 4 which are chiefly in other counties), 3 extra-parochial chapelries, and 46 dependent chapelries. The difference between these numbers and those given by Messrs. Lysons, may be partly accounted for by supposing several of the dependent chapelries to be entered as distinct parishes. Of the 117 parishes given by Messrs. Lysons, 50 are rectories, 58 vicarages, and 9 donatives, or perpetual curacies. Some of the Derbyshire parishes are very large, especially those in the High Peak hundred. Glossop parish contains 49,960 acres, or more than 79 square miles; Bakewell, 43,020, or above 67 square miles; Hope, 36,160, or above 56 square miles; and Hartington (in Wirksworth hundred), 24,160, or above 37 square miles: 9 other parishes in the county have from 10,000 to 20,000 acres, or from 15 to 30 square miles.

Derbyshire is in the midland circuit: the assizes and the quarter-sessions are held at Derby, except the Easter sessions, which are held at Chesterfield. Until the year 1569 this county and Nottinghamshire formed but one shrievalty. Until the reign of Henry III. the assizes for both counties were held at Nottingham: afterwards, until Derby was made a distinct shrievalty, they were held alternately at Nottingham and Derby.

Beside the ordinary county jurisdiction, Derby has some legal peculiarities, the relics of the institutions of former times. The hundred of Appletree and the honour of Tutbury form parts of the duchy of Lancaster. The courts of pleas of the duchy, commonly called the three weeks' courts, are held at Sudbury for the hundred of Appletree, and at Tutbury (which is in Staffordshire) for the honour of Tutbury. The jurisdiction of these courts extends to most places in the county: in them all debts and damages under forty shillings are recoverable. The Peveril court has likewise a very extensive jurisdiction; actions are brought in it for the recovery of small debts, and the proceedings are more expeditious and less expensive than in the courts at Westminster. This court is held at Basford, near Nottingham.

Derbyshire has some peculiar laws and regulations connected with the working of the lead-mines. These laws and regulations are of very high antiquity. The principal part of the county where lead ore is found in any considerable quantity is called 'the King's Field,' and comprehends nearly all the wapentake of Wirksworth and a considerable part of the High Peak hundred. 'The King's Field' has been from time immemorial let on lease. The lessees (of whom, when Pilkington wrote his account of Derbyshire, A. D. 1789, there were two) have each in his respective district a steward and barmasters. The steward presides as judge in the barmote courts, and, with twenty-four jurymen, chosen every half-year, determines all disputes which arise respecting the working of the mines. Debts incurred in working the mines are cognizable in these courts. These courts meet twice a year, or oftener if need be. The court for the High Peak district meets at Monyash, that for the wapentake district at the town of Wirksworth.

The office of the barmaster is principally to put miners into the possession of veins that they have discovered, and to collect the proportion of ore to which the lessee of the crown or the lord of the manor has a claim. When a miner has discovered a new vein of ore in 'the King's Field,' he may acquire a title to the exclusive possession of it, provided it be not in a garden, orchard, or high road, by a proper application to the barmaster of the liberty. Should the miner neglect to work the vein, the barmaster may, after a certain time, dispose of it to any one who is willing to try it.

There are four members of parliament returned for the county (two for the northern and two for the southern division), and two for the borough of Derby. The northern division of the county includes the hundreds of High Peak and Scarsdale, and part of the wapentake of Wirksworth: the principal place of election is Bakewell, and the polling stations are Bakewell, Chesterfield, and Chapel-en-le-Frith. The southern division includes the hundreds of Appletree, Morleston and Litchurch, and Repton and Gresley, and part of the wapentake of Wirksworth: the principal place of election is Derby, and the polling stations are Derby, Ashbourne, Wirksworth, Melbourne, and Belper.

History and Antiquities.—Before the Roman conquest Derbyshire appears to have been included in the territory of the Coritani, who, with the Cornavii, occupied the whole of the midland district from the Lincolnshire coast to the upper part of the Severn and the Dee. Upon the conquest of South Britain by the Romans, and its division into provinces, Derbyshire was included in the province of Flavia Cæsariensis, not (as Pilkington, and after him, Messrs. Lysons state) of Britannia Prima.

The barren moors of this county abound in masses of gritstone, and single stones of vast size appearing above the surface: many tors (as Mock Beggar Hall, on Stanton moor, between Winster and Bakewell, Robin Hood's Mark, on Ashover common, &c.) and rocking stones have been found, and many rock basins; but all these, to which it was once common to ascribe a druidical origin, seem referable, like the granite tors of Cornwall and Devonshire [CORNWALL], rather to natural causes. There are however circles of stones some upright stones, and tumuli or barrows of earth and stones, (called in Derbyshire, 'lows'), and some rude military works which appear to be memorials of the early inhabitants. The most remarkable of these monuments is the stone circle of Arbelows, or Arbor-low, two or three miles north-west of the town of Winster. An elliptical area of fifty-two yards by forty-six (having the greater diameter in a direction north and south), is enclosed by a ditch six yards broad, and an outer bank formed of the soil thrown out from the ditch, five yards high on the inside. In the inclosure there are openings or entrances on the north and south sides about fourteen yards wide, and adjacent to the southern entrance is a small mound or barrow. About thirty rough unhewn stones about five feet long by three broad, and one foot thick, lie round the inclosure, having their smaller ends pointing towards the centre: there reason to think these once stood obliquely on one end. About fourteen smaller stones are intermingled with these in an irregular manner, and there are three stones lying near the centre, one of which is larger than any other within the area. (Pilkington's *Derbyshire.*)

The antient British road, the Rykneld Street, and the Roman road, which usually coincided with it, cross this county in its whole extent from south-west to north-east, from the borders of Staffordshire to those of Yorkshire. The Rykneld Street enters Derbyshire where Monk's-bridge, over the Dove, now stands, and runs north-east in the direction of Little Chester, supposed to be the Roman station Derventio: the Rykneld Street is supposed to have passed the Derwent by a ford, perhaps at the town of Derby, the Roman road by a bridge a little higher up the river. [Derby.] The two roads meet again near Derventio, and they may be traced in a direction nearly N.N.E. towards Chesterfield.

Chesterfield has been supposed to be a Roman station, the Lutudarum of Ravennas; and the first part of the name of the town (Chester—which, with its kindred forms, cester and caster, usually indicates the site of a Roman station) and the discovery of Roman coins there give probability to the supposition. The name of Lutudarum in an abridged form (LVT and LVTVD) is stamped on three Roman pigs of lead (now in the British Museum) which have been found at different times near Matlock. (*Library of Entertaining Knowledge; Townley Gallery*, vol. ii., p. 288.)

A second Roman road has been traced from Brough in Hope Dale to Buxton, both of which are ascertained to have been Roman stations. At Brough three sides of the station, which was an oblong 310 feet by 270, are still perfect; and the foundations of a temple and another large building, with other antiquities, have been discovered. At Buxton several Roman baths have been discovered, and three of their roads at least, the one mentioned above, one from Derventio, and a third from Mancunium (Manchester), meet here,—a sufficient indication of the site of a station. It is conjectured that it was the Aquæ mentioned by Ravennas. Another Roman road, locally designated Long Lane, runs through the county from the river Dove at or near Rocester, which from its name was probably a station, to Derventio, and appears to have continued in the same line from thence into Nottinghamshire. Another Roman road, locally designated the Doctor's Gate, runs from the station of Melandra Castle, in Glossop parish, on the border of Cheshire, to Brough. There are some traces of other roads.

Derventio, now Little Chester [Derby], appears to have been the most considerable Roman station in the county. The stations at Buxton, Brough in Hope Dale, and Melandra Castle in Glossop, have been mentioned. The last is on a moderate elevation at the meeting of two mountain streams: it is nearly square, 366 feet by 336; the ramparts and part of the ditch still remain, and the gates and the site of the Prætorium may be discovered: there are the foundations of many buildings on the side sloping to the water. It has been conjectured, but on uncertain grounds, hat there were Roman stations at Parwich, between Buxton and Ashbourne, and at Pentrich, on the Rykneld Street, between Derventio and the modern Chesterfield: there are camps of the Roman form at both these places. The wo camps, one on a hill above Castleton, and the other at Combe Moss, four miles from Buxton, may perhaps have been Roman summer camps.

Of Roman antiquities the most remarkable are an altar preserved at Haddon Hall, a silver plate found in Risley park, and the pigs of lead found near Matlock. These last are sufficient proofs of the Romans having wrought the ead mines of Derbyshire; and the number of their roads and stations indicates the importance they attached to the district. It is considered by some (Glover, *Hist. of Derbyhire*) that the working of the mines was anterior to the Roman conquest.

In the Saxon division of England, Derbyshire was comrehended in the kingdom of Mercia; and Repandun, or Repton, on the south bank of the Trent, was one of the oyal residences. In the great invasion of England by the Danes in the time of Ethelred I. and Alfred [Alfred], Derbyshire was overrun by them, and in the wars which Alfred and his successors maintained against them this ounty was frequently the scene of contest. The town of Derby was repeatedly taken and retaken. [Derby.] At the Norman conquest considerable grants of land within the ounty were made to Henry de Ferrers, whose son Robert was the first earl Ferrers. Another Robert, son of the first earl Ferrers, was created earl of Derby in 1138. William Peverel, a natural son of the Conqueror, received also considerable grants. He built the castle of the Peak; and he, or his son, is supposed to have built the original Bolsover Castle. [Bolsover.] The Peak castle is now an 'ill-shapen ruin,' situated on the verge of the rocky precipice that forms the roof of the Peak cavern at Castleton. It was small, but, from its situation, very strong. In the civil war in the reign of Henry II., Robert, earl Ferrers and Derby, who had supported prince Henry in his rebellion against his father, surrendered his castles of Duffield in Derbyshire and Tutbury in Staffordshire to the king. He was afterwards deprived of the earldom of Derby by Richard I., who bestowed it on his own brother John. In the civil war in the time of John, William earl Ferrers, who had obtained a new grant of the earldom of Derby, and who was one of the king's party, took the castles of the Peak and Bolsover, which had by this time passed out of the hands of the Peverel family, and were held by some of the party of the insurgent barons. In the reign of Henry III. the earl of Ferrers and Derby was one of the most active of the insurgent barons; but having been worsted and taken prisoner by Henry, the king's nephew, at the battle of Chesterfield, he was deprived of the earldom of Derby, with the vast possessions attached to it. These were afterwards given to Edmund, earl of Lancaster, son of Henry III., and thus eventually formed part of the domains of the duchy of Lancaster. No public events of interest are connected with Derbyshire until after the Reformation. The earldom of Derby, in connection with that of Lancaster, descended from prince Edmund to his son Thomas, who headed an insurrection of the barons against Piers Gavestone and Hugh de Spencer, the successive minions of Edward II.: the failure of this last enterprise led to the death of the earl, who was defeated and taken at Boroughbridge, and beheaded in Pontefract Castle in 1322. He was succeeded in his titles and possessions by his brother Henry, who supported queen Isabella and the earl of March (Roger Mortimer) in their successful attempt to dethrone Edward II. The earl was appointed head of the council of twelve bishops and peers, to whom the government was ostensibly intrusted. He died in 1344, and was succeeded in the earldoms of Lancaster and Derby by his son Henry, who had, with the title though not the possessions of earl of Derby, commanded the English forces in Guienne with signal success. This Henry died without male issue; his daughter Blanch married John of Gaunt, or Ghent, son of Edward III., who thus became earl of Lancaster and Derby, and transmitted these titles to his son, afterwards Henry IV. The earldom of Derby was conferred by Henry VII. upon his supporter, lord Stanley, in whose family it has ever since continued.

Derbyshire contains various relics of the middle ages, baronial, ecclesiastical, and monastic. Besides the Peak Castle, there are some remains of Codnor Castle, near Heanor, the antient residence of the Greys of Codnor· these remains are partly converted into a farm-house. Haddon Hall, the seat of the duke of Rutland, is on the north-east or left bank of the Wye, below Bakewell: it consists of two courts of irregular form, approaching to squares, surrounded by suites of apartments, and was evidently designed to have a domestic, not a military character. The chapel and the hall, the most antient parts, were erected in the earlier part of the fifteenth century, and no part of the edifice appears to be of later date than the reign of Henry VIII., except some of the interior fittings, which may be of the time of Elizabeth. The situation is beautiful, and the variety of the outline and the fine trees round the hall render it a very picturesque object. Hardwick Hall is a curious specimen of the style of domestic architecture in Elizabeth's reign, and has remained unaltered since the time of its erection; it is between Chesterfield and Mansfield, and belongs to the duke of Devonshire. Some of the furniture is perhaps older than the house itself, and was removed from the old hall, now in ruins, near the present mansion. There is at Hardwick some embroidery done by Mary, queen of Scots, who was imprisoned here and at Chatsworth and South Winfield for some time. South Winfield manor-house, near Alfreton, was built in the reign of Henry VI., and ruined in the civil wars of Charles I.: the remains present some beautiful features.

The churches of Derbyshire contain some very antient portions. Repton church has under the chancel a very curious Norman or rather Saxon crypt, which there is reason to suppose was a part of the conventual church destroyed here by the Danes, A.D. 874. The rest of the church is of a later period; the architecture is varied, partly Norman, partly early English, and partly decorated English: the tower and spire, which are very lofty and of fine outline, are in the perpendicular English style. Melbourne church, near the border of Leicestershire, is a fine example of early Norman architecture, and is nearly in its original state. It has been conjectured, but without sufficient reason, to be as antient as the seventh century. The desecrated chapel at Streetly is a Norman edifice, perfect, with the exception of the windows, which have been enlarged, and the roof: the ornaments are elaborate and well executed. The remains of early Gothic architecture in Derbyshire are few and by no means remarkable, except All Saints church at Derby [DERBY], and perhaps Ashbourne, Bakewell, Chesterfield, and Dronfield churches, the last of which has been noticed above. [ASHBOURNE, BAKEWELL, CHESTERFIELD.]

The monastic establishments of Derbyshire were neither large nor wealthy; there are very few remains of them. Some remains of Repton priory may be seen in the school at Repton and in the master's house. Repton has been noticed as a residence of the kings of Mercia. The priory was the place of sepulture for several of that royal race. After the old Saxon priory was destroyed by the Danes (see above), a monastery of Black (or Augustinian) canons was founded here by Maud, widow of Ranulph, second earl of Chester. Its yearly revenue at the dissolution was 167*l.* 18*s.* 2*d.* gross, or 118*l.* 8*s.* 6*d.* clear. There are at Yeaveley, four miles south of Ashbourne, some ruins of a chapel, formerly a preceptory of the order of St. John of Jerusalem. Of Dale Abbey, 6½ miles east of Derby, founded in 1204, for Premonstratensian Canons (clear yearly revenue, at the dissolution, 144*l.* 12*s.*), there are no remains, except the arch of the east window of the church. Beauchief Abbey, Norton, near Sheffield, is just within the boundary of Derbyshire: it was founded in 1183, for Premonstratensian or White Canons, by Robert Fitz Ranulph, lord of Alfreton, said to have been one of the murderers of Thomas à Becket, in expiation of whose murder the abbey was built, and to whom, when canonized, it was dedicated. Its yearly revenues, at the dissolution, were 157*l.* 10*s.* 2*d.* gross, or 126*l.* 3*s.* 4*d.* clear. The only part of the abbey now remaining is the west end of the conventual church, which is used as the chapel of the extra-parochial district of Beauchief. The architecture is plain, but the situation amidst woods and hills delightful. Dr. Pegge denies that Beauchief Abbey was erected in expiation of Becket's death, or that Fitz Ranulph had any connection with that deed.

The principal historical events connected with Derbyshire, since the Reformation, occurred during the civil war of Charles I. The county at first declared for the king, who, after setting up his standard at Nottingham, marched to Derby; but it was soon brought over to the side of the parliament by the activity and influence of Sir John Gell, who, marching from Hull into Derbyshire (October, 1642), with a regiment of foot, only 140 men, raised 200 men at Chesterfield, and, proceeding to Derby, garrisoned that town. South Winfield manor-house was also garrisoned for the parliament. In November, 1642, Sir John drove Sir Francis Wortley and the king's forces from Wirksworth and the Peak, took Bretby House, south of the Trent, which had been fortified by the earl of Chesterfield, and defeated the royalists at Swarkestone bridge on the Trent. Next year (A.D. 1643) he took Bolsover Castle, which the earl of Newcastle had fortified for the king; and his brother, Colonel Gell, took Sutton House, near Chesterfield, which had been also garrisoned for the king by lord Deincourt. The earl of Newcastle is said, however, to have gained a victory over the parliamentarians near Chesterfield; he afterwards took South Winfield manor-house; and the royalists possessed themselves of the northern parts of the county. In March, 1644, there was an engagement on Egginton Heath, near the junction of the Dove with the Trent, in which the victory was doubtful. In the summer of the same year, Sir John Gell took South Winfield manor-house, and defeated the forces sent to relieve it; and General Crawford, another parliamentary commander, took Bolsover Castle and Stavely House. The king, after the battle of Naseby (A.D. 1645), retreated through Derbyshire into Yorkshire, gaining some advantages over Sir John Gell by the way. The subsequent events of the war were unimportant.

The advance of the young pretender to Derby in 1745 has been noticed in the account of the town of Derby. [DERBY.]

STATISTICS.—*Population.* Derbyshire is both an agricultural and manufacturing county; it ranked the twenty-ninth on the list of agricultural counties in 1811, but in 1831 it was the thirty-second, its manufacturing class having increased in a greater proportion than the agricultural class. Of 58,178 males twenty years of age and upwards, inhabitants of Derbyshire in 1831, 18,170 were engaged in agricultural pursuits, 10,593 of whom were labourers; and 8863 were employed in manufactures, or in making manufacturing machinery; there were likewise 10,897 labourers not employed as agriculturists. Of those employed in manufactures, about 1700 were engaged in the cotton-yarn and in the silk manufactures; 1400 in frame-work and twist; 1200 in cotton and silk hosiery: calico and ginghams, 600; lace and twist net, 450; tape, 60; paper, 40; and about 1400 not accurately classed, engaged in some of the above manufactures and in the preparation of dye colours, &c.; of these about 900 were employed in the town of Derby.

The following summary of the population taken at the enumeration of 1831, exhibits the number of inhabitants, &c., in each hundred of the county.

HUNDREDS, &c.	HOUSES.				OCCUPATIONS.			PERSONS.			
	Inhabited.	Families.	Building.	Uninhabited.	Families chiefly employed in agriculture.	Families chiefly employed in trade, manufactures, and handicraft.	All other families not comprised in the two preceding classes.	Males.	Females.	Total of Persons.	Males twenty years of age.
Appletree . .	6,143	6,542	23	180	2,778	2,689	1,075	16,212	16,271	32,483	7,9
High Peak . .	8,911	9,335	115	565	2,619	4,246	2,470	23,654	23,831	47,485	11,8
Morleston and Litchurch . .	7,322	7,754	36	184	2,036	3,154	2,564	18,877	19,275	38,152	9,1
Repton and Gresley	3,664	3,826	26	69	1,728	1,384	714	9,259	9,295	18,554	4,5
Scarsdale . . .	10,552	11,008	91	384	2,841	3,762	4,405	27,072	26,510	53,582	13,3
Wirksworth . .	4,664	4,784	22	275	1,267	1,873	1,644	11,397	11,890	23,287	5,6
Derby (borough) .	4,842	5,071	44	332	55	3,680	1,336	11,269	12,358	23,627	5,
Totals . . .	46,098	48,320	357	1989	13,324	20,788	14,208	117,740	119,430	237,170	58,

The population of Derbyshire at each of the four periods of—

	Males.	Females.	Total.	Incr. per cent.
1801 was	79,401	81,741	161,142	
1811 „	91,494	93,993	185,487	15.10
1821 „	105,873	107,460	213,333	15.01
1831 „	117,740	119,430	237,170	11.22

Showing an increase between the first and last periods 76,028, or not quite 47½ per cent., which is about 10 per cent. below the general rate of increase throughout England.

County Expenses, Crime, &c.—The sums expended in the relief of the poor at the four dates of—

			for each inhabitant.
1801	were £54,459,	which was 6s. 9d.	
1811	„ 93,963	„ „ 10s. 1d.	
1821	„ 86,756	„ „ 8s. 1d.	
1831	„ 78,717	, „ 6s. 7d.	

The sum expended for the same purpose in the year ending 25th March, 1836, was 55,018*l.* 1*s.*, and assuming that the population had increased at the same rate of percentage since 1831, as in the ten years preceding that period, the above sum gives an average of 4*s.* 5*d.* for each inhabitant. All these averages are below those for the whole of England and Wales.

The sum raised in Derbyshire for poor's-rates, county-rate, and other local purposes, in the year ending 25th March, 1833, was 108,074*l.* 6*s.*, and was levied upon various descriptions of property as follows:—

	£	s.
On land	81,846	0
„ dwelling-houses	20,340	6
„ mills, factories, &c.	3,358	3
„ manorial profits, navigation, &c.	2,529	17
	£108,074	6

The amount expended was:—

For the relief of the poor	76,685	18
For suits of law, removal of paupers, &c.	4,211	11
For other purposes	30,226	2
	£111,123	12

In the returns made up for the subsequent years, the descriptions of property assessed for local purposes are not distinguished. In the years 1834, 1835, and 1836, 107,236*l.* 19*s.*, 93,392*l.* 19*s.*, and 80,578*l.* 17*s.*, were respectively raised, and the expenditure in the same years was as follow:—

	1834.		1835.		1836.	
For the relief of the poor	£72,720	13	£62,885	15	£55,018	1
In suits of law, removals, &c.	4,163	8	3,422	10	2,981	17
Payment for or towards the county-rate	31,232	12	12,652	9	11,368	3
For all other purposes			13,818	7	11,829	14
Total money expended	£108,116	13	92,779	1	81,197	15

The saving effected in the sums expended for the relief of the poor in 1836, as compared with the expenditure of 1834, is therefore about 24¼ per cent., and the saving effected upon the whole amount is rather more.

The number of turnpike trusts in Derbyshire is 40, as ascertained in 1834; the number of miles of road under their charge was 574; the annual income of that year, arising from the tolls and parish composition, was 38,920*l.* 10*s.* 2*d.*, and the annual expenditure 41,819*l.* 14*s.*

The county expenditure in 1834, exclusive of the relief for the poor, was 12,311*l.* 5*s.* 4*d.*, disbursed as follows:—

	£	s.	d.
Bridges, buildings, and repairs, &c.	778	10	0
Gaols, houses of correction, &c., and maintaining prisoners, &c.	1,781	5	11
Shire halls and courts of justice—building, repairing, &c.	271	16	7
Prosecutions	1,690	3	5
Clerk of the peace	1,020	3	2
Conveyance of prisoners before trial	322	8	7
„ of transports	145	16	8
Apprehending and conveying vagrants	48	14	3
Constables—high and special	393	15	6
Coroner	244	13	0
Payment of debt, principal and interest	4,941	15	0
Miscellaneous	672	3	3

The number of persons charged with criminal offences, in the three septennial periods ending with 1820, 1827, and 1834, were 670,736, and 1314 respectively; making an average of 96 annually in the first period, of 105 in the second period, and of 189 in the third period. The numbers of persons tried at quarter-sessions in each of the years 1831, 1832, and 1833, in respect of which any costs were paid out of the county-rates, were 96, 82, and 68 respectively. Among the persons charged with offences, there were—

	1831.	1832.	1833.
Committed for felonies	85	73	63
„ misdemeanors	11	9	5

The total number of committals in each of the same years was 123, 107, and 82 respectively: of whom

	1831.	1832.	1833.
The number convicted was	82	80	64
„ acquitted	40	24	17
Discharged by proclamation	1	3	1

In 1835, at the assizes and sessions, 175 persons were charged with crimes in Derbyshire. Of these, 14 were charged with offences against the person, 7 of which were for common assaults; 17 for offences against property, committed with violence; 132 offences against property, committed without violence; 3 for uttering counterfeit coin; 7 for poaching; and 2 for misdemeanors. Of the whole number committed, 125 were convicted and 50 acquitted, or no bill found against them. Of those convicted, 21 were transported for life, 2 for 14 years, and 23 for 7 years; 19 were imprisoned for 1 year or above 6 months, and 58 for 6 months and under; 1 was fined, and 1 was discharged on sureties. Of the offenders, 155 were males and 20 were females. Among the offenders 60 could read and write, 56 could read only, 58 could neither read nor write, and the instruction of 1 could not be ascertained. The proportion of the offenders to the population was 1 in 1355.

The number of persons qualified to vote for the county members of Derbyshire is 12,040, being 1 in 19 of the whole population, and rather more than 1 in 5 of the male population twenty years of age and upwards, as taken in 1831. The expenses of the last election of the county members to parliament were to the inhabitants of the county 282*l.* 8*s.* 8*d.*, and were paid out of the general county-rate.

There are six savings-banks in this county. The number of depositors and amount of deposits on the 20th of November, 1832, 1833, 1834, and 1835 respectively, were:—

	1832.	1833.	1834.	1835.
Number of depositors	4829	5086	5380	5710
Amount of deposits	£172,581	177,470	187,258	201,927

The various sums placed in the savings-banks in 1834 and 1835 were distributed as under:—

	1834.		1835.	
	Depositors.	Deposits.	Depositors.	Deposits.
Not exceeding £20	2462	£19,382	2568	£21,933
„ 50	1796	54,310	1905	58,174
„ 100	696	47,851	794	53,843
„ 150	232	28,153	248	30,076
„ 200	145	24,786	142	24,555
Above 200	49	12,771	53	13,346
	5380	187,253	5710	201,927

Education.—The following particulars are obtained from the parliamentary inquiry on education, made in the session of 1835:—

	Schools.	Scholars.	Total.
Infant Schools	46		
Number of infants at such schools; ages from 2 to 7 years:—			
Males		497	
Females		498	
Sex not specified		411	
			1,406
Daily Schools	730		
Number of children at such schools; ages from 4 to 14 years:—			
Males		10,989	
Females		8,723	
Sex not specified		3,390	
			23,102
Schools	776		
Total of children under daily instruction			24,508
Sunday Schools	420		
Number of children at such schools; ages from 4 to 15 and 16 years:—			
Males		16,764	
Females		17,005	
Sex not specified		5,415	
			39,184

Assuming that the population between 2 and 15 years has increased in the same uniform ratio from 1821 to 1834, as the whole population increased between 1821 and 1831, we find the approximate number living between those ages in Derbyshire, in 1834, was 81,982. A very large number of the children attend both daily and Sunday-schools; only 18 of the latter are in places where no other schools are kept; and 34 schools, in which there are 2058 children are both Sunday and daily schools. Duplicate entry is therefore known to have been created thus far, and probably in a much larger degree in other places; but this cannot be ascertained with exactness. In a few of the Sunday-schools there are some pupils receiving instruction who are beyond twenty years of age. Making allowance, therefore, for this uncertain data, we may conclude that perhaps not more than two-thirds of the population between 2 and 15 were receiving instruction at the period of the inquiry.

Maintenance of Schools.

Description of Schools.	By endowment.		By subscription.		By payments from scholars.		Subscrip. and payment from scholars.	
	Schls.	Scholars.	Schls.	Scholars.	Schls.	Scholars.	Schls.	Scholars.
Infant Schools			1	12	34	900	11	494
Daily Schools	120	3632	23	646	533	14,393	54	4431
Sunday Schools	6	306	385	36,870	3	72	26	1936
Total...	126	3938	409	37,528	570	15,365	91	6861

The schools established by Dissenters, included in the above statement, are :—

	Schools.	Scholars.
Infant Schools	3	48
Daily „	9	287
Sunday „	166	18,485

The schools established since 1818 are :—

Infant and other daily schools	332	10,600
Sunday Schools	293	28,496

Thirty boarding-schools are daily included in the number of daily schools given above.

No schools in the county appear to be confined to the children of parents of the Established Church, or of any other religious denomination, such exclusion being disclaimed in almost every instance, especially in schools established by Dissenters, with whom are here included Wesleyan Methodists, together with schools for children of Roman Catholic parents.

Lending libraries of books are attached to 90 schools in Derbyshire.

DEREHAM, EAST. [NORFOLK.]

DERG, LOUGH. [DONEGAL.]

DERHAM, the Rev. WILLIAM, D.D., an eminent English divine and philosopher, was born at Stowton, near Worcester, in November, 1657, and received his early education at Blockley in the same county. He was admitted of Trinity College, Oxford, in 1675. Having completed his academic studies, he was ordained, and in 1685 was instituted in the vicarage of Wargrave in Berkshire; and four years afterwards to the valuable rectory of Upminster in Essex, where he spent the remainder of his life. To this residence he was much attached; mainly because it gave him, by its contiguity to London, ample opportunities of associating with the scientific men of the metropolis. He was made canon of Windsor in 1716, and in 1730 he received from his university the diploma of D.D.

He devoted his attention, with great earnestness, to natural and experimental philosophy. He was enrolled a member of the Royal Society; and he contributed a considerable number of memoirs to its Transactions. These papers prove him to have been a man of indefatigable research and careful observation.

His first publication was the 'Artificial Clock-Maker,' which has gone through three or four editions, and is considered a useful manual even now. In 1711, 1712, and 1714, he preached those sermons at Boyle's Lecture which he afterwards expanded into the well-known works 'Physico-Theology' and 'Astro-Theology,' or a demonstration of the being and attributes of God from the works of creation and a survey of the heavens, enriched with valuable notes, and good engravings after drawings of his own. His next separate work was 'Christo-Theology,' or a demonstration of the divine authority of the Christian religion, being the substance of a sermon preached in the Abbey Church of Bath, in 1729. His last published work of his own was entitled 'A Defence of the Church's Right in Leasehold Estates,' written in answer to a work entitled 'An Inquiry into the Customary Estates and Tenant-rights of those who hold lands of the Church and other Foundations.' It was published in the name of Everard Fleetwood.

Dr. Derham also published some of the works of the naturalist Ray, of which he had procured the MSS., and to him the world is indebted for the publication of the philosophical experiments of Dr. Hook. He also gave new editions of other of Ray's works, with valuable additions, original, and from the author's manuscripts; besides editing other works of value, amongst which was the 'Miscellanea Curiosa,' in 3 vols. small 8vo., a work of value even at this time.

A considerable number of his papers were printed in the Philosophical Transactions, from the 20th to the 39th volume inclusive, the principal of which are—

1. Experiments on Pendulums in vacuo.
2. Of an Instrument for finding the Meridian.
3. Experiments and Observations on the motion of Sound.
4. On the Migration of Birds.
5. On the Spots on the Sun from 1703 to 1711.
6. Observations on the Northern Lights, Oct. 8, 1726, and Oct. 13, 1728.
7. Tables of the Eclipses of Jupiter's Satellites.
8. Difference of Time in the Meridian of different places.
9. On the Meteor called Ignis Fatuus.
10. The History of the Death-watch.
11. Meteorological Tables for several years.

Dr. Derham was of an ungainly appearance, small stature, and distorted form. He was not only the moral and religious benefactor of his parishioners, and of all those who came in his way, but he was likewise the physician of their bodies, and their pecuniary friend in all their difficulties. He lived beloved, and died lamented, at his rectory, in 1735, aged seventy-eight.

DERIVATION. The term *law of derivation* almost explains itself. Thus in finding the successive differential coefficients of a power of x, the law is,—to get the next differential coefficient, multiply the last by its exponent, and reduce the exponent by a unit. To treat of derivation in the most general sense would be to write a work on mathematical analysis, of which it may be said that most of its difficulties arise from want of sufficient knowledge of methods of derivation. But there is a more restricted use of the term, derived from the work of Arbogast [ARBOGAST], in which it applies to those laws of derivation which spring out of Taylor's Theorem. Hence the differential calculus, considered either in the manner of Lagrange, or in that of Arbogast, which is the treatment of a particular branch of the subject, is sometimes called the calculus of derivations. Lagrange himself calls the differential coefficient a derived function, the objection to which is the application of a generic term to one of its particular cases. For the successive logarithms, sines, &c., differences, integrals, &c., of a given function, are also functions derived from the original in different ways.

DERMATOBRANCHUS, a genus of Mollusks, established by M. Van-Hasselt and arranged by him among the *Nudibranchiata*. M. de Blainville thinks that its appropriate place is by the side of the *Scyllææ*. M. Rang in his manual, uncertain of its position, consigns it to the Genres non classés at the end of his book.

Generic character.—Animal depressed, semicircular, provided with a considerably large foot, and protected above by an enlarged mantle, rounded anteriorly, narrowed posteriorly, beset with elongated striæ or pustules, which are branchial. A pair of short, approximated, contractile tentacula situated between the head and the mantle. Eyes none? Three apertures on the right side of the body, the anterior opening near the head for the generative apparatus, the second for the vent, and the third for the urinary organ. *Locality*, Coast of Java.

DERMESTES. [DERMESTIDÆ.]

DERME'STIDÆ (Leach), a family of Coleopterous insects of the section Necrophaga (Mac Leay). Technical characters:—antennæ short, eleven-jointed, terminated by a compressed club, consisting of three or four joints; palpi small; mandibles short, thick, and generally dentated; head deeply inserted into the thorax; body generally oval, and more or less furnished with scales or hairs; legs short; tarsi five-jointed. The species of this family are for the most part of small size: their larvæ (at least those which are known) are covered with hair, and feed upon animal substances. The principal genera are *Dermestes*, *Ctesias*, *Megatoma*, and *Attagenus*.

The principal distinguishing characters of the genus *Dermestes* are:—antennæ scarcely differing in the sexes; the basal joint thick, the six following joints nearly of equal size, the eighth broader than long, the ninth and tenth very broad, and nearly of equal size, the eleventh also broad, but not equal in size to the two preceding; palpi short and thick; body of an elongated oval shape.

Dermestes lardarius is about a quarter of an inch in length, and of a dull black colour; the basal half of each elytron is of an ashy tint, and has three black spots.

This insect is sometimes very abundant in houses in the neighbourhood of London and elsewhere, and when this is the case, is very destructive, since it will devour almost any animal substance, but we believe only in a dried state.

Dermestes vulpinus is about the same size as the last, from which it may be distinguished by the elytra being totally black, and the sides of the thorax and under parts of the body being covered with white scales.

This insect is brought over in great abundance in ships laden with hides. We have seen them in skins of quadrupeds, both from India and America. The larva is about half an inch in length, and covered with blackish brown hairs: like the perfect insect, it feeds upon dried skins, and hence, when abundant, is very destructive to this sort of property*.

Dermestes murinus is also about a quarter of an inch in length, and of a black colour; the upper parts of the head, thorax, and elytra, are mottled with scales of an ashy tint; the scutellum is of a fulvous colour; the under parts of the body are white.

This species is common in various parts of England, and is found in dried animals which have been suspended in the open air by gamekeepers and other persons.

In the genus *Ctesias* (Stephens), the two basal joints of the antennæ are thick; the six following are nearly of equal size, and rather slender; the ninth joint is rather long, and of an obconic form; the tenth joint is shorter than the last; and the terminal joint is conical. These three joints form together an elongated knob.

Ctesias serra is about an eighth of an inch in length, of a black colour, with yellowish antennæ. It is found under the loose bark of elm-trees. The larva is covered with long hairs †.

Genus *Megatoma* (Herbst). In this genus the two basal joints of the antennæ are thick; the four following are slender; the seventh and eighth joints are larger than the last mentioned, and the remainder form an elongated club; the terminal joint is twice as long as the others in the male, and but slightly elongated in the female.

Genus *Attagenus* (Latreille). Antennæ with the basal joint thick; the second less robust and shorter; the three following joints slender; the sixth, seventh, and eighth joints gradually increasing in size; the remainder forming a three-jointed club, of which the terminal joint is extremely long and almost cylindrical in the male, and of an elongated oval form in the female.

Attagenus Pellio is about an eighth of an inch in length, and of a black colour; the base of the antennæ is yellowish, and there is a round white spot in the middle of each elytron.

This insect is common in houses, and is very frequently found in quills, upon the pith of which it probably feeds.

DERMO'CHELYS. [Tortoises.]

DERRY, a bishop's see in the archdiocese of Armagh in Ireland. The chapter consists of a dean, archdeacon, and three prebendaries. The diocese embraces the greater part of the county of Londonderry, a small portion of Antrim, a considerable portion of Tyrone, and a part of Donegal. Length from east to west 60 English miles; breadth from north to south 54½ do. It contains 55 parishes, constituting 57 benefices. In 1792 there were in this diocese 51 churches of the establishment. In 1834 the numbers were—churches of the establishment 62; Roman Catholic, 70; Presbyterian, 84; and other places of Protestant worship, 28. In the same year the gross population of the diocese was 367,041, of whom there were 50,350 members of the established church; 196,614 Roman Catholics; 118,339 Presbyterians; and 1,738 other Protestant dissenters; being in the proportion of rather more than five Protestants of whatever denomination to six Roman Catholics. There were at the same time in the diocese 574 schools, educating 37,385 young persons, being in the proportion of $7\frac{33}{100}$ per cent. of the entire population under daily instruction, in which respect Derry stands 5th among the 32 dioceses of Ireland. Of the above schools 74 were in connection with the national board of education.

Derry signifies 'a place of oaks.' In Pagan times, the eminence on which the city and cathedral of Derry now stand, was known as Derry-Calgaich, or the oak grove of Calgach. The place began to be known in ecclesiastical history towards the end of the sixth century, when Columba came hither from Iona, and founded a church. From this period down to the plantation of Ulster it was called from him Derry-Columbkill, and was famous for its abbey and religious foundations. There is no trace of a bishopric here till the time of the council of Rath-breasil in 1118, when this district seems to have been included in the antient diocese of Ardstraw or Rathlury. The distinct episcopal see of Derry was not however established till 1158, when Flahertach O'Brolchain, the then abbot of the monastery, was raised to the dignity of bishop, by decree of the council of Brighmac-Taidhg, over which the celebrated primate Gelasius, who is said to have been the chief instrument in establishing the discipline and influence of the church of Rome in Ireland, presided.

This see remained unreformed, together with those of Raphoe and Clogher, down to the time of the plantation of Ulster. The first Protestant bishop was George Montgomery, nominated to the succession in 1603. Among the succeeding Protestant prelates may be mentioned Bramhall, the able partisan of Strafford; King, the author of the 'State of the Protestants in Ireland under king James's government;' Nicholson the compiler of the English, Scotch, and Irish Historical Libraries; and Hervey, earl of Bristol, distinguished for his zealous patriotism and munificent patronage of the arts. Derry is the richest bishop's see in Ireland. By the return of the Commissioners of Ecclesiastical Revenue and Patronage in Ireland, it appears that on an average of three years ending 1st December, 1831, the net yearly income of this see amounted to 12,159*l.* 3*s.* 6*d.* By the 3rd & 4th Wm. IV. c. 64, this is curtailed by 4160*l.* per annum during the life of the present bishop, which reduction is to be increased to the further amount of 6160*l.* per annum during the lives of his successors. [Londonderry.] There is a very full account of the history and antiquities of this see in the first part of a 'Memoir of the Ordnance Survey of Ireland,' 4to. Hodges and Smith, Dublin, 1837.

DERWENT, DERWENTWATER. [Borrowdale; Cumberland.]

DERWENT. [Derbyshire.]

DERWISH is a Persian word, properly an adjective which signifies poor, indigent; as a substantive it is used to denote a religious mendicant, hermit, or any one who retires from social life in order to devote himself entirely to religious contemplation. It is synonymous with the Arabic *Fakîr*, and both expressions are chiefly employed to designate a class of persons in Mohammedan countries nearly corresponding to the different orders of monks among the Christians. It would be difficult to determine the age to which the origin of the Derwishes is to be referred. From time almost immemorial, pious men in the East, as elsewhere, seem to have thought it meritorious to renounce the enjoyment of temporal things and the ties of domestic and social relations, and to live in poverty and solitude for the purpose of turning their thoughts altogether towards spiritual matters. Oriental tradition makes the order of hermits as antient not only as St. John the Baptist or Elias, but even as the time of Seth. In the *Koran* poverty is recommended as meritorious; and Mohammed is reported to have said, 'See that ye come poor before God, for the poor shall have the first place in his mansion.' Jâmi, the well-known Persian poet, is the author of an esteemed work on the lives of the *Sûfîs*, or Mohammedan mystics: in the introduction, he divides those 'who seek the future life' into four classes: the *Zâhids*, who being filled with religious faith, look down with contempt on the life on earth, which they consider as imperfect and miserable; the *Fakîrs*, who renounce the world, hoping that they will thus have less to account for, that they shall be hereafter recompensed for present privations, and that their minds will by poverty be rendered fitter for the exercise of virtue; the *Khâdims*, who attach themselves as servants to persons conspicuous for their sanctity; and the *Abids*, who hope to merit future reward by entirely devoting themselves to religious exercises. Among the Turks several orders of Fakîrs or Derwishes exist. The principal one is that of the *Maulavîs*, founded by the celebrated Persian poet Jelâl-eddîn Rûmî, who died A. D. 1262. The Derwishes of this order have a great monastery at Galata, and another at Iconium. Their demeanour is very humble, and their robes are extremely coarse: besides the fast during the month of Ramazan, they keep a weekly fast on every Thursday. It is part of their religious practices to turn round with great velocity to the sound of a pipe, and when the music ceases to stop at once, without showing symptoms of giddiness. They may leave their order, and are then released from their vow of chastity, and permitted to marry. Some amuse the common people by tricks of legerdemain, or apply themselves to the practice of sorcery and conjurations. They are notorious for their fondness of intoxicating liquors and of opium. They have convents in nearly all Mohammedan countries, which serve the travelling pilgrims of this order as inns. The order of the Ruffâîs, founded A. D. 1182, by Sheikh Ahmed Ruffâî, is distinguished by the strange excesses of self-mortification to which its members are carried by their fanaticism. In their weekly assemblies in the hall of their convents, some are always selected to hold a red hot piece of iron between their teeth till it becomes cool, while the others make deep incisions in their bodies with sharp-edged instruments. Another class of Derwishes is that of the *Calenders*. They are distinguished by the singularity of their dress, which is sometimes made of party-coloured cloth, and sometimes consists of a tiger's or sheep's hide, or is made of iron. Frequently the Calenders go about half naked, with their skin painted red or black. They wear feathers in their ears, and have their heads covered with hats or turbans of a fanciful shape. They generally carry in their hands a stick or a hatchet, or sometimes a drawn sword. In their girdles they carry a plate or bowl, which they hold out to receive charities. They often visit coffee-houses and other places of public resort to preach, and act as if they were inspired. In their religious opinions the greatest variety prevails. The Derwishes do not seem to be much respected by the public: they are considered as hypocrites, who have assumed a sanctimonious appearance in order to have a pretext for idleness, and who clandestinely indulge in the grossest licentiousness. All Derwishes, with the exception of the Maulavîs, are allowed to marry; but they are obliged to sleep one or two nights in the convent of their order. (Chardin's *Travels*, ed. Amsterdam, 1735, 4to., vol. ii., pp. 269-97; Paul Rycaut, *The present state of the Ottoman Empire, &c.*, London, 1668, fol., p. 135 et seq.; D'Herbelot, *Bibl. Or.*, art. Derviche and Fakir; Mouradgea d'Ohsson, *Tableau de l'Empire Ottoman.*)

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* In the 14th vol. of the Linnæan Transactions, page 586, will be found a notice of the occurrence of several specimens of this insect, and also of another beetle (*Necrobia violacea*) in the Egyptian mummy; and in the Transactions of the Entomological Society (vol. i. 'Journal of Proceedings,' page 11) the Rev. F. W. Hope describes several species of Coleopterous insects which had been found in the heads of Egyptian mummies. They are as follows:—*Necrobia Mumiarium*, *Dermestes pollinctus*, *Dermestes Roei*, and *Dermestes elongatus*:—accompanying these insects there were also found some fragments of a species of Pimelia—probably the *P. spinulosa*.

† A figure of this larva will be found in the 'Entomological Magazine,' vol. ii., plate 10.

DERZHAVIN, GABRIEL ROMANOVITCH, the most distinguished lyric poet Russia has yet produced, being acknowledged superior to Lomonosov himself, was born at Kasan, July 3, 1743. After completing his education in the Gymnasium of that city, he commenced the usual military career, 1760, by entering the engineer service, in which the attention he gave to his mathematical studies soon obtained for him promotion. He did not, however, rise to the grade of lieutenant until 1774, when he was sent with his corps to reduce the rebel Pugachev, on which occasion he displayed much bravery and address. He continued to advance in military promotion; but quitted the service, on being appointed a counsellor of state, in 1784, and afterwards governor of Olonetz and of Tambov successively. In 1791, Catherine bestowed on him the office of secretary of state; in 1793 he was called to the senate, and the following year was made president of the college of commerce. Various other appointments followed, the last of which was that of minister of justice, in 1802; from which he retired the following year, on a full pay pension. This he lived to enjoy for a considerable period, as he did not die until 1816, three days after he had entered his 74th year.

Such a career, both military and official, by no means an unusual one with the literary men of Russia, however uncongenial it may appear to us, did not prevent his cultivating the Muses during some of the most busy portion of it; for the finest of his odes were produced at that period. Pre-eminent among these, and perhaps unrivalled by any similar composition in any other language, is his 'Oda Bog' o: Address to the Deity,' a piece full of sublimity both as regards the ideas and expressions. Indeed, elevation of conception and nobleness of sentiment, no less than great energy and mastery of language, are striking characteristics of Derzhavin's poetry; and if occasionally more negligent then Lomonosov, it is because he is borne away by the intensity of his feelings. On the other hand, he manifests greater freshness, originality, and richness than his predecessor; and while he enchants by the eloquence of his lyre, he elevates and purifies the soul by the moral grandeur of his strains. In the art of which he was so profound a master, he has shown himself no less able as a theorist and critic by his treatise on Lyric Poètry, printed in the 'Tchenie v Besedæ,' a miscellany edited by a society for the cultivation of the Russian language. Besides the essay just mentioned, he wrote some other works in prose, among which is a 'Topographical Description of the Government of Tambov.' A collection of his works was first printed in 1810, in four volumes; to which was added another, shortly before his death.

DESAGUADERO. [Bolivia, vol. v., p. 85.]

DESAGULIERS, JOHN THEOPHILUS, D.D. was brought to England while an infant by his father the Rev. John Desaguliers, a French Protestant refugee, after the Revocation of the Edict of Nantes. He was born at Rochelle, on the 12th of March, 1683.

His early education he owed to the instructions of his father, who appears to have been a very respectable scholar and sound divine, and at an early age he was sent to Christ Church, Oxford. In 1702, being then only nineteen, he succeeded Dr. Keil in reading lectures on Experimental Philosophy at Hart Hall; and he ever afterwards prosecuted his physical researches with great earnestness and success. Upon his marriage in 1712, he settled in London, where he was the first that introduced the reading of lectures to the public on natural and experimental philosophy. This he did with great and continued reputation to the end of his life, which terminated in 1749, in the sixty-sixth year of his age. The highest personages were attracted by the novelty of this mode of teaching; and he was several times honoured with reading his lectures before the king and royal family.

In 1714 Desaguliers was elected a Fellow of the Royal Society, of which he proved a valuable member. The duke of Chandos appointed him his chaplain, and presented him with the living of Edgware, near his seat at Cannons; and he was afterwards made chaplain to the prince of Wales.

From some causes which are not well understood, Desaguliers appears to have fallen into a state of great destitution;—we say appears, for the authority on which the assertion rests has, so far as we know, neither received collateral proof nor denial. He certainly did remove to lodgings over the Piazza in Covent Garden, in which he continued his lectures; but the lines of the poet Cawthorn are the only authority on which the statement of extreme indigence rests:—

> Here poor neglected Desaguliers fell!
> How he who taught two gracious kings to view
> All Boyle ennobled, and all Bacon knew,
> Died in a cell, without a friend to save,
> Without a guinea, and without a grave!

If this statement be true, he must either have been the dupe of others to a great extent, or singularly improvident in his own affairs; as besides his emoluments from his lecturing, he held two church livings.

Desaguliers left a family. One of his sons was an officer in the royal artillery, being Colonel of one of four battalions of which that regiment was composed. Colonel Desaguliers, who was a great favourite with George the Third, died in 1775; and if any of his descendants be living they may possibly be able to clear up this otherwise inexplicable circumstance.

The separate writings of Desaguliers contain an elegant exposition of the more popular portions of experimental philosophy. His mind was more fitted for the popular and the practical than for the profounder inquiries into these branches of science; and for the geometrical method of investigation than for the higher and then new calculus which has since so completely changed the whole current of research. His works are—

1. A Course of Lectures on Experimental Philosophy. 2 vols. 4to. 1734.

2. An Edition of Dr. David Gregory's Elements of Catoptrics and Dioptrics, with an Appendix on Reflecting Telescopes, 8vo. 1735.

This Appendix contains some original letters between Sa

Isaac Newton and Mr. James Gregory relative to these telescopes, which are worthy of attention.

3. A Translation of the curious, valuable, and little known Treatise on Perspective, by S'Gravesande, 8vo.

4. A Translation of S'Gravesande's Natural Philosophy, 2 vols. 4to. 1747.

5. A Translation of Nieuwentyt's Religious Philosopher, 3 vols. 8vo.

Several respectable papers by Desaguliers are inserted in the Philosophical Transactions from 1714 to 1743.

DESCANT, in music—(the etymology is very doubtful)—signifies, in strict language, a melody or air, extemporized on a *canto-fermo* [PLAIN CHANT], or, in other words, an enlarging *all'improvviso, i. e.* unpremeditatedly, on a given subject, which subject, sung by another voice, or other voices, forms the accompaniment of the descant Thus the term was understood in the eleventh and twelfth centuries, both by Franchinus and John de Muris; but afterwards it became synonymous with counterpoint. [COUNTERPOINT.] It has now however fallen into disuse, and is not to be met with, except in dictionaries, in any writer of modern date.

DESCARTES, RENE', was born at La Haye, in Touraine, on the 31st of March, 1596, and died at Stockholm on the 11th of February, 1650, before he had completed his fifty-fourth year.

Descartes was of noble descent, being a younger son of a councillor in the parliament of Rennes. He is one of the many instances of great delicacy of constitution being combined with the highest order of mind. His early education was among the Jesuits, who had, shortly previous, established one of their seminaries or colleges in the neighbourhood of his father's residence at La Flêche; and though Descartes was one of those men who would have educated himself in the absence of all instruction, there can be no doubt that the system adopted in the colleges of the Jesuits was much better calculated to develop the peculiar powers of the students than any other which has ever prevailed in modern Europe.

During his course in the college of La Flêche he contracted a friendship with Marsenne, which continued to the end of the life of that distinguished monk, and this circumstance doubtless tended much to increase the attachment of Descartes to mathematical and metaphysical studies. Algebra was at this time studied by few, and it had acquired but little extent and power as an instrument of investigation; whilst geometry, as it was then cultivated, tended too much to run into a mere deduction of isolated but curious and difficult propositions, without much regard to the general principles upon which their analysis and synthesis depended, or to the nature of the fundamental principles upon which geometrical reasoning was ultimately founded. The comparative novelty of the algebraic methods would give a charm to the study in a mind constituted like that of Descartes; and an examination of its first principles, and the operations of the mind in the actual development of the truths of geometry, would be more likely to arrest his active mind than the mere deduction of curious but necessary consequences. It is easy to conceive that his reading and course of study in the college would be somewhat desultory, and that he often depended more upon his own innate power for going through his exercises than upon the lectures of the professor, or the books which were put into his hands. This character in Descartes was properly appreciated by his friends and tutors. He formed the determination of renouncing all books, and endeavouring to efface from his mind the knowledge which he had been taught, so as to only employ the power which he had gained by the discipline of his college, to investigate the fundamental principles of human knowledge *ab initio*. Still this can hardly be thought to be a suddenly-formed resolution. Even allowing this to have been a plan gradually formed, the execution of it was a Herculean task; nor was it unattended with personal danger, as the contemporary history of Galileo sufficiently proves. Considering therefore that Descartes was at this time only nineteen years of age, the whole circumstance is one without a parallel in intellectual history.

Descartes wisely abstained from publishing his views at this time, or indeed his mathematical discoveries, of which there is some probability that he was in possession at this early age; but conformably with the fashion of the age among men of his social and political condition, he engaged in the profession of arms. He served first as a volunteer in the army of Holland, and then in that of the duke of Bavaria; and he was present at the battle of Prague in 1620, in which he conducted himself with great intrepidity. There is no profession more inimical to the study of abstract science than that of arms, and hence Descartes soon abandoned it for the purer and more honourable career to which his previous studies and native ardour of mind were so admirably adapted. But even during his attachment to the camp he did not neglect his mathematical and philosophical inquiries. It is believed to have been during his stay at Breda that Descartes composed his *Compendium Musicæ*, although it was not printed till after his death. Another circumstance indicative of his devotion to geometry is also narrated in connection with the same campaign, and occurring also at Breda. One day, seeing a group of people surrounding a placard, he found it written in Flemish, a language which he did not understand, and therefore applied to one of the bystanders for an explanation. This person chanced to be Beckmann, principal of the college of Dort, who, wondering that a young soldier should take any interest in geometry—the placard being in keeping with the practice of the age, a problem proposed as a challenge—explained the problem to him, but is said to have displayed something of the collegiate pedantry which was then so common. Descartes however promised him a solution, which he sent to the principal early next morning.

The cause of his resigning his commission is said to have been disgust at the atrocities which he witnessed in Hungary: but it is more likely that his object was to see the world under a different aspect, which his travelling as a private individual would enable him to do. He visited in succession Holland, France, Italy, and Switzerland, and stayed some time in Venice and Rome. It has often created surprise, that while in Italy he did not visit Galileo; and the cause which has been usually assigned was his jealousy of the fame of that father of physics, an assumption which there is reason to fear is too well founded. His repulsive conduct towards Fermat, whose overtures of an amicable correspondence he so long rejected with an appearance of disdain, seems also to intimate the wish of Descartes to reign alone in the circle of his associates, and in the philosophic world altogether.

After completing his travels, Descartes determined to devote his attention exclusively to philosophical and mathematical inquiries; and his ambition was to renovate the whole circle of the sciences. He sold a portion of his patrimony in France, and retired to Holland, where he imagined he should be more free to follow his inclination without the interruptions to which his celebrity in his own country rendered him perpetually liable. His writings, however, involved him in much controversy; and the vivacity and dogmatism of his temper often led him to treat in a somewhat supercilious manner the greatest men amongst his contemporaries. The personal courage of Descartes was great; and, unlike many valiant writers, he was valiant in the most trying personal dangers.

The fame of Descartes was very great, even in his lifetime: and that not only among the learned, but in the highest circles of society in every part of Europe. When, therefore, the church rose in arms against the heresy of his philosophy, and he was subjected to much persecution and some danger, he accepted the invitation of Christina, queen of Sweden, who offered him an asylum and complete protection from the bigoted hostility of his enemies. He was treated by the queen with the greatest distinction, and was released from the observance of any of the humiliating usages so generally exacted by sovereigns of those times from all whom they admitted into their presence. The queen, however, probably from the love of differing from every one else, chose to pursue her studies with Descartes at five o'clock in the morning; and as his health was always far from robust, and now peculiarly delicate, the rigour of the climate, and the unseasonable hour, which formed such a striking contrast with those to which he had been many years habituated, brought on pulmonary disease, of which he very soon expired, in the fifty-fourth year of his age. The queen wished to inter him with great honour in Sweden; but the French ambassador interposed, and his remains were conveyed for sepulture amongst his countrymen in Paris. Thus fell one of the greatest men of his age, a victim to the absurd caprice of the royal patron under whose auspices he had taken shelter from the persecutions of the church.

Probably there is scarcely a name on record, the bearer of which has given a greater impulse to mathematical and philosophical inquiry than Descartes. As a mathematician he actually published but little; and yet in every subject which he treated he has opened a new field of investigation. The simple application of the notation of indices to algebraical powers has totally new modelled the whole science of algebra. The very simple conception of expressing the fundamental property of curve lines and curve surfaces by equations between the co-ordinates, has led to an almost total supersedence of the geometry of the antients. The view which he proposed of the constitution of equations is contested as to originality; but admitting, as we do, his claims on this head to be open to dispute, the writings and discoveries of Descartes have laid the foundation for such a change in the general character of mathematical science as renders it extremely difficult for those who have not given very great attention to the older writers to follow the course of reasoning which they employed. The claims of Descartes, however, to the originality of his views on the composition of equations and the relation between their roots and their co-efficients, are discussed under the name of his competitor. [Harriott.]

His speculations in physics have often been ridiculed by subsequent writers, and there can be no doubt that they are sufficiently absurd. Still many reasons may be urged in mitigation of that ridicule, and even of the more temperate censure which careful and judicious historians of science have dealt out upon the intellectual character of Descartes. It ought especially to be observed that the theories of all his predecessors were mere empirical conjectures respecting the places and paths of the celestial bodies; they constituted, so to speak, the plane astronomy of those times, in contradistinction to the physical astronomy of ours. Those paths were not deduced as the necessary effect of any given *law of force*, but as the result of some fixed and unalterable system of machinery invisible to us, and directly under either the control of original accident or the original will of God. Innumerable hypotheses of the nature of this machinery had been framed before the time of Descartes; and he, being dissatisfied with all others, adopted that of an ethereal fluid, which was continually revolving round a centre, like the water in a vortex. This was not so unnatural to a philosopher living before the 'Principia' made its appearance as it would be absurd in any one to contend for it now. We have indeed been too much in the habit of measuring the philosophical sanity of Descartes by the knowledge of our own times—a most unjust test to be applied to the intellectual efforts of any man by his successors. We ought rather to look to what he did accomplish under all the difficulties of his position in respect to the then state of science than measure him by the efforts which were attended with no beneficial result. He was, however, the first who brought optical science under the command of mathematics, by the discovery of the law of the refraction of the ordinary ray through diaphanous bodies. He determined the law itself, but not as the result of any law of force. This was a later discovery: but Descartes led the way.

His inquiries in the positive philosophy were distinguished by great acuteness and subtlety; and though his theory has not in a direct form obtained many advocates in this country, it has in reality been the foundation of most of the sects which have since risen in every part of Europe. Differing as these systems do so very widely at first sight, this may be considered a paradoxical assertion. It is nevertheless the fact. For its proofs the reader is referred to the articles Philosophy (Positive), Metaphysics, and Philosophy of the Human Mind.

The works of Descartes have been collected and reprinted three times. The first—

1. Opera Omnia, 1690-1701, 9 vols. 4to. Amst.
2. Opera Omnia, 1713, also 9 vols. 4to. Amst.
3. Opera Omnia, 1724-26, in 13 vols. 12mo. Paris.

DESCENT, in English law (from *discent*, Norman French, and so written in our older law books), may be defined the act of law by which on the death of the owner of an inheritance, without making any disposition thereof, it is cast upon another as an heir. Inheritance is sometimes used in the same sense, though it rather signifies that which is, or may be, inherited, or taken by descent. (Littleton, sect. 9.)

1. The law of inheritance with respect to descents which have taken place since, or shall take place after the 1st of January, 1834, is now regulated by the Act 3 & 4 Wm. IV. c. 106, but some notice of what the law was before that time is necessary; since it is the constant practice, in the investigation of titles to property, to inquire what happened fifty or sixty years ago.

2. The death of the owner of the inheritance is the occasion of the descent of it. In his lifetime, there can be no descent, and therefore no heir, though there may be an 'heir apparent,' or 'heir presumptive;' an heir apparent being he who must be the heir, if he lives till the inheritance descends; an heir presumptive, he who may be forestalled by the birth of a nearer heir.

3. The person who dies must be at his death owner of the inheritance, or no descent of it will then take place.

4. Inheritances, *hereditaments*, things which may be *inherited* or *taken by descent*, are various. The principal of these is the crown, the descent of which differs in one material respect from that of a private inheritance, inasmuch as where there are no sons of the king, an elder daughter takes the whole of the inheritance, in exclusion of the younger sisters. Again, dignities and honours, as baronies and other peerages, are descendible, according to the limitations contained in the patents by which they were created. If created by summons in the first instance, they are called dignities in fee, and are descendible to females. [Barony.] Finally, all the subjects of real property and all annuities, offices, and whatever other things may be 'held in fee,' are 'descendible,' and this whether they are in possession, reversion, remainder, or expectancy. So are all rights and titles to things that may be held in fee, and the expectancy of an heir apparent or presumptive. There are also 'descendible freeholds,' that is, estates created by leases for lives, which, though not estates in fee, may during their continuance be inherited as if they were. It has been already noticed [Chattel] that the large class of things called chattels are not generally the subject of descent, but that some of them are.

5. Upon the death of the owner, the law casts the inheritance upon the heir, without any act done by him, or price paid for his acquisition: in both these respects, the present law of descent differs from the old feudal customs from which it is derived. According to the old feudal customs, upon the death of the tenant of a fee, the lord of whom it was held was entitled to take and retain it till the heir, for whom proclamation was made, appeared, and paid a sum of money called a relief [Relief] as the consideration for his admission into the tenancy; whereupon 'seisin' or possession was given him, and he took the 'oath of fealty' [Fealty], and if the tenancy was by 'knight's service,' 'did homage' [Homage] also to the lord. All this was more like a new donation, than the present quiet succession of an heir. The descent of copyholds, however, is still regulated much in the manner described. The heir was not however formerly to the same extent as now, subject to the charges and debts of the deceased tenant, in respect of the property descended [Assets]; and he had also an advantage, which is much insisted and commented upon by the old law writers, though its value is not so apparent to us. The descent of an inheritance, of which the rightful owner had been *disseised* or unlawfully dispossessed, prevented him from making an *entry* upon the heir of the disseisor, or bringing an action of ejectment, the right to maintain which is founded upon the right to make an actual entry, and left him only 'a writ of right,' or other real action, for the recovery of his property. One whole chapter of Littleton's *Tenures* is taken up with treating of descents which 'toll' (take away) entries, but a late Act (3 & 4 Wm. IV. c. 27) prevents descents from having any longer this effect. The present law of descents qualifies materially in one respect the title of the heir to the inheritance descended. Though it makes him as completely the owner of it as if he had purchased it, as to right of enjoyment and power of alienation, it does not allow it at his death to descend as if he had purchased it, but, on the contrary, declares that it shall descend as if he had never had it. Such at least is the new law (s. 1, 2 of the Act). The heir of an inheritance must be always the heir of the last 'purchaser' of it, that is, of the last person who acquired the property 'otherwise than by descent, or than by an escheat partition or inclosure, by the effect of which the land shall have become part of, or descendible, in the same manner as other land acquired by descent.' The practical importance of this rule cannot be understood without knowing who the person is who in any case is designated by the law as the 'heir' to another.

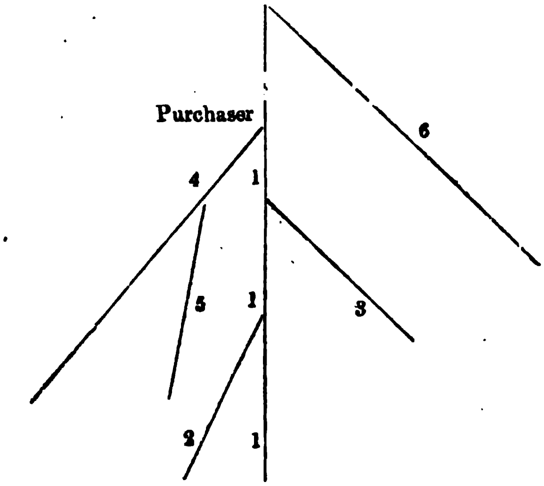
As to descents in fee simple, the fundamental rule is, that any person *of kin* to another, that is, descended from the same ancestor, however distant, mav be his heir, but that no person connected with him by marriage or affinity only [AFFINITY], can inherit to him. If the son inherits to the father, his mother cannot succeed to him, for though she may be heir to the son, she cannot be heir to the father, from whom, and not from the son, 'the descent is to be traced.' On the other hand, f the father inherits to the son, the mother may succeed to him, for though she cannot be the heir of the father, she may be the heir of the son. The fee, fief, or feud, which may thus now descend to the kindred of the purchaser *in infinitum*, was once nothing more than a life interest given to the tenant or holder of it in consideration of the military services to be rendered by the latter to the donor. [ALLODIUM.] The fee was afterwards permitted to descend to the issue of he original grantee, and in process of time to his *collateral* heirs. This was only effected by means of a fiction; for so firmly settled was the notion that 'the blood' (descending) alone of the purchaser or original grantee could be allowed o inherit, that the feudal law was never brought to allow collateral heirs, as such, to be heirs. But when a feud was granted *ut antiquum*, that is, to be held by the donee as if t had descended to him from some remote unknown ancestor, then the law permitted collateral relations however distant, that is, relations descended from any common ancestor, however remote, to inherit. For it was not known how far distant the ancestor was who was supposed to have been the purchaser, nor who he was, and it was sufficient hat the heir *might* be a descendant of his. (See for he early history of inheritable fiefs, Robertson's *Charles V.*, Sullivan's *Lectures*, Wright's *Tenures*, Gilbert *on Tenures* by Watkins, Butler's *Coke upon Littleton* 191. a. n. where here is an excellent comparison of the Roman and feudal aws of inheritance.)

While the law however went thus far, it did not, for reasons which some writers have attempted to explain, allow the *lineal ancestors* of the purchaser of the *quasi* ancient feud to nherit it, nor his relations by the half blood, that is, persons descended not from the same father *and* mother as the purchaser, or any lineal ancestor of his, but from one of them only. Still further exclusions followed from the rule which was afterwards established, that the heir of the fee must be the heir of the person last *seised* or possessed of it, as well as a kinsman of the whole blood to the actual purchaser. Among the practical consequences of this rule were the following: that if the child of the actual purchaser inherited to him, and became seised, the purchaser's child by another wife could not succeed, because only half brother to the person last seised; and that if the father's brother inherited to the son and became seised, the mother's brother could not succeed, because only related by marriage to the person last seised. All these exclusions and the fictions of the ancient feuds are done away with by the new act, the effect of which is, as before said, to admit among the heirs of the purchaser all his kindred, both of the whole and the half blood, and notwithstanding any previous descent to any heir of his. This it does by enacting that every lineal ancestor shall be capable of being heir o any of his issue (s. 6); that any person related to the purchaser by the half blood shall be capable of being his heir (s. 9), and that in every case descent shall be traced from the purchaser (s. 2). Still, however, the wife or her relations cannot inherit to the husband, nor the husband or his relations to the wife. But the hardship of these exclusions is at least mitigated by the law of dower and curtesy, which must be read together with the law of descent as one law. It remains to show in what order the kindred of the purchaser inherit. The old law on this subject is reduced by Blackstone to seven rules, which have been generally copied by later writers; but the new act so interferes with them, and they seem, besides, to be so capable of being simplified, that we shall propose instead of them the following rules, which, it is believed, embody the present law on this subject. We shall follow Blackstone's plan of stating the rules in the order in which they may have to be applied in searching for an heir.

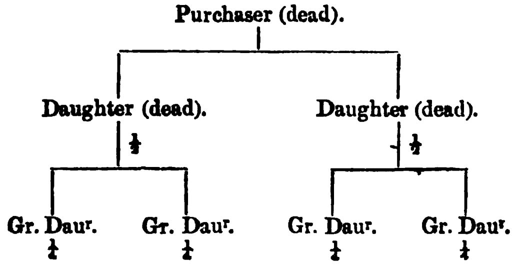
1. The child (if any) of the last owner deceased is the heir of the purchaser. Thus not only is the child of the purchaser his heir upon his death, but if any other heir of the purchaser dies after having inherited, *his* child is the heir of the purchaser.

2. The person through whom another must trace his descent from the purchaser is (if living) the heir before that other person. Now, bearing in mind that descent is always to be traced lineally, that is, either from parent to child, grandchild, &c., or *vice versâ*, it follows that the purchaser's child must, if living, inherit before *his* child-the brother before the nephew, the father before the brother or the grandfather, &c. If the purchaser had a child who died in his lifetime, leaving a child, that child is the purchaser's heir, according to rule 1: for the expectancy of the child of being next heir to the purchaser descended, upon his death, to his child, as being his next heir, who consequently becomes, upon the purchaser's death, *his* heir. It is surprising that this plain and certainly true explanation of the effect in question has been overlooked by all the writers on the law of descents, who lay down a separate rule (the 4th of Blackstone's) to account for it.

According to these rules 1 and 2, the effect of which is very much to simplify the course of descents, when an inheritance has once got into a *line*, it will keep continually descending in that line, till the line ends; and then it will only go back as far as the head of the next line, which springs from the line in which it has been descending, and will descend in that line, and so on; thus:



3. Of persons related to each other, as brothers and sisters, the males inherit before the females: the former successively in order of birth; the latter altogether in equal shares, being therefore called *coparceners*. (This rule is qualified by rule 5.) Hence the sons of the purchaser inherit before the daughters, and first his eldest son, then his second, &c.; then all his daughters together. It makes no difference whether the coparceners are related to each other by the whole or the half blood. This division among females often causes the minute splitting of inheritances, as thus:



According to the custom of *gavelkind*, all the sons, and in default of sons, all the daughters inherit together as coparceners. As to the custom of *Borough English*, see that title.

4. Every male ancestor inherits before any female one. This is qualified by rule 2. (See s. 7 of the new act.) Hence the father takes before the mother, &c., but not the mother's father before her, for he claims through her.

5. Those who are relations by the half blood to the purchaser inherit next after their brothers and sisters, who are relations by the whole blood to the purchaser. (Qualified by rule 4 and 2; see s. 9 of the new act.) What the half blood is has been already explained. Thus (by an

exception to rule 3) the half brother takes after the whole sister, and the half sister does not share with the whole sister. The like is true of half uncles, &c. According to this rule 5, however, the purchaser's brother of the half blood on the part of the *mother* does not take next after his brother of the whole blood, for such half brother claims through, and therefore takes *after* (rule 2) the mother, who (rule 4) is postponed to the father.

6. The mother of the more remote male ancestor inherits before the mother of the less remote; and the mother of any male ancestor before the mother. (See s. 8 of the new act.) Thus the father's mother takes before the mother, and the father's father's mother before the father's mother, &c.

These six rules, read one with another, will, it is believed, point in any case to the heir. It is observable, and in this respect the new differs from the old law, that there cannot be a nearer heir born after the heir who has inherited. Formerly the sister of the purchaser might inherit, and a brother of his be afterwards born, in which case the inheritance *shifted* to the latter. But at present this cannot be, as the father takes before his children (rule 2), and all children in the womb are considered by law as if born. The practical difficulty in finding an heir or proving a title by descent is, not to understand the law, but to ascertain and prove the facts on which the law must operate. (As to this, see Burton's *Compendium of the Law of Real Property.*) The new act provides against the difficulty of tracing descent from the purchaser, by the enactment that the last owner shall be always presumed to be the purchaser till the contrary is proved (s. 2).

To comment at length upon the rules regulating the course of descent is beyond our limits. Some observations and references are however necessary. Rule 3, which makes the eldest son, brother, &c. sole heir, exclusive of the other children, or the other nephews and nieces, &c., is well known by the name of 'the law of primogeniture.' It is almost peculiar to our country, not having been observed by the antients, and being generally abolished where it existed on the Continent and in the United States of America. For the history of this rule, see Hale's *History of the Common Law;* Sullivan's *Lectures;* Robinson *on Gavelkind;* 2 Blackstone's *Com.;* Wright's *Tenures;* and for observations on its expediency, Smith's *Wealth of Nations.* The preference of males to females is not so peculiar. The Jews, Athenians, and Arabians, though not the Romans, gave the inheritance to sons exclusive of daughters. (For the Athenian law of inheritance, see Jones's *Isæus;* for that of the Jews, Selden *de Successionibus apud Hebræos.*) This is not however the case among most foreign nations at present. The preference of the child of the elder son dead in the purchaser's lifetime to the younger son (which we have endeavoured to show is the necessary consequence of rule 1) has some interesting historical associations. The law on this point seems to have been derived from the civil law, and not to have been settled till after most of the other rules of descent. It was still somewhat doubtful when King John kept his nephew Arthur from the throne by disputing it. (See 2 Bl. *Com.;* Sullivan's *Lectures,* lect. 14. In Robertson's *Charles V.,* vol. i., p. 272, there is a curious story of the trial by combat of this point of law.)

The descent of estates tail (regulated by stat. 3 Ed. I., c. 1.) differs from that of fees simple principally in this, that only the descendants of the first donee can inherit; and of these only males claiming exclusively through males can be heirs when the estate is in 'tail male:' when it is in tail female (a mode of gift which is quite obsolete), only females claiming exclusively through females. [ENTAIL.] The limited descent of the estates, together with other qualities of them, makes them the best representatives at present existing (excepting indeed copyholds) of the antient fiefs.

(On the law of descent, as it existed before the late act, see Sir Matthew Hale's *History of the Common Law,* chap. xi.; 2 Bl. *Com.,* chap. xiv.; Cruise's *Digest,* vol. iii. Watkins *on Descents* principally treats of curious points, many of which have ceased to be important. As to the reasons for the new alterations, see *First Report, Real Property Commissioners.*)

DESCENT OF BODIES. [FALL OF BODIES.]

DESERTER, an officer or soldier who, either in time of peace or war, abandons the regiment, battalion or corps to which he belongs, without having obtained leave, and with the intention not to return.

As the last-mentioned circumstance distinguishes the crime of desertion from the less grave offence of being absent without leave, it becomes necessary, before the conviction of the offender, that evidence should be apparent of such intention. This evidence may be obtained generally from the circumstances under which the deserter is apprehended; for example, he may have been found in a carriage or vessel proceeding to a place so distant as to preclude the possibility of a return to his corps in a reasonable time; or letters may have been found in which an intention to desert is expressed; or some offer may have been made by him of enlisting in another corps, or of entering into some other branch of the service.

The civil courts of law, in this country, have ever had authority to try offenders accused of desertion; but they have long since ceased to exercise such authority, and they now interfere only in the rare case of an appeal from the decision of the court-martial which is held for the purpose of investigating the charge and awarding the punishment. The latter courts are permitted the exercise, to a certain extent, of a discretionary power in proportioning the punishments to the degrees of criminality in the accused; and this power is generally considered as more likely to promote the ends of justice than the inflexibility of the law in civil courts, where, since no middle course can be taken between condemnation and acquittal, the criminal frequently escapes through the compassion of the jury, when the punishment which by law must follow a verdict of guilty appears disproportionate to the crime. The leniency which has invariably characterised the decrees of courts-martial, and the custom of not awarding the punishment in its full extent till after a repetition of the crime, sufficiently justifies the confidence reposed in those courts.

The practice of deserting from one regiment or corps, and of enlisting in another, either from caprice or for the sake of a bounty, having been very frequent, a particular clause has been inserted in the Articles of War, in order to prevent this abuse. It declares that any non-commissioned officer or soldier so acting shall be considered as a deserter, and punished accordingly; and that any officer who knowingly enlists such offender shall be cashiered. It is also declared, that if any soldier, having committed an offence against military discipline, shall desert to another corps, he may be tried in the latter corps, and punished for such offence; and his desertion may be stated before the court as an aggravation of his guilt. Any officer or soldier who may advise or encourage another to desert is also punishable by a general court-martial.

Absconding from a recruiting party within four days after having received the enlisting money is also considered as desertion. And an apprentice who enlists, representing himself as free, if he afterwards quits the corps, is esteemed a deserter unless he deliver himself up at the expiration of his apprenticeship. Vagrants also, who, pretending to be deserters, give themselves up as such with a view of obtaining money or provisions, are, by a clause of the Mutiny Act, to be considered as soldiers whether enlisted or not.

A non-commissioned officer or soldier who simply absents himself from his corps without leave is exonerated from the graver part of the charge, if any circumstances can be adduced from which it may be inferred that the absence was intended to be but for a short time. Such circumstances are,—goods of value being left behind,—the occupation in which the absentee is found to be engaged being in its nature temporary,—an intention of returning having been expressed,—or again, the offender suffering himself to be brought back without resistance. Simple absence without leave is referred to regimental courts-martial, merely, and these award the punishment discretionally.

The Mutiny Act authorises general courts-martial to condemn a culprit to death, should his crime be found to deserve the extreme punishment; in other cases they may sentence him to be transported as a felon, either for life or for a term of years, or to serve in the ranks for life, or for a length of time exceeding that for which he had originally engaged to serve. In some cases, also, corporal punishment is awarded, and an offender may be sentenced to lose the increased pay or the pension to which he would have been entitled if the guilt had not been incurred.

The crime of desertion is justly considered as one of the greatest that can be committed by any man who has adopted the profession of arms. The officer or soldier who has undertaken to assist in the defence of his country, and steals away from the duties he is called upon to perform, violates a sacred engagement, and shows himself insensible to the dictates of honour, patriotism, and morality. Whether he withdraw through caprice, or to escape the privations to which the soldier is occasionally exposed, he sets an example of discipline infringed, he deprives the army of his services at a time perhaps when he can with difficulty be replaced; and while he basely seeks his own ease, he throws an additional burthen upon his companions in arms. If he pass over to the enemy, he becomes the vilest of traitors; and, should he escape the retribution which awaits him from his injured country, he must submit to live dishonoured, an exile from its bosom.

DESERTS. This word is of very vague signification; it is used generally to designate an uninhabited place, a solitude, and in this sense is equally applicable to the fertile plains watered by the Marañon and the sandy wastes of Libya. It is, however, more exclusively appropriated to sandy and stony plains.

Whatever may be the origin of sand, whether it be the detritus of sandstone rocks or other quartzose masses, or to whatever causes it be due, we consider it is of great importance to man by reason of the fertility which its admixture with clayey soils procures, and by the innumerable uses to which it is applied in the arts.

In considering, however, the vast seas of sand which cover such an amazing proportion of the earth's surface, we are tempted to believe that there is too much of it, and that it had been better if in its stead were rich meadows and arable land; but since deserts exist, we must remain persuaded that they are necessary to the general economy of the globe.

Deserts of sand are much more abundant in the old than in the new world. Almost every plain, even the best cultivated in Europe, contains patches of sand of greater or less extent; but to confine ourselves to *deserts*, properly so called, let us consider the immense surface which they occupy on the antient continent.

Africa, from its western coast, between the Senegal river on the south and Marocco on the north, to the border of the Red Sea, presents one vast sea of sand, occupying upon an average about 48 degrees of longitude and 10 of latitude, which is but partially interrupted by a projecting part of Fezzan and by the narrow valley of the Nile. This steril region is divided into two unequal parts; the more considerable, that to the west, being called the Sahara, or Great Desert, and the other, to the eastward, sometimes bearing the name of the Libyan Desert. Both the one and the other inclose a few small fertile spots called *Oases*, which rise in the midst of the sands like islands in the ocean. They serve as resting-places to the merchants, who, by means of camels, poetically termed the ships of the desert, traverse these dismal regions.

The Desert of Sahara is represented to us as covered with moving sands formed into ridges like the waves of the sea. In the midst of these sands, whose position and aspect are continually changing by the effect of the wind, are dispersed a few rocky hills, and small hollows where the collected waters nourish a few shrubs, ferns, and grasses. The mountains which bound the desert on the west present insulated pinnacles, descending gradually into a plain covered with white and sharp siliceous stones, and which is at last confounded with the sands. At Tegazza, and some other places, a gem salt, whiter than the whitest marble, extends in vast beds beneath a stratum of rock.

'During the greater part of the year,' says Malte Brun, 'the dry and heated air presents the aspect of a red vapour; the horizon seems beaming with the fires of innumerable volcanoes. The rains, which fall from July till October, do not extend their uncertain and momentary benefits to all parts alike. An aromatic herb resembling thyme, the plant which bears the Sahara berry, acacias, and other thorny shrubs, nettles, and briars; such is the only vegetation which is met with on a few spots in the desert: rarely is a grove of date trees or of other palms to be seen. A few monkeys, a few antelopes, content themselves with what little food they can find. The ostrich also inhabits this region in numerous flocks, feeding upon lizards and snails and a few coarse herbs. Lions, panthers, and serpents, often of a monstrous size, add to the horror of these dreadful solitudes. The desert presents no traces of a beaten path, and the caravans that traverse it, directing their way by the polar star, describe a tortuous road in order to profit by the oases, described as brilliant with vegetation, but which probably owe a great part of their reputation to the contrast they form with the absolute barrenness of the desert.'

Such is the dryness of the terrible burning wind named Samoom, Samum, or more properly *Samiel*, that it frequently absorbs the water contained in the skins borne by the camels for the use of the merchants and drivers. A last cruise of water has been sold for ten thousand drachmas of gold. In 1805, an akkabah or caravan, composed of 2000 persons and 1800 camels, not having found water in the usual halting places, they all, men and animals, perished of thirst. It is in the desert that is seen most particularly that singular optical illusion termed the *Mirage*.

Desert of the North-East and East of Africa.—The great sandy region, as we have said, is contracted in one place by the country of Fezzan. To the east and south of this are deserts occupied by the Tibboos, a nation of Berbers; whilst on the north-east the desert of Barca, the antient Cyrenaica, extends as far as the Mediterranean: both these are continued on the eastern side by the great desert of Libya, which borders on Egypt, forming its western boundary. These deserts differ little in character from the Sahara. To the south, the Libyan desert joins the equally steril region of northern Nubia; leaving which, and crossing the Nile, we again meet with sandy and rocky tracts, which, from Abyssinia on the south as far as Suez on the north, occupy the whole space between the river and the Red Sea.

Deserts of Arabia.—Passing from Africa to Arabia, we first meet with the sandy hills which form the isthmus of Suez, and separate the Arabian gulf from the Mediterranean, whose coast-line they follow as far as Palestine. Immediately to the south of these sands extends the stony and barren tract known by the name of Arabia Petræa. Mount Sinai, an imposing mass of granite, is there surrounded by rocks of inferior height, composed in part of sandstone, and inclosing a few fertile valleys producing grapes, pears, and other excellent fruits; but the country in general is of frightful sterility, presenting nothing but a few shrubs of Egyptian thorn (*acacia vera*), which furnishes the gum arabic, with capers, and a few other plants, intermixed with rocks of a blackish granite, of jasper, and of sienite, and plains covered with sand, flints, and rolled stones. There are however large herds of gazelles and other game.

On the south, as far as Hadramaut, and bounded on the east by the Euphrates and Persian Gulf, and on the west by Hejaz and Yemen, extend the vast deserts of Nejd and Ahkaff, which produce nothing but a few saline plants, and their general appearance differs little from the deserts of Africa, unless it be that they contain many hilly oases adorned with palms and date trees.

Continuing our route towards the Euphrates, we leave on our left that part of the Arabian desert which bears particularly the name of the Desert of Syria, which extends northward as far as Haleb, and in the middle of which the traveller discovers the extensive and solitary ruins of Palmyra, the once magnificent residence of Zenobia.

Desert of Mesopotamia.—Having crossed the Euphrates, we find ourselves in the antient Mesopotamia, so called from two Greek words signifying *between the rivers*, i. e., the Euphrates and the Tigris, and which, in the most extended sense of the name, includes Aljezireh on the north, and Irak-Arabia or Babylonia on the south.

With the exception of narrow slips along the two rivers just mentioned, Mesopotamia is a desert still more horrible than those of Africa and Arabia, of which it may be regarded as the continuation. It is covered with burning sands and steril gypsum. Wormwood and certain aromatic shrubs are the only vegetation, which, covering immense spaces, banish all other plants. The waters of this desert mostly all saline or sulphurous, give rise to pestilential miasmata, which remain suspended over the desert till, the equilibrium of the air being disturbed, there is formed that pestiferous wind so justly dreaded in Syria and the neighbourhood, and which suffocates any one who has temerity enough to expose himself to its influence.

This desert, occupied by Arabs living upon plunder, is traversed by the caravans which carry on the commerce between Haleb and Bagdad. Its southern portion, or Irak Arabia, presents, by reason of the proximity of the two rivers, an aspect quite different from that of Aljezireh. That portion of the plain which forms the antient Babylonia is covered with alluvium, and, like the delta of Egypt, is periodically inundated. It is an immense meadow, requiring only the hand of industry to be covered as heretofore with abundant harvests, and to become once more the garden of Asia.

Deserts of Persia.—Scarcely have we left behind us these dismal regions, still directing our course eastward, and near the 34th parallel of N. lat., when we meet with the mountains of Kurdistan, covered with forests, and intersected by fruitful valleys.

Having scaled this wall, which forms the eastern boundary of the basin of the Tigris and Euphrates, we find ourselves on the high table-land of Persia, where we again meet with extensive deserts, some of them sandy, such as we have already seen, but more generally of an argillaceous soil; and thus it is that the Persian deserts seem to form the transition between those of Africa and Arabia and the Tartarian *steppes*.

In Persia there are five principal deserts, which occupy about three-tenths of the surface of the country. Of these the first is the great salt desert, which separates Irak-Ajemi from Khorassan, and is about 130 leagues long and 70 wide. On the south it joins the desert of Carmania; on the east it unites to the province of Khorassan. Its soil is a stiff clay, whose surface is covered with a saline efflorescence in some places an inch thick; and its vegetation, as in all the high plains of the country, consists of saline plants, such as the *Statice Tartarica*, intermingled with a few patches of pasture. The three other deserts are those of Kiab, of Meckran, and of Karakoum. The desert of Meckran is in Beloochistan. It is bounded on the south by the sea of Oman, and is separated from the desert of Sinde in Hindostan by the Brahouic mountains and the Indus. It does not belong to the table-land of Persia, but to the basin of the sea, of which it forms the northern boundary, or coast line followed by a part of the army of Alexander the Great on its return from India. Its productions differ from those of the Great Desert, and consist of the Indian palm, and the aromatic shrubs of Arabia Felix. The desert of Karakoum is to the north of Khorassan; it is sandy.

Deserts of Grand Tartary.—Descending the Paropamisian mountains which bound Khorassan on the north, and form in that direction the escarpment of the great highland of Persia, of which the sandy province of Kohistan seems to form the ridge, we enter upon the deserts of Independent Tartary. This country is bounded on the south by the Paropamisus already named, and by the lofty chain of the Hindoo Koosh, of which it seems to be the continuation; on the east by the high mountains [Bolor Tagh] which separate it from China; on the north by some ridges which, on the one hand descend from the great Altaic chain; and on the other from the extremity of the Ouralian mountains; and on the west by the Caspian. It may be regarded as the north-western declivity of the great central plateau of Asia. It occupies a surface of about 60,000 square leagues, of which the greater half is a desert; for, with the exception of the immediate foot of the mountains and the water-courses, the whole country is condemned to drought and sterility. The saline and sandy plains extend even round the northern part of the Caspian as far as the Don, and, to the east of the Oural, join the steppe of Isim, claimed by Russia.

The country of Khowarezme or Karissum on the south of Lake Aral is now reduced, by causes among which the invasion of the sands is perhaps the most powerful, to the little district of Khiva, which rises like an oasis in the desert, and which a man may ride round in three days.

The Greater Bucharia, or Bokhara, is also surrounded by sands to the north and west. The whole of Independent Tartary at the present time perhaps hardly contains a population of five millions,—a proof of the extreme sterility of the soil.

On the south-east of the province of Kohistan, of which we have spoken, is situated Segestan, and the country of the Afghans.

Desert of Afghanistan.—Afghanistan is an extensive country, containing the city of Candahar. It is a vast sandy basin, except in the immediate vicinity of the mountains by which it is bounded on the east and north, and along the banks of the rivers Lhorah and Helmend or Hindamend, which latter traverses it from east to west, and terminates in the Lake Zorah. The land rises on the north-east towards the lofty mountains which sustain the great central plateau of Asia, and from which descend the Indus towards the south-west, and the Ganges to the south-east.

The vast extent of arid deserts which we have just described, scarcely interrupted by the Indus itself, reaches to the very banks of the Hesydrus, the most eastern of the rivers of the Penjab.

From Cape Bojador on the Atlantic to beyond the Indus, the sandy region extends in a curved line of 1400 geographical miles, and, setting aside the fertile oases, is estimated by Humboldt as covering a surface of 300,000 square leagues; and yet, however extensive this tract, which seems condemned to eternal sterility, we have still to consider the great central table-land of Asia, not less arid than what we have just seen.

Deserts of the Great Central Plateau of Asia.—The first country we meet with as we go eastward is Little Bucharia, bounded on the north by the mountain chain of Alak, which separates it from Songaria, and on the south by the Moos Tagh and Great Tibet. On the east it joins Mongolia.

Little Bucharia is tolerably fertile near the mountains, whence descend innumerable streams, which uniting in the river Yarkand, flow with it into the Lake Lop, having no issue. The whole of the centre and eastern portion of the country is a sandy and salt desert.

Leaving on the north Songaria, which also contains immense arid spots, and whence the river Irtish takes its rise, still continuing our route towards the east, we find the steril plain extending towards Mongolia, where it opens out to form the vast desert of Shamo, which extends to the Great Wall of China through a length of 500 leagues, rarely interspersed with a few fertile spots.

From the outer slopes of those mountains which inclose and sustain the central plateau, the highest in the world, descend those mighty rivers which, on the one hand, fertilise the great empire of China, and pour the tribute of their waters into the Pacific, and on the other, traverse the widely-extended *steppes* of Siberia to disembogue into the frozen ocean.

As for the area of the sandy deserts of the Tartarian table-land, it may on a very moderate computation be estimated at 100,000 square leagues, which, together with the former 300,000 for the African, Arabian, and Persian deserts, and about 100,000 more for the widely-spread sandy and barren tracts in the south of Africa, and sandy patches of Europe, gives a grand total of half a million of square leagues of desert in the old world alone; that is, a surface equal to the whole of Europe, or forty-four times the extent of Great Britain, and this without including the boundless *steppes* of Siberia, nor the marshy plains of northern Asia bordering on the icy sea.

The deserts of America being of a different character, and known by other names, as Pampas, Savannahs, &c., are described under their proper heads.

DESHOULIÈRES, ANTOINETTE DU LIGIER DE LA GARDE, a French poetess, born of distinguished parents in 1633. Great pains were taken with her education: she learned the Latin, Italian, and Spanish languages, and studied poetry under the poet Hesnant, who often assisted her in her juvenile compositions, and polished her verses when defective. Her life was rather a romantic one. In 1651 she married the Seigneur Deshoulières, a lieutenant-colonel in the service of the Prince of Condé. She visited the court of Brussels in company with her husband, where she rendered herself suspected by the government, which caused her to be arrested and imprisoned at Vilvorde, near Brussels. Here she passed her time in reading the Bible and the works of the Fathers, until, after eight months, she found means to escape, with the assistance of her husband. They were shortly afterwards introduced to Louis XIV., and Mad. Deshoulières was soon esteemed one of the literary ornaments of the age. Not only did she write a variety of poems herself, but she was an object of adoration to the contemporary poets, who honoured her with the title of the tenth muse. Racine and Pradon having each written a tragedy on the subject of Phædra, Mad. Deshoulières brought upon herself some discredit by taking the part of the latter against the former, in ridicule of whom she composed a satirical poem. Racine, however, soon had his revenge, for Mad. Deshoulières brought out a tragedy which met with nothing but ridicule, and afforded him an opportunity of writing a parody. She wrote several other dramatic pieces, but totally without success. The death of her husband, to whom she was greatly attached, was the occasion of one of her most popular Idyls; indeed her fame rests on her Idyls alone, the rest of her works having fallen into oblivion. She died in 1694, leaving a daughter, who obtained some celebrity as a poetess, and whose works are often bound up with those of her mother.

La Harpe, after saying that the Idyls are the only works of Mad. Deshoulières worth noticing, limits his commendation to three of them. He places her below Segrais, an old French pastoral poet, and justly censures her for treating books, flowers, &c., as if they were living persons. Thus, for instance, she envies a streamlet for bearing fish without pain to itself, and asks it why it murmurs when it is so happy? However, her little poem of *Les Oiseaux*, cited in La Harpe's *Cours de la Littèrature*, is written with great lightness and elegance, and fully deserves the commendations bestowed on it by that severe though impartial critic.

DESICCATION is the chemical operation of drying bodies, and is effected in different modes according to the nature of the substance.

One of the simplest cases is that of drying a precipitate which has subsided in the fluid from which it is thrown down: this may be effected after due washing by transferring it to a glass, porcelain, silver, or platinum capsule, the weight of which being previously determined, that of the substance dried is readily found on weighing. Sometimes substances are dried merely by exposing them to the air, in other cases at a temperature regulated according to the nature of the substances, as at 100° or 212°, in warm chambers, or a sand heat, or at a red or white heat.

The desiccation of precipitates upon paper filters is very commonly effected to a certain extent by absorption, or by placing the filter and its contents upon a piece of chalk or upon a brick; the operation being completed either by exposure to the air, or in any of the vessels and at any of the temperatures above named. In many instances desiccation is performed by means of the air-pump, which is useful in those cases where delicate organic bodies, which would be injured even by moderate degrees of heat, require drying. Mr. Leslie's process consists in placing the substance to be dried (or a fluid to be evaporated) under the receiver of an air-pump, over a basin containing sulphuric acid, or some other substance having great affinity for water. The receiver being exhausted, the operation is left to itself. On account of the absence of the air, the moisture is readily vaporized and is quickly absorbed by the sulphuric acid; and the vaporization and absorption continue till the substance is dry.

Desiccation may be carried on at common temperatures without the process of exhaustion above described; thus a basin containing quick-lime with a moist precipitate placed above it, and the whole covered with a jar or receiver, will soon render the precipitate dry. Any deliquescent salt may be substituted in some cases for sulphuric acid or quick-lime, such, for example, as potash, carbonate of potash, and chloride of calcium.

In chemical investigations it is frequently necessary to deprive gaseous bodies of their moisture. The nature of the drying substance employed must depend upon that of the gas to be desiccated: thus ammoniacal gas is absorbed by chloride of calcium, and immediately by sulphuric acid; but potash or carbonate of potash answers well for it: again, chloride of calcium would be decomposed if exposed to sulphurous acid gas and some others; potash would absorb them, and its carbonate would evolve carbonic acid, and also unite with them. In fact care must be taken that the desiccator exert no chemical action upon the substance to be dried.

DESIGN. In the fine arts the word design (from the Italian *disegnare*, to draw) is employed in two very different significations: in the first place it is used merely to signify the act of drawing, or representing in lines, the form of any object; in the next place it expresses that combination of invention and purpose which enables the artist to compose a picture or a group, without reference to the material in which it is executed. The accurate conception of form and beauty is displayed in the most masterly degree in the antient Greek sculptures; and in the invention of appropriate attitudes and perfection of physical form the design of the best Greek sculptors cannot be surpassed.

But of all the existing specimens of art the paintings of the Italian masters display the most consummate excellence in design, especially the Florentine and Roman schools, and among them Raphael's in particular. The conception of the story, and the ruling passion of the moment; the selection of forms appropriate to the dumb actors of the story; the invention of appropriate attitudes, not merely for the single figures, but for whole groups, artfully disposed in such manner as to be adapted at once to the freedom of nature and the intention of the artist to assign to each its position according to its prominence in the story; and the perfect execution of the design, placing before our eyes in a palpable shape the inward thoughts of the painter, combine to render the design of Raphael's works the most perfect in existence. Michel Angelo's power is more apparent in the conception and execution of forms purely physical, and his design is therefore of a more limited and less elevated style. In proof of this, a single figure, a mere life-study for instance, from his unrivalled hand may be contemplated with emotions of admiration and wonder scarcely less than those which we feel when the whole of his greatest work is before us. Raphael designed not merely to overawe the spectator with physical vastness, but to elevate him above the visible world. Human suffering, superhuman inspiration, and divine benignity are subjects within the reach of his pencil. The tortured figure of the chastised Ananias, the terrible power inspired into Peter, the prophetic absorption of the prophet near him, pointing with his finger to the source of that power, bring into the design of that one picture (the Death) the most awful and sublime speculations; and, if it is second to the Transfiguration, it is no less a model of perfection in design.

The student in design may discover the means by which former artists attained their power, by copying and analysing their works, namely, the sculptures of Greece, and the works of the old masters. But he must avoid following the implied advice of Reynolds, to do no better than store his mind with their thoughts, and give them forth second-hand as his own. That the greatest poets and painters have borrowed is no apology for an education which recommends only borrowing: to appropriate with justice and effect the thought of another, the borrower must be at least as great as the original inventor. A figure from Raphael in a poor design is only a mockery and a foil to the poverty of the rest. The legitimate object of study, or that part of study which seeks to shorten the process of education, is to discover the mode which other artists have pursued in disciplining their minds, and eyes, and hands, in order to comprehend and express the nature which they had to portray. In this way the student learns, not to pilfer the works of others, but to turn to the best account his own ability and industry, to produce originals instead of mere copies. The study of the best poets, of histories, and the lives of individuals, of emotions casually displayed in the events of daily life, and in fact everything that helps to teach a knowledge of human nature, and the working of its internal feelings, combined with an accurate knowledge of those external forms which must enter into every composition, will conduce to the development of a power of original design. For technical points no work approaches in utility to the *Treatise on Painting* by Leonardo da Vinci.

DESIGN, ARCHITECTURAL. The scheme, idea, or, as it is more usually termed, the design, whether for an intended building or that of one already erected, is shown by means of a series of diagrams or drawings, which being exact geometrical representations, therefore too technical and formal to satisfy those who look at them as pictures, and likewise in some degree imperfect as separate representations, yet, taken one with another, convey a much more exact and complete notion of the whole, both internally and externally, than can be obtained by any other mode of delineation; because they not only exhibit the actual forms and dimensions as they really exist, and not merely as they appear to the eye according to the situation of the spectator; but reveal the whole anatomy of the fabric, together with many particulars that are concealed from view in the edifice. Such drawings consist of *plan*, *elevation*, and *section*, besides others of *details*, or *parts at large;* and their number will depend either upon the nature of the building, that is, on its being more or less complex, or as it is intended to show it more or less fully.

Although a certain prejudice exists against such drawings, on the score of their being too technical and difficult, they become, when once explained, intelligible enough to any person of common capacity, however ignorant he may be of architecture. To begin with the *plan* (the *plant*, or *plot*, as it is sometimes termed by old writers), as the first in natural order, it being that which must be determined upon before the walls can be raised,—it may no less briefly than clearly be described as the map of the building; consequently, any one who understands geographical or topographical plans of that kind can be at no loss to comprehend the nature of an architectural one; the latter being a far more exact and less arbitrary and conventional representation than the other class. By means of the plan we distinguish most clearly the exact shape and extent of the building as regards the space on which it stands; the thickness of the walls, the internal arrangement, with the forms, number, and areas of the rooms and passages into which it is divided; and the situation and width of the doors, windows, fire-places, staircases, &c.; the solid and raised parts, such as walls, columns, piers, &c., being shaded, and the voids or apertures in the walls, such as doors and windows, being left white. For every story of a building there must be a separate plan, although it is not usual in books of designs to give more than those of the ground-floor and the principal one above it, from which the arrangement and size of the rooms above them may be tolerably well guessed at, unless there should happen to be some uncommon deviation in such respects from those below. Plans may further be distinguished as simple or detailed: the former are mere *floor-plans*, indicating no more than belongs to the floor and walls, while the latter describe, by means of dotted lines on the floor, the projection of cornices, the compartments of ceilings, or the groining and coffering of those which are vaulted or arched; likewise domes and skylights. Or else, instead of expressing what belongs to the ceiling plane, a plan of this kind is made to indicate the pavement of floors, the situation of statues, sideboards, bookcases, and other pieces of furniture, particularly of the beds in sleeping-rooms, the position of which is of material importance. Sometimes, too, plans are given showing the exterior of the roof of the building, with its chimney-stacks, gutters, skylights, dormer-windows, parapets, &c.

Another species of plan is that termed a *block-plan*, namely, a map displaying the general mass of the building, together with its locality, either in regard to other edifices or not, as the case may be; and such plans are an exceedingly useful accompaniment to others, because they serve to make us acquainted not only with the structure itself, but with its situation. From a ground-plan alone, for instance, of St. Paul's, all that could be learnt in respect to the last-mentioned circumstance is, that it is insulated, whereas a block-plan would show the precise form and extent of the surrounding area; how confined and irregular it is, and how far it would be necessary to set back the houses in some places in order to reduce the whole to uniformity. Plans of this kind are, in fact, *special* maps laid down upon a larger scale, and therefore more exact and detailed, although less comprehensive than ordinary ones.

An *elevation* (formerly termed an 'upright,' in Italian *alzata*, in German *aufriss*) may be described as a vertical plan, showing the front or one external face of the building as raised upon the plan; it therefore gives the precise forms and measurements of every part, delineated geometrically according to scale, and not as they appear according to distance or the accidents of perspective, whether depending on the level at which the eye is placed, or as the building happens to be viewed parallelly, or more or less obliquely. When the elevation is a single general plane, as is the case, for example, with the Travellers' Club House, in London, it will not differ very much from a direct front view, the projections being only those of the cornice, the dressings of the windows, &c., which are rendered manifest, and may be measured from their profiles; consequently, an eye unaccustomed to such drawings cannot be puzzled. It is necessary, on the contrary, that a person should understand the principle of geometrical drawing before he can form a correct idea of the subject, and judge what its actual appearance would be, if it consists of several planes or separate elevations placed one by the side of the other, all standing upon the same line, and without their returns or the planes perpendicular to and connecting them together, being shown; because, unless the plan is also seen, the shadows alone serve to indicate what parts project and what recede beyond the general line of the front, and in what degree they do so, the shadows being at an angle of 45°, whereby they are made equal to the projection of the part which occasions them, beyond the plane or surface they are thrown upon. This may be easily exemplified by St. Paul's Cathedral: in a geometrical elevation of the western front, the shadowing informs us (without referring to the plan) that the columns in the centre are at some distance from the wall behind them, yet do not form a projecting portico (or porticoes, one above the other); for that would cast a shadow from itself on the building; but that the parts behind the columns recede inwards. Again, we should perceive the whole of the cupola just as if it were immediately over the front, and *between* the two western towers. The only thing to indicate the contrary is, that the shadows would be less forcible, and a tint would be thrown over it, by way of expressing distance; and although, independently of that, no architect would imagine it to be so placed, yet it would be impossible to determine the precise distance from the front, there being no shadow cast upon it by any other part of the building. Consequently, this would remain to be ascertained, either from the ground-plan or from a lateral elevation of the building, in which the cupola would be shown above the transept. One particular in which elevations differ materially from other drawings and from the appearance of the objects themselves, is, that no distinction is made between curved horizontal lines and straight ones: so that whether the part be a plane or curved surface, can be understood only from the shadowing, unless there happens to be something that assists in denoting curvature of plan. Thus, the mouldings of the base of a column are all straight lines; consequently, without shadow to express rotundity, we could not determine whether they belonged to a flat or round surface, unless the shaft be fluted, in which case the flutes will diminish in width, according to their distance from the centre, as may be seen by referring to the cuts in the article Column, pp. 385 and 386. So likewise, in respect to a tower without either apertures or vertical lines regularly placed, we cannot judge whether it be circular or not; whereas, if there be either, they suffice to show that the surface is curved, although represented only in outline: because the apertures and the spaces between them would become narrower in proportion as they are more distant from the centre, and their *reveals*, or inner surfaces, would appear. Still, without shadow, we should not know whether the surface was convex or concave, except by referring to the plan, or by the nature of the subject, there being no difference between the two as regards outline alone. This will be obvious when it is understood that the elevations of curved surfaces are projected, as it is termed, from their plans, by lines drawn perpendicularly to the geometrical plane of representation, which determine where the vertical lines to be shown in the elevation will fall, and the distances between them; consequently, whether the elevation be projected from a convex or concave plan, the result will be the same. When no curved parts occur in the elevation, the process just described is superfluous, because the measurements may be taken at once from the plan. The same method, however, it should be observed, is employed for polygonal figures as for circular or curved ones. Thus, of an octagon three sides would be shown in elevation: yet, although of the same width, the two diagonal or oblique ones will appear narrower than that seen directly in front; and the same applies to all oblique surfaces, let the angle they are placed at be what it may; and to such likewise as are oblique to the horizon as well as to those which are vertical. Hence a roof terminated by gables or pediments at the ends of the elevation will, as regards outline, be drawn as an upright plane, and the sloping lines of the pediment will appear vertical.

Notwithstanding, however, these circumstances, which are apt to perplex those who are prejudiced against geometrical drawings because they are not satisfactory as 'pictures,' a person at all accustomed to them is so far from being in danger of misconceiving them, that it would require an effort on his part to imagine the objects other than what the drawings are intended to express—to fancy a semicircular projection to be a plane, or the profile of a pediment to be upright.

Nevertheless, although the whole may be perfectly well nderstood, it is not always that sufficient allowance is nade, even by architects themselves, for the great differnce which sometimes occurs between an elevation and the uilding itself; or that the real effect is duly considered beorehand. Recourse is therefore occasionally had to what is ermed a *perspective elevation*—a kind of conventional epresentation, partly geometrical, partly perspective, and ombining in some degree the advantage of both modes, lthough strictly neither of them As in elevations of the sual kind, the building is shown exactly parallel to the icture, with the point of sight precisely in the centre, at he proper height from the ground, and as far as regards he first or principal plane, is treated as any other geomerical drawing; but the parts beyond this plane are thrown nto perspective so as to show the sides of projections, the offit of entablatures, the ceiling and pavement within poricoes, and how much of a dome or other part of the strucure, standing back from the front, would be concealed rom view, at a given distance. It may be further observed, hat elevations, both those of the above description and uch as are strictly geometrical, have very frequently a ictorial character given them, not only by colouring as vell as by shadowing, but also by the addition of sky nd background. Yet it would be better were such acompaniment no more than what is just sufficient to relieve he building, instead of being extended over the whole rawing, and carefully worked up; because it is calculated o seduce the eye, while, by making too great pretensions o the character of a picture, it causes the elevation itself o appear offensively formal and unnatural. In fact, *outline* levations (which mode is now generally adopted in modern rchitectural publications, especially foreign ones) are preerable to those which are shadowed, as they exhibit all the orms more distinctly, and admit of being measured with nuch greater exactness. They do not, indeed, convey any otion of effect; yet that may very well be dispensed with n such drawings, particularly if they be accompanied by erspective views.

We now come to speak of *sections*, which are for the nterior what elevations are for the exterior of a building. A section or profile (in French *coupe*, Italian *spaccato*, erman *durchschnitt*,) is a plane cutting through the strucure on some line of its plan, and showing the thickness of he walls and floors, the heights of the rooms, the forms nd profiles of ceilings, whether plain or decorated, flat, oved, or arched; also the exact forms of domes and skyights. In fact it exhibits all the separate elevations of the ooms intersected by such plane, that is, the elevation of hat side of them which faces or lies behind the plane of epresentation. In addition to the particulars just enumerated, we are by this means made acquainted with a variety f others, in regard to which a plan cannot be made to fford any information. The thickness of the walls may be scertained by the plan as well as by a section; so also night the height of the rooms be expressed in the former by means of figures, as the other dimensions generally are; nd the form and size of the windows may be learned from the elevations; still we should not know what are the heights of the doors, how they are panelled and decorated, nor what is the form of the chimney-pieces, &c.; nor be able to judge so well of the general proportions of the apartments. Besides which, sections may be made to show much more than what belongs to the architecture alone, for there are many instances in which furniture, pictures, and other decorations and fittings-up, are introduced; and unless this be done, a section is apt to have a naked appearance, except the architecture itself be particularly interesting and rich. For detailed and filled-up sections it is usual to employ outline, with the walls and floors shaded, the former as more solid being made much darker than the latter. When, on the other hand, the elevations of the rooms themselves are shadowed, the thickness of the intersected walls, &c. are left white, in order to prevent confusion and exhibit the profiles better. It should be observed, too, that in sections of this latter description, it is the practice to throw a shadow from the side walls and ceilings of the rooms, as if it were a model of the building really cut through; thus producing an effect both disagreeable and unnatural, and by no means assisting towards rendering the representation more intelligible. Indeed, indispensable and interesting as they are, sections are a far more conventional mode of drawing than elevations, because they represent a building as it never can be seen at all, except where the front of a house has been taken down for the purpose of rebuilding it, while the floors and partition-walls are left standing; in which case any one may obtain a good idea of the nature of a section, but of one seen in perspective. Besides general sections showing the whole of a building from top to bottom, there are frequently partial ones, showing only the rooms on one floor, or even a single room, when it is desired to show it on a larger scale than could conveniently be done any other way. Or instead of this, recourse is sometimes had to a plan of the room with each of its elevations or sides drawn around it, as if laid down flat on the ground, by which means the whole of the apartment is described; for the ceiling may be represented on the plan itself. Horizontal sections again are occasionally made use of, in order to show more accurately than can be done upon a plan, not only the ceiling and its ornaments, but the soffits of entablatures, of window recesses and door-cases, also the capitals of columns and their projection.

Although not in general use, there are likewise many other modes and combinations which deserve to be pointed out. One of them is that of elevation and section united; that is, one half the drawing shows half the elevation, which, as far as understanding it, fully answers the purpose of an entire one; while the other half shows half the section. Another is that of *sectional perspective view*, which, while it serves the purpose of a section in regard to showing the exact form, profiles, and measurements, on the first plane, intersecting the structure, gives also a picture of its interior just as it would appear in any other drawing of the kind; the only difference being, that in this case the drawing extends beyond the interior, while in other views it is bounded by and confined within it. It is hardly necessary to observe that such a mode is suited only for showing a single space, and not one divided into separate rooms. It is exceedingly well calculated for displaying the interior of a portico, as it admits of the situation of the columns in front being shown by the foreground being made a *perspective plan*.

Besides the usual plans, elevations, and sections, there must likewise be *details* or *parts at large*, answering in some respect to what are termed working drawings; since without these we can judge only of the general design, but not of its minutiæ and finishing, whether belonging to decoration or construction:—and far more may be learned, and that too more satisfactorily, by studying a single good example thoroughly, than by looking at many which are only imperfectly described. It is therefore to be regretted that published designs, unless they happen to be those of actual buildings, are so exceedingly defective in this respect, generally showing no more than a couple of plans with one or two elevations, while, although so very essential, sections are entirely omitted. In order to illustrate a subject properly, not only should there be a plan of every floor and an elevation of every side, but sections, both longitudinal and transverse, and as many of each as the nature of the plan may require.

Having done thus much to show the whole anatomy of the structure, we may then provide perspective views both of the exterior and principal parts of the interior, in order to show the character and effect, which, without such drawings, can be judged of only piecemeal, and inadequately even by those who perfectly understand the others. Yet however satisfactory as a representation, a perspective view of an interior must still leave much to conjecture, as one of the sides or ends of it cannot possibly be shown, while of the others two will be more or less foreshortened, so that if there be deep receding parts in them, they can be but imperfectly seen,—perhaps may be quite misunderstood; or can be well understood only by the aid of plan and section. In many cases, therefore, an interior would require two or even more perspective drawings in order to show it completely. But with every part of the building thus fully made out and described in drawings, the whole may be understood as well, in some respects even better, than by a model of it; for besides that the latter can do very little towards showing the interior—certainly not its effect, there is this drawback attending it, that it conveys no idea of situation or locality, and that, instead of the eye being confined either as to due distance or height, it views it from points from which the building itself can never be seen under any circumstances. Neither has it the accompaniment of sky, background, foreground: a model exhibits the mere building alone—as it is, certainly, yet not as it appears; for it is seldom any attempt is made to give the proper local colouring—at least to do more than merely hint at it. By means of perspective views, on the contrary, provided they be sufficiently numerous and judiciously chosen, and not deceptively embellished with effects of rare occurrence, we may obtain a most accurate idea both of the architecture and of all its local accompaniments and accessories, whether favourable or the contrary. Of *bird's-eye* views of buildings [Bird's-Eye] we have said nothing, both because they are now seldom made use of, and because we consider them not only most awkward, disagreeable, and unnatural representations in themselves, but as altogether superfluous, if a building is properly described by the other modes, or even by a block-plan and elevation alone.

DESMAHIS, JOSEPH-FRANÇOIS-EDOUARD DE CORSEMBLEU, was born in the year 1722, at Sully-sur-Loire. His father designed him for the law, but he devoted himself to poetry, and at the age of eighteen came to Paris, where he was well received by Voltaire, and admitted into high society. He distinguished himself by a number of little poems, which enjoyed a considerable reputation in their day, but which, as most of them are suited to particular persons and occasions, and moreover are filled with mythological allusions, have little interest at present. The Greek mythology was put to a peculiar use in the days of Louis XIV. and those of our own Queen Anne; poems were written altogether in the court taste, and yet perpetual references were made to pagan gods. Not the slightest attempt was made to write in the true spirit of the Greeks, as Shelley and other modern poets, who have chosen mythological subjects, have done of late. Hence a variety of little works, which acquired a great reputation during the reign of a certain fashion, have fallen into oblivion on that fashion having passed away. The poems of Desmahis are precisely of this class. He wrote some comedies, of which 'L'Impertinent' was very successful in its day, but attempts to revive it have proved ineffectual, and La Harpe has censured it pretty severely. Desmahis was greatly blamed for the articles 'Fat' and 'Femme' in the 'Encyclopédie.' Instead of writing something that contained information, he only made two satirical essays in the style of Rochefoucauld. He died in 1761.

DESMARAIS. [Regnier.]

DESMOND, and EARLS OF DESMOND. [Clare and Cork.]

DESPOTISM. [Monarchy.]

DESSALINES, JACQUES, a negro from the Gold Coast of Africa, was imported into the French colony of St. Domingo as a slave. Having become free like all his fellow slaves by a decree of the Convention, 4th February, 1794, he soon figured among the foremost in the insurrection of the blacks against the white colonists. He attached himself to the negro chief, Toussaint l'Ouverture, who made him his first lieutenant. His intrepidity, his extreme activity and quickness of movements, distinguished him in the war against the French troops, and particularly against generals Rigaud and Leclerc in 1802. After Toussaint's capture by the French, Dessalines submitted for awhile, and accepted an amnesty, but he was soon after at the head of a new insurrection against general Rochambeau, Leclerc's successor, and contributed greatly to the victory of the blacks at the battle of St. Marc, which decided the evacuation of the island by the French in October, 1803. Dessalines encouraged a general massacre of the whites, without distinction of age or sex. In 1804 he had himself proclaimed emperor of Haiti, under the name of Jacques I., and established his court in imitation of that which Bonaparte had just formed in France. But his cruelty and arbitrary conduct towards his former comrades led to a conspiracy, at the head of which were the negro chief Christophe, and Pethion, a mulatto. They rose upon Dessalines at a review, in October, 1806, and killed him on the spot. Christophe succeeded him as emperor of Haiti, by the name of Henri I.

DESSAU, ANHALT, a Saxon duchy in the north-west of Germany, bounded, where its limits do not touch the other duchies of Anhalt, Bernburg and Cöthen, by the Prussian province of Saxony. It is composed of six detached portions of territory, situated on the banks of the Elbe, Mulde, Fuhne, and Wipper; and they are subdivided into

	Towns.	Market Towns.	Vill.	Houses.	Population.	Chief Town.
1. Dessau Proper.						
Bailiwick of Dessau	1	..	14	1638	13,700	Dessau, 10,930
" Qualendorf	2	..	18	2372	6,290	Radegast, 1180
" Oranienbaum	..	1	26		10,500	Oranienbaum, 2070; Wörlitz, 1910
Town of Raguhn, on an island of the Mulde	1	..	..	200	1,670	
Town of Jessnitz, on the Mulde	1	..	..	340	2,380	
2. Bailiwick of Gröbzig	1	..	10	430	2,930	Gröbzig, 1310
3. " Sandersleben	1	..	7	880	5,250	Sandersleben, 1790
4. " Gross Alsleben	..	1	2	260	1,770	Gross Alsleben, [illegible]
5. " Greater Zerbst 6. " Lesser Zerbst	1	..	24	2180	12,790	Zerbst, 8570
Total	8	2	101	8300	57,210	

The duchy has an area of about 357 square miles: it extends from 11° 30′ to 12° 35′ E. long.; its most southerly point is in 51° 39′, and its most northerly in 52° 7′ N. lat. With the exception of some high ground in the bailiwick of Sandersleben, it presents a uniform and beautiful plain, the surface rising slightly along the banks of the Elbe and Mulde. The character of the soil varies considerably; the districts adjoining the Fuhne and Wipper are highly cultivated, and fertile in grain, vegetables, &c.: the vicinity of the Elbe and Mulde is noted for its rich meadows and pastures; but the soil of Zerbst is poor and hungry, and many parts of Dessau Proper are sandy heaths. In general it may be said that the districts on the left bank of the Elbe are extremely fertile, and on the right bank sandy and unproductive. A fifth part of the surface of Anhalt-Dessau is covered by woods and forests, which occupy about seventy-three square miles, mostly on the left bank of the Elbe, about Wörlitz, Oranienbaum, &c., and from the abundance of game still render the duchy as famed in Germany as in former times.

The chief river is the Elbe, which traverses Anhalt-Dessau from east to west, and divides it into two very unequal parts, of which the larger lies on the left bank: its banks are defended by strong dams, called 'the Elbewall,' for the purpose of checking the inundations which at times devastate the adjacent lands. The Elbe separates Zerbst from the Prussian dominions, and is traversed by a flying-bridge, about three miles north of Dessau. All the streams in the duchy are tributaries of this river, either directly or indirectly; those of any importance which flow directly into it are the Mulde, a navigable stream, well known for its salmon, which comes from the bailiwick of Alsleben, receives the Wipper, and meets the Elbe at Henscheinen above Dessau, and the Ruthe, which enters the duchy from Zerbst. The minor streams, indirectly tributary to the Elbe, are the Taube, Wipper, Fuhne (the only native river of Anhalt-Dessau), and the Ziethe or Zittau, which flows into the Fuhne: the three first uniting their waters with the Saale, a tributary of the Elbe. The duchy is full of 'stillinge,' narrow tracts of successive ponds or pieces of water, which bear evident traces of having been parts of the former beds of rivers; they partially skirt the course both of the Mulde and Elbe. There are a number of lakes also, the largest of which is the Pötnitz, situated between the Mulde and Elbe, and close to their confluence; the high road from Dessau to Oranienbaum passes across it by means of a wooden bridge, resting on stone piers. Lake Schönitz is of considerable length, and connected with Lakes Rehsen, Röttingen, and Döbritz. But the most picturesque is Lake Wörlitz, which is also connected with Lake Röttingen. All these receive their waters from the Elbe, and are supposed by many to have once been portions of an old bed of that river.

The climate of Anhalt-Dessau is temperate and healthy, though the inhabitants suffer at times from fevers and other diseases occasioned by inundations.

The industry of the people, encouraged by the paternal care of the government, who introduced the English system of husbandry in the latter part of the last century, has brought almost every available tract under cultivation, and placed the duchy in a situation to produce more grain than its wants require: and the same remark applies to fruit and vegetables. It grows all the ordinary descriptions of corn, as well as hops, hemp and flax, pulse, succory, madder, tobacco, rape seed (from which about 220 tons of oil are annually obtained). Buckwheat is raised in Zerbst, and yields large crops in wet seasons.

There are no mines in Anhalt-Dessau, nor any quarries, except those of limestone in the bailiwick of Sandersleben; neither has any advantage yet been taken of the beds of salt near Gröbzig and Sandersleben. There are beds of coal near the last-mentioned place, where also gypsum is dug; and at Qualendorf a species of agate is found which, when polished, has the appearance of diamonds. The soil near Zerbst is impregnated with iron, and there are chalybeate springs in this quarter. Here and there potters' clay and porcelain earth are obtained.

Game is so important a product of the duchy that the seignorial revenues derived from boars alone have at times amounted to 6000 rix dollars (about 850*l.*) a year. In 1688 we are told that 215 of these animals, some of them weighing from 4½ to 5½ cwt. each, were taken in one day. During the twenty years' interval, 1810 to 1829, 19,859 red deer and boars, including 2359 of the latter, were caught or killed. The lakes and rivers afford a good supply of fish, among which the salmon of the Mulde is highly esteemed; of this fish the produce for the seven years, 1817—1823, was 3348. Shadfish and sturgeons of large size are caught, and the lamprey is at times plentiful in the Mulde.

The duchy of Anhalt-Dessau, 23 years before the duchy of Zerbst was united to it in 1770, contained 31,909 inhabitants: in 1787 it had increased to 36,093; at the time of the union, in 1793, it was estimated at 38,000, exclusive of upwards of 10,000 for Zerbst; in 1812 the united territory had a population of 53,608, including 13,608 for Zerbst, at least according to Crome's returns. If he be correct, the numbers must have fallen off in the six years succeeding, inasmuch as they did not amount to more than 52,947 at the time of the census in 1818. The subsequent returns in 1830 state the number of houses in the whole duchy to be 8293, and of inhabitants 57,629, of whom 1125 were Roman Catholics and 1614 Jews. The males amounted to 27,471, and the females to 30,158. In the towns there were 4310 houses and 31,492 inhabitants; and in the rural districts 3983 houses and 26,137 inhabitants. Lindner observes that the duchy is more densely peopled than the other two duchies of Anhalt, Bernburg and Cöthen.

The rearing of cattle is an object of much attention in all parts, particularly on the private domains of the duke, which are very extensive, contain between 4000 and 5000 inhabitants, are let in large farms, and raise large crops of clover. The duchy abounds in fine pasture land. The whole stock of horned beasts in 1830 was 14,826, and most of them are of improved breeds. Greater care is taken of the flocks than in almost any other part of Germany, and the whole of those on the ducal dominions have been improved by crossing them with Merinos. Of sheep of all kinds the numbers in 1830 were 85,831. Less attention has been bestowed on the breed of horses, the stock of which in 1830 amounted to 4743. Swine are very generally reared.

The inhabitants being chiefly engaged in agriculture and rearing cattle, comparatively little attention is paid to manufactures. Linen-yarn is spun by the female peasantry in winter, and linens, including damask-cloths, are woven by small manufacturers and under the peasants' roofs, for home consumption only. There are manufactures of woollen cloths in Raguhn and Jessnitz, and on a smaller scale in Dessau, Zerbst, and other towns, whence there is some exportation.

There are tobacco manufactories at Dessau and Zerbst, and in the latter town an earthenware manufactory and wax bleaching grounds, as well as a large manufactory of gold and silver articles. Anhalt-Dessau has oil and paper mills, tile-houses, limekilns, potash and tar works, and tanneries, and manufactures leather, turnery, &c. The manufacturing part of the population, however, did not, in 1830, exceed 2796 masters and 2060 assistants, of whom upwards of one half (2557) were settled in the bailiwicks of Dessau and Zerbst.

The trade of Anhalt-Dessau is chiefly internal. Its external transactions do not amount to more than about 150,000*l.* per annum, imports and exports both inclusive. The exports consist principally of grain, rapeseed-oil, butter, cheese, timber, game, dried fruits, wool and woollens, fish, pork, linen-yarn, tobacco, turnery, and gold and silver wares. The imports consist of drugs and colonial produce, cottons, silks, &c. Dessau and Zerbst are the chief seats of trade.

The duke is uncontrolled sovereign, except with regard to taxation, which is subject to revision by the states-general of the three Anhalt duchies; and the affairs of the country are administered under his immediate direction by a secret cabinet (*geheime-kabinet*), and the revenue-board (*rent-kammer*), the latter of which administers the ducal revenues and domains as well as all matters of police. The supreme tribunals of justice are at Oranienbaum, Qualendorf, and Zerbst, in which last town is a high court of appeal for the three Anhalt duchies and the principalities of Schwarzburg-Rudolstadt and Sondershausen. The revenues (including about 19,000*l.* arising from the duke's isolated domains in Eastern Prussia, Brandenburg, and other parts of the Prussian dominions, of which the whole area is about 189 square miles, and the population about 12,000), are estimated by some at about 65,000*l.*; but Crome is of opinion that they are much underrated at that amount. The public debt is said to be about 92,000*l.* The military, on a war-footing, consist of a battalion each of regulars and militia; and the duke's contingent for the army of the German Confederation is 529 rank and file.

The national religion is the Lutheran; the non-conformists consist of about 1600 Jews and 1100 Roman Catholics. The number of parishes is 53, divided into two general superintendencies at Dessau and Zerbst. There are gymnasia or high schools in Dessau and Zerbst: in the former a seminary for educating teachers, and a Jewish school; and the duchy is so well provided with elementary and other schools that the proportion of children receiving instruction exceeds one in every nine inhabitants. (Lindner's *Hist. and Descript. of Anhalt;* Crome's *Anhalt-Dessau;* Hassel's *Principalities and Freestates of Germany;* Von Stein, Hörschelmann, &c.)

DESSAU, the capital of the duchy of Anhalt-Dessau, is situated on the left bank of the Mulde, about two miles from its junction with the Elbe, in 51° 48′ N. lat., and 12° 18′ E. long., at an elevation of 116 feet above the level of the sea. The town is about half a league in circumference. three sides of it are enclosed by a wall, and the fourth, towards the east, is bounded by the Mulde, which is crossed by a handsome bridge. Dessau has six gates, and is divided into the Altstadt, Neustadt, and the Sand, and three suburbs: it contains seven public squares, and thirty streets, which, upon the whole, are well and regularly built. Dessau may in fact be ranked among the better class of German cities: the Cavalier Street, would be an ornament to any capital, and some of the public buildings are handsome, especially the palace of the dukes of Dessau, which is a noble edifice, and contains some beautiful specimens of the old masters, and collections of works of art, coins, and engravings, among which are many excellent architectural designs; the palace or ducal chapel contains a chef-d'œuvre of Lucas Cranach, 'the Last Supper,' in which he has introduced portraits of Luther, Melancthon, and other contemporary characters. Among the other buildings we may mention the palace of the duchess-dowager, the town-hall, four churches, of which two are of the Reformed Lutheran ritual, one Lutheran, and one Roman Catholic; one synagogue, two hospitals, a poor-house, orphan asylum, infirmary, the Amelia and Wilhelmina foundation for the indigent and infirm; a theatre and musical academy, the fine ducal riding-school, and the public cemetery, which is laid out with great taste, and embellished with an elegant entrance in the Roman style.

Dessau is well supplied with schools of public instruction. The Franz school, for the education of Jews, is known throughout Europe. The gymnasium, or high-school, too, is an admirable institution, both for its system of instruction and the attention bestowed on the pupils. It took its rise from the Philanthropin, which was founded by Duke Francis in 1774, and remodelled in 1785. It is divided into three departments: an upper or classical school, consisting of five classes, which in 1819 had 79 pupils, and in 1830, 116; a citizens (bürger) school of three classes, which in 1819 had 123 pupils, in 1830, 160; and the elementary-school, which is preparatory to the two others, has four classes, and had 217 pupils in 1830. A small library and collection of models is attached to the gymnasium, which is besides in connection with the seminary for school-masters. Another excellent institution is the Louisa school of industry for the spinning of flax and cotton, the profits arising from which are partly divided among the children, and partly deposited in a savings'-bank; there is likewise a society for apprenticing young men to trades. The total number of children receiving instruction in the various public schools in Dessau is estimated at 1750, of whom 1020 are boys.

The population of Dessau in 1818 amounted to 9136, of whom 807 were Jews; in 1830, including the suburbs, it contained 1005 houses and 10,611 inhabitants, of whom 763 were Jews; and in 1836 the population was estimated at 10,900. They have but few manufactures, principally of cloth, stockings, hats, tobacco, vitriol, silver-lace, and beer: the retail trade is almost exclusively in the hands of the Jews. It however carries on a considerable trade in grain, &c., and has a salmon fishery on the Mulde. Dessau has three annual fairs. It is the birth-place of the philosopher Moses Mendelsohn, who died in 1786. In the environs are the ducal villas of Louisium, Georgium, and Vogelheerd, with gardens laid out in the English taste; the Drehberg is the burying-place of the dukes of Anhalt Dessau, which is excavated in an artificial mount, planted with shrubs, and surmounted by a building with a lantern and cupola; and the Stieglitzberg on the Elbe, with the monument to the memory of the duke of Dessau, who fell at the battle of Torgau.

It seems probable that Dessau, like many of the neighbouring towns, was built by the Dutch in the latter half of the twelfth century, under Albrecht the Bear; and though it is not mentioned by any existing records until 1213, it is, with some probability, conjectured that the church of St. Mary is of earlier date, the hospital having been erected some time previous to 1228. The school, which is the oldest in Anhalt, was founded in 1313. [ANHALT.]

DESTOUCHES, PHILIPPE NERICAULT, was born at Tours, in 1680. He much displeased his relations by turning actor, when they had designed him for the law. He wandered from town to town as director of a company of comedians, among whom he was distinguished by his strict morality and his great regard for religion. His first dramatic piece, 'Le Curieux Impertinent,' (founded on the episode of the same name in Don Quixote) was acted in 1710, and received with enthusiastic applause. Three pieces which followed seem to have had more success than they merited. In 1717 Destouches accompanied Cardinal Dubois to England, where he married an English Catholic lady, with whom on his return to France he retired to an estate in the country, where he passed nearly all the remainder of his life. In 1723 he was chosen a member of the Academie. About this time commenced his great reputation as a dramatist, for though his former pieces had been successful, they rose little above mediocity. His 'Philosophe Marié' raised him to a high rank among the comic writers of France, and the envious critiques which were written against it only showed how highly it was valued. 'Le Glorieux,' which followed, was by some critics considered even superior to 'Le Philosophe Marié,' and La Harpe seems to be of this opinion; however the latter is generally considered the most perfect. He continued to write for the stage till his sixtieth year, though the pieces he produced were not equal to the two already mentioned; one of the most favorite was 'La Fausse Agnés,' a farcical comedy resembling Murphy's 'Citizen.' From that time he devoted himself to theology, and wrote several essays against infidelity. He died in 1754.

The 'Philosophe Marié,' on which, as we have seen, the fame of Destouches chiefly rests, is a model in its way. Although the subject and style of the whole are generally serious, there are situations and scenes which can scarcely be excelled for humour. The moral tendency of the piece is such as must give pleasure to a well-constituted mind. There are no hacknied sentiments or mawkish expressions, but the best of feelings are pourtrayed, and exhibited in so attractive a form, that even the bad characters of the piece are overcome by them, and the spectator feels that their conversion is perfectly natural. The very weaknesses which the author has implanted in his virtuous characters show that he knew human nature to be more interesting than a picture of faultless abstractions.

DESVAUXIA'CEÆ, an obscure and little known natural order of plants, consisting of a few New Holland sedge-like herbs, of no known utility. They are nearly related to Restiaceæ and Cyperaceæ, and are principally characterized among other glumose endogens by having several carpels placed in the middle of each flower. The most recent character is the following, given by Endlicher, in his 'Genera Plantarum.'

Dwarf Australian herbs with the appearance of a pigmy Cyperus or Scirpus; the roots fibrous or fasciculated. Culms filiform, undivided, leafless. Leaves radical, between thread-shaped and bristly, sheathing at the base. Spikelets hermaphrodite, in two ranks, one-flowered, or terminal and solitary with one or many florets. Glume single, anterior, or two nearly opposite each other, coarse. Paleæ none, or delicate, single or double, parallel with the glumes. Stamen single, anterior. Filament filiform, simple. Anthers turned inwards, one-celled, attached by the back above the base. Ovary either single and sessile (we would exclude this character) or several attached to a common axis at different heights, imbricated downwards, one-celled. Ovule solitary, suspended from the apex of the ovary, orthotropous, with the foramen regarding the base of the ovary. Styles filiform, simple, united to each other at the base. Stigmas simple, or with a feathery beard. Utricles membranous, dehiscing lengthwise at the side. Seed orthotropous, pendulous; skin leathery and rather hard. Albumen fleshy and abundant. Embryo antitropous, lenticular, applied to the albumen at the extremity of the seed opposite the umbilicus; the radicular extremity papillose, and regarding the base of the fruit. (*Genera Plantarum*, p. 119.)

DETACHMENT, in military affairs, is a certain number of battalions of infantry and squadrons of cavalry which are selected from an army for the purpose of being employed on some particular duty.

The danger of being beaten in detail renders it, generally speaking, improper to have considerable divisions of an army far separated from the main body, but in warfare many circumstances occur which render such a measure adviseable; as, for example, the necessity of keeping possession of certain important positions while the rest of the army is otherwise employed; of masking a fortress, or keeping a body of troops in check, during the temporary advance of the army into the enemy's country; or of protecting the magazines and ensuring the safety of convoys with provisions or stores. In these cases however, great precautions should be taken that the detachment may not be cut off; it should therefore be protected by some fortified place, or its distance from the main body should not be so great as to prevent it from rejoining the latter before it can be attacked by a superior force: good roads should of course exist, or be formed, by which it may retire if compelled.

Detachments, when judiciously disposed on a field of battle, may contribnte much to a victory by turning an enemy's flank while a powerful attack is being made in front; but the greatest foresight and a perfect knowledge of the ground are necessary in order that the operations of the main body and the detachment may take place at the proper times. The king of Prussia (Frederick II.) seems to have been averse from making detachments on the field of battle; and, in his Instructions to his Generals, he observes, that they generally arrive too late or too early at the appointed place, on which account they frustrate the object which was intended by them. He quotes as examples, the defeat of Charles XII., at Pultawa, in consequence of the detachment which he sent out on the preceding evening having lost its way; and the failure of Prince Eugene to surprise Cremona from some such cause. The objection however does not apply when the army is able to make detachments without weakening itself too much, and when the divisions are not separated by local obstacles which might prevent them from succouring each other if required. At the battle of Vittoria, in 1813, the troops under General Graham may be considered as forming a detachment from the principal part of the army commanded by Lord Wellington and Sir Rowland Hill; and, as the communications between the divisions were very difficult from the nature of the country, so that the commanders were obliged to act independently of each other, the circumstances must have been very unfavourable for a unity of action; yet the event justified the measures taken, and the victory there gained completed the deliverance of Spain.

When an officer is detached with a few troops to watch an enemy, he should endeavour to get well acquainted with the ground, in order that he may be enabled to change his position according to circumstances, and he should keep his division concealed as much as possible. He may act offensively if a favourable opportunity should present itself, but, in general, his object is to gain information and keep the enemy on the alert rather than to fight. Men of intelligence should be appointed to such commands, which are frequently attended with considerable difficulty and danger but, on that account, the officer has the greater chance of distinguishing himself.

Small detachments are sent out in presence of the army to perform outpost duty, to throw up field-redoubts, repair bridges, roads, &c., or to protect the flanks on a march.

DETERMINATE, a word applied in mathematics to those problems which have one answer only, or at least a certain and finite number of answers. Thus the problem, 'given the base of a triangle, and the sum of the other two sides, to construct the triangle so that its vertex may be on a given straight line,' is determinate; for the number of ways of solving it cannot exceed two. But if we omit the condition that the vertex is to be upon a given straight line, and merely require that a triangle shall be constructed having a given base, and two other sides of a given amount of length, the problem becomes indeterminate, that is, has an infinite number of solutions. The peculiarities of this subject, namely determinate analysis, are not striking: it is to the word INDETERMINATE that we must look for the most characteristic points of distinction.

DETINUE is the form of action prescribed by the English law for the recovery of goods and chattels which have lawfully come into the possession of a defendant either by delivery or finding. It does not lie for real property, but for mere personal chattels, except only deeds and charters. [CHATTELS.] In this action the plaintiff recovers either the thing detained, or if the thing cannot be had, the value of it, with damages for the detention. In order to enforce the redelivery, the court will frequently give very large damages, with liberty to reduce them to a small amount on payment of costs and return of the thing itself. This is the only remedy at law for the recovery of a personal chattel in specie, unless in those cases where they can be recovered by replevin. The action of detinue is similar to the actio depositi of the civil law, and is identically the same in its properties, process, circumstances, and forms as the action of debt, with this difference, that one is for the recovery of a chattel, the other of money. In order to ground an action of detinue, which is only for the detaining, these points are necessary: 1. That the defendant came lawfully into the possession of the goods. 2. That the plaintiff have a property. 3. That the goods themselves be of some value. 4. That they be ascertained in point of identity. As in this action the defendant might formerly wage his law [DEBT], it has of late given place to the action of trover [TROVER], but the wager of law having been abolished by 3 and 4 W. IV.. c. 42, it is probable that the action of detinue will again come into use. (F. N. B.; Fitzherbert, *Natura Brevium*.)

DETMOLD. [LIPPE.]

DETONATION is a chemical term employed to express combination or decomposition which occurs with noise and frequently with combustion. It may take place between bodies in very different states, as between gaseous bodies, a gas and a solid, &c. One of the simplest and most powerful cases of detonation is that which happens when two volumes of hydrogen gas and one volume of oxygen gas are mixed, and fired either by the taper, electricity, the action of spongy platinum or sudden compression; in this case the detonation is loud, and the result of the chemical action is water formed by the union, in the proportions stated, of the gases above mentioned.

The sun's rays falling suddenly on a mixture of hydrogen and chlorine gases cause them to detonate and combine with the formation of hydrochloric acid. A detonating tube for the union of gases is termed a eudiometer. [EUDIOMETER.]

Detonation also occurs when phosphorus, with chlorate of potash or with nitrate of lead, &c., is struck. And there are certain combinations of metallic oxides which detonate or fulminate, by slight friction, by heat, electricity, or sulphuric acid; such are the ammoniuret of silver and gold, fulminate of silver and of mercury. The chloride of azote and the iodide of the same element are very powerful detonating bodies. In some cases, as has been mentioned, the result of detonation is combination, as when oxygen and hydrogen unite to form water, chlorine and hydrogen to form hydrochloric acid, &c. In other cases decomposition occurs and is the result of detonation. Thus ammoniuret of gold is separated into metallic gold, and the ammonia is decomposed; iodide of azote separates into its elements, the iodine appearing as a purple vapour, and the azote assuming the gaseous form

DETRI'TUS and **DEBRIS**, two words now universally received into the language, the former of Latin, the latter of French origin. They are very frequently employed in works of geology and physical geography, when treating of the formation of alluvial deposits. By *debris*, in geological language, is meant generally the fragments of rocks, boulders, gravel, sand, trunks of trees, carcasses of animals, &c., detached from the summits and sides of mountains by the effect of the elements, or resulting from sudden convulsions at the surface of the earth. By *detritus* we understand the same debris finely comminuted or pulverized by attrition. Debris in general comprises detritus; but detritus excludes the idea of the larger debris.

Modern debris seldom extend beyond the foot of the mountains whence they are derived, the channels of torrents, and the higher parts of the beds of rivers; detritus alone, except in the case of such things as float, being carried down to the mouths of large streams. The boulders which lie strewn over such great extents of land, and which are found at great depths below the surface soil, together with fossil trees, bones of animals, &c., are the debris of a former age, no cause now in action being apparently capable of bringing them to such distances from their original sites.

DETROIT, a fortified town and capital of the Michigan territory or State (for we believe Michigan has, in the present session of congress, 1836-7, been admitted into the Union) in the United States of America, is situated in Wayne county, on the bank of the river Detroit, one mile from Lake Saint Clair. The town was founded by the French about the year 1670; it was taken in 1812 by the English under General Brock, and recovered in the following year by the Americans under General Harrison. The fort is a regularly constructed work, with parapets and bastions, and surrounded by palisades, a deep ditch, and glacis.

Detroit is a thriving place, and carries on an active trade with Ohio and New York. Several lines of railroad have been projected, which, when completed, must add importantly to the trading facilities of the town. One of these lines, to connect Detroit with the east side of Lake Michigan at the mouth of the river Saint Joseph, was begun in the spring of 1836; when completed it will be nearly 200 miles long, and will accomplish a direct line of communication between Lake Michigan and New York, through Lake Erie. There were, belonging to the town in 1834, 13 steam-boats and 69 other vessels of the aggregate burthen of 4913 tons. The population of Detroit in 1821 was 1422; it had increased to 2222 in 1831, since which time the number has been greatly augmented. There are two incorporated banks established in the town, with capitals amounting to 1,550,000 dollars. Detroit is 526 miles north-west from Washington.

DETTINGEN, a market-town in the circle of Aschaffenburg and province of the Lower Main, in Bavaria: it lies on the right bank of the Main, has 80 houses and about 600 inhabitants. It was the scene of the signal victory obtained, on the 26th June, 1743, by the allied forces of England and Austria over the French army under the Marshal Duke de Noailles. The allies were commanded by the earl of Stair, and animated by the presence of George II., king of England.

DEUCA'LION, a prominent personage in the mythical traditions from which Greek history sprung up. He is represented as the son of Prometheus and Clymene (Schol. Pind. *Olymp.* ix. 72), or of Prometheus and Pandora (Strabo, ix. p. 443, and others), and is sometimes called the father (Thucyd. i. 3), and sometimes the brother of Hellen (Schol. Apollon. iii. 1086), the reputed founder of the Greek nation. The seat of his authority was Thessaly, from which, according to general tradition, he was driven to Parnassus by a great deluge (Apollodorus, i. 7, 2), which, however, according to Aristotle (*Meteorol.* i. 14), occurred between Dodona and the Achelous. But whatever may have been the scene of Deucalion's deluge, the old traditions represent it merely as a local one; and it was not till the time of Ptolemy Philadelphus, when the Hebrew scriptures became known to the Greeks, that some features borrowed from the universal deluge of Noah were incorporated into the story of the Thessalian flood. (See Clinton's *Fasti*, vol. i., p. 43, note.) The legend which tells how he repeopled the wasted district by throwing stones behind him on Mount Parnassus, in obedience to the injunctions of the oracle of Themis, is well known to the readers of Ovid. (*Metam.* i.

375, foll.) The date assigned to Deucalion by the Parian Marble is 1548 B.C., and by Eusebius 1541 B.C.; but the stories connected with his history are so manifestly fabulous, that doubts as to his actual existence are unavoidably entertained, and it seems reasonable to conclude that he was a mere personification. It must be confessed that there are no etymological grounds for thinking so, as appears to be the case more or less with the early kings of Attica (*Philolog. Mus.* ii., p. 345, foll.), for the name Deucalion seems to signify nothing more than 'the illustrious' (Hesych. sub v. δευκές), and is a possible name for a real person; it was also borne by a son of Minos II. (Apollod. iii. i. 2.)

DEULE, CANAL DE, is chiefly in the department of Nord in France. It commences in the river Scarpe and runs north-west to the neighbourhood of La Bassée; a small canal from that place joins it. It then turns to the north-east, passes through Lille, and turning again to the north-west joins the Lys at Denslemont near Warneton. Its course is partly in the department of Pas de Calais. Its whole length is about 40 miles. The part from the Scarpe to Lille is called Haute (or Upper) Deule, and was finished in 1690: from Lille to the Lys it is called Basse (or Lower) Deule.

DEUTERO'NOMY, the fifth book of the Pentateuch, or five books of Moses. The Hebrew title אלח חדברים, al*e*h h*a*d*e*b*a*rim, 'These (are) the words,' consists as usual of the commencing phrase, a mode of appellation similar to that adopted in technically quoting a legal instrument. Among the Rabbins it is also called *sepher tuckhuth*, 'the book of reproofs,' or 'denunciations,' of which there are many, as in chs. iv. ix. xxviii. xxx. xxxii; and *Mishneh torah*, the repetition of the law, a restatement being made in this book of the Mosaic laws contained in the preceding books of the Pentateuch. The Greek title Δευτερονόμιον, *deuteronómion*, given in the Septuagint translation, is equivalent to Mishneh torah, being composed of two words signifying 'second' and 'law.' By the Jews this book is divided into ten paraschioth, or chapters. In the translations the number of chapters is thirty-four. The events directly related by the writer are comprised in a period of five lunar weeks, from the commencement of the eleventh month to the seventh day of the twelfth month of the fortieth year of the wandering of the Israelites in the wilderness, after their departure from Egypt. The book is generally considered to have been written A.M. 2553, or 1451 B.C., by Moses, in the last year of his life, when at the age of 120, and in the plains of Moab (i. 5; *Numbers* xxxiii. 50, xxxv. 1), near the ford of the Jordan, where the Israelites afterwards crossed over into Canaan: not 'over against the Red Sea' (i. 1), as in the authorized version, where the word סוף, Suph, the name of a city or nation, is wrongly translated the Red Sea, but as Dr. Geddes reads, 'in the wilderness on the other side of the Jordan, in the plain, over against Suph,' only 'eleven days journey from Mount Horeb,' the Israelites on their way from thence to the Jordan having wandered about nearly forty years. The opinion which attributes the authorship of this book to Moses is attended with difficulties which have induced Eichhorn and other learned commentators to assign a much later date to it than the age of Moses. The concluding chapter, which gives an account of the death of Moses, and of his having been buried by God, is believed by most but not by all of the commentators to have been not written by Moses, for some consider this account as a prophetic one, related in the past tense, a practice not unusual among the Jewish prophets. This last chapter is supposed by others to have been jointly or rather successively supplied by Joshua, Samuel, and Esdras. Dr. Adam Clarke adopts the opinion that it is properly the first chapter of the following book of Joshua. (Clarke's *Bible*, Alexander's *Heb. and Eng. Pentateuch*). This opinion seems probable, as the Pentateuch in some synagogue copies is written as one continuous whole. However the assertion in verse 10, that 'there arose not a prophet since in Israel like unto Moses,' indicates a longer subsequent period than that from the death of Moses to the death of Joshua; and it must be remarked that the book of Joshua contains an account of the death and burial of Joshua (xxiv. xxix. xxx). The first book of Samuel also gives an account of the death and burial of Samuel (xxv. 1). Calmet suggests that the parts of the book of Deuteronomy which are not attributable to Moses may have been written by Aaron; but unfortunately for this suggestion the book itself contains an account of the death and burial of Aaron, as having occurred long before the earliest time at which it is supposed to have been written. (Deut. x, 6.) Some writers have assumed that the whole book was written considerably after the age of Moses, probably after the return from the captivity of Babylon, when the sacred canon was re-collected and arranged.; and they maintain that the entire plan of the book indicates it to be the work, not of Moses, but of another writer, who relates the proceedings of Moses historically in the third person, and occasionally introduces him as speaking at length in the first person. This dramatic style of the antient Jewish historians commences at the sixth verse of the first chapter whence Moses speaks in the first person to verse 41 of chap. iv. The remaining nine verses of this chapter, and the beginning of verse 1 of chap. v., are by the writer. Moses is thence represented as speaking until chap. xxvii; in the 1st, 9th, and 11th verses of which the writer speaks. Thence, to the end of chap. xxviii., the words of Moses are continued. In verses 1 and 2 of chap. xxix. the writer speaks, and again in chap. xxxi., verses 1, 7, 9, 10, 14, 16, 22, 23, 24, 25, and 30; in chap. xxxii., verses 44, 45, and 48; in chap. xxxiii., 1; and finally throughout the xxxivth and concluding chapter. In the translation of the Bible by Dr. Geddes, all the parts consisting of the words of Moses are distinguished by inverted commas from the words of the writer by whom they are introduced. Besides an historical repetition from the preceding books of the Pentateuch of the events which passed throughout the forty years from the departure from Egypt, the book contains a complete recapitulation of the moral, ceremonial, and judicial law, exhibited in the preceding books of Exodus, Leviticus, and Numbers, with alterations, and some additions; as, for instance, that of the law (xxi. 18) which requires the parents of a stubborn son to lead him forth to be stoned to death by his fellow citizens. In repeating the 4th article of the decalogue (v. 12, 15), a difference from Exodus (xx. 8, 11) in the reason assigned for the sanctification of the Sabbath has occasioned considerable controversy on the subject. It is said in Exodus, 'the Lord rested on the seventh day, *wherefore* he blessed and hallowed the Sabbath day.' In Deuteronomy it is said, 'the Lord brought the Israelites out of Egypt, *therefore* he commanded them to keep the Sabbath day.' The thirteen first verses of chap. xxviii. proclaim the blessings promised to the observers of the law, and the fifty-five following verses recite the curses on the disobedient. The twelve last verses of the xxviith chap. contain the twelve curses which serve to compose the Commination of the English Liturgy. The passages in chap. xviii. 15, 18, 19, are considered as prophetical of the Messiah, on the authority of Acts iii. 22, 23; and vii. 37. Chap. xxxii. consists of the last song of Moses, the poetry of which, in the opinion of a very competent judge, Bishop Lowth, is singularly magnificent. Dr. Adam Clarke remarks, that 'very few parts of the Old Testament Scriptures can be read with greater profit by the genuine Christian than the book of Deuteronomy,' which is to be considered as correlative with St. Paul's Epistle to the Hebrews. Some important amendments are proposed by Dr. Kennicott, in his 'State of the Hebrew Text,' especially in chap. xxxiii. 1-5, the adoption of which Dr. Clarke recommends, on account of 'the impossibility of giving a rational meaning to the text as it now stands.' In Wilson's 'Archæological Dictionary,' article *Law*, a valuable tabulated exhibition is given of the whole Mosaic Law, in three classes, moral, ceremonial, and political, with the places of references to Exod., Levit., Numb., and Deut. Dr. Adam Clarke concludes his commentary on the book with six elaborate chronological tables, for which he deserves the thanks of every biblical student. The 'Biblioth. Brit.,' by Watt, contains a numerous list of sermons and commentaries on Deuteronomy. (Eichhorn's *Einleitung in das Alte Test.*, abtheil ii., p. 385-433; Poli *Synopsis Criticorum*, tom. i., p. 751-895; Calmet's *Dict.*; Horne's *Introduc.*, vol. iv., p. 24; *Horæ Mosaicæ*, by Rev. G. Faber; *Lectures on the Pentateuch*, by Dr. Graves; *Comment. on the Mosaic Laws*, by Michaelis, trans by Dr. Smith.)

DEUTZIA, a genus of deciduous shrubs, inhabiting the North of India, China, and Japan, and nearly allied to Philadelphus, with whose species they agree in habit, but from which they differ in having their flowers generally smaller and more panicled, and in the filaments being toothed, and placed on the outside of a cup-shaped disk.

DEUXPONTS (Germ. *Zweibrücken*), formerly a duchy but now a bailiwick (*Land-comissariat*) in the south-western part of the Bavarian province of the Rhine, is bounded on the south by France, and on the west by the Prussian province of the Lower Rhine. It has an area of about 1181 square miles, and a population of about 140,000 souls: and contains three circles, five towns, five market-towns, and 208 villages. The general character of the country is mountainous, with many gentle eminences, whose declivities and lowest parts are rich in woods, corn-fields, pastures, and vineyards. The principal river is the Blies, into which flow the Erlbach, Hornbach, Schwolb, and other streams. Deuxponts produces rye, barley, oats, and other grain; rapeseed, flax, and hemp are cultivated in large quantities, but the two last are not converted into manufactured articles. Much attention is paid to the rearing of horses and cattle, and particularly to the breeding of sheep. There is abundance of wood. The only minerals are iron, copper, and freestone. There are few manufactures.

DEUXPONTS, the capital of the bailiwick, in 49° 24′ N. lat. and 7° 20′ E. long., is a pretty town situated on the Erlbach, about fifty miles west of Spires. It is embosomed in gardens and luxuriant meadows, encircled by eminences and woods. The town, which consists of the Old and New Towns, is surrounded by a wall, has a pleasant suburb, and is regularly built: it contains about 850 houses, and 7200 inhabitants, 5300 of whom are Protestants and 180 Jews. Of the public edifices the principal are a handsome old palace, part of which is at present used as a Roman Catholic place of worship, two Protestant churches, a gymnasium and lyceum, an orphan asylum, an hospital, and a school of industry. The inhabitants are engaged in various branches of industry, especially in breeding Merino sheep; linens, leather, oil, plaster of Paris, tobacco, and steel ware, are manufactured. The printing-press still exists from which issued the editions of the Greek and Latin classics, by Croll, Emser, and Erter. Deuxponts is the seat of the judicial tribunals for the bailiwick as well as of its local government. Close to the town is 'Schifflick,' a country seat built by Stanislaus Lesczinski king of Poland, which has been converted into an establishment for breeding horses.

Deuxponts, or 'Two-bridges' (in its Latinized form, Bipontium) derives its name from the site of its old castle between two bridges. Its origin is unknown, nor is it mentioned in history until the year 1197, when it was the property of the counts bearing its name. On the extinction of the direct line, in 1394, the earldom fell into the possession of Ruprecht, the elector-palatine, who divided it among his three sons, in 1410, all of whom being dukes, the country itself was thenceforward denominated a duchy. During the Thirty Years' War it was overrun by the Imperialists under Gallas, who laid siege to the town and treated it with great barbarity. Deuxponts suffered also severely during the campaigns of Lewis XIV., and the French held possession of it until the peace of Ryswick in 1697, by the terms of which they were obliged to evacuate the place. As the duke, in the meantime, had died childless, it fell to the next heir, Charles XII. of Sweden, and, upon his decease, to the count-palatine: this prince also dying without children, in 1723, the duchy reverted to the house of Birkenfeld, the ancestors of the family who now occupy the throne of Bavaria. In 1793 Deuxponts was taken possession of by the French, but it was restored to Bavaria in 1816, when other adjacent territories were added to it, and the whole was annexed to its dominion by the name of the Province of the Rhine.

DEVELOPMENT. (Algebra, &c.) A name given to the process by which any mathematical expression is changed into another of equivalent value or meaning, and of more expanded form. It is not to be understood that development either facilitates the calculation or the explanation of an expression, necessarily; it may sometimes do the one, and sometimes the other, but as often it is the reverse. Nevertheless, the mathematical use of an expression is frequently facilitated by employing its development, and this in a great variety of ways.

The expression of common algebra will frequently furnish instances of this. Let us take the development of $(x+y)^3$, namely $x^3+3x^2y+3xy^2+y^3$. The original expression implies an addition and two multiplications, while the development involves six multiplications as difficult as those of the original, two of a more simple character, and three additions. Nevertheless the BINOMIAL THEOREM, of which the preceding is a particular case, is the foundation of many important branches of algebra. But the usual form of development is into infinite series [SERIES], a subject of peculiar interest, and the various points of which, as may readily be seen from comparison of mathematical writings, are not perfectly well settled.

The mere word development suggests only one question, namely, what connexion exists between the expression itself and its development. Are they both actual representations of the same arithmetical value? Or do they merely represent algebraical forms which have the same properties? There are cases in which the first question must be answered in the affirmative, and others in which the second question must be so answered, while it is palpably the contrary with regard to the first. Without entering into the reasons of such difficulties, it must here suffice to remind the student who seeks for such matter as is immediately connected with the common use of the word, that he must be cautious what he admits upon any point connected with it, since it may frequently happen that he will find himself endeavouring to reconcile a very narrow meaning of the term with the forms of expression used by writers who take for granted a knowledge such as can only be acquired by considerable experience and reflection. So wide is the modern use of the term, that the following caution may frequently be useful. When an author speaks of the development of an expression, remember that he may have so extended a signification of the word, that the student should consider him as meaning merely 'algebraical substitute,' or an expression which may be used for the original without change of algebraical properties. He will hardly understand what we mean, nor is it for our present purpose necessary that he should do so: our intention will be answered, if, in referring to this work for the use of this particular term, he should be distinctly made to understand that in all probability his difficulty arises from an indistinct view of the meaning of equality, or of the sign $=$, as employed in algebra, such as we conceive a very eminent modern English writer to have had, when he proposed, in order to overcome the difficulties attending the interpretation of a series, to consider *one* and *one* as having a meaning distinct from *two*.

There are two points connected with developments which it may be worth while to point out, as illustrative of this (at first sight) apparent want of connexion between an expression and its development, which it should seem ought to exist between two forms which are used indifferently each for the other.

1. An expression may preserve an algebraical identity with its development in cases where arithmetical identity is entirely lost. Let us consider the series $P=1+x+x^2+\ldots.$ continued without end, of which it is an evident property that $P=1+xP$. And the same is also a property of its well known equivalent form $1\div(1-x)$ which is in truth nothing more than the value of P derived from the last equation. But suppose that $x=2$, and there is no imaginable arithmetical connexion between $1+2+4+8+\ldots.$ continued for ever, and $1\div(1-2)$ or -1. On this point see, INFINITE, DIVERGENT, and SERIES.

2. A development may present an intelligible result, in cases where the original expression altogether loses meaning. Thus, let the following expression be considered, 'the product of all whole numbers, beginning with 1 and ending with x,' of which 1.2.3.4.5 or 120 is a particular case. Considering this as a function of x, it is obvious that we can find meaning and value in all cases in which x is a whole number. But when x is a fraction, we lose all idea of meaning: what is implied for instance, by the product of all whole numbers up to $10\frac{1}{2}$? Nevertheless, when we take the approximate expression for this product mentioned in COMBINATIONS, or the series of which it is the first term. namely,

$$\sqrt{2\pi x}\left(\frac{x}{\varepsilon}\right)^{x}\left(1+\frac{1}{12x}+\frac{1}{288x^2}+\ldots\right)$$

the difficulty has disappeared: this series is as easily intelligible and calculable when x is a fraction as when x is a whole number. This paradox, namely, an alteration of form giving more meaning to an expression than it had at first, is of a character which cannot be briefly treated.

The inverse word to development should be *involopment*, so that while we say that $1+x+x^2+\ldots$ is the develop ment of 1 ÷ (1 − x), we should also say that the latter is the *involopment* of the former. But the latter term is never used, which frequently gives rise to a circumlocutory and sometimes defective mode of description.

DEVENTER, a fortified town in the province of Overyssel, is situated on the right bank of the river Yssel, about forty-six English miles east from Amsterdam. Deventer was formerly a free imperial city, and a member of the Hanseatic league. The town is surrounded by a wall flanked with numerous towers, and defended by a broad deep ditch. The cathedral is a fine Gothic building, with an excellent set of bells. The college contains a well-chosen and extensive library; population 10,500.

DEVEREUX. [Essex.]

DEVICE, an emblem or ensign, formerly borne on shields or embroidered upon banners as a cognizance, contemporary, in the history of heraldry, with coat-armour itself. As early as the twelfth century, King Henry II. caused certain devices to be painted, which had a descriptive reference to his name: the *planta-genista*, or broom-sprig, and a jenet passing between two broom plants, the former of which is engraved upon the Great Seal of his son, Richard I., on either side of the throne. For many succeeding centuries these devices appear to have been confined to the royal use; but from the reign of Richard II., various houses of the nobility adopted their use. Thomas Mowbray, duke of Norfolk, appeared against Henry, duke of Hereford, in the celebrated just at Coventry, upon a horse whose velvet trappings were embroidered with lions and mulberry trees, intended to typify his name. The devices of greatest notoriety were the white and red roses, by which the contending families of the royal stem are still metaphorically described. From the close of the fifteenth to the middle of the sixteenth century the frieses, entablatures, and stained windows of the more sumptuous habitations were crowded with devices. The Bourchier and Stafford knots were of this description. Camden, in his Remains, has a section entitled 'Rebus, or Name-Devices;' these were probably adopted in imitation of the emblems which, during the Neapolitan wars of the fifteenth century, were painted by the Italian chiefs upon their shields, accompanied by mottoes or quotations descriptive of enterprise, or of the general character of the bearer. Such were called Impresses, from the Italian word 'Impresa.'

DEVIL is the English name of the malignant evil being—the great spiritual adversary of mankind. He is regarded as the chief of a host of rebellious angels who, before the creation of the world, and after a contest with the obedient angels, headed by the archangel Michael, were expelled from heaven (2 Peter ii., 4; Rev. xii., 7—9; Jude 6.) for the sin of arrogance and insubordination. The etymology of the word is variously given by different lexicographers. Dr. Johnson, supposing its derivation to be from *διάβολος* (diabolus), considers divel the more correct mode of spelling. Others assert devil to be a mere contraction of *the evil*, as God from *the good*. (Lemon's *English Etymology*.) It is however apparent that, as Christianity was originally diffused throughout Europe from the church of Rome, the Latin diabolus and Greek *διάβολος* produced the Welsh *diafol*, Saxon ꝺioꝼul and ꝺeoꝼl, Gothic *diofl*, English *devil*, German *teufel*, Dutch *duyvel*, French *diable*, Spanish *diablo*, and Italian *diavolo*, as these appellatives are similar not only in form and sound, but in designating the peculiar character of this evil being; and their existence is subsequent to the introduction of Christianity. The simple original signification of *διάβολος* (*διαβάλλειν*) is adversary, accuser, calumniator, opponent; it therefore serves to translate the Hebrew שָׂטָן *satan*, which has precisely the same meaning. (Heb. and Gk. Lexicons of Parkhurst and Pasor.) The name *διάβολος* is applied to the spirit of evil as being specially the accusing enemy of the human race, who accuses them before God night and day (*ὁ κατηγορῶν*, &c. *Revelation* xii. 10). Divines enumerate about thirty different titles appropriated to the devil. The following are some of the principal:—

The god of this world (age, seculum), *ὁ Θεὸς τοῦ αἰῶνος τούτου*, 2 Corinth. iv. 4. The prince of this world, *ὁ ἄρχων τοῦ κόσμου τούτου*, John xii. 31. The prince or power of darkness, the prince of the power of the air, *ὁ ἄρχων τῆς ἐξουσίας τοῦ ἀέρος*, Ephes. ii. 2. The angel of the bottomless pit, Abaddon or Apollyon, *ὁ ἄγγελος τῆς ἀβύσσου*, Ἀβαδδὼν, Ἀπολλύων, *Rev.*. ix. 11. The prince of devils, *ἄρχων τῶν δαιμονίων*. The great red dragon, old serpent, devil and satan, *δράκων μέγας, πυῤῥὸς ὁ διάβολος, ὁ Σατανᾶς*, *Rev.* xii. 3, 9; and xxii. 2. A murderer from the beginning, a liar, and the father of lying, *ἀνθρωποκτόνος ἀπ᾽ ἀρχῆς, ψεύστης, καὶ ὁ πατὴρ αὐτοῦ*. The tempter, *ὁ πειράζων*, Matth. iv. 3.

For explanations of numerous other appellatives, as Beelzebub, Lucifer, Belial, &c., we refer to the various works mentioned in the present article. The statements under the word Devil in Cruden's *Concordance* may serve to represent the doctrine of the church concerning the power and dominion of this being. Man, it is said, since the fall, is under the tyranny and slavery of Satan, who is an adversary surprisingly subtle, with strength greatly superior to ours; with malice the most deadly, and with activity equal to his malice. He has principalities and powers under his command, and walks about like a roaring lion (1 Peter v. 8) to tempt and betray us, seeking to involve us in sin, and to bring us to ruin and everlasting misery. In a work entitled 'The Attributes of Satan,' 8vo., 1818; also 'An Essay on the Existence of the Devil, and his Influence on the Human Mind,' 12mo., 1810, and an Essay 'On the Influence, Power, and evil Agency of Satan,' 8vo., 1822, it is maintained that the same testimony which establishes the existence of God establishes also the existence of the devil, that is, an evil spirit, the enemy of the whole human race, who possesses the power of exciting evil thoughts and actions; and that though God in his wisdom has left his expulsion from heaven in mystery, there is no one point on which the Scriptures are more clear and explicit than this, that the hearts of men are under his dominion. In a subsequent part of this article we shall notice the discrepancy of opinion among Christians as to the reality and personal existence of this evil being.

It is not altogether useless nor uninstructive to trace the history of opinions, however absurd they may be. As to the notions entertained of this evil being, it would be easy to show that in forming their speculations upon his nature, men early abandoned the plain words of Scripture, and by consequence fell into the wildest extravagances and conjectures. The more the knowledge of the original text and the exact study of it declined, the more did superstitious and unfounded notions as to this being obtain credit among mankind. The history of these absurdities is often ludicrous enough, but unfortunately the belief in supernatural agency of all kinds forms also one of the darkest chapters in the history of our race. Ignorance, which is the parent of superstition, is also the parent of cruelty and persecution. But as the popular belief in witchcraft is now gradually disappearing before sound knowledge, so the absurd and unscriptural notions of the nature and power of that evil being whom we call the devil have gradually lost ground since the Bible has been translated into modern languages and become the possession of the humblest reader. Divines too have at last discovered that a critical investigation of the original text of scripture, on this as well as other subjects of revelation, can alone lead to any true results.

An early sect of Christians we are told worshipped the devil. 'The Ophites,' says Tertullian, 'worship the serpent-devil more than Christ, because by him we have the knowledge of good and evil.' Of the conviction entertained by some of the early Christians of the supernatural power of the devil, we have abundant proof in the accounts of demoniacal possessions and exorcism recorded in the writings of the fathers. Saints Anthony, Bernard, and Dominic, we are told, had frequent communications with Satan himself. (Butler's *Lives of the Saints*.) Even Luther relates his personal discussions with the devil, whom he compliments as being a very expert logician, with a loud and sonorous voice, 'Diabolus sua argumenta fortiter figere et urgere novit voce gravi et forti.' (Luther, *de Missa Privata*, tom. vi. p. 28.)

The curious work entitled 'Compendio dell' Arte Essorcista,' by Girolamo Menghi, 12mo. 1601, gives a history of the supposed process of ejecting devils. The subject of the devil's battle with Michael and his expulsion from heaven excited during a long period the subtle wits of the schoolmen, in ascertaining when and where it was fought, what time it occupied, what was the number of forces arranged on each side, and what was the rank of each commander; questions which at length were determined by dint of logic, proving the battle to have lasted precisely three seconds, &c. (Reginald Scott's Trea tise on the Nature and Substance of Devils, fol. 1665, Lucifer's Fall, ch. 8. Heywood's 'Hierarchy of Angels, and Fall of Lucifer,' fol. 1635.) St. Jerome declares it to have been the common opinion of the primitive church that the middle region of the air between heaven and earth was still crowded with devils. During the sixteenth century the prevalence of the belief in the devil's supernatural agency was truly alarming. A sermon on witchcraft preached by bishop Jewel before queen Elizabeth, entreats her majesty to check the tremendous operations of the devil by exterminating his agents, the witches and wizards, who were then very numerous. ('Discovery of Witchcraft, by Reginald Scott,' fol. 1665. 'Doctrine of Devils the grand Apostacy, an essay to rectifie the undue apprehensions we have about evil spirits,' 12mo. 1676.) The following description of the devil's personal appearance in the days of Reginald Scott, is taken from the author's treatise on the subject. 'Our mothers' mayds,' he says, 'terrifie us with the ouglie devel, with hornes on his head, fier in his mouth, a huge tayle in his breech, eies like basons, fangs like a boar, claws like a tiger, a skin like a bear, and a voice roaring like a lion.'

Before the end of the last century, this extravagant superstition had greatly subsided, and tracts tending to make the existence of devils a questionable point began to appear even from ministers of the church; for instance, 'An Inquiry into the scriptural meaning of the word Satan,' by the Rev. Mr. Barker of Leeds, 8vo. 1772; 'Advocates for Devils refuted' by the Rev. H. Huntington, 8vo. 1794; 'An attempt to shew that the opinion concerning the Devil or Satan as a fallen angel, and that he tempts men to sin, has no foundation in scripture,' by William Ashdowne, 8vo 1791. The following work is of an earlier date, with a similar design, 'A critical Dissertation concerning the words *Δαίμων* and *Δαιμόνιον*,' 8vo. 1738. In these treatises it is contended that the word Satan is never used in the Old Testament as a proper name, to signify a fallen angel, or an evil spirit really existing: and that even Diabolus in the New Testament will admit of explanations which are inconsistent with the existence of the devil. A more recent and elaborate work, by a minister of the Unitarian community, the Rev. Russel Scott, is 'An analytical investigation of the Scriptural claims of the Devil,' 8vo. 1822. The proposition sought to be proved in this work may be stated in the words of the Rev. John Simpson ('Essays on the Language of Scripture,' vol. i. p. 159.) that, the word Satan or devil signifies, throughout the Scriptures, an adversary; that no single text, nor any number of texts in which these words occur, afford any proof of the proper personality or real existence of any such being as Satan or the devil is generally supposed to be; and that many distinct passages, and the general spirit of them all, oblige us to understand these terms figuratively, not of a *real*, but of an *allegorical* person.' Several hundred passages are adduced in proof and illustration of this statement, and it must be observed that the instances in which Satan and Diabolus, being taken in a particular instead of a general sense, have been unwarrantably Englished by the word *devil*, are sufficient to show the impossibility of forming any just argument on this subject from the authorised version, without referring to the words of the original text. The word Satan occurs in the Old Testament thirty-four times, and is variously translated in adaptation to preconceived dogmas, and occasionally in disregard of consistency, as in 1 Chron. xxi. 1, where it is said that *Satan* urged David, which is at variance with the statement in 2 Sam. xxiv. 1, which says the Lord in anger urged him, that is *an adversary*. God's angel stood as *Satan* (an opponent) before Balaam's ass to *satanize* (oppose) his progress. (Numb. xxii. 22. 32.) Dr. Campbell, in his 6th preliminary Dissertation (on *διάβολος*) observes, that the prefixing of the article restricts the signification to the devil, but that without the article the sense is accuser in general; otherwise in Titus ii. 3, the aged women would be exhorted to refrain from being, not false accusers, but *devils* (*διάβολοι*). We must here notice the work of Dr. Bekker of Amsterdam, 'Die Bezauberte Welt, oder eine gründliche untersuchung des allgemeinen aberglaubens betreffend die Art und das Vermögen Gewalt und Wirkung des Satans, und der bösen geister über den menschen,' Balthasar Bekker, S. T. D. 4to., Amsterd. 1673. Bayle, in one of his letters (tom. i. p. 340), says that the publication of this work caused a great commotion in Holland, and that the synods took alarm at the fact of a learned theologian having composed a book to demonstrate the non-existence of the devil and his angels. The author adduces and explains all the passages in the Scriptures which relate to the subject, and concludes that there is no satisfactory evidence of the devil's existence: observing that, if all which is commonly believed about him were true, he would be infinitely superior to God in the extent of his power, in the number of his subjects, and in the ready obedience they render. The two following works are replies, 'De gebannen Duyvel weder in geroepen,' &c. (The banished Devil recalled) 4to., Amst. Dr. Bekker, 'Consideratien over zyn Boek,' door I. S., 4to., Amst. Bekker's work is translated into French, 4 tomes, 12mo., 1694, Amst. Another very learned production nearly to the same purpose, is by the distinguished biblical critic John Salomon Semler, entitled, 'Versuch einer biblischen Daemonologie, oder untersuchung der lehre vom Teufel und seiner macht,' 8vo., Halle, 1785.

This and a large number of other treatises on the same subject are examined and replied to, in the 'Historia Diaboli,' by John Godof. Mayer, 8vo. 1780, a work written in Latin, and replete with curious learning and researches on the existence and power of evil spirits, and their state before and since their fall from heaven. The reader may consult also Schulz, 'Untersuchung über die bedeutung des worts Teufel und Satan in der Bibel.' Other learned works of Germany on this subject are G. F. Meyer, in 'philosophischen gedanken von den wirkungen des Teufels;' Cotta, 'historia dogmatis de angelis;' Edelman's 'Glaubensbekenntniss;' Faber's 'dissertat. de influxu adæmonismi;' Pfaffius 'dissertat. de operationibus diabolicis in hoc mundo.' Among the German adæmonists, or those who deny the personality of the devil, may also be named Wetstein, Webber, Naudæus, Wagstaaff, Reich and Damm. Unitarians, in accordance with the scriptural adæmonists of Germany, maintain that the Bible affords no sufficient evidence of the existence of a being purely malevolent, endowed with indefinite powers to do mischief, who shares with God the attributes of omniscience and omnipresence, and destroys his claim to omnipotence and infinite goodness. In rejecting therefore the theory of dualism, they attribute to God alone whatever exists, and especially refer to the passage in Isaiah (xlv. 7) where God expressly says, 'I create evil.' The reader may see the question as to those who in the Gospels are described as being possessed with devils treated at large by the commentators, and especially by Worthington, Barker, Lardner, and others.

The statements of biblical critics upon the subject of the temptation recorded in the first book of Genesis are very various and discordant. (See Edwards, *Πολυποικίλος Σοφία*, p. 61.) 'From the authority of many of the antient interpreters,' says Dr. Middleton, 'and from my own reflections, I have ever been inclined to consider the story of the fall of man as a moral fable, or allegory, in which certain doctrines are represented by a fiction of persons and facts, which had no real existence, for to understand it literally shocks at once the principle of probability.' (Middleton's Works, vol. ii. p. 131.) Dr. Clarke in his edition of the Bible declares this to be 'one of the most difficult and most important narrations in the whole book of God,' believing it however, in opposition to Middleton, to be, not an allegory, but a relation of facts. Dr. Clarke, finding the Hebrew word *nachash*, which is translated serpent, to be an ideographic term admitting of numerous meanings, resorts to the not very dissimilar Arabic word *chanas*, signifying ape, fiend, or satyr, and thence concludes that on this occasion the tempter assumed the form of a monkey, or ourang-outang, adding that the ability to chatter is all they have left of their original gift of speech which they lost at the fall. Such speculations, though supported by learning and ingenuity, can scarcely be said to be confined within the legitimate limits of scriptural interpretation.

Plutarch in his treatise on Isis and Osiris, speaks of the great antiquity and universality of the dogma of the two principles. All nations, he says, have admitted two deities, one the author of good, the other of evil. In Persia, the deities of good and evil, or light and darkness, were Oromasdes and Ahrimanes (ARIMANES); in Egypt and Phœnicia (Sanchoniathon), Osiris and Typhon.

As to the account of the origin of evil in the antient cosmogonies the student will find a store of erudition rather curious than useful in 'L'Origine de tous les Cultes,' par Dupuis, 4to., tome ii., c. 5; tome iii., c. 1. In Beausobre's 'Histoire de Manicheisme,' 4to., tome ii., l. 5; Bayle's Dict.

art. 'Manicheens'; Dr. Hyde's 'Hist. Relig. Veterum Persarum;' Brunet, 'Parallèle des Religions,' 4to., tome i., p. 69; Gebelin's 'Monde Primitif;' Selden 'De Diis Syriis;' Mallet, 'North. Antiq.;' Brucker's 'Vedam,' tom. v. and vi.; Bryant's 'Analysis,' vol. iii.; Anquetil du Perron's 'Zendavesta,' 4to., 1771; Maximus Tyrius, dissert. 38, 'On Serpent Worship of Antient India.'

To the works incidentally mentioned on the subject of this article may be added—Michael Psellus, 'De Operatione Dæmonum,' 1615; M. Illyricus, 'Demonstrationes de Essentiâ Imaginis Dei et Diaboli,' 1569; Peter Viret's 'Devil let loose,' 1588; 'A Dissertation in Logic, arguing the moral, religious, and political Use of a Devil or Evil Spirit,' 1797-99, by G. Leicester; Dr. Hibbert's 'Philosophy of Apparitions;' art. 'Demon,' in Calmet's Dict.; A Comedy on the Temptation of Christ by Satan in the Desert, 1538, by John Bale, bishop of Ossory; Dissertations by Perkins, Waldegrave, Udall, Andrews, Farmer, &c. on the Combat of Jesus and the Devil in the Wilderness. De Foe's 'History of the Devil' is merely a satirical and political composition. As poetical fictions on the subject, see Milton's 'Par. Lost;' Dante's 'Inferno;' Rev Robert Montgomery's 'Satan.'

DEVIL IN A BUSH,
DEVIL IN A MIST, } vulgar names of the genus Nigella.

DEVIL'S BIT, the vulgar name of Scabiosa succisa.

DEVISE. [Will.]

DEVIZES, a borough and market town, having separate jurisdiction, locally in the hundred of Potterne and Cannings, in the county of Wilts; 22 miles N.W. by N. from Salisbury, 19 E. by S. from Bath, and 89 W. by S. from London.

Before the Boundary Act, the borough of Devizes was considered to be coextensive with the parishes of St. John the Baptist and St. Mary the Virgin, including an old disparked park and the site of the antient castle; but since the passing of that act, for the purposes of parliamentary representation, the town extends into the chapelry of St. James and into the parish of St. Rowde, which adjoins that chapelry.

In antient records this place is called Divisæ, De Vies, Divisis, &c. The origin of the name seems to be a supposition that this place was divided by the king and the bishops of Salisbury.

In the reign of Henry I. a spacious and strong fortress was erected here by Roger, the wealthy bishop of Salisbury, which his nephew Nigel, bishop of Ely, garrisoned with troops and prepared to defend until the expected arrival of the Empress Matilda; but Stephen having besieged it, declared that in the event of its not surrendering, he would hang the son of Bishop Roger on a gallows which he had erected in front of the castle. On this being made known to Nigel, he surrendered the fortress, together with all the bishop's treasures, amounting to the sum of 40,000 marks. This castle was afterwards seized by Robert Fitz-Herbert, on pretence of holding it for Matilda, but on her arrival he refused to deliver it up, and was subsequently hanged as a traitor to both parties. About the end of the reign of Edward III. the castle was dismantled, and the site has lately been converted into pleasure-grounds.

It appears from Leland, who calls it 'The Vies,' that in the reign of Henry VIII. Devizes was celebrated for its market. It was besieged by Sir William Waller in the parliamentary war, but just as the royalists were preparing to capitulate, Lord Wilmot, who had been dispatched by the king from Oxford, appeared on Roundaway Hill, with 1500 horse and two pieces of artillery. Sir William withdrew his forces from the town, and immediately attacked Lord Wilmot, but was totally discomfited and obliged to fly to Bristol, having lost a considerable number of men, together with all his cannon, bagage, and ammunition.

The first charter of incorporation was by the Empress Matilda, granting to her burgesses 'De Divisis' freedom of toll throughout all England and the ports of the sea. This charter was successively confirmed by all the Henrys and the Edwards. The present governing charters were granted by James I. and Charles I. The corporation have power to hold a Court of Record on Friday for debt or damage not exceeding 40*l.* The quarter sessions of the county are held here in rotation with Salisbury, Warminster, and Marlborough. Petty sessions are held quarterly before the mayor, recorder, and justice, or any two of them.

Devizes returned members to the parliaments of Edward I., to two of Edward II., and constantly since the 4th of Edward III. The revenue of the corporation is only 434*l.* per annum.

This town is situated nearly in the centre of the county, on the Kennet canal: it consists of several streets, well paved and lighted with gas, and contains many good houses. There are no buildings of any consequence, except the town-hall and the churches. The former is a handsome modern building, in the basement of which a cheese-market is held.

The parishes of St. John and St. Mary the Virgin form a united rectory, in the archdeaconry and diocese of Salisbury; the net revenue of which is 518*l.* per annum. St. John's church is built partly in the Norman style and partly in the later English style of architecture, with a square embattled tower, and consists of a nave, transept, chancel, and two chantry chapels. The chancel is very handsome, and the tower is supported by two circular and two pointed arches enriched with foliage and mouldings of different periods. St. Mary's is situated in the north-eastern part of the town. The chancel is supposed to have been built soon after the Conquest, but nearly all the rest of the structure was rebuilt by William Smyth, who died in 1436. There are places of worship for the Society of Friends, Baptists, Independents, Presbyterians, and Wesleyan Methodists.

The woollen manufacture, once of considerable importance, is now extinct. There are at present three manufactories of silk, which afford employment to about 400 persons: the weaving of crape and sarsnet is on the increase. The malting business is carried on to some extent, and there is a large snuff manufactory. The market is on Thursday, and is the largest in the west of England for corn. A large cross, which is said to have cost nearly 2000*l.*, was erected, in 1815, in the market-place by Lord Sidmouth, for many years member for and recorder of the borough. Fairs are held, on the 4th February for horses; Holy Thursday and April 20th, for cattle; and June 13th, July 5th, and October 2nd and 20th, for cattle, hops, cloth, &c. Devizes contains 1200 houses, and 6367 inhabitants. At the first election after the passing of the Reform Act there were 277 registered voters.

A national school was erected at the expense of John Pearse, Esq. There is a charity school called the 'Boar Club School,' in which 40 boys are instructed and clothed for three years, and then apprenticed to various trades, &c. There are also schools on the Lancasterian system and infant schools.

Richard of Devizes, a Benedictine monk of the twelfth century, who wrote a chronicle of English history, was a native of this place.

DEVONPORT, formerly called Plymouth Dock, in the parish of Stoke Damerall, hundred of Roborough, and county of Devon, 218 miles west by south from London, and one mile and a half from Plymouth.

Devonport owes its present importance to a naval arsenal established there in the reign of William III., under the name of Plymouth Dock, which name it retained till 1824, when the appellation of Devonport was conferred on it by royal permission. It was first fortified in the reign of George II., but the fortifications were considerably enlarged and improved under an act passed in the 21st year of the reign of George III. The government of the town is vested in Commissioners, among whom are the lord of the manor, who holds courts leet and baron at Michaelmas, the stewards of the manor, the rector of the parish, the commissioner of his majesty's dock-yard, the port-admiral, the mayor, aldermen, and recorder of the boroughs of Plymouth and Saltash, the manorial lords of East Stonehouse, and of East and West Anthony; with the stewards of those manors. These commissioners have the superintendence of all the affairs of the poor, the lighting, watching and cleaning of the town, and the granting of licenses to porters and watermen.

Petty sessions are held by the county magistrates every Wednesday in the town-hall, for the despatch of business connected with the town and parish.

Devonport was enfranchised by the 2nd William IV. chap. 45, and since the passing of that act returns two members to parliament. The parliamentary borough includes, in addition to the town of Devonport, the whole of the parish of Stoke Damerall and the township of Stonehouse. At the first election after the passing of the Reform Act there were 1777 persons registered. We understand that the inhabitants of the borough have recently petitioned the king to grant them a charter of incorporation, which petition is now before the Privy Council. (March 1837.)

Devonport is situated at the south-west corner of the county, and is bounded on the south and west by the mouth of the river Tamer, which forms the spacious harbour of Hamoaze; and on the east by Stonehouse creek. The streets are wide and regular, well paved, and lighted with gas; the footpaths are made of marble obtained in the neighbourhood. The houses are generally large and well built. The Fore-street is approached from the east through a handsome gateway, where there is a fosse and a drawbridge, and forms a thoroughfare to the dock-yard. A wall, twelve feet in height, called 'the king's interior boundary wall,' defends the town on the north-east and south sides; and the heavy batteries on Mount Wise protect the entrance from the sea. Without the wall is a line, or breastwork, with a fosse excavated in the solid rock from twelve to twenty feet deep. There are three gates in the line, the north gate, the state barrier, and the Stonehouse gate. A promenade, called Richmond Walk, was recently made near the sea-shore under the direction of the duke of Richmond when master-general of the ordnance.

There is a small theatre, a subscription library, and a spacious and elegant assembly-room at the royal hotel, where balls are held. To the south of the town are convenient hot, cold, shower, vapour, and swimming baths. The water which supplies the inhabitants is brought from Dartmoor in a circuitous line of about thirty miles to a reservoir on the north side of the town, from whence it is conveyed in pipes to the different houses.

The town-hall is a spacious and handsome building, with a Doric portico. It contains a county-meeting room seventy-five feet by forty, a watch-house, temporary prison, engine-house, &c. Near it is a fluted column of the Doric order, to commemorate the naming of the town in 1824, from the top of which there is a splendid view of the harbour and the neighbouring scenery. To the south of the town are the port-admiral and the governor's houses, the telegraph, and the Grand Parade. Thirty-two telegraphic stations connect this place with the Admiralty in London; and it is said that on the occasion of Napoleon surrendering to the Bellerophon the news was known in the metropolis fifteen minutes after it was known in Devonport.

The dock-yard, one of the finest in the world, comprises an area of seventy-one acres. Within the yard is the basin, constructed in the reign of William the Third, and the dock sufficiently capacious for the reception of a seventy-four gun ship, as well as four building-slips, and three other docks, one of which, the new north dock, is 260 feet by 85 feet, and 27 feet 8 inches deep. The 'blacksmith's shop' is a building 210 feet square, containing 48 forges, the fires of which annually consume 1300 chaldron of coal. Several hundred of anchors, some weighing five tons each, are piled up on the wharf in front of this building.

The 'rigging-house,' is a splendid edifice 480 feet in length, and three stories high; it forms one side of a quadrangle, the area of which is entirely composed of stone and iron, and is called the 'combustible storehouse.' Our limits will not permit us to describe one half the objects of interest that are contained within the precincts of this dock-yard, and we must content ourselves with merely mentioning the boiling-house, the mast-house, the mast-pond, and the rope-houses. The rope-houses are limestone buildings 1200 feet long, parallel to each other, and two stories high. Cables are made here, 100 fathoms in length, and measuring in circumference 25 inches; a cable of this size weighs 116 cwt. 1qr. 6 lbs., and costs 404*l*.

The immense roofs over the docks, being on the span of an arch without a buttress, are extraordinary specimens of architectural skill; the area of one of them amounting to 1 acre 39 poles and 200 feet. The harbour of Hamoaze is four miles long and half a mile broad; its greatest depth at high water is about 20 fathoms, and at low water 15. [Plymouth.]

A chapel has recently been erected by government in the yard, the chaplain of which receives, in addition to a stipend from government, twopence per month from the pay of each of the officers and seamen belonging to ships laid up in ordinary. There are two episcopal chapels of ease at Devonport, St. Aubyn's, erected 1771, and St. John's erected in 1799. The inhabitants have also access to the dock-yard chapel. There are places of worship for Baptists, Independents, Wesleyan Methodists, and Moravians. A classical school was established by subscription in 1821, and a public school for boys in 1808; over the latter is a school for girls, where about 100 are educated and clothed. The Baptists and Methodists have also their respective schools. A public dispensary for this town and East Stonehouse was erected in 1815, and a Savings' Bank in 1829.

Devonport is a branch of the port of Plymouth. [Plymouth.] There is a market on Tuesdays, Thursdays, and Saturdays, well supplied with provisions of all kinds. To the south of Devonport is a ferry to Mount Edgecumbe, and to the north-west, one to Torpoint. The population is returned with the parish, and in 1831 consisted of 34,883 inhabitants, of whom 19,466 were females.

DEVONSHIRE, a maritime county in the south-west part of England. Its form approximates to that of an irregular quadrangle, having for its angles, on the west, Hartland point on the Bristol channel; on the north the boundary of Devonshire and Somersetshire, near Oare, on the coast of the same channel; on the east the boundary of Devonshire and Dorsetshire, on the coast of the English channel, near Lyme Regis; and on the south Prawle Point, near the Start Point, on the coast of the English channel. The county is bounded on the north and north-west by the Bristol channel; on the north-east by Somersetshire; on the east by Dorsetshire; on the south-east and south by the English channel, and on the west by Cornwall, from which it is separated, along part of the boundary line, by the river Tamer. There is an insulated portion of the county inclosed between Dorsetshire and Somersetshire, and the boundaries, as given above, include an insulated portion of Dorsetshire which is entirely surrounded by Devonshire. The length of this county from north to south is about 71 miles; the breadth from east to west about 68. The area of the county is stated by Mr. Arrowsmith at 2580 square miles, and in the population returns at 2585: the aggregate areas of the parishes give 1,636,450 acres or about 2557 square miles. The population in 1831 was 494,478, giving 191 or 193 persons to the square mile according as we adopt the highest or lowest estimate of the area. Devonshire is the third English county in respect of size, being exceeded only by Yorkshire and Lincolnshire, and the fourth, in respect of population, being exceeded by Yorkshire, Middlesex, and Lancashire. Exeter, the capital, is 160 miles from London in a straight line W.S.W.; 164½ miles by the shortest road, through Staines, Basingstoke, Andover, Amesbury, Mere, Wincaunton, Ilminster, and Honiton; 173 miles by the Exeter mail-road, through Staines, Andover, Salisbury, Shaftesbury, Yeovil, Crewkerne, Chard, and Honiton; 176 by the Penzance and Falmouth mail-road, through Salisbury, Blandford, Dorchester, Bridport, and Honiton or 193 miles by the Devonport and Plymouth mail-road, through Reading, Devizes, Bath, Wells, Bridgewater, Taunton, and Collumpton.

Coast-Line, Islands.—The coast of the Bristol channel which bounds Devonshire to the north and north-west is for the most part steep and rocky. On the side towards Somersetshire, the coast-line runs nearly east and west for about 22 miles, measured in a straight line from the border of Somersetshire to Bull Point, west of Ilfracombe; along one part of this line there are cliffs, in the other parts the coast, though steep, is not broken or precipitous: there are no marked headlands. From Bull point to Morte point (distant a mile and a half south-west) the coast forms a small bay (Rockham bay) bounded by cliffs; from Morte point to Baggy point, distant three miles and a half south by west, it forms a larger and deeper bay (Morte Bay), with cliffs at each extremity and a low shelving beach in the middle. From Baggy point to Hartland point (distant 14 or 15 miles south-west) the coast forms the deep bay, Barnstaple or Bideford Bay, into which the united stream of the Torridge and the Taw empties itself. From Baggy point to the æstuary of the Taw and Torridge, except near Baggy Point, the coast is shelving and sandy, with a multitude of sand-hills, called Braunton barrows; from the æstuary of the rivers to Hartland point the coast is lined with steep cliffs and rocks. From Hartland point the coast, still lined with cliffs, runs south or south by west for about eight miles to the border of Cornwall. This coast presents, in several places, very picturesque views, especially about Lymouth, or Lynmouth (the mouth of the river Lynn), on the border towards Somersetshire, and at Clovelly, in Bideford Bay.

The coast of the English channel, which bounds the county on the south, runs W.S.W. from the neighbourhood of Lyme Regis (in Dorsetshire), 22 miles measured in a direct line, to the mouth of the river Ex. This coast is lined with cliffs throughout its whole extent, and is marked by one headland, Beer Head, at the western extremity of Seaton Bay. The rivers Axe and Otter enter the sea in the course of this line. From the mouth of the Ex the coast, lined with cliffs, runs S.S.W. six miles to the mouth of the Teign, and from thence five miles south or south by east to the headland called Hope's Nose, at the northern extremity of Tor Bay. Tor Bay is a deep bay bounded on the south by Berry head (distant about five miles from Hope's Nose), having a shelving beach at the bottom of the bay, interrupted by a bluff headland (Roundham Head), and an abrupt coast towards each extremity. Tor Bay is memorable as the place in which William prince of Orange, afterwards William III., landed at the Revolution of 1688. Berry head appears to have been the Promontorium Hellenis of the antients (Richard of Cirencester). From Berry head the coast, still possessing the same bluff character, runs S.S.W. five or six miles to the mouth of the Dart, from thence to the Start point, nine miles further; it forms a wide shallow bay (Start bay), lined with a high sandy beach (Slapton sands) that intercepts the flow of the waters which descend from the interior toward the sea, and has formed a lagoon (Slapton Lee) similar to the étangs of Gascogne or Languedoc. From Start point a high rocky coast runs W.S.W. four miles to Prawle point, the southern extremity of the county, and thence three miles west by north across the wide æstuary of the Kingsbridge river to Bolt Head (430 feet high), and thence four or five miles further in the same direction to Bolt Tail. From Bolt Tail the coast, still for the most part lined with cliffs, runs W.N.W. to the entrance of Plymouth Sound, distant 12 miles in a straight line from Bolt Tail. This interval is partly occupied by the wide and shallow Bigbury bay, into which the rivers Avon or Aune and Erme flow, and by the mouth of the river Yealm. About two or three miles of coast on the west side of Plymouth sound belong to Devonshire. Plymouth sound is three miles wide and extends many miles inward. It receives from the north-west the Tamer (united with the Lynher or St. German's river), upon the æstuary of which, called Hamoaze, is the town of Devonport, formerly 'Dock,' the royal dock-yard of which ranks next in importance to that of Portsmouth; and from the north-east the Plym, the æstuary of which is called Catwater. Mill bay and Sutton pool are small inlets at the bottom of Plymouth sound; the latter is almost encircled by the town of Plymouth. Plymouth sound, with the æstuaries of the streams that run into it, forms one of the finest harbours in Great Britain for extent and safety. It is secured from the heavy swell, which formerly set into it, by a breakwater, nearly a mile long, which extends across the middle of the sound. [PLYMOUTH.]

The Devonshire coast may be estimated at from 155 to 160 miles; 55 to 60 miles on the Bristol channel and about 100 miles on the English channel.

Lundy Island, in the Bristol channel, 10 to 11 miles N.N.W. of Hartland point, is a mass of granite two miles and a half long from north to south and about a mile from east to west. Its area is about 900 to 1100 acres. It is surrounded on every side with rocks; the landing-place, up which two men can scarcely walk abreast, is on the eastern side. The southern point is occupied by a light-house. Rat Island is a rocky detachment from Lundy Island on the south-east or south. The northern part of Lundy Island rises considerably above the level of the sea, the highest part being 200 feet high. Several brooks flow from the higher ground into the sea. Considerable plantations have been formed on the island, but the trees are too exposed to keen north-easterly winds to flourish; in the south part of the island the soil is said to be pretty good. There is an abundance of puffins and rabbits, and the island is much infested with rats. Of the number of inhabitants we have no account: they must be very few; for in 1794 there were seven houses and 23 inhabitants, and in 1822 only two houses beside the residence of the light-house keeper. Their principal business is shooting rabbits for their skins, and puffins for their feathers. There are the remains of a fort with a few dismounted guns commanding the landing-place· also the ruins of a chapel, dedicated to St. Ann. St. Nicholas Island is in Plymouth sound: it is fortified.

Surface, Hydrography.—Devonshire is more uniformly hilly than any other of the large counties of England. The principal ranges of hills may be considered as offsets from the elevated districts of Dartmoor, Exmoor, and Blackdown. Dartmoor is a granitic table-land, having its greatest elevation towards the north, and containing the highest ground in Devonshire. Cawsand or Cawsorn hill, in the northern part of the forest, is 1792 feet high: Rippon Tor, four or five miles north of Ashburton, 1549 feet: Butterton hill, in the south part of the forest, 1203 feet: the head of the river Erme 1131 feet; and the site of Hareford or Harford church, also near Butterton, 658 feet. These heights are from the Ordnance Survey, except the last, which is given on the authority of Dr. Berger.

Dartmoor extends nearly 22 miles from north to south (from Belston, near Oakhampton, to the Plymouth road between the rivers Erme and Avon or Aune); and 14 miles from east to west, from the neighbourhood of Moreton Hampstead to that of Tavistock. This immense waste is thus described by Dr. Berger (*Geol. Trans.*, vol. i., p. 119): 'From Harford church (near the southern limit of Dartmoor) the country assumes quite a bare and alpine appearance, presenting a vast plain, extending beyond the visible horizon. The face of the country is formed by swellings and undulations gradually overtopping each other, without ever forming distinct mountains. There is neither vegetation nor any human dwelling; we tread upon a boggy soil of very little depth, and scarcely affording sufficient food to support some dwarf colts as wild as the country they inhabit.' The area of Dartmoor forest has been estimated at 80,000 (Fraser, *Agric. Report*) or 100,000 acres. Part of the waste is appropriated by the surrounding parishes, the freeholders of which possess the right of common, or as it is termed the right of *venville*, on these appropriated parts. The rest of Dartmoor, to which the name of Dartmoor forest (frequently given to the whole waste) strictly applies, and which belongs to the duchy of Cornwall, has been found by survey to contain 53,644 acres. It was on this part that the prison was built during the last war for the prisoners of war. The highest part of Dartmoor forest, in which some of the most important rivers of the county (the Taw, the Dart, the Teign, &c.) have their rise, consists of a succession of morasses formed by the decay of the successive crops of aquatic plants, with which this part teems. these morasses are in some parts 40 to 50 feet deep, in others not more than 5. In several places there have been land-slips, owing to the over-accumulation of marshy soil: these slips would be more frequent but for the granite rocks or 'tors' which continually rise to the surface. Peat is dug in this forest; and many sheep pastured there in summer, and some all the year round. The elevation of Dartmoor forest causes it to have a much lower average temperature than other parts of the county. The average difference of the temperature at Ilfracombe, on the north coast of the county, and Oakhampton, just on the northern border of Dartmoor, is 10° 5′ of Fahrenheit: in summer the difference is small, but in winter it rises to 16° or 18°. (Vancouver's *Agric. Survey.*) Amicombe hill, Okement hill, and others, are elevated parts of Dartmoor. Brent Tor (802 feet, according to Dr. Berger,) and Blackdown, both near Tavistock, border upon Dartmoor, but are not composed of granite.

Dartmoor has been described as an elevated plain: the descent to the lower country all round is rapid. With the exception of Blackdown, there is no eminence near it which comes within 800 or 900 feet of its highest point. From Dartmoor several ranges of hills, composed chiefly of rocks of the transition series, branch off; one from the north-west part of it, near Oakhampton, runs in the direction of Hartland point, dividing the basin of the Tamer from that of the Torridge, and sending out branches which separate the valleys of the various feeders of the Tamer. This range has no remarkable elevations: part of it, with one of its branches, has the name of Broadbury. Another branch running northwards separates the valley of the Okement, and afterwards of the Torridge, from that of the Taw, and terminates near the junction of these last two rivers. Another branch runs eastward towards Exeter, turns to the south-south-east near that city, and separates the valleys of the Ex and the Teign. Little Haldon, in this range, near its termination, has a elevation of 818 feet. A branch which this range sends off soon after leaving Dartmoor, runs north-eastward, separates the basin of the Ex from that of the Taw, and connects the heights of Dartmoor with those of Exmoor. Another range running south-east from Dartmoor separates the valleys of the Teign and the Dart: Furland hill, in this range between Brixham and Dartmouth, is 589 feet high.

Exmoor is a tract of high land, having its greatest elevation towards the north. It is composed of rocks of the transition class, and is chiefly included in Somersetshire, but extends into the north and north-east parts of Devon. Its highest point, Dunkerry beacon, Somersetshire, attains to the height of 1668 feet, according to the Ordnance Survey, or according to another measurement, 1784 feet. A range of hills extends from Exmoor along the north coast of Devonshire to Morte Bay; some of the summits are probably 1000 feet high: the village of Linton on this range, at the mouth of the river Lynn, is 428 feet high. The ridges of Exmoor forest and the branches which it sends off towards the south separate the valleys of the upper waters of the Ex.

A third system of hills consists of Blackdown, in the eastern part of the county, on the border of Somersetshire, between Taunton and Honiton; and of the ranges of hills which it sends off, chiefly to the southward, separating the basin of the Otter from those of the Ex on one side, and the Axe on the other, and dividing from each other the valleys watered by the several affluents of the Otter and the Axe. Dumpdon hill, north-west of Honiton, is 879 feet high. These hills have flat tabular summits; their steeper side is toward the west. [CRETACEOUS GROUP.]

Rivers.—The rivers of Devonshire are numerous, and some of them important. The Ex rises in Exmoor, in Somersetshire, and flows south-east past the villages of Exford and Winford to Exton, where it turns to the south, and reaches the border of Devonshire about 18 or 19 miles from its source. For about two miles it divides Devonshire from Somersetshire, being joined in this part by the river Barle, which also rises in Exmoor, and has a south-east course of 22 to 24 miles through Somersetshire before it falls into the Ex. A little below the junction of the Barle, the Ex enters Devonshire, and flows in a southerly direction, but with a very circuitous course, to Tiverton (about 10 or 11 miles), receiving in its way several feeders, of which the chief are the Batham (9 or 10 miles long), which flows from the border of Somersetshire past Bampton, and falls into the Ex on its left or eastern bank; and the Loman (8 or 10 miles long), which flows from the hills on the Somersetshire border, near Bampton, and joins the Ex on its left bank at Tiverton. From Tiverton the Ex flows still southward, 13 miles, to the junction of the Culm, receiving by the way, on its right bank, the Dart (8 miles long) from the moors between Tiverton and South Molton; and about 2 miles lower down, on its right bank, the Creedy (16 miles long), which passes near Crediton, and is joined by the Yeo (12 or 13 miles long) below that town. From the junction of the Creedy the Ex flows between 2 and 3 miles southward to Exeter, and then about 5 miles south-east to Topsham, where it receives the Clist, 16 or 18 miles long: just above Topsham, the Ex becomes a tide river. The tideway of it is about 5 miles long (or 7 by the low-water channel), and about a mile wide at high water. A sand-bank, dry at low water, divides its mouth into two channels. The whole length of the Ex is from 57 to 60 miles. A canal, formed in the reign of Henry VIII., runs by the side of this river between Exeter and Topsham: this canal was originally more than 3 miles long, and it has been lately lengthened so as to enter the tideway lower down. By this canal and the tideway of the river, vessels can get up to Exeter, above which the river is not navigable.

The Culm, mentioned above, rises in the Blackdown hills, just within the border of Somersetshire, and flows 11 miles westward to the village of Uffculm; from thence 5 miles south-west to the town of Collumpton or Cullumpton, and from thence for 10 miles south-west (26 miles in all) into the Ex.

The Torridge rises on the border of Devonshire and Cornwall, near the head of the Tamer [CORNWALL], and flows eastward about 7 miles to the neighbourhood of the villages of East and West Putford; it then turns to the south-east, and runs 8 or 9 miles to Bradford Mill, where it receives the Waldon (12 miles long) on its right bank. From Bradford Mill it runs eastward 9 miles past Sheepwash or Shipwash to the junction of the stream (10 or 12 miles long) which passes Hatherleigh; and thence 1½ mile north-east to the junction of the Okement, which is formed of two brooks (East and West Okement) that rise on Dartmoor and unite at Oakhampton, and has a northward course of 18 to 20 miles. From the junction of the Okement the Torridge has a very sinuous course of 25 or 26 miles in a north-west direction, past Torrington to Bideford, where it becomes a tide river. The tideway from Bideford to Appledore, where the Torridge and the Taw unite, is 3 miles, making the whole course of the Torridge 53 to 56 miles. The Torridge is navigable for vessels up to Bideford, and for boats to Wear Giffard, 4 or 5 miles higher up.

The Taw rises on Dartmoor, on the slope of the same hill (Okement Hill) from which the East and West Okement rise, and has a northward course of 17 or 18 miles to below the mill and village of Brushford: from thence it has a winding course of nearly 7 miles in a north-north-west direction to the junction of the Little Dart (16 or 18 miles long), which rises in the range of hills connecting Dartmoor with Exmoor, and flows westward past Chumleigh into the Taw. From the junction of the Little Dart, the Taw flows northward 3 miles to the junction of the Mole (20 miles long), which rises on North Molton ridge, Exmoor, on the border of Devonshire and Somersetshire, passes North and South Molton, and after receiving the Bray (14 miles long), which also rises on Exmoor, joins the Taw on its right bank. After the junction of the Mole, the Taw flows north-north-west 16 miles to Barnstaple, where it becomes a tide river. The tideway is about 5 miles in length from Barnstaple to the junction of the Torridge, making the length of the Taw nearly 50 miles. It is navigable for small vessels up to Barnstaple, and for boats to New Bridge, 3 or 4 miles higher. The æstuary of the united rivers Taw and Torridge is not 2 miles long.

The Dart rises on Dartmoor. The head of the East Dart, which may be considered as the true head, is on the southern slope of Okement hill, near the springs of the Okement and the Taw. It flows 10 miles south-east to the junction of the West Dart (9 miles long) at Dartmeet Bridge, between Ashburton and Tavistock. From Dartmeet Bridge the river flows south-east 30 miles past Buckfastleigh and Totness, to its outfall just below Dartmouth. Its whole course is thus about 40 miles. The tide flows up to Totness 10 or 11 miles from the mouth of the river: above this place the river is not navigable. The navigation is chiefly used to convey coal and shelly-sand manure to Totness and the neighbourhood, and to export the produce of the tin, lead, and copper mines, worked on the border of Dartmoor Forest. The entrance to the river forms a good harbour.

The Teign (the North Teign) rises on Dartmoor near the head of the Dart, and after flowing three or four miles to the north, turns eastward, and flows about 14 miles to Dunsford, between Exeter and Moreton Hampstead. It then runs south about 12 or 13 miles, near Chudleigh, receiving by the way the West Teign or Bovey river (15 miles long) from North Bovey, to the neighbourhood of Newton Bushel and Newton Abbot; below Newton Bushel it has an eastward course of five miles (chiefly tideway) into the sea at Teignmouth. Its whole course is about 35 miles: it is navigable up to Newton Bushel, five miles from the mouth.

The Otter rises on the southern slope of Blackdown, near the village of Otterford, and flows south-south-west about 25 miles, past Honiton, Ottery St. Mary, and Otterton, into the sea about five miles east of the mouth of the Ex. It is not navigable, and has no tributary worthy of note. The Axe rises in Dorsetshire, not far from Beaminster, and has a circuitous course (north-west, west, and south-west) of 16 miles, through Dorsetshire, Somersetshire, and Devonshire, to Axminster. Below Axminster it flows 7 or 8 miles south-south-west into the sea at Axmouth, receiving the Yart (12 or 13 miles long) from the hills adjacent to Blackdown.

The Avon or Aune, the Erme, and the Yealm rise on the southern side of Dartmoor, and flow southward into the sea between Plymouth Sound and Bolt head. They are respectively 22, 15, and 14 miles long. The Aune and the Yealm have each a navigable tideway of three miles, the Erme of two miles. The Plym rises near the Erme, and flows south-south-west 16 or 17 miles into Plymouth Sound at Plymouth. Its tideway 'Catwater' is three miles long.

The Tamer, which divides Cornwall from Devonshire, has been already described. [Cornwall.] Its principal Devonshire feeders are the Deer (9 miles long), which flows past Holsworthy; the Carey (13 miles long), and the Lyd (13 miles long), which rises on Dartmoor; both these join the Tamer near Launceston; and the Tavy or Tay (26 or 28 miles long), which rises on Dartmoor, and flows past Tavistock. The Tavy joins the tideway of the Tamer, and has itself a tideway of more than three miles. The Lew Water (nine miles long) and the Thistle Brook (10 or 11 miles long) are feeders of the Lyd; and the Wallcomb (13 miles long) is a feeder of the Tavy. There is a picturesque fall in the Lyd, near Lidford, four or five miles from its source.

The other rivers of the county are too small to require particular notice. It will suffice to mention the Lynn (10 miles long) on the north coast, and the Sid (6 miles long) on the south coast. Salcombe harbour, between Bolt head and Prawle Point is the æstuary of several small streams, to which the maps do not assign a name. This æstuary is navigable up to Kingsbridge four miles from the mouth.

Canals.—The Bude and Holsworthy canal, with which is connected the Bude and Launceston canal, enters this county from Cornwall, near the head of the Tamer, and proceeds in a very circuitous course of more than 15½ miles to Thornbury on the river Waldon, one of the feeders of the Torridge, where the canal terminates. It has two inclined planes in Devonshire and two in Cornwall: part of its course is through a tunnel. The chief purposes of this canal are to facilitate the importation of Welsh coal, and to convey shelly sand from the coast to the interior for manure. In Nichols' and Co.'s Map of Canals, one is marked as extending from Torrington along the valley of the Torridge for about four miles, and opening into that river at Wear Giffard, between Torrington and Bideford, where the navigation of the river begins. The Stover or Teigngrace canal is connected with the Teign at Newton Bushel, and extends about four miles up the valley of that river toward Bovey Tracey: it serves for the importation of coal, culm, sea-sand, and lime; and the exportation of Bovey coal, pipe-clay, and potters' clay. The Tavistock canal extends four miles from Tavistock to the tideway of the Tamer; it has a tunnel one mile and a half long, and a branch two miles long, to Millhill slate-quarries. The Exeter canal has been noticed. Two important canals have been projected, 'the Grand Western Canal' (Acts obtained A.D. 1796, 1811, 1812), from Taunton in Somersetshire, by the valleys of the Tone, the Culm, and the Clist, to Topsham; with branches to Tiverton and Collumpton; and 'the English and Bristol Channels Ship Canal' (Act obtained A.D. 1825), from Bridgewater Bay to Beer Road in Seaton Bay at the mouth of the Axe, crossing the eastern extremity of Devonshire by the valley of the Axe.

There is a railroad from Dartmoor, near the prison originally built for prisoners of war, to the river Plym near Plymouth: a branch from Catdown and Sutton Pool, close to Plymouth, joins this railroad at its termination on the Plym. The length of the railroad and branch together is about 25½ miles. Another railroad, 8 miles long, formed of granite blocks, extends from the Haytor quarries to the Teigngrace canal. Railways have been projected between Bristol and Exeter, passing by Axminster, Taunton, Bridgewater, &c.; and between Exeter and the Southampton railway at Basingstoke, Hants. An act of parliament has been obtained for the former of these.

There are no less than four roads between London and Exeter traversed by the mails. The Devonport, Exeter and Bath mail-road enters this county between Wellington and Collumpton, and passes south-west through Bradninch to Exeter, and from thence by Chudleigh, Newton, and Totnes to Devonport. The Exeter mail-road enters Devonshire between Chard and Honiton, from which place it runs to Exeter. The Penzance, Falmouth, and Exeter mail-road enters Devonshire between Bridport and Axminster, and proceeds by the latter town and Honiton to Exeter, and from thence by Oakhampton, skirting the north side of Dartmoor, to Poulston Bridge, where it crosses the Tamer into Cornwall. The Falmouth, Devonport, and Exeter mail-road enters the county between Ilminster and Honiton and runs to Exeter, and from thence by Chudleigh and Ashburton to Plymouth and Devonport, and from whence the mail is conveyed across the æstuary of the Tamer into Cornwall. A mail-road from Bristol to Bideford enters Devonshire between Wiveliscombe and Bampton, and runs by South Molton and Barnstaple to Bideford. A road from Exeter runs by Crediton and Chumleigh to Barnstaple, and from thence by one branch to Ilfracombe, and by another to Combe Martin. From this road, at or near Crediton, are branches to Tiverton and Bampton and South Molton on the one hand, and to Oakhampton on the other: and between Chumleigh and Barnstaple another road branches off to Bideford, Clovelly, and Hartland. Besides the mail-road from Exeter to Plymouth, there is a road through Moreton Hampstead, and over Dartmoor. A road from Ashburton leads to Tavistock over Dartmoor.

Geological Structure.—A few spots occur in the eastern portion of the county and along the coast between Sidmouth and the border of Dorsetshire, which are occupied by outlying portions of the chalk formation. The sections of these portions on the coast present the last chalk cliffs toward the west. In the cliffs eastward of the Axe, the chalk does not occupy the whole cliff but only the upper portion: the central part of the cliff is composed of green-sand, and the lower part of the lias: for the chalk and green-sand in their extension westward overlie the other formations, which elsewhere are found beneath them and rest immediately upon the lias. Westward of the Axe, where the chalk cliffs reappear, the chalk dips rapidly towards the west: a portion of the upper part of the cliff has been detached and has subsided toward the beach, the shattered mass of chalk exhibiting a variety of picturesque forms.

The green-sand formation presents on the confines of Dorset and Devon many outlying masses forming considerable hills. To this formation belong the flat-topped hills of Blackdown, the range connected with them which separates the valleys of the Otter and the Axe, and the branches of this range which separate the smaller valleys watered by the tributaries of the Axe (the Yart, the Coly, &c.) and by the Sid. A range extending westward from the Blackdown hills, and bounding the valley of the Culm on the north, also belongs to the green-sand formation: and beyond Exeter the range of the Haldon hills, divided only by the valley of the Teign from the granite of Dartmoor, is capped by green-sand; thus affording a remarkable instance of the approximation of primitive rocks and those of much later formation. The green-sand heights in Devonshire are for the most part in the state of unreclaimed heath. [Cretaceous Group.]

On the eastern side of the Blackdown and connected ranges, the green-sand rests upon lias, the lowest of the oolitic series of formations. Lias occupies the valley of the Axe above Axminster, and the upper part of the valley of the Yart. On the western and southern sides of Blackdown the green-sand overlies all the oolitic formations, and rests immediately upon the red marle, which, with the accompanying sandstone and conglomerate, constituting the formation designated the new red sandstone, occupies the tract from the Blackdown hills westward to the valley of the Loman and the Ex: it constitutes the bed of the Loman, but extends not quite to the bank of the Ex, which flows for the most part over a bed of transition rocks. Between Silverton and Exeter the red marle is found extending westward across the Ex and the Creedy, and along the valley of the Yeo, nearly to the valley of the Taw. It extends southward from the Blackdown hills along the valley of the Otter, and across the country between the Otter and the Ex to the coast; crosses the Ex immediately below Exeter, and extends along the coast with some interval to Torbay: it forms the valley of the Sid and the Coly, and the lower part of the valleys of the Axe and the Yart. The green-sand which caps the Haldon hills rests chiefly on this formation. Between Exeter and the village of Exminster the layers of red and white sand in this formation are strangely intermixed. The conglomerate which belongs to it is quarried for building at Heavitree, near Exeter. In the vicinity of Exeter, and in other places near the junction of the sandstone and transition districts, there is found amygdaloidal trap interposed between the sandstone beds.

The district occupied by the various formations enumerated above is small, compared with that which consists of the rocks of the transition class. These occupy all the county northward and westward of the new red sandstone, except the primitive district of Dartmoor. The western side of Great Haldon (green-sand) rests upon the transition rocks. These transition rocks consist of an argillaceous slate, which in the neighbourhood of Dartmoor does not attain to an average elevation of more than 500 feet; except on the western flank of the moor, where it forms a steep eminence of more than 1100 feet. In the north of Devon it rises considerably higher, and the heights of Exmoor (which are in some parts 1800 feet high) consist of it. In this part of the county the rocks which compose the formation differ materially in their mineralogical characters: they have for the most part the structure of sandstones, and are essentially composed of quartz and clay, but in different proportions; quartz predominating in the coarser and clay in the finer grained varieties: these last graduate into a fine slate, the laminæ of which are as thin as paper. The strata of greywacke near Clovelly incline in every direction, and describe the most capricious and picturesque forms. The undulating surface of the country may be partly ascribed to the predominance of the argillaceous slate, which is, of all the rocks of earlier formation, the most subject to decomposition. These slate rocks are quarried for roofing-slates: they are metalliferous, affording ironstone; and veins of tin, copper, and lead: the veins or lodes which yield tin or copper run, as in Cornwall, from N.E. to S.W. (approaching more or less to E. and W.), and those which afford lead run nearly at right angles to these. The strata in the mining field about Tavistock which yields tin, copper, lead, and manganese, are traversed by porphyritic (elvan) beds, bearing nearly east and west. A few lead and copper mines are wrought in North Devon: the lead is combined with silver. In many parts of the transition district, beds of limestone and masses of greenstone occur. The limestone rocks in the vicinity of Plymouth, Tor Bay, Ashburton, Newton Bushel, and Chudleigh, as containing organic remains and alternating with argillaceous slate, may be referred to the transition series: the limestone is quarried for building and burnt for manure: beautifully veined marble is worked in different places. The limestone of the north of Devon which crosses the county in parallel courses E. and W., is referable to the same series. The greenstone occurs in various parts of the slate district on the northern and western sides of Dartmoor: and detached portions of amygdaloidal trap, observed in many situations round Dartmoor, may probably be referred to this formation.

It is in the transition district that the imperfect coal or lignite, called Bovey coal, is found. It occurs at Bovey Heathfield, on the right or S.W. bank of the West Teign or Bovey river in a plain where the strata of it rise to the surface. It lies in parallel seams from four to sixteen feet thick, at six or eight feet distance from each other, to the depth of sixty feet, and exhibits a gradation from the most perfect ligneous texture to a substance nearly approaching the character of pit coal. Potters' clay and pipe clay are found in the same neighbourhood. These various substances are of a later formation, and are deposited with intermingled beds in a basin formed of older rocks. The Bovey coal is used for fuel in the potteries on Bovey heath, and by the poorer people of the neighbourhood: but its difficult and imperfect combustion, and fetid gas, render it unfit for domestic use.

Granite forms the mass of Dartmoor. Numerous rifted rocks called tors, are scattered over the surface of this moor: they appear to occupy their primitive sites and to owe their present figure to the resistance which their more perfect crystallization has enabled them to offer to the influence of the atmosphere. The Dartmoor granite is remarkable for the size of the felspar crystals which it contains: it is much valued for its durability, fineness of texture, and the size of the blocks; it is quarried and exported to a considerable extent, especially to London. It is metalliferous; containing veins of tin, and even the rock itself being sometimes impregnated with this metal. (Conybeare and Phillip's *Outlines of the Geology of England and Wales; Geological Trans.* vol. i.; Lysons's *Magna Britannia; Physical and Political Geog. of the Brit. Isles in the Library of Useful Knowledge.*)

Agriculture.—The lower hills which occupy so large a part of the surface of this county are covered with grass; the higher with moor and rock. The county contains along its numerous rivers many fertile meadows, some of which are only imperfectly irrigated, and others not at all. Grass seems to be the natural produce of a mild moist climate, like that of Devonshire, in which corn is everywhere a secondary object. The improvements in the cultivation of arable land which have been rapidly introduced into other counties, especially in the north, have not been so favourably received in Devonshire. The oldest system of Devonshire cultivation is a rude species of convertible husbandry, very different from what is called by that name in the north of England and south of Scotland. When grass land begins to wear out by injudicious management, or from a natural defect in the soil, the surface is pared thin, and the sod when dried is burnt in heaps. The ashes thus produced stimulate the soil and enable it to bear a few crops, frequently three corn crops in succession. When the land is thus nearly exhausted, it is laid down again in grass without much care, and is pastured for eight or nine years, when the same process is repeated. This system is so common in Devonshire, that the operation of paring and burning is frequently called *Devonshiring*, or contracted, *Denshiring*. Opinions differ very much on this practice. There are soils and situations where burning may be extremely useful, by improving the texture of the soil, and destroying weeds and insects; and the practical result proves that it has its advantages. But in other circumstances the burning does harm, and reduces the soil to a state of great sterility, after having stimulated it to produce one or two crops. It is becoming less common every year, and there is no doubt but in due time it will be confined to land abounding in vegetable matter in that state in which it is not fertile, as in peat or turf.

The soil of Devonshire consists of the substance of the rocks of which the hills are composed, which are granite, grauwacke, red sandstone and slate, and marble. The decomposed slate gives the argillaceous part, which binds the silicious and calcareous sand produced from the other rocks. The waters have mixed these substances in every proportion; but the best and most fertile soils are composed of a mixture in the proportions which form a good sound loam very favourable to the growth of wheat and of potatoes. A great part of North Devon is above mediocrity as to fertility; and portions of the southern part of the county are highly productive. Considerable wastes and heaths have been gradually brought into cultivation; and although many wastes and commons still remain, and there are extensive moors and bogs scarcely susceptible of improvement, the quantity of land which is productive in grass or corn is very considerable for so hilly a country. The grass land occupies more than four-fifths of the soil under cultivation. Where an improved system of husbandry has been introduced, chiefly by resident proprietors, a regular course of crops is adopted; but the old Devonshire farmer takes three, or at least two corn crops after breaking up a pasture, and a small portion of turnips or potatoes, and has no regular rotation. After the surface is pared and burnt, lime is used for manure, and earth from banks and hedge rows, mixed with the ashes. For turnips and potatoes farm-yard dung is used. When the sod is not burnt, the land is ploughed up in autumn or in spring, cross-ploughed in May or June, then cleared of weeds which are burnt, and then limed and manured: thus a tolerable preparation for wheat is produced. In some situations where shelly sea-sand can be procured, it makes an excellent dressing for the land · 160 horse loads, or *seams*, as they are called, of 2½ cwt. each, are mixed with 40 or 50 bushels of lime for an acre. When the soil is strong, and the land is ploughed from a state of pasture for immediate sowing with wheat, the seed is frequently covered by the hack, a kind of heavy hoe like a shipwright's adze. The furrow-slices are laid on edge in ploughing, and the wheat falls in between them; the hacking fills up the intervals, and the wheat comes up in regular rows. This is a very old mode of cultivation, and common in different parts of the Continent. If the land has been well prepared, it is a method of covering the seed preferable to harrowing it in, but it is more expensive. The practice of shovelling out the intervals between the stitches to cover the seed with the earth taken out, is common and much to be commended.

The rapid growth of weeds in the climate of Devonshire renders all the corn crops very foul, even after a good fallow. This should have pointed out the advantage of the row culture, which admits of hoeing the crops; but drilling is not yet introduced to any extent. Great expense is bestowed in hand weeding, where attention is paid to having clean crops: where this is neglected, the return is much below what might be expected from the soil.

Some of the lands on the hills are so steep that the crop must be brought home upon horses, who carry a pack saddle with large hooks on each side, in which the sheaves are laid. A horse so loaded looks at a distance like a little moving stack, being almost entirely covered with sheaves.

A considerable quantity of potatoes are raised in Devonshire and sent to London, where they obtain good prices. They were formerly planted in lazy-beds, as in Ireland, but the superior method of single rows moulded up is now very generally adopted. The rich brown loam on a rocky subsoil, which gives a dry sound bottom, especially if it has been for some time in grass, whether pared and burnt, or only ploughed and well worked, produces an abundant crop of very good potatoes. An acre well cultivated and manured will give from 300 to 400 bushels of potatoes for twenty planted.

Grass land being far more abundant in Devonshire than arable, butter, cheese, and live stock may be considered as the chief agricultural produce for exportation. The finest and richest meadows are situated on the alluvial borders of the principal rivers. These ought never to be ploughed up, although this is sometimes done, especially near the end of a lease, if not prevented by a restrictive clause. When such lands are ploughed, sudden floods sometimes destroy the crops, and carry off the finest particles of the soil. Where the meadows are irrigated they are worth from 2*l.* to 3*l.* per acre, and will produce two tons of hay per acre after having been fed off till May-day. The upland meadows are less productive, and require occasional manuring. They will produce from 20 to 30 cwt. of superior hay for horses by being shut up in March. The rent of these is from 30*s.* to 40*s.* per acre. The average quality of good upland pastures, whether of old grass or newly laid down, is such as will feed a cow of 9 stone per quarter on two acres for five months, and two sheep per acre for the remaining seven. When the land has been much exhausted by corn crops, the grass seldom continues good beyond the first or second year, when it shows the mischief that has been done by the appearance of poor weak grasses which succeed the clover and rye-grass.

The clouted cream of Devonshire is a well-known delicacy. It is made by heating the milk on the hearth, or by means of a stove, to a degree a little below the boiling point, when the clouted cream rises to the top like a thick scum, and is taken off when cooled. This cream being merely stirred briskly with the hand or a stick, is converted into butter. It is universally admitted that the butter thus produced is inferior to that which is made from the cream which has risen slowly and spontaneously, and in all the largest and best dairies in the vale of Honiton the cream is never clouted, except to be eaten in that state as a luxury.

The cows used for the dairy are almost exclusively of the breed of the county, and of a red colour. They are handsomely shaped, and some of them give much good rich milk. In general however they have too great an aptitude to become fat to be good milkers. A good Devonshire cow gives three gallons of milk a day, which will make twenty ounces of butter, for the first twenty weeks after calving: after this the milk gradually decreases, till, at the end of nine months, she goes dry. Thus the average produce per cow of a whole dairy through the year will not be more than half this quantity, even if all the cows are good, which is seldom the case. Cheese is made of skimmed milk, and is consequently inferior in quality. Where porkers are in request, as near great towns, they are profitably fattened on the skim milk, or on the whey, with the addition of meal.

A great many oxen are reared and annually exported from all parts of Devonshire, but chiefly the northern parts. About Barnstaple and South Molton the best breeds are met with. The North Devon oxen are famed for their docility and activity at work, and especially for their great aptitude to fatten. They are peculiar in form, and easily distinguished from all other breeds. The breed which resembles them most is the Sussex, but the latter are coarser in the limbs and horns, and have not that peculiar colour of the muzzle and round the eyes, which marks the North Devon breed. The cows of the pure North Devon are chiefly kept to breed; for the dairy they are improved by a cross with a short horn. Some very fine cows of a mixed breed may be seen in the neighbourhood of Exeter, and along the whole vale of the Exe, fine in the coat, horn, and bone, and short in the legs. A cow bred from a North Devon by a Yorkshire bull, produced regularly twenty-four quarts of milk per day for five months after calving, and for several years; but the milk was not quite so rich as that of the pure breed, twelve quarts producing only one pound of butter, while eight quarts of the milk of the pure Devon cow made the same quantity.

The sheep fed on the hills and wastes of this county are of a peculiar breed, with fine wool and excellent flesh. The Exmoor sheep are extremely hardy, and well adapted to cold bleak mountains. The wethers at three years old, when fatted, weigh 12 or 15lbs. per quarter, and the fleece from 4 to 7lbs. In the valleys some remarkably fine sheep of an improved breed, as far as wool and carcase are concerned, have been produced by crosses of the native sheep with the Leicester. The wet state of the low meadows is not favourable to the breeding of sheep, although they fatten rapidly on water meadow grass. The higher pastures are consequently resorted to for breeding flocks, but it requires a hardy race to withstand the wet and cold winters on the Devonshire hills; for frost is not so hurtful to lambs as continued rains. The pasture on Dartmoor Forest is very good, and the rot is almost unknown there. In order to avoid the danger of the rot, which is prevalent in the lower pastures, the sheep are often left too long exposed to the autumn rains and mists on the hills, and consequently lose much of their condition.

The following table, taken from the report of the county by Vancouver, may be interesting to the breeders of sheep.

NATIVE BREEDS.	Age of wethers, when killed, in months.	Average weight per quarter in lbs.	Average weight of fleece in lbs.	Condition of Fleece.	Comparative value of Fleece.	Rough fat in lbs.	Kidney fat in lbs.	Total inside fat.
Exmoor-horned, white legs and face, with a moderately long staple of wool, pure .	30	15	7	Yoak.	5*s.* 10*d.*	7	5	12
Dartmouth, do. do.	30	16	9	do.	6 8	8½	6	14½
South Devon nott, brown face and legs, long wool, pure	30	22	10	do.	8 4			
Bampton nott, white face and legs, short wool, pure . .	20	22	6½	do.	5 5	10	7	17
	32	28	8	do.	6 8			
CROSSED BREEDS.								
Old Leicester, crossed with Bampton	24	30	10	do.	8 4			
Do. with Exmoor	36	24	6½	do.	5 5			
New Leicester, crossed with Exmoor	24	18	6½	do.	5 0			
South Devon	20	20	8½	do.	7 1			
Bampton	20	24	8	do.	6 8	13	8	21
Merino, crossed with Exmoor.	..	..	5	Washed.	10 0			

The race of pigs in Devonshire is very good generally; and in some districts, where care has been taken to select the best animals and cross the breeds with judgment, as fine hogs are fatted as in any part of England.

The extremely prolific nature of the pig makes it an easy task to improve the breed by selection and crossing. A very few years' careful observation will enable any intelligent farmer to keep only the most profitable breeds. In less than a year the result of any cross is known; and when a hog twelve months old, and put up to fatten for three months, pays amply for his food, the farmer may be contented with the manure for his profit. But some breeds pay more than this; and the porkers fed with the offal of a dairy, often give a profit which forms a very important item in the balance of accounts. To prove this it is only necessary to look at the account of the receipts and expenses of a dairy farm as given by the reporter, p. 233, where it will be seen that out of a profit of 88*l.* 4*s.* 9*d.*, that upon pigs alone is reckoned at 25*l.*, which is almost one-third of the whole.

The land in Devonshire is held in fee or on lease for lives. Where the owner or lessee on lives grants a lease, the tenant, according to the length of his tenure, may make improvements; but where the chief lessee has an uncertain tenure, and the land is underlet at rack rent from year to year, no improvement can be expected. The practice of letting farms at a nominal rent for three lives, or for a long term, often induces a man without much capital to offer a great price for a lease which he has not the means of making profitable by good cultivation. A lease for fourteen or twenty-one years to a man who possessed an adequate capital, at a full rent, with proper restrictions to secure good cultivation, would be more likely to improve a property, and in the end would be much more lucrative both to the landlord and the tenant.

The farm buildings in Devonshire are frequently very inconveniently situated with respect to the farm. The object seems to have been to choose a sheltered spot, without regard to the situation of the land attached to the farm.

The materials of which the buildings are constructed are stone or earth, made into a species of mortar, and formed into thick walls, which dry and harden gradually, and are called by a provincial term *cob* walls. Of this material, houses, barns, granaries, and especially garden walls are made; it is in some respects similar to the *pisé* of the south of France; but in this last no water is used, whereas the cob walls are made in a moist state, and harden by drying. If the wet is kept off by a good coat of plaster, and a projecting roof, a cob wall will last many generations.

The farms are not so extensive as in the more level parts of England; 150 to 200 acres, of which at least three-fourths are pasture, are considered a large farm. The extensive commons and wastes, where cattle can be turned out for a mere trifle, even if no common rights can be claimed, tend to increase the number of small holdings: a farm of fifty acres of grass land can maintain a great number of cattle, when they are out of it for seven months in the year.

There are also in this county many more small proprietors and lessees for ninety-nine years, which is nearly the same, than in most other parts of Britain. They are mostly frugal and industrious, and if they do not cultivate their land in the most approved manner, they at least contrive to live comfortably. This is chiefly owing to the rearing of cattle, which requires constant attention, and the eye of the master, much more than the cultivation of the soil, and in which small occupiers are generally more successful in proportion than large farmers.

The chief beverage of the Devonshire people is cider, which is here superior to any other in England. The soil on the slopes of the hills is peculiarly adapted to the growth of fruit trees, especially on a loose rocky bottom, where the roots may insinuate themselves and find moisture at all times. The fruit trees in many parts of the county give a stranger the idea of forest trees, and it is only when they are seen in blossom or covered with fruit, that an orchard could be distinguished from a wood, if it were not for the regular distance between the trees, and the grass growing under them. There are some favourite sorts of apples which have been perpetuated by grafting, at a time when it had not yet been discovered, that every variety from seed has its limited period, beyond which it cannot be continued. Most of the orchards now shew symptoms of old age, and gradually diminish in produce. A new generation of apples is much wanted, and will no doubt arise to take the place of the old. The true golden pippin and the cocagee are now nearly extinct; but many new varieties have been raised from seed, some of which may probably rival the old, if not surpass them. Another cause of the degeneracy of orchards, is the planting of young trees on the exact spot where the old trees have decayed. Although trees do not require so frequent change as herbaceous plants or shrubs, they no doubt exhaust the soil in the immediate neighbourhood of the stem, as may be perceived by examining the roots which continually spread outwards for nourishment. As a quick hedge will not grow in the bank from which an old hedge has been grubbed up, however rich and mellow the soil may appear, so a tree will not thrive on the spot where another has stood for years, unless the soil be renovated by an abundance of lime or fresh mould. Hence new orchards planted in a good deep soil where none existed before, will produce far more abundant fruit, than if the trees had been planted in old orchard grounds; and the principle of change of crop extends to trees as well as to herbs.

Devonshire was formerly no doubt well wooded, and in some places there are still fine trees, but the progress of cultivation has greatly diminished the timber, and except in sheltered situations, trees do not thrive and acquire so great a size as they seem to have done when they sheltered one another. It has also probably been found out, that the return from a closely planted wood cut down at the end of thirty, forty, or fifty years, is greater than if the trees were allowed to increase for a century or two. Coppice wood however is plentiful, most of the steep sides of hills towards the banks of the rivers being covered with this growth, which adds considerably to the beauty of the valleys. The coppice wood is generally cut when twenty years old, some few poles being left till the next cutting. The best trees survive four or five cuttings; but unless they be very fine and thriving, they are usually cut down at threescore years old. The coppice wood is used for fencing, hurdles, and hop poles, and what is unfit for this purpose is sold in faggots for fuel, if near any town, or converted into charcoal. The value of a coppice cut at twenty years old, and which has been protected from the depredations of cattle, may be from 15*l.* to 20*l.* per acre. Where a coppice is well managed, and the timber preserved, the ground may be made to produce an average rent of from 15*s.* to 20*s.* per acre.

In some parts there are extensive furze brakes, which being cut every five years for fuel, produce a very considerable return, varying according to situation from 7*l.* to 10*l.* per acre.

It is to be observed that coppice woods with a southern aspect will be two years in twenty more advanced than those facing the north. A sheltered situation will often make a still greater difference; besides the coppice in the latter situation is considerably more valuable when it is sold. The wood grown in Devonshire is chiefly oak, but beech, ash and elder are interspersed, according to the soil and situation. The sweet chesnut was probably a common tree formerly in sheltered situations in Devonshire, as the oldest buildings contain timbers of this tree. How it has been nearly extirpated it is difficult to say; but the climate of the vales seems peculiarly suited to this tree, so useful for its fruit as well as its timber. Since the late discovery of the quantity of sugar which can be extracted from the chesnut, this tree may again become an object of interest to those who form new plantations.

Trees planted on the summit of the hills in Devonshire, seldom succeed, owing to the violence of the winds; but on the slopes of the hills they thrive well, and as they ascend, they protect each other; and thus in time the tops may be covered. Where the Scotch fir and larch have been planted in sheltered situations, they thrive well.

On a general retrospect of the agriculture of Devonshire, it must be allowed to be good, and yet it is capable of much improvement. When the springs, which are abundant, shall have been collected in drains, and the water turned into channels where it may be rendered useful to turn mills or irrigate meadows, instead of injuring the arable fields; when the meadows shall have been improved by judicious cultivation, and when a better system of convertible husbandry, shall be more generally introduced; the soil and climate of Devonshire, will make it one of the first counties for producing every kind of animal and vegetable food, and the cultivation will extend to thousands of acres which now are looked upon as almost absolutely barren.

The principal fairs in this county are:—Ashburton, June 4; August 10; November 11. Axminster, April 25; Wednesday after June 24. Bampton, Wednesday before March 25; Whit Tuesday; last Thursday in October; last Wednesday in November. Barnstaple, September 19; second Friday in December. Broad Hembury, December 11. Collumpton, first Wednesday in May; first Wednesday in November. Crediton, May 11; August 21; September 21. Chagford, March 25; May 4; September 29; October 29 Culmstock, May 21; October 1. Dodbrook, Wednesday before Palm Sunday. Exeter, third Wednesday in February; third Wednesday in May; last Wednesday in July; second Wednesday in December. Hatherleigh, May 22; June 22; September 4; November 8. Hartland, Easter Wednesday; September 25. Holdsworthy, April 27; June 10; October 2. Honiton, first Wednesday after July 19. Kingsbridge, July 20. Modbury, May 4. Moreton Hampstead, June 4; July 18; November 30. Molton, (North) Tuesday after May 11, and November 12. Molton, (South) Saturday after February 13; Saturday after March 25; Saturday before August 1; Wednesday before June 22; Wednesday after August 26; Saturday before October 10; Saturday before December 12. Oakhampton, second Monday after March 11; May 14; first Wednesday after July 5; August 5. Plymouth, February 5; last Thursday in October. Plympton, February 25; April 5; August 12. Sampford Peverel, Monday before last Wednesday in April; first Thursday in July. Tawton, third Friday in April; November 3; December 11. Tavistock, January 17; May 6; October 10; December 11. Thorncombe, Easter Tuesday. Tiverton, second Tuesday after Trinity Sunday; September 29. Torrington, May 4; July 5; October 10. Totness, May 12; July 25; October 28. Uffculm first Wednesday before Easter; August 12.

Divisions, Towns, &c.—In the Exon Domesday*, mention is made of at least thirty-eight hundreds into which Devonshire was then divided. In the hundred roll, a document of the time of Edward I., thirty-three hundreds (including that of Lovetot, incidentally mentioned as co-extensive with the manor of Fremington) are noticed. The present number is thirty-three. We give these three lists in a tabular form, placing in a line the name of the hundreds which are mentioned in more than one of the lists, and of those which, though mentioned by different names, are supposed nearly or quite to coincide.

Exon Domesday.	Hundred Roll.	Modern Name, Situation, Area, and Population in 1831.
Alleridge	Harridge	Hayridge, E. and Central, 44,890 acres, 13,444 inhabitants.
Axemeninstre	Axeministre	Axminster, E., 51,930 acres, 13,939 inh.
Axemuda	Axemue	Axemouth, united with Axminster; the united hundred was formerly called Axminster and Axmouth, now Axminster only.
Badentone	Baunton	Bampton, N.E., 29,430 acres, 7000 inh.
Brauntone	Braunton	Braunton, N., 68,830 acres, 21,974 inh.
Budeleie	Buddele	East Budleigh, S.E., 50,290 acres, 20,266 inh.
Cadelintone	—	West Budleigh, Central, 16,890 acres, 3047 inh.
Carsewille	Haytorr	Haytor, S.E., 61,340 acres, 24,143 inh.
Cl.ridiatone	Cridiaton	Crediton, Central, 34,160 acres, 12,237 inh.
Clawetone	—	—
Clistone	Cliston	Cliston, Central, 19,260 acres, 3482 inh.
—	Colrige	Coleridge, S., 50,090 acres, 20,339 inh.
Culintone	—	Colyton, E., 27,410 acres, 7374 inh.
Dippeforde	Stanburg	Stanborough, S., 61,870 acres, 14,521 inh.
Esseministre	Exminstre	Exminster, S.E., 43,740 acres, 18,232 inh.
Framintone	Fremington	Fremington, N.W., 83,350 acres, 8844 inh.
Halbreton or Hasbertone	Hauberton	Halberton, N.E., 10,090 acres, 2866 inh.
Hamioke	Hemyok	Hemiock, or Hemyock, E., 26,440 acres, 5807 inh.
Hermetone	Ermyntone	Ermington, S., 51,610 acres, 10,524 inh.
Hertesbie	—	—
Hertilande	Hertilande	Hartland, W., 30,360 acres, 4646 in.
Liftone	Lifton	Lifton, W., 136,350 acres, 13,447 inh. Lifton includes Dartmoor Forest, which contains 53,900 acres, and had in 1831 353 inh.
—	Lovetot	—
Mertone	Schefbeare	Shebbear, N.W., 79,200 acres, 20,159 inh.
Mollande	—	—
Offecolum	—	—
Otrie	—	Ottery, E., 9470 acres, 3849 inh.
Plintone	Plympton	Plympton, S., 32,230 acres, 9817 in.
Rueberge	Rouburg	Roborough, S.W., 60,170 acres, 96,430 inh. (with Plymouth.)
Scirewelle	Syrewell	Sherwell, N., 45,790 acres, 4186 inh.
Sutmoltone	Sudmolton	South Molton, N.E., 67,930 acres, 13,825 inh.
Sulfertone	—	—
Tainbruge	Teynebrugg or Tingebrugg	Teignbridge, S.E., 59,230 acres, 14,465 inh.
Taintone	—	—
Tautone	Nortauton	North Tawton, Central, including Winkley, 65,300 acres, 13,422 in.
—	Tavystoke	Tavistock, S.W., 19,790 acres, 6954 inh.
Toritone	Blaka Toriton	Black Torrington, W., 141,600 acres, 19,492 inh.
Tulvertone, or Twertone	—	Tiverton, N.E., 23,960 acres, 10,519 inh.
Walchentone	—	—
Wenfort	Womford or Wonford	Wonford, Central and S.E., 98,770 acres, [illegible]61 inh. (with Exeter.)
Wetrigge. or Witric	Wyrugg, or Wytherugg	Witheridge, Central and N. E., 84,680 acres, 9567 inh.
—	Wynklegh	Winkleigh, or Winkley, Central, included in the return for North Tawton.

Clawtone hundred, in the Exon Doomsday, evidently took its name from the village of Clawton in Black Torrington hundred; Mollande from the village of Molland Botreaux in South Molton hundred; Offecolum from the town of Uffculme, or Ufculm, in Bampton hundred; Sulfertone from the village of Silverton in Hayridge hundred; Taintone either from the village of Drew's Teignton in Wonford hundred, near the upper part of the Teign, and not far from the road from Exeter to Oakhampton, or more probably from King's Teignton in Teignbridge hundred and Bishop's Teignton in Exminster hundred, both near the mouth of the Teign and not far from each other, and Walchentone from Walkhampton in Roborough hundred. The situation of Lovetot hundred has been mentioned already.

The county is divided into two parts for the purpose of parliamentary representation: each division sends two members. The divisions comprehend respectively the following hundreds

Northern Division.—Bampton, Black Torrington, Braunton, Crediton, Fremington, Halberton, Hartland, Hayridge, Hemiock, North Tawton, Shebbear, Sherwell, South Molton, Tiverton, Winkleigh, Witheridge, West Budleigh.

Southern Division.—Axminster, Cliston, Coleridge, Colyton, East Budleigh, Ermington, Exminster, Haytor, Lifton, Ottery, Plympton, Roborough, Stanborough, Tavistock, Teignbridge, Wonford (except what is included in the city of Exeter).

Devonshire contains forty market-towns. Of the most important we subjoin a list, adding the locality of each, and the population in 1831. For further information the reader is referred to their respective articles:

Ashburton, a parliamentary borough on a small feeder of the Dart, 4165; Axminster, on the Axe, 2719; Bampton, on the Bathern, or Batham, a feeder of the Ex, 1961; Barnstaple, a parliamentary borough on the Taw, 6840; Bideford, on the Torridge, 4846; Brixham, near Berry Head, the southern extremity of Tor Bay, 5015; Dartmouth, a parliamentary borough on the Dart, 4597; Devonport, formerly called Plymouth Dock, or colloquially Dock, on the æstuary of the Tamer, near Plymouth, a parliamentary borough, population given with Plymouth; Exeter, a city, and the county town, on the Ex, 28,201; Honiton, a parliamentary borough on the Otter, 3509; Plymouth, on Plymouth Sound, a parliamentary borough, and one of the great naval ports of England, pop. including Devonport and Stonehouse, 75,534, Sidmouth, on the English Channel, 3126; Stonehouse, between Plymouth and Devonport, included in the parliamentary borough of Devonport, population given with Plymouth. [DEVONPORT.] Tavistock, a parliamentary borough on the Tavy, 5602; Tiverton, on the Ex, a parliamentary borough, 9766; Totness, a parliamentary borough on the Dart, 3442.

Of the remaining towns we shall subjoin an account here, giving them in alphabetical order.

Appledore is a port and market-town on the western side of the river Torridge, just at its junction with the Taw: it is in the parish of Northam, and in the hundred of Shebbear, 204 miles west by south of London, through Barnstaple and Bideford. It is a small place, but has a considerable coasting trade. Risdon, who compiled his survey of Devon A. D. 1605-1630, says of Appledore that it is 'a place, since our fathers' age, meanly inhabited, but at present mustereth many mansions, and may for multitude compare with some towns.' Appledore has two weekly provision markets, on Wednesday and Saturday, for the convenience of shipping. There is a chapel in the town kept in repair by the church of Windsor, but it has not been used as a place of public worship within memory: the church is at the village of Northam, above a mile from the town. The living of Northam is a vicarage, of the yearly value of 125*l*., with a glebe-house, in the gift of the dean and chapter of Windsor. The parish contains places of worship for Independents, Baptists, and Wesleyan Methodists. The population of the parish in 1831 was 2727; that of the town of Appledore was not distinguished. The education returns from this parish in 1833 contain six infant schools with about 90 scholars; seven day-schools (one a national school of 50 boys and 30 girls, supported by an endowment and by subscription), containing in all [illegible] scholars; and three Sunday-schools with above 200 scholars. A parochial lending library is connected with the national school, and a lending library with one of the Sunday-schools.

On the coast, near Appledore, is a sandy tract of about 800 acres, called 'Northam Burrows,' adjoining to which is a high bank of pebbles, about a mile long, resembling the Chesil-bank, near Weymouth. Kinwith, or Kenw[illegible] Castle, in besieging which Ubbo or Hubba the Dane was killed, A. D. 878, was near Appledore. Henni Borough, or Henni Castle, a small fortified spot not far from Bideford has been supposed to be the site of this castle.

South Brent is a small town in the hundred of S orough, on the road from Exeter to Plymouth, and on the river Avon or Aune, twenty-six or twenty-seven miles from Exeter, and sixteen or seventeen from Plymouth. The population of the parish, which is very large (10,180 acres) was, in 1831, 1248, chiefly agricultural. The market is on Friday; and there are two fares in the year. The living is a vicarage, endowed with the great tithes, and worth 122*l.* a year, with a glebe house. The education returns for 1833 give for this parish four day-schools with about 200 children (one of these schools, containing 50 children, is endowed), and two Sunday-schools containing 100 scholars.

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* The 'Exon Domesday' contains a description of the five western counties, Wilts, Dorset, Somerset, Devon, and Cornwall; and is supposed to contain an exact transcript of the returns made by the Conqueror's commissioners at the time of the general survey from which the great 'Domesday' itself was compiled. The original is preserved among the records belonging to the Dean and Chapter of Exeter

Chagford is in the hundred of Wonford, near the right bank of the Teign, and not far from the border of Dartmoor Forest, three and a half miles west by north of Moreton Hampstead, and fifteen or sixteen west by south of Exeter. This small town lies in a picturesque situation at the foot of some rugged and lofty hills. There is a bridge of three arches over the Teign, half a mile above the town: the church is an antient structure, and there are remains of antient chapels at Great Week and Teigncombe in the parish. The parish is large (8710 acres) and contains several hamlets: the population in 1831 was 1868, about half of whom were engaged in agriculture, and a few in the manufacture of woollens. The market is on Saturday, and there are four fairs in the year. The living is a rectory, of the yearly value of 442*l.*, with a glebe house. The number of schools in the parish by the returns of 1833 was as follows: five day-schools (one partly supported by an endowment), with 190 children, and three Sunday-schools with 210 scholars. There are places of worship for Wesleyan Methodists and Calvinistic Baptists. Chagford is one of the Stannary towns. In 1643, during the great civil war, there was an action at Chagford between the Parliamentarians and the Royalists, in which the Royalists were victorious. In the latter part of the seventeenth century the town was destroyed by fire.

Chudleigh is in the hundred of Exminster, a short distance from the left bank of the Teign, and on the road from Exeter to Plymouth, between nine and ten miles from Exeter. The town, which is situated in a delightful country, chiefly consists of one long street, having the church, a small building, in which are some monuments of the Courtenay family, at its south-western extremity. There is a bridge over the Teign, nearly a mile from the town. The population of the parish, which comprehends 6230 acres, was, in 1831, 2278, of whom about a third were engaged in agriculture, and a few in manufactures, probably of woollens. The woollen manufacture was once pursued more extensively. The neighbourhood of Chudleigh is very productive in cider. There is a market on Saturday, and three fairs in the year, chiefly for cattle. There is a Dissenting meeting-house in the town. The living is a vicarage, of the yearly value of 505*l.*, with a glebe house, in the gift of the parishioners, who purchased the advowson. There were in 1833 four infant schools with 91 children; six day-schools (two of them, containing 60 to 80 children, supported partly or wholly by endowment; and one, for the children of Catholic parents, partly supported by charitable contributions), containing altogether 140 to 160 children; and one Sunday-school with 93 scholars and a library attached. One of the endowed schools is a grammar-school.

The bishops of Exeter had formerly a palace at Chudleigh, of which there are some remains a quarter of a mile from the town: the manor formed part of the possessions of the see. Ugbrooke, a mile south-east of the town, now the residence of Lord Clifford, was formerly the residence of the precentor of Exeter cathedral. The park, with the adjacent pleasure grounds and plantations, occupies a space several miles in circumference; it is richly wooded, and is adorned with a large piece of water and a cascade; the house contains some good paintings by the antient masters. About half a mile from the town is 'Chudleigh Rock,' a limestone cliff celebrated for its picturesque appearance. Midway down the cliff is a cavern, the entrance to which is by a natural arch, twelve feet wide and ten feet high; according to tradition, a dog put into this cavern, which soon becomes too contracted for men to trace it, came out at a place three miles distant. Local superstition has peopled this cavern with Pixies, a minute variety of the fairy race. The limestone quarried is here considered to be of superior quality. Many persons are employed in these works.

In May, 1808, a dreadful fire broke out at Chudleigh, by which 166 houses were destroyed: the damage was estimated at 60,000*l.*, and the sum of 21,000*l.* was promptly gathered by subscription for the relief of the poorer sufferers.

Chulmleigh, Chumleigh, or Chimleigh, is in the hundred of Witheridge, on the north bank of the Little Dart, just above its junction with the Taw. It is on the road from Exeter to Barnstaple, about twenty-one or twenty-two miles north-west from Exeter. It is a small town. The parish contains 8650 acres, but had in 1831 not more than 335 houses (including 1 building and 30 uninhabited) and 1573 inhabitants, more than half of them engaged in agriculture. The church, dedicated to St. Mary Magdalen, was much damaged by lightning in 1797. It contains some antient screen work. There were, in 1772, chapels at Ladywell and Cadbury, both desecrated, and some remains of chapels at Coleton, or Colleton, and Stone, all in this parish. There is one Dissenting place of worship, if not two, in the town. The manor of Chulmleigh once belonged to the Courtenays, earls of Devon, who had a castle here, of which there are no remains. In 1803 a destructive fire broke out in the town, and destroyed ninety-five houses and uninsured property to the value of 11,000*l.* The market is on Friday, but as a corn-market is almost disused: there are three fairs in the year.

The church was formerly collegiate, and has five prebends, which are not necessarily united with the rectory, though of late years they have been held by the rector. The present value of the rectory (we presume without the prebends) is 415*l.* a year. The education returns of 1833 assign to the parish five day-schools with 210 scholars; one day and Sunday-school with 20 day scholars and 13 additional on Sundays, who attend the Established Church; and two Sunday-schools, one supported by Churchmen and the other by Independents, with 120 children in each. Two of the day-schools are partially endowed, another is supported by the Independents.

Collumpton, Columpton, or Columbton, otherwise Cullompton or Cullumpton, is in Hayridge hundred, on the right or west bank of the Culm, a tributary of the Ex, and on the road from Taunton to Exeter, twelve miles north-east of Exeter. Collumpton is a town of tolerable size, having its main street along the Exeter and Taunton road, nearly a mile in length; other shorter streets branch off from this. The streets are ill-paved; but the houses are tolerably well built, some thatched and some covered with slate.

The whole number of inhabited houses in the parish, which comprehends 5790 acres, was, in 1831, 787: the number of inhabitants was 3813. About one-third of the adult males were engaged in agriculture, and about one-fourth in manufactures. There are several bridges over the Culm or the brooks which flow into it. The church, which is dedicated to the Virgin Mary, is very antient and handsome; it is in the perpendicular English style, and has an elegantly carved and gilt roof. A Gothic chapel was added by John Lane, a clothier of the town, who died in the reign of Henry VIII., and is buried in the chapel: it is a specimen of the gorgeous richness of that time. The tower of the church is 100 feet high. There are the remains of a chapel at Langford. There are meeting-houses for Independents, Baptists, Quakers, Wesleyan and Bryanite Methodists, and Presbyterians who have embraced Unitarianism. The principal manufacture is of woollen goods, as serges, kerseymeres, and a few broadcloths. The market is on Saturday for butchers' meat and other provisions, and occasionally for corn: there are two fairs in the year for cattle, cloth, &c. Petty sessions are held here: the town and the adjoining parish of Kentisbere are governed by a high constable chosen yearly, and alternately by Collumpton and Kentisbere.

The living is a vicarage of the yearly value of 351*l.* with a glebe-house, in the gift of R. B. de Beauvoir, Esq.: the church was formerly collegiate. In 1833 there were, at Columpton, a national school, supported by subscriptions, with 221 scholars (116 boys and 105 girls), and seven other day schools, with 99 boys and 96 girls; and five Sunday-schools, with 548 scholars: to one of the Sunday-schools a lending library is attached.

Colyton or Culliton is in the hundred of Colyton, and on the little river Coly, a feeder of the Axe, about twenty-two miles east of Exeter. The town is pleasantly situated, but small; the houses, many of which are antient, are principally built of flint and covered with thatch. In 1831, there were in the parish, which comprises 5430 acres, 436 inhabited houses and 2182 inhabitants: about two-fifths of the adult males were engaged in agriculture. The church is a fine cruciform structure, in the perpendicular English style: it has been enlarged by subscription in the course of the present century. There is a fine stone screen across the south transept, and an altar tomb of a young lady of the Courtenay family, granddaughter of Edward IV. An adjoining chapel is the burial-place of the family of De la Pole. The upper part of the tower of the church is octagonal. The vicarage house is an antient structure. There were formerly chapels at Colcombe, Colyford, Whitford, Gatcombe, and Leigh, in this parish. There are some valuable lands at Colyton, left for charitable purposes, from which a school for 20 or 25 boys is supported. There are meeting-houses for Independents and Unitarian Presbyterians. The markets are on Thursday and Saturday, and there are two fairs in the year for cattle.

The living of Colyton is a vicarage with the chapelries of Monkton and Shute annexed, worth 403*l.* per annum with a glebe-house, in the gift of the dean and chapter of Exeter, in whose peculiar jurisdiction it is. According to the return for 1833, there were in Colyton parish eight day schools (including the endowed school), with 198 children; and two Sunday-schools (one partly endowed), with 235 scholars.

In the parish of Colyton is Colyford, a considerable village, which is incorporated and governed by a mayor, who receives the profit arising from the tolls of a large cattle fair held annually. Near the town also are Colcombe castle, once the seat of the Courtenays, earls of Devonshire, and of the De la Poles; and Yardbury, the seat of a branch of the Drakes: both are now converted into farm-houses.

Crediton, antiently written Chridiatone, Cridiaton, Crideton, and Kirton, which last is still the colloquial designation, is in the hundred of Crediton, near the junction of the brook Yeo with the river Creedy, a feeder of the Ex, seven or eight miles north-west of Exeter: the Creedy flows a short distance from the town to the east, the Yeo a short distance to the south. The area of the parish is 11,440 acres: it is divided into ten tythings, containing in all, in 1831, a population of 5922. The town is divided into East town and West town: it is irregularly built; the principal street runs nearly east and west, between two hills, of which that on the south rises with a quick ascent and overtops the houses. The church is a handsome cruciform structure in the later perpendicular style of architecture; it stands in the middle of the town and was probably erected about the close of the fifteenth century. The interior is very neat: the tower rises from the intersection of the nave and aisles, and is supported by four pillars of uncommon magnitude. This church contains a parochial library once consisting of 1000 volumes, but many have been lost, and the rest are becoming a prey to worms and spiders. (*Beauties of England and Wales.*) There is an antient decayed chapel at the west end of the town, formerly belonging to the hospital of St. Lawrence; and the walls of a chapel at Yew or Yeo, in the parish. The serge manufacture was established in Crediton from the first introduction of it into the county, and was formerly carried on with considerable activity. Vast quantities of wool and yarn were sold weekly in the market-place; but this branch of industry has declined in Crediton, as it has elsewhere in Devonshire, and the returns of 1831 gave only 5 adult males out of 1336 as engaged in manufactures of any kind: 468 adult males were at the same time engaged in agriculture as occupiers of land or labourers, and 566 in trade or handicrafts. The market, which is on Saturday for corn and provisions, is considerable, but not equal to what it was formerly: the market which precedes the last Wednesday in April is one of the largest marts for bullocks in the west of England. There are three cattle fairs in the year. There are congregations of Presbyterians (who have, like many of the English Presbyterians, embraced Unitarian sentiments), Independents, Baptists, and Methodists. There are two sets of almshouses, each for four poor persons.

There is said to have been a collegiate church at Crediton early in the time of the Saxons, which church, upon the division of the diocese of Sherbourne in the reign of Edward the Elder, was made the cathedral of the bishops of Devonshire, about A.D 905 or 910: about A.D. 1040, the diocese of Crediton was enlarged by the addition of that of St. German's, which included Cornwall; but in A.D. 1050 the see was removed to Exeter. The palace at Crediton continued to be the occasional residence of the bishops, and the manor and hundred of Crediton continued to belong to them till the reign of Henry VIII., when the bishop (Veysey) reluctantly surrendered them to the crown. The site of the old church or cathedral, dedicated to St. Gregory, is now occupied by a range of houses by the side of the present churchyard. Although the see was removed to Exeter, the church retained the chapter, which consisted of eighteen canons or prebendaries, of whom three bore the titles of precentor, treasurer, and dean, and eighteen vicars. The chapter was dissolved in the reign of Edward VI.: its yearly revenue at the dissolution amounted to 332*l.* 17*s.* 5*d.* The small tithes, and subsequently the great tithes, of Crediton, Sandford, and Exminster, were vested in a corporation of twelve governors, nine from Crediton and three from Sandford. The governors appoint the vicar of Crediton, who has a yearly stipend of 400*l.* with a parsonage house: there is an assistant minister who has 200*l.* a year.

Crediton sent representatives to the parliament held at Carlisle in the time of Edward I. The town is governed by a portreeve: petty sessions are held here.

There were, in 1833, in Crediton parish, one infant school, partly supported by subscription, and containing 90 children; an endowed grammar school, containing 20 boys: a Lancasterian school, with 200 children, partly endowed and partly supported by subscriptions and collections; an endowed school for 15 boys; and nine other schools, containing 285 children; one day and boarding school, with [illegible] scholars; and six Sunday-schools, with 352 children.

Crediton was occupied by the revolters who rose in the west of England A.D. 1549, on account of the Reformation, but they were driven out by Sir Peter and Sir Gawen Carew. The town was repeatedly occupied by the contending parties in the civil war of Charles I. In A.D. 1743 a dreadful fire broke out in the western town, which occasioned the destruction of 460 houses; the damage was estimated at 40,000*l.*, and sixteen lives were lost. In 1769 a second fire consumed many of the houses rebuilt after the former fire, together with the market-house and shambles.

Culmstock or Columbstock is on the border of Somersetshire, in the hundred of Hemyock, on the upper part of the river Culm, nineteen or twenty miles north-east of Exeter. The parish comprises 4530 acres or seven square miles, and includes several villages and hamlets besides the town: it had, in 1831, 312 inhabited houses and 1519 inhabitants: of the adult males nearly one half were engaged in agriculture, and nearly one-seventh in manufactures. There is a market-house, 'built,' say Messrs. Lysons (*Magna Britannia*, vol. vi., p. 151, published 1822), 'not many years ago by the dean and chapter of Exeter.' The market, now much declined, is held on Friday for butchers' meat. There are two fairs in the year, at one of which cloth is sometimes sold; but the clothing trade, which once flourished in this place, has much declined. The church, dedicated to All Saints, is in the centre of the town: it contains a fine stone screen, with a rich doorway, canopied with foliage. There are meeting-houses for Quakers and Wesleyan Methodists; and one for Calvinistic Baptists at the village of Prescot, in the parish. The living is a vicarage, in the gift of the dean and chapter of Exeter, in whose peculiar jurisdiction it is: its annual value is [illegible] with a glebe-house. There were in the parish, in 1833, [illegible] day-schools (one of them partly supported by contributions) with 144 children; and three Sunday-schools, with nearly 300 children.

Hatherleigh is in the hundred of Black Torrington, on the east or right bank of a stream which flows into the Torridge a short distance above the junction of the Ockment: Hatherleigh is twenty-eight miles west-north-west of Exeter. The parish comprises 6500 acres, and had, in 1831, 290 inhabited houses and a population of 1606. Of the adult males nearly two-thirds were engaged in agriculture, and a very few in the manufacture probably of woollens. The town is very irregularly laid out, and the houses, which are principally built of red clay, and are thatched, have a very mean appearance. The market is on Tuesday and Saturday, and there are four cattle fairs in the year, and a large cattle market on the Friday nearest the [illegible] of March. The town is governed by a portreeve, two constables, and other officers annually chosen at the court [illegible] by the lord of the manor. Petty sessions are held here. The living is a vicarage, of the annual value of 202*l.* with a glebe-house. There were in the parish in 1833, five day-schools (one of them supported partly by endowment and subscription) containing 150 to 155 children, and one Sunday-school with 160 scholars: a lending-library is attached to the Sunday-school.

The manor of Hatherleigh formerly belonged to the abbey of Tavistock; one of the abbots gave a large plot of common land for the advantage of the townsmen.

Holsworthy is in the hundred of Black Torrington, not far from the east or left bank of a small stream that flows southward into the Tamer: it is forty-one or forty-two miles west by north of Exeter. The parish, which comprises 8870 acres, includes besides the town, four villages, if not more: the population in 1831 was 1628; not quite half of the adult males were engaged in agriculture. The Bude and Holsworthy canal, which unites with the Bude and Launceston canal, passes near the town. The market, which was held formerly on Saturday, has lately been changed to Wednesday; there is a great market on the second Wednesday in February, and there are three fairs in the year; one of them (in October) is a great fair for cattle and all sorts of commodities. The parish church is antient: it has some Norman piers and a plain Norman door, and some portions of later date. There were formerly chapels at Chelsworthy and Thorne in the parish. There are places of worship for Independents and Wesleyan Methodists. The petty sessions for the division are held at Holsworthy. The living is a rectory of the yearly value of 478*l.*, with a glebe-house. In 1833 there were in the parish six day-schools (one of them partly supported by subscription) with 222 children, and three Sunday-schools with about 250 children.

Ilfracombe is in the hundred of Braunton, on the coast of the Bristol channel, ten miles north of Barnstaple, and forty-seven or forty-eight north-west from Exeter. The parish has an area of 3620 acres, and had, in 1831, a population of 3201: of the adult males more than one-fifth were engaged in agriculture, and about the same number in retail trade and handicraft: there is a considerable coasting trade and herring fishery. The town consists of one main street extending north-east and south-west along the sea-coast, and reaching at the north-east end to the harbour, which is formed by an inlet or cove of the Bristol channel, very commodious and safe, affording anchorage to vessels of 230 tons, and rendered additionally secure by a pier 850 feet in length. The harbour being accessible to vessels which cannot make Barnstaple or Bideford, has caused much of the port business of Barnstaple to be transferred hither: there are a battery and lighthouse at the entrance of the harbour. Oats are the chief article of export. The houses are tolerably well built; a number, intended for the reception of visitors, range along the harbour. The shore is convenient for bathing, and there are warm baths for invalids. The town is considered an agreeable summer residence, and is much resorted to. There is a market on Saturdays well supplied with fish, and two cattle fairs in the year. The church is a large building at the south-west end of the town; it contains a monument, erected at the national expense, to the memory of Captain Richard Bowen, R.N., who fell in the unsuccessful attack made by Nelson on Teneriffe, July, 1797. There are meeting-houses in the parish for Wesleyans and Independents. The town is governed by a portreeve.

The living of Ilfracombe is a vicarage of the yearly value of 150*l.* with a glebe-house; the rectorial tithes are in the hands of one of the prebendaries of Salisbury cathedral who is patron of the vicarage. There were at Ilfracombe in 1833 one national school with about 130 children, supported partly by an endowment and subscriptions, and partly by a small weekly payment from the children: nineteen day-schools with 341 children (one of these schools with 18 children is supported by a small endowment and by subscription), and two Sunday-schools with 356 children.

Kingsbridge is in the hundred of Stanborough, in the southern part of the county, a short distance north-west of Start Point, at the head of a considerable æstuary into which a number of small streams flow: it is thirty-five miles south-south-west of Exeter. The town may be considered as composed of Kingsbridge and Dodbroke, or Dodbrook, which is in Coleridge hundred, and is separated from Kingsbridge only by a rivulet. The area and population of these parishes in 1831, were, Kingsbridge, 150 acres, 1586 inhabitants; Dodbroke, 420 acres, 1038 inhabitants; total 570 acres, 2624 inhabitants. The number of inhabited houses in the two parishes was in 1831, 378. Of the adult male population scarcely more than one-tenth was engaged in agriculture, and scarcely any in manufacture: the manufacture of woollen cloths and serges formerly carried on with considerable activity having become nearly or quite extinct. Ships of burden can come up to the town at high water, and there are two quays, one in Dodbroke, and the other in the parish of West Alvington, or Allington, adjacent to Kingsbridge. Cider, corn, malt, and slate are exported; the chief imports are sea-borne coals. The market is on Wednesday, for corn, butchers' meat, and provisions: the corn-market is one of the largest in Devonshire. There is one fair in the year. Kingsbridge consists mainly of one street on the Modbury and Plymouth road; Dodbroke, of one on the Exeter road: these streets unite at the lower end of the town near the haven. The church of Dodbroke, dedicated to St. Thomas-à-Becket, has an early stone font, and some portions of good screen work. There are meeting-houses for Independents, Baptists, Quakers, and Wesleyan Methodists. The living of Kingsbridge is a vicarage united with that of Churchstow, or Churstow, an adjacent parish to the north-west; their joint yearly value is 118*l.*, they are in the gift of the crown. The living of Dodbroke is a rectory of the yearly value of 183*l.*, with a glebe-house. There were in Dodbroke in 1833, 6 day-schools with 130 children, all very young; and in Kingsbridge, 1 infant school with 14 children, and 7 other day-schools, 6 of them containing 150 children of both sexes; the seventh is a grammar-school endowed for the instruction of at least 15 boys, with exhibitions for three or four scholars to the universities: the number of scholars actually taught is not stated in the return. There were in Kingsbridge also 4 Sunday-schools with 97 scholars.

Modbury is in the hundred of Ermington, on a rivulet whose waters flow into the Erme: thirty-five miles south west of Exeter. The parish comprehends an area of 5910 acres, and had, in 1831, 364 inhabited houses, with a population of 2116 persons. Besides the town the parish comprehends the villages of Brownston, Leigh, Caton, Penquit, part of Ludbrook, and others. Nearly half of the adult males are engaged in agriculture, scarcely any in manufacture. The town consists of an irregular assemblage of streets. The church is spacious and handsome; the tower is 134 feet high, built soon after the church in 1621. There are meeting-houses for Baptists, Independents, Quakers, and Methodists. There are some ruins of the antient mansion of the Champernounes, who held the manor of Modbury, and lived here in great splendour: a large deer-park which was at a small distance from the mansion, is now converted into a farm, which retains the name of Modbury Park. Modbury is a borough, though without a charter of incorporation: it sent representatives to parliament in the reign of Edward I., but it is said soon to have got excused on the ground of the expense: whether this was the cause is, however, doubted by Messrs. Lysons. Modbury is now governed by a portreeve (usually styled mayor) two constables, and several other officers, chosen at a court-leet. Until the beginning of the eighteenth century the borough court took cognizance of debts under forty shillings. There was an alien priory of Benedictines here as early as the reign of Stephen, but it was suppressed at the dissolution of alien priories, and its revenues, valued at 70*l.* per annum, were given by Henry VI. to Eton College. The market is on Thursday, for corn, butchers' meat, and other provisions: there is a great market for cattle on the second Tuesday in every month, and a great fair for cattle, cloth, and other merchandise, in the month of May. The living of Modbury is a vicarage of the annual value of 302*l.*, with a glebe-house, in the gift of Eton College. There were at Modbury in 1833, two infant schools with 76 children, and a Lancasterian school with 70 boys, all partly supported by charitable contributions; four other day-schools with 116 children, and three Sunday-schools with 287 children. A lending-library is attached to one of the Sunday-schools.

South Molton is a market-town and municipal borough in the hundred of South Molton twenty-seven or twenty-eight miles north-west of Exeter, on the right or west bank of the river Mole. The limits of the borough are the same as those of the parish, and comprehend an area of 6160 acres, with a population, in 1831, of 3826: of the adult males about three-eighths were engaged in agriculture. The town is well situated for business at the convergence of several principal roads, viz.: one from Exeter by Crediton, one from Tiverton, one from Barnstaple, one from Torrington, and one from Chulmleigh: it consists of a spacious market-place and several streets, well paved, with flagged foot-ways, and lighted; the public walks are kept remarkably clean. The guildhall is a convenient building, and the borough gaol, built a few years since, contains six cells (two of them strong cells,) two large day-rooms and a good yard. The church, which is adjacent to the market-place, is a handsome building in the perpendicular style of architecture: it has a rich stone pulpit adorned with statues and a profusion of varied carved foliage. There are meeting-houses for Independents and Wesleyans. At Honiton, two miles south-west of the town, is an episcopal chapel, built on the site of a more antient one, and handsomely decorated, and endowed by the Rev. Lewis Southcomb, A.D. 1730; over the altar-piece is a picture of our Saviour baptized by John the Baptist.

The woollen manufacture is carried on at South Molton to some extent; nearly 70 adult males are engaged in it: serges, shalloons, and felts were formerly made, and (in 1822) coarse woollens for Spain and the East Indies; the lace manufacture has recently been introduced. The markets are on Tuesday and Thursday for butchers' meat, and on Saturday for corn and provisions generally: the Saturday market is considerable, and there are great markets on the Saturday after February 13 and March 25, and before April 23, August 1, October 10, and December 12. There are two fairs in the year for horses and cattle.

By the Municipal Reform Act the town has a mayor, four aldermen, and twelve councillors. The sessions of the peace are held quarterly, the petty sessions every three weeks, or oftener if required, and the court of record every three weeks.

The living of South Molton is a perpetual curacy in the gift of the dean and chapter of Windsor, who are impropriators of the great tithes which they lease to the corporation; the annual value of the curacy is 157*l.* The number of schools in the parish in 1833 was as follows: eleven infant (or dame) schools, with about 200 children; seven day, or day and boarding-schools, with above 350 children; and three Sunday-schools, with 640 children. Of the day-schools one is an endowed grammar-school; one (the Blue-coat school, in which most of the children are clothed), is supported by an endowment and contributions; and a third is supported by contributions.

Moreton Hampstead is in Teignbridge hundred, near the eastern border of Dartmoor Forest, and near the Wadley brook, which flows into the Bovey river, and so into the Teign, twelve miles west by south of Exeter, on one of the roads from that place to Tavistock and Plymouth. The area of the parish is 7370 acres, and it contained in 1831, 383 inhabited houses, and a population of 1864. The town is romantically situated on a gentle eminence bounded on almost every side by high hills. The principal street runs for about half a mile along the Exeter and Plymouth road. There are meeting-houses for Unitarians, Independents, Baptists, and Methodists. Of the adult male population above half are engaged in agriculture: there are no manufactures carried on: that of woollen yarn and serge has become extinct. The market is on Saturday for corn and provisions; the market next before Whitsuntide is a great cattle market: there are two cattle fairs in the year. The town is governed by a portreeve, and other officers chosen annually at the court of the lord of the manor. The townspeople are distinguished by singularity of dialect and manners, owing probably to their secluded situation on the border of Dartmoor. The living is a rectory in the gift of the earl of Devon: annual value 401*l.*, with a glebe-house. There were in the parish in 1833, eight infant schools, with 70 scholars; one day-school, with 33 boys and 6 girls, partly supported by an endowment and an allowance from the parish; six other day-schools, with 69 boys and 42 girls; and three Sunday-schools, with 82 children; one of the Sunday-schools has a lending-library attached to it.

Newton Abbot is in the parish of Woolborough, or Wolborough, in the hundred of Haytor; and Newton Bushel, which is adjacent to Newton Abbot, being separated from it only by a narrow brook which flows into the Teign, is in High Week parish, and in Teignbridge hundred: the two may be considered as forming one town a short distance from the south or right bank of the Teign, fifteen miles south by west of Exeter. The area, population, &c., of the parishes by the census of 1831 were as follows:—

	Acres.	Inhabited houses.	Inhabitants
High Week	2140	216	1109
Woolborough	970	442	2194
Total	3110	658	3303

Of the adult male population, amounting to 734 persons, 110 were engaged in agriculture and only 3 in manufactures. There is a market on Wednesday held at Newton Abbot: that on the last Wednesday in February is a great cattle market: there are three cattle fairs in Newton Abbot. The principal street of the town runs north-west and south-east for above half a mile: another principal street runs into this from the south-west, and there are some smaller ones: the houses are indifferently built, and the streets ill paved: the market-place and shambles in the principal street obstruct the thoroughfare. The parish churches are at some distance from the town: there is a chapel of ease at Newton Bushel, the minister of which is appointed by the incumbent of High Weeks, and another chapel in Newton Abbot, served by the minister of Woolborough. There are meeting-houses for Independents and Calvinistic Baptists. There is an alms-house in the parish of Woolborough for two clergymen's widows, originally for four. The living of High Week is a curacy united with the vicarage of King's Teignton; the value of the joint livings is 396*l.*, with a glebe-house, in the gift of the prebend of Teignton Regis, or King's Teignton, in Salisbury cathedral. The living of Woolborough is a donative united with the curacy of Newton Abbot, of the annual value of 235*l.*, in the gift of the earl of Devon. In 1833 there were in High Week and Woolborough parishes, one national school, containing 82 boys and 64 girls, who were taught daily, and 10 boys and 12 girls additional on Sunday; one endowed day-school for 100 children of both sexes; two boarding and day-schools, with 63 scholars, eight day-schools with above 200 children of both sexes, and one Sunday-school of 33 children.

Oakhampton, or Okehampton, is in Lifton hundred, on the northern border of Dartmoor, at the junction of the East and West Okement rivers, twenty-two miles west of Exeter, on the road to Launceston. The parish comprehends an area of 12,570 acres, and includes, beside the town of Oakhampton, the villages of Chissacot and Meldon, and the hamlet of Kigbear, which extends into Black Torrington hundred. The number of inhabited houses in 1833 was 393, of inhabitants 2055: of the adult males about half were engaged in agriculture; none in manufactures. The town lies in a valley, and is surrounded by rich meadows and wooded acclivities. The town is irregularly laid out. There is an old chapel in the market-place, dedicated to St. James, originally founded as a chantry, which belongs to the corporation; divine service is occasionally performed in it. The church is on an eminence some distance west of the town. There are in the parish places of worship for Independents and Wesleyan Methodists. Oakhampton Castle, formerly in the possession of the Courtenays, was on a hill within a mile south-west of the town. It was dismantled by order of Henry VIII., and is now a mere ruin; the extent of the area occupied by it, and the solidity of the walls, show it to have been a fortress of importance. Oakhampton is a place of little trade: the market is on Saturday: that next before Christmas is a great cattle market. There are seven fairs in the year; one of them, a holiday fair, called 'Giglet Fair,' is held on the Saturday next after Christmas Day. Oakhampton is a municipal, and was, up to the passing of the Reform Act, a parliamentary borough. The bounds of the borough included the whole parish. It sent members to parliament in the reigns of Edward I. and Edward II but the privilege was lost or disused until the time of Charles I.; the right of election was in the freeholders or the freemen by servitude and their eldest sons: it was disfranchised by the Reform Act. The municipal corporation consisted of a mayor, eight principal and eight assistant burgesses, with other officers. When the commissioners for inquiring into the state of the municipal corporations visited Oakhampton, the borough court of record had gone quite into disuse, the borough sessions nearly so, and the gaol was in a most wretched state: the chaplaincy of St. James's chapel had been long vacant, and the grammar-school given up.

The living of Oakhampton is a vicarage, of the yearly value of 480*l.*, with a glebe house. There were in the parish, in 1833, thirteen day-schools with 348 children, and three Sunday-schools with 315 children. Four of the day-schools, containing 128 children, are supported by subscription: one of the Sunday-schools has a lending library attached.

Ottery St. Mary is in the hundred of Ottery, and on the east or left bank of the river Otter, about eleven miles from Exeter. The hundred of Ottery contains only this parish, which has an area of 9470 acres; the population in 1831 was 3849: of the adult males above half were engaged in agriculture, and only one person in manufacture. The town is irregularly laid out, but in a pleasant situation. The church, formerly collegiate, is large and in the form of a cross: it resembles Exeter cathedral in having two towers for transepts. The architecture is chiefly in the early English style, of a character rather different from what is common, and with various alterations of a later date: the northern tower is crowned by a low spire. There is a Lady chapel. There are several monuments in the church of some antiquity, especially an altar tomb with the effigy of an armed knight and a rich monumental arch over it. There were formerly chapels at Ottery dedicated to St. Saviour and St. Budeaux, and also chapels of which there are some remains at Holcome and Knighteston, in the parish. There is a place of worship for Independents. The remains of an ancient mansion, once inhabited by Sir Walter Raleigh, are said (*Beaut. of Eng. and Wales*, 1809) to be yet existing; and there are some antient collegiate houses just outside the churchyard. The serge manufacture, formerly flourishing, has declined. The market is on Tuesday for butchers' meat and provisions, and there are three fairs in the year.

The living of Ottery is a vicarage in the gift of the lord chancellor, of the yearly value of 112*l.* with a glebe house. There were, in 1833, one infant-school with 40 children, principally supported by private charity: nine day or boarding and day-schools with 421 children; two day and Sunday-schools, with about 60 children, supported by private charity; and three Sunday-schools, with 257 children. Of the day or boarding and day-schools one is an endowed grammar-school, with hardly any boys on the foundation.

Plympton St. Maurice, commonly called Plympton Maurice, or Plympton Earl, is in the hundred of Plympton, not far from the south bank of the Tory brook, which flows into the Plym, and is on the road from Modbury to Plymouth, about thirty-nine miles south-west of Exeter. The parish contains only 170 acres: it had, in 1831, 123 inhabited houses, and a population of 804 persons. It was, up to the passing of the Reform Bill, a parliamentary borough, and has still a municipal corporation: the borough limits comprehend part of the adjacent parishes of Plympton St. Mary, and Brixton, and some extra-parochial ground. It is one of the stannary towns. There was formerly a castle here, belonging to the family of De Redvers, or Rivers, who held the earldom of Devonshire before the Courtenays. This castle was on the north side of the town; there are only some scanty remains of the walls of the keep, but the earth-works show it to have been a place of great strength. The town has two principal streets: the town-hall contains a portrait of Sir Joshua Reynolds, who was a native of the place, painted by himself. There is an Independent meeting-house. The market is on Friday for corn and provisions, and there are five cattle fairs in the year. The borough revenue has been insufficient to meet the expenditure; and as the supply afforded to the corporation funds by the patron of the borough has been withdrawn since the passing of the Reform Act, it is probable the corporation will fall into desuetude. The living of Plympton Earl is a perpetual curacy, of the yearly value of 100*l.*, in the gift of the dean and chapter of Windsor. The grammar-school, though endowed with estates producing upwards of 200*l.* a year, has been useless for twenty years or more, the office of master having been converted into a complete sinecure. There were, in 1833, six day-schools with 111 children, one boarding school with 17 girls, and one sunday-school with 50 children.

Teignmouth is in the hundred of Exminster, at the mouth of the river Teign, on the north side of the river, about sixteen miles south of Exeter. It consists of East Teignmouth and West Teignmouth, which are separated by a small brook. The area, population, &c. of their respective parishes, according to the returns of 1831, were as follows:—

	Acres.	Inhabited houses.	Population.
East Teignmouth	700	315	1810
West Teignmouth	580	523	2878
Total	1280	838	4688

There are no manufactures carried on, and the proportion of persons engaged in agriculture is very small. Teignmouth is much frequented as a bathing-place, and has every accommodation for invalids. The trade too is considerable: the inhabitants are much engaged in the Newfoundland fishery. There are considerable exports of granite (for the conveyance of which from the Haytor quarries a railroad has been constructed), pipe-clay, potters' clay, manganese, timber, bark, and cider: the imports are of culm, coal, deals, iron, &c. There is a considerable fishery for soles, whiting, turbot, mackerel, and pilchards, on the coast, and for salmon in the river Teign. East Teignmouth church is near the sea-shore; it has been rebuilt within a few years on an enlarged scale: the former church was an antient fabric, with a massive tower, and had some windows and other parts of Norman architecture. West Teignmouth church is large and handsome; it was built under an Act passed A. D. 1815. There is an Independent meeting-house in East Teignmouth; also a theatre, assembly, coffee, and billiard rooms. The bridge over the Teign, opened in 1827, is the longest in the united kingdom, being 1671 feet long, 429 feet longer than Waterloo Bridge. A new market-place has been built of late years. The market is in East Teignmouth; it is on Saturday for provisions of all kinds: there are three fairs also in East Teignmouth. The livings of East and West Teignmouth are perpetual curacies. The yearly value of East Teignmouth is 127*l.*; West Teignmouth is now united with the vicarage of Bishop's Teignton, the yearly value of which is 334*l.*, with a glebe house. Teignmouth contained in 1833 five infant schools with 134 children, sixteen day-schools with 570 children, and two Sunday-schools with 199 children. Of the day-schools one was partly supported by a small endowment and another was on the so-called 'national' system. The cliffs near Teignmouth rise in some parts to the height of from 150 to 200 feet.

Topsham is in the hundred of Wonford, three and a half miles south-east of Exeter, on the left or eastern bank of the Ex, at the junction of the Clist. The parish comprehends an area of 1740 acres, and had in 1831 a total population of 3184. No manufacture is carried on at Topsham. The town consists almost entirely of one street of irregular breadth, and about a mile in length, extending along the bank of the Ex, with a quay at the lower end of it. At the back of the town is a bridge over the Clist, communicating with the road from Exeter to Lympstone and Exmouth. The houses are generally of mean appearance; but some of them are handsome. The end towards the quay, called the Strand, is inhabited chiefly by persons of property, of whom there are many at Topsham. The houses here command a fine view of the Ex, with the opposite country, backed by the lofty heights of Great and Little Haldon. The church is in the centre of the town, on a high cliff next the river. There are places of worship for Presbyterians, Independents, and Wesleyan Methodists. Topsham was formerly considered as the port of Exeter: lately the facilities for vessels getting up to Exeter have been increased. There is a communication by steam-boats between Topsham and London. The market is on Saturday, and there is one small fair in the year.

The living of Topsham is a perpetual curacy in the gift and the peculiar jurisdiction of the dean and chapter of Exeter: its yearly value is 227*l.*

The number of schools in 1833 was as follows: twenty-four day, or boarding and day schools, with 636 children; and four Sunday schools, with 402 children. One of the day schools was a National school, and contained 90 boys and 77 girls.

When Exeter was besieged by the Royalists under prince Maurice, in the civil wars of Charles I., A.D. 1643, the earl of Warwick, who commanded the parliamentary fleet, in attempting to relieve the town, battered down a fort at Topsham, and killed seventy or eighty men. Topsham was antiently called Apsham or Apsom.

Torrington (distinguished from Little Torrington and Black Torrington by the epithet Great) is a municipal borough and market-town in the hundred of Fremington, about thirty-six miles from Exeter, by Crediton, Chulmleigh, and Cranford Moor. The borough is co-extensive with the parish, which comprehends an area of 3640 acres. The total population in 1831 was 3093. The town is situated on a hill, on the northern or right bank of the Torridge, over which there is a bridge communicating with the little suburb of Taddy Port. The church is in a central situation. Torrington castle stood on the south side of the town, on a steep eminence, overlooking the Torridge; it was built by Richard de Merton, A.D. 1340: its site is now a bowling-green.

The principal manufacture carried on in Torrington and the country round is that of gloves; this branch of industry was in 1834 in a very flourishing state. The market is held on Saturday, for corn and butchers' meat; there are three fairs in the year, and a great cattle-market on the third Saturday in March.

The quarter sessions and petty sessions are regularly held; the court of record has gone into disuse. The new act assigns to Torrington four aldermen and twelve councillors.

The living of Torrington is a vicarage, united with the perpetual curacy of the neighbouring parish of St. Giles in the Wood: their joint yearly value is 162*l.*: they are in the gift of Christ Church College, Oxford. There were in 1822 places of worship for Presbyterians, Wesleyans, and Baptists. (Lysons.)

The number of schools in 1833 was as follows:—three infant schools, with 112 children; seven day schools (one partly endowed, and one partly supported by subscription), with 322 children; and three Sunday schools, with 383 children. There are two sets of almshouses, one for six poor persons, unendowed; another for eight poor persons, with an endowment.

In February, 1646, the Royalists under Lord Hopton were attacked at Torrington by the Parliamentary forces under Fairfax, and entirely defeated. This defeat was the death-blow to the Royalist cause in the west. Torrington gives the title of Viscount to the family of Byng.

Uffculm, or Uffculme, is in Bampton hundred, on the right or north-west bank of the river Culm, a feeder of the Ex, about sixteen or seventeen miles north-north-east from Exeter. The parish comprehends an area of 5920 acres, and had, in 1831, 416 inhabited houses and 2082 inhabitants: of the adult male population nearly half were engaged in agriculture. Uffculm was in the middle, and even towards the close of the last century, a considerable manufacturing town; a great quantity of serge was made and exported to Holland by the Tiverton merchants. Flannels were afterwards made, but at present the manufactures have ceased. The market is on Wednesday, and there are three fairs in the year, but the fairs have all declined. The church, dedicated to St. Mary, contains some antient monuments and a rich wood screen. There are places of worship for Independents and particular Baptists. The living at Uffculm is a vicarage, of the yearly value of 350*l.*; the rectory forms the corps of a prebend in Salisbury Cathedral; the prebendary is the patron of the vicarage. There were at Uffculm in 1833 nine day-schools and one evening-school with 144 children, and three sunday-schools with 253 scholars. One of the day-schools is a grammar school, with an endowment worth from 70*l.* to 80*l.* a year, but it contained in 1833 only two scholars.

Beside the above market-towns, there are a few other places in Devonshire which are entitled to a brief notice.

Combe Marten is in Braunton hundred, on the north coast, about five miles east of Ilfracombe. It had in 1831 a population of 1031 inhabitants. It was formerly known for the growth of excellent hemp and the manufacture of shoemaker's thread, but these branches of industry have been given up. The trade of the place is inconsiderable. Welsh coal is imported, and corn and bark are exported: lime is burnt in considerable quantity. The market has been long discontinued: the living is a rectory, of the yearly value of 387*l.*, with a glebe house. The Wesleyans have a place of worship here.

Hartland is an extensive parish in Hartland hundred: it contains several villages. The church is in the village of Stoke, and the market was held in that of Harton. The market-house is standing, but no weekly market has been held for half a century. There is a great market or fair for cattle on the second Saturday in March, and two cattle fairs in the year. At Hartland Pier, near Hartland Point, corn is exported, and coal and limestone imported. The living of Hartland is a perpetual curacy in the gift of the governors of the Charter-house in London; it is worth 97*l.* a year. It is said there were formerly eleven chapels in the parish. The Independents have a meeting-house. Hartland Abbey was founded by the wife of earl Goodwin for secular priests; but in the time of Henry II. these seculars were changed into an abbot and convent of Black or Augustinian canons. The revenues of this house at the dissolution were 306*l.* 13*s.* 2*d.* according to Speed, and 306*l.* 3*s.* 2*d.* according to Dugdale. Some portion of the cloisters of the abbey remain; they are in the early English style. The population of the parish in 1831 was 2143. There were in 1833 seven day-schools, with 179 children.

Bradninch, a borough between Collumpton and Exeter, is in Hayridge hundred. It had in 1831 a population of 1524, more than half of which was agricultural. The market has been disused beyond the memory of those now living. The boundaries of the borough are identical with those of the parish, and include an area of 4320 acres. The town consists principally of one street, extending for above half a mile along the Exeter and Collumpton road; the foopaths are paved. The quarter sessions, petty sessions (monthly), and court of record are kept up. There is a guildhall with a small gaol under it, which has been lately rebuilt. The church is near the middle of the town, and has a rich screen across the nave and aisles. The living is a perpetual curacy of the yearly value of 102*l.*, with a glebe-house in the gift of the Dean and Chapter of Windsor. There is a Baptist meeting-house, with which a Sunday-school is connected. There were in 1833 three day-schools and one boarding-school at Bradninch, containing sixty or eighty children. Beer Alston is in the parish of Beer Ferris or Ferrers, and in the hundred of Roborough; it is between the Tamer and the Tavy. It had no market for many years, but was up to the Reform Act a parliamentary borough. [BEER ALSTON.] Thorncombe, in a detached part of the county, included between Dorsetshire and Somersetshire, had formerly a market, which was discontinued about the year 1770. The population of the parish, which is large and includes several villages, was, in 1831, 1368. In this parish stood Ford Abbey, to which an abbot and twelve Cistertian monks were removed A.D. 1141. This abbey at the dissolution was valued at 381*l.* 10*s.* 6*d.* gross yearly income, or 374*l.* 10*s.* 6*d.* clear. There are some remains of the monastic buildings: the chapel has a groined roof (early English) and some late Norman arches; the hall and cloisters are of rich late perpendicular architecture. Silverton is between the Ex and the Culm, seven miles north of Exeter, in Hayridge hundred. There has been no market since 1785. The church, which lies a little back from the principal street, is a handsome edifice in the perpendicular style. The population of the parish in 1831 was 13 Sheepwash or Shipwash is in Shebbear hundred on the north bank of the Torridge, a short distance west by north of Hatherleigh. The market was considerable in the middle of the last century, but since the latter end of that century it has been discontinued. The parish is not large, and had in 1831 only 446 inhabitants. Exmouth, the situation of which is indicated by its name, is a place much resorted to as a bathing-place. It is in East Budleigh hundred, and about eight miles south of Exeter. The population of the joint parishes of Littleham and Exmouth in 1831 was 31 Exmouth was in the reign of King John one of the principal ports of the county, and in 1347 it furnished 10 ships and 193 mariners for the expedition against Calais. In the civil war of Charles I. Exmouth fort was garrisoned for the King, but taken by the Parliamentarians. There is a national school, for which Lord Rolle built a school-room, and to which Lady Rolle bequeathed an endowment. Dawlish, between the mouths of the Ex and the Teign, is also frequented as a bathing-place. It is in Exminster hundred, and had in 1831 a population of 3151. Torquay, also a fashionable watering-place, is on the north side of Torbay, in the parish of Tor Mohun, or Moham in Haytor hundred. Tor Mohun parish had in 1831 a population of 3582. A market-house has been built, and there are hotels and ball-rooms, terraces, and detached cottages. The inhabitants are engaged in the Newfoundland and home fisheries, and carry on some coasting trade. Paignton, population, in 1 1960, formerly a market-town, is on the west side of Torbay. Clovelly, on the north coast, is a village remarkable for its picturesque situation and appearance. The houses are built on the face of a steep rock. There is a pier at Clovelly. The inhabitants are engaged in fishing. Population, in 1 907.

Though none of the above places (except perhaps To quay) has a market now, several of them are put down in the maps as market-towns.

Divisions for Ecclesiastical and Legal Purposes.—From the introduction of Christianity among the Anglo-Saxons to the year 703, the southern part of England, from Kent to Cornwall, was under one bishop. Upon the ecclesiastical division which took place in 703 (in the reign of Ina, king of Wessex), Devonshire became part of the diocese of Sherbourne. About A. D. 910 (in the reign of Edward the Elder, son of the great Alfred) Devonshire formed a diocese of itself, the see being at Crediton. About the year 1040, in the reign of Harold I., or Hardicanute, Cornwall, which had previously formed the separate diocese of St. Germans, was united with Devonshire, and the see was soon afterwards, A. D. 1050 (in the reign of Edward the Confessor), removed to Exeter, where it has ever since continued. That part of the diocese which is in Devonshire is divided into three archdeaconries, which are subdivided into twenty-three rural deaneries, as follows:—I. Archdeaconry of Exeter, in the eastern part of Devon, comprehending the rural deaneries of (1) Aylesbeare, (2) Cadbury, (3) Christianity, or Exeter, (4) Dunkeswell, (5) Dunsford, (6) Honiton, (7) Kenne, (8) Plymtree, (9) Tiverton. II. Archdeaconry of Barnstaple, in the north, comprehending the rural deaneries of (10) Barum, or Barnstaple, (11) Chulmleigh, (12) Hertland, (13) Shirwell, (14) South Molton, (15) Torrington. III. Archdeaconry of Totness, in the south and west, comprehending the rural deaneries of (16) Holsworthy, (17) Ipplepen, (18) Moreton, (19) Oakhampton, (20) Tamerton, (21) Tavistock, (22) Totton, or Totness, (23) Woodleigh. The office of dean rural is an efficient one; the deans are appointed yearly at the visitations.

The number of benefices in the county is given by Messrs. Lysons (*Magna Britannia*) at 471, of which 258 are rectories, 130 vicarages, 42 donatives, or curacies, and 41 parochial chapelries. There are several chapels of ease. Several of the churches are in the peculiar jurisdiction of the bishop, the dean, the dean and chapter, or the vicars choral of Exeter; one is in the peculiar jurisdiction of the dean and chapter of Salisbury. The diocese of Exeter is in the ecclesiastical province of Canterbury.

Devonshire is included in the western circuit: the assizes and quarter sessions for the county are held at Exeter, which city is a county of itself, having been made so by statute 2 & 3 Edward VI. The stannary laws [CORNWALL] have been in force from a very early period in the mining district in the south-west part of the county. The stannary towns are Ashburton, Chagford, Plympton, and Tavistock. The stannary prison was at Lidford Castle, now a ruin.

The county returns four members to parliament, two for the northern and two for the southern division. The election for the northern division is held at South Molton; the polling stations are South Molton, Collumpton, Barnstaple, Torrington, Holsworthy, and Crediton. The election for the southern division is held at Exeter, and the polling stations are Exeter, Plymouth, Honiton, Newton Abbot, Kingsbridge, Tavistock, and Oakhampton. The city of Exeter returns two members, as do the following boroughs: Barnstaple, Devonport, Honiton, Plymouth, Tavistock, Tiverton, and Totness. The boroughs of Ashburton and Dartmouth return one each; making the total number of members for the county, city and boroughs, twenty-two, four less than before the Reform Act. Beer Alston, Bradninch, Crediton, Fremington, (near Barnstaple), Lidford, (between Tavistock and Oakhampton), Modbury, South Molton, Oakhampton, Plympton, and Great Torrington, once sent members to parliament. Torrington lost the right in consequence of the inhabitants finding the maintenance of their representative too heavy a burden, and petitioning to be excused: it is said that the same was the case with several of the other boroughs; but there are no records to show this. Beer Alston, Oakhampton, and Plympton were disfranchised by the Reform Act. Exmouth and Teignmouth sent representatives to the great councils for maritime affairs.

History. Antiquities.—The earliest ascertained inhabitants of this county were the Damnonii (Richard of Cirencester), Dumnonii or Dumnunnii (*Itin.* Antonin.), or Δουμνόνιοι (Ptolemy). It has been disputed whether these were the original Celtic inhabitants, or whether they were Belgic invaders who drove out a Celtic people (the Cimbri of Richard of Cirencester, as some think), who had previously occupied the country. The Cimbri, according to Richard, inhabited the country west of the river Uxella (the Parret); their territory therefore probably included the north part of Devonshire. We have no authentic accounts of any conflict between the Damnonii, or Cimbri, and the Romans during the conquest of Britain by the latter: Geoffrey of Monmouth speaks of a drawn battle near Exeter between Vespasian, afterwards emperor, and the Briton, Arviragus; but his authority is worth little. The many antient encampments in Devonshire mark it as the scene of early encounters: some of these camps are evidently Roman. After the Roman conquest Devonshire was included in the province of Britannia Prima.

Of this remote period there are many remains. Circular enclosures formed by low stone walls occur in various parts of Dartmoor. Grimpspound, as it is called, about three miles from the village of Manaton, on the east side of the moor, is a circular enclosure of three acres: it has two entrances directly facing the north and south: at these points the wall, which appears to have been about twelve feet high, was the thickest. In the enclosure are several circles of stone of twelve feet diameter, especially near the south side of the enclosure. This enclosure has been supposed by some to be a British town, connected with some antient tin works, which may be traced near the spot; by others, a place of religious worship. There are in the parish of Bratton Fleming, between South Molton and Ilfracombe, six upright stones, the remains apparently of an antient circle. The granite tors of Dartmoor are natural. There are some sepulchral stones on Maddocks' Down (south of Combe Marten), and a cromlech at Drew's Teignton, between Exeter and Oakhampton. There seems no reason to trace the name of Drew's Teignton to the Druids, as some have proposed to do; it is more probably derived from Drogo, or Drewe, who possessed the manor in the time of Henry II. Numerous barrows, or tumuli, occur on Haldon, and other downs, particularly in North Devon, and some cairns, or piles of stones. Roman antiquities have been found in some barrows when opened.

Of Roman stations in Devonshire the most important appears to have been Isca Damnoniorum, which the name, and the antiquities discovered, concur in fixing at Exeter. We believe the best modern antiquaries are agreed as to the site of Isca: the earlier antiquaries (Horsley, &c.) were misled by what is now an evident corruption in the Itinerary of Antoninus. Another Roman station, Moridunum, or Muridunum (Itin. Anton.) is agreed by most to have been in this county, but whether at Hembury, near Honiton, where there is an antient camp, or at Seaton, on the coast, at the mouth of the Axe, is not so clear. Two other stations are mentioned by Richard of Cirencester: 'ad Durium,' (the station on the Durius, or Dart,) supposed to be Totness; and Tamara, the name of which indicates its situation somewhere on the river Tamara (Tamer), and which was probably at Tamerton Folliot, on the æstuary of the river some miles above Devonport. Richard also mentions two British towns, Termolus and Artavia, in the territory of the Cimbri, and probably in the north of Devon. These are identified by the late bishop of Cloyne in Lysons' 'Magna Britannia,' with the Termonin and Mostevia of the geographer Ravennas. The former of these towns (Termolus) the bishop fixes at Molland Bottreaux (between South Molton and Dulverton, Somersetshire), where there is a large antient cairn, and to which a number of roads on all sides point; and the latter is supposed to have been near Hartland point. It has been conjectured that Denbury, near Newton Abbot, is the place called Devionisso by the geographer Ravennas.

An antient British road, afterwards converted by the Romans to their own use, traversed the whole county from east to west, passing near Axminster and Honiton to the camp at Hembury, and by a subsequent bend, to Isca, or Exeter. From Isca, it ran south-west over Haldon and near Newton Abbot to Totness, and from thence west to the Tamara, or Tamer. This road has preserved in Dorsetshire (before it enters Devon) its old British name of the Ikeneld way. Many other roads may be traced. The Roman antiquities found in the county have not been numerous: the principal seem to have been at Exeter, where a tessellated pavement was found, some bronzes, coins, and other remains. Some antiquities have been found at Seaton, and other places.

The name of the British nation, the Damnonii, or Dumnonii, has been (but apparently with little reason) derived by some from two Phœnician words, 'dan,' or 'dun,' a hill, and 'moina,' mines. The Cornish Britons named the country, 'Dunan;' the Welsh, 'Deuffneynt,' which evidently contains the same elements as the Saxon, Devenascyre, Devnascyre, or Devenschire. The Welsh, Deuffneynt, is defined by Camden to mean 'deep valleys.'

In the Saxon invasion this county became the scene of contest. Cynegils, king of the West Saxons, is said by the Saxon chronicle to have beaten the Britons at Beamdune, supposed to have been Bampton, A. D. 614. Matthew of Westminster speaks of a battle fought A. D. 633, between Penda, king of Mercia, who had besieged Exeter, and Cadwallo, king of the Britons, but his account is hardly consistent with the history of the time. We find no historical notices of Devonshire from this period until the invasions of the Danes.

The pressure of the West Saxons gradually constrained the Britons to retire westward. Devonshire was for a long period debateable ground; it was in great part occupied by the Saxons, but there is reason to think that it was not until the reign of Athelstan, who is said to have defeated Howell, king of Cornwall, near Exeter, A. D. 926, that the Britons were finally compelled to retire beyond the Tamer. Their complete expulsion from Devonshire was probably retarded by the incursions of the Danes, who commonly found them ready to unite with them against the Saxons, the objects of their common hostility. In A. D. 876, 877, the Danes seem to have wintered at Exeter, and were in 877 besieged by Alfred, who compelled them to make peace, and to give hostages for the observance of it. In A. D. 878, when Alfred had been compelled by a Danish invasion to conceal himself, Ubbo or Hubba, one of the sons of Ragnar Lodbrog and one of the chiefs of the invaders, landed in the north of Devon, and blockaded Kynwith castle, near Appledore. Odun (who is styled earl of Devon,) who occupied the castle, made a vigorous sally just about daybreak, slew Ubbo and nearly 1000 of his men, and captured the magical standard of the Danes, woven by the sisters of Ubbo, and worked with the figure of a raven. In A. D. 894 the Danes were again in Devonshire; those of them whom Alfred had settled in East Anglia and Northumbria, induced by Hastings, who was then infesting England, took ship, and sailing round the headlands of Kent and along the Channel, besieged Exeter; but on the approach of Alfred's army they fled to their ships.

The great battle of Brunanburh, which has been usually placed in Northumberland, has been by others supposed to have been fought near Axminster in Devonshire. This decisive conflict gave to Athelstan the undisputed possession of England, and a nominal supremacy over Wales and Scotland. Axminster is supposed to have derived its present name from a college of priests founded here by Athelstan, to pray for the souls of those who fell in the conflict, and who were buried in the cemetery of Axminster: there were five kings and eight earls among them.

In A. D. 997 the Danes came up the Tamer, ravaged the country up to Lidford, and burnt Tavistock Abbey: in A. D. 1001 they landed at Exmouth and besieged Exeter, but in vain: they however defeated the king's army, and burnt several villages. In A. D. 1003 they again besieged Exeter, took it through the treachery or negligence of the governor, and nearly destroyed it.

When William of Normandy attacked England, his second campaign was in the west. Exeter yielded on his approach. In the next two years, when the Saxons of the neighbourhood rose in revolt, or rather renewed the struggle for independence, under the sons of Harold, who had fallen at Hastings, the citizens refused to admit them. William sent some troops to relieve the city, and the Saxons were defeated with great slaughter.

The coasts of Devonshire were, about this time, laid waste by the Irish, and the civil broils which arose during the next hundred years between the children and descendants of the Conqueror rendered Devonshire the scene of contest. The succeeding centuries are marked by few historical events, except occasional attacks by the French on the towns on the coast, and some contests of inferior moment during the wars of the Roses. The nobility of the county were divided between the rival houses; the Courtenays, earls of Devon, were Lancasterians, and three brothers who successively enjoyed the title, fell in the field or died on the scaffold.

In the rebellion of the Cornish men under Lord Audley and Flammock [CORNWALL], and in the rebellion under Perkin Warbeck, Exeter was the object of attack, but in both cases the attack failed. The last siege was raised by Courtenay, earl of Devon, attended by several Devonshire knights,' and the *posse comitatus*. Warbeck retired to Taunton.

Of the troubled periods to which the foregoing sketch refers, Devonshire contains several memorials in the baronial castles, the ruins of which are still in existence. At Exeter, Plympton, Oakhampton, and Tiverton were castles, all of which belongd to the Courtenays. [EXETER; TIVERTON.] Some of the walls of the keep of Plympton castle yet remain; and some scanty ruins of that of Oakhampton. Berry Pomeroy castle, near Totness, is an antient mansion on the brow of a steep hill in a well wooded country; it was the seat first of the Pomeroys, afterwards of the Seymours. [BERRY POMEROY.] Compton castle near Torbay, and Affeton castle near Chulmleigh, are still standing and converted into farm-houses; and there are remains of Gidley castle; Hemyock castle, near the upper waters of the Culm; Dartmouth castle; Kingswear castle, near Dartmouth; and Lidford castle, formerly the stannary prison, between Tavistock and Oakhampton. Of antient mansion houses, Dartington near Totness, built in the reign of Richard II., about the end of the fourteenth century, and an old mansion at Bradley near Newton Bushel, built in the fifteenth century, are among the most remarkable.

When the alteration of the church service took place at the Reformation, A. D. 1549, great disturbances broke out in Devonshire. They began at Sampford Courtenay, between Oakhampton and Chulmleigh, and gradually assumed a serious aspect, as some of the gentry joined in the revolt. The spirit of disaffection spread into Cornwall. Exeter was besieged by the rebels; and it was not until several severe actions had taken place, that Lord Russell, who had been sent down to suppress the revolt, succeeded in doing so. In 1554 Exeter was occupied by Sir Peter and Sir Gawen Carew, who had taken up arms to oppose the coming of Philip of Spain.

Of the monastic establishments of Devonshire, Tavistock Benedictine Abbey; Buckland, Buckfastre, Dunkeswell, Ford, and Newenham, Cistertian abbeys; Plympton and Hertland, the former a priory and the latter an abbey of Augustinian canons; and Tor abbey for Premonstratensian canons, were the chief. The ruins of these buildings are inconsiderable: the chapel and other parts of Ford abbey on the river Axe; the refectory and abbot's hall and the gate-house at Tavistock; part of the conventual church of Tor abbey; and some remains of Buckland, Hertland, and other establishments are yet standing. There are considerable remains of St. Nicholas's priory at Exeter: the crypt which has massive Norman arches has been converted into a kitchen.

In the great civil war of Charles I. the county seems generally to have embraced the cause of the parliament. Plymouth was seized by the townsmen during the absence of the governor appointed by the king, and the earl of Ruthen was soon after made governor. Exeter was the head-quarters of the earl of Stamford, the parliamentary general. The defeat of the parliamentarians at Bradock Down, near Liskeard, [CORNWALL] early in 1643, raised the confidence of the royalists, but they suffered some severe checks in different parts of the country, and the predominance of the parliamentarians was restored. The defeat of Lord Stamford at Stratton [CORNWALL], 16th May, 1643, again turned the current in favour of the royalists, whose superiority was confirmed by the arrival and activity of Sir John Berkeley, sent with a reinforcement by the king, and by the subsequent arrival of Prince Maurice, the king's nephew. The royalists besieged Exeter, which the earl of Warwick who commanded the fleet for the parliament was unable to relieve. Colonel Digby, a royalist, defeated the parliamentarians at Torrington; and Barnstaple, Bideford, and a strong fort at Appledore, which were held for the parliament, surrendered. Exeter also was compelled to surrender about the same time. Had Prince Maurice marched to Plymouth, he might perhaps have gained possession of that important station, then the greatest trading port in the west of England, but he lost a month in besieging Dartmouth, which he took; his troops were diminished by sickness, and the garrison at Plymouth was reinforced. When the town was at last blockaded it was without success. two assaults made in December, 1643, were repulsed; and the siege was for a time abandoned. In the spring of 1644 several fresh attempts were made upon it, but with no better fortune. In 1644 the earl of Essex with his army reached Devonshire, but no great or decisive event took place, until Essex marched into Cornwall, where his infantry was obliged

capitulate to the king, who had followed him thither.
ORNWALL.] The king, returning from Cornwall, sum-
oned Plymouth to surrender; and on its refusal, Sir
chard Grenville was left to carry on the siege. In January,
45, Sir Richard made an assault, which was repulsed, and
remainder of the year was marked by a series of disasters,
ich may be in no small degree ascribed to the misconduct
d dissensions of the king's generals. In October, 1645,
Thomas Fairfax, commander-in-chief for the parliament,
tered the county with his army, and in the course of the
lowing winter and spring entirely put down the opposite
rty. Mount Edgecumbe surrendered on the 21st April,
46, and was the last post held for the king in Devonshire,
cept Charles fort at Salcombe Regis, which did not sur-
ider till the following June.

At the revolution of 1688, the Prince of Orange landed
Torbay, November 5th: on the 8th he made a public
try into Exeter, where he remained for some days before
y of the principal people of the county joined him: on
21st he quitted Exeter on his march to London. A small
rrison under the command of Sir Edward Seymour was
ced in Exeter.

Teignmouth was burnt by the French, A.D. 1690. In 1719,
on the apprehension of a French invasion, an encamp-
ent was formed on Clist Heath, four or five miles north-east
Exeter. In 1779 the appearance of the combined French
d Spanish fleets off Plymouth caused great alarm, and
prisoners of war were removed to Exeter. In 1798,
on the alarm of a French invasion, several regiments of
lunteers were raised, artillery was brought from Ply-
outh for the defence of Exeter, and placed in an antient
trenchment on Woodbury Down, a few miles south-east of
ceter, where a camp was formed. Similar measures were
ken upon the renewal of the alarm in 1803.

STATISTICS.

Population.—Devonshire is an agricultural county; it has but few manufactures, but many of its inhabitants are employed in quarrying stone, or in obtaining some other of the valuable minerals it contains. It ranks the twenty-fourth on the list of agricultural counties, and in this respect has remained stationary since 1811. Of 116,188 male inhabitants twenty years of age and upwards, in 1831, 47,995 were engaged in agricultural pursuits, 35,311 of whom were labourers; only 1,221 were employed in manufactures or in manufacturing machinery; and there were 14,307 labourers not agricultural. Of those employed in manufactures about 700 were engaged in the woollen manufacture, and were distributed at Axminster, Ashburton, Buckfastleigh, Chagford, Cullumpton, North and South Molton, and at North Tawton; glove-making employs about 70 at Great Torrington; lace-making about 70 at Barnstaple, Pilton, and Tiverton; the rest are too miscellaneous for particular description. About 90 are employed in different manufactures in the city of Exeter.

The population of Devonshire, at each of the four enumerations during the present century, was:—

	Males.	Females.	Total.	Inc. per cent.
1801	157,240	185,761	343,001	
1811	179,553	203,755	383,308	11·75
1821	208,229	230,811	439,040	14·54
1831	235,789	258,689	494,478	12·55

Showing an increase between the first and last periods of 151,477, or a little more than 44 per cent., which is 13 per cent. below the whole rate of increase throughout England.

The following table is a summary of the population, &c., of every hundred, as taken at the census of 1831:—

HUNDREDS, &c.	HOUSES.				OCCUPATIONS.			PERSONS.			
	Inhabited.	Families.	Building.	Uninhabited.	Families chiefly employed in agriculture.	Families chiefly employed in trade, manufactures, and handicraft.	All other families not comprised in the two preceding classes.	Males.	Females.	Total of persons.	Males twenty years of age.
xminster	2,648	2,928	24	92	1,300	905	723	6,878	7,061	13.939	3,336
ampton	1,316	1,523	11	52	710	463	350	3,560	3,440	7,000	1,773
ack Torrington . . .	3,337	3,590	47	131	2,595	628	367	9,911	9,581	19,492	4,675
raunton	3,941	4,449	58	214	1,366	1,674	1,409	10,313	11,661	21,974	5,088
udleigh, East . . .	3,896	4,244	40	269	1,444	1,256	1,544	9,257	11,009	20,266	4,550
udleigh, West . . .	560	580	4	16	419	130	31	1,579	1,468	3,047	794
liston	627	694	10	20	472	139	83	1,788	1,694	3,482	939
oleridge	3,119	4,223	29	160	1,316	1,585	1,322	9,618	10,721	20,339	4,530
olyton	1,431	1,538	15	66	725	391	422	3,643	3,731	7,374	1,785
rediton	2,417	2,554	31	108	1,141	1,020	393	5,823	6,414	12,237	2,864
rmington	1,835	1,984	22	113	1,161	543	280	5,293	5,231	10,524	2,626
xminster	3,187	3,472	33	207	1,223	1,273	976	8,560	9,672	18,232	4,055
remington	1,672	1,746	17	93	880	493	373	4,318	4,526	8,844	2,040
alberton	525	626	3	14	356	156	114	1,405	1,461	2,866	723
artland	849	913	4	27	591	175	147	2,332	2,314	4,546	1,099
ayridge	2,660	2,945	21	117	1,370	1,102	473	6,755	6,689	13,444	3,429
aytor	4,370	4,830	81	263	1,580	1,559	1,691	11,166	12,977	24,143	5,134
emyock	1,105	1,217	14	42	673	306	238	2,917	2,890	5,807	1,449
fton	2,259	2,524	22	80	1,435	540	549	6,908	6,539	13,447	3,611
olton, South . . .	2,626	2,752	36	114	1,305	694	753	6,779	7,046	13,825	3,352
ttery St. Mary . . .	738	856	5	23	296	258	302	1,847	2,002	3,849	863
lympton	1,575	1,927	16	61	620	438	869	4,949	4,868	9,817	2,433
oborough	1,862	2,077	14	121	1,146	406	525	5,433	5,463	10,896	2,615
hebbear	3,829	4,004	48	259	1,803	874	1,327	9,670	10,489	20,159	4,452
herwell	789	820	6	33	579	149	92	2,103	2,083	4,186	1,094
tanborough . . .	2,573	2,746	20	132	1,406	885	455	7,154	7,367	14,521	3,479
avistock	1,006	1,337	3	43	263	369	705	3,325	3,629	6,954	1,659
awton, North, with Winkley	2,370	2,585	27	134	1,441	714	430	6,499	6,923	13,422	3,152
ignbridge	2,427	2,810	17	131	1,376	854	580	7,169	7,296	14,465	3,542
iverton	1,988	2,165	18	61	671	1,185	309	4,950	5,569	10,519	2,509
itheridge	1,779	1,886	18	105	1,286	426	174	4,955	4,612	9,567	2,518
onford	4,785	5,493	113	227	2,214	1,611	1,668	13,206	14,213	27,419	6,676
xeter, city and county of the same	4,056	6,038	80	279	105	3,004	2,929	12,683	15,559	28,242	6,573
lymouth, borough and suburbs .	7,842	17,835	474	413	237	7,134	10,464	33,043	42,491	75.534	16,771
Totals . . .	81,999	101,911	1,381	4,220	35,505	33,339	33,067	235,789	258,689	494,478	116,188

County Expenses, Crime, &c.—The sums expended for the relief of the poor at the four dates of

	£.		s.	d.	
1801	were 124,022,	which was	7	2	for each inhabitant.
1811	„ 217,757	„	11	4	„
1821	„ 207,686	„	9	5	„
1831	„ 233,074	„	9	0	„

The sum expended for the same purpose in the year ending March 25, 1836, was 172,405*l.* 16*s.*; and assuming that the population had increased at the same rate of percentage since 1831 as in the ten years preceding that period, the above sum gives an average of 6*s.* 5½*d.* for each inhabitant. These averages are below those for the whole of England and Wales.

The sum raised in Devonshire for poor's rate, county-rate, and other local purposes, in the year ending the 25th of March, 1833, was 260,320*l.* 10*s.*, and was levied upon the various descriptions of property as follows:—

	£.	s.
On land	190,707	11
Dwelling-houses	60,408	17
Mills, factories, &c.	5,404	2
Manorial profits, navigation, &c.	3,800	0
	260,320	10

The amount expended was:—

	£.	s.
For the relief of the poor	226,891	11
In suits of law, removal of paupers, &c.	8,030	19
For other purposes	28,518	2
	263,440	12

In the returns made up for the subsequent years, the descriptions of property assessed for local purposes are not distinguished: 250,270*l.* 4*s.*, 231,766*l.* 6*s.*, and 212,691*l.* 2*s.* were raised in the years 1834, 1835, and 1836 respectively, and the expenditure of each year was as follows:—

	1834.		1835.		1836.	
	£.	s.	£.	s.	£.	s.
For the relief of the poor	210,825	8	189,917	3	172,405	16
In suits of law, removals, &c.	7,507	8	6,251	2	6,108	2
Payment for or towards the county rate	26,539	0	15,188	12	15,149	9
For all other purposes			18,051	11	16,390	4
Total money expended	244,871	16	229,408	8	210,053	11

The saving effected in the whole sum expended in 1836, as compared with the expenditure of 1834, is therefore rather more than 15 per cent.; but the saving on the sum expended for the relief of the poor is about 18¼ per cent. in 1836, as compared with the expenditure of 1834.

The number of turnpike trusts in Devonshire is 28, as ascertained in 1834; the number of miles of road under their charge was 782; the annual income of that year, arising from the tolls and parish composition, was 61,374*l.* 12*s.* 11*d.*, and the annual expenditure 61,786*l.* 17*s.* 1*d.*

The county expenditure in 1834, exclusive of that for the relief for the poor, was 14,733*l.* 14*s.* 11*d.*, disbursed as follows:—

	£.	s.	d.
Bridges, buildings, and repairs, &c.	2,851	2	5
Gaols, houses of correction, &c., and maintaining prisoners, &c.	4,720	15	4
Shire halls and courts of justice—building, repairing, &c.	265	5	1
Lunatic asylums	181	19	6
Prosecutions	3,517	17	5
Clerk of the peace	682	2	7
Conveyance of prisoners before trial	819	15	5
,, of transports	210	16	8
Vagrants—apprehending and conveying	147	10	0
Constables—high and special	16	8	10
Coroner	459	16	11
Miscellaneous	860	4	9

The number of persons charged with criminal offences in the three septennial periods ending with 1820, 1827, and 1834, were 2347, 2741, and 3106 respectively; making an average of 335 annually in the first period, of 391 in the d, and of 443 in the third. The number of persons tried at quarter-sessions in each of the years 1831, 1832, and 1833, in respect to which any costs were paid out of the county rates, were 230, 258, and 193 respectively. Among the persons charged with offences, there were committed for—

	1831.	1832.	1833.
Felonies	212	245	185
Misdemeanors	18	13	8

The total number of committals in each of the same years was 203, 248, and 194, respectively.

	1831.	1832.	1833.
The number convicted was	144	195	139
„ acquitted	71	42	28
Discharged by proclamation	35	37	34

In 1835, at the assizes and sessions 518 persons were charged with crimes in Devonshire; of which number 55 were charged with offences against the person, 37 of which were common assaults; 19 for offences against property, committed with violence; 401 for offences against property, committed without violence; 10 for arson; 1 for forgery; and 13 for uttering counterfeit coin; 9 for riot and prison breaking; and 10 for misdemeanors. Of the whole number committed, 326 were convicted, and 191 acquitted, or no bill was found. Of those convicted, 29 were transported for life, 15 for 14 years, and 48 for 7 years; 1 was to be imprisoned for 3 years and above 2 years, 2 for 2 years and above 1 year, 31 for one year and above 6 months, and 192 for 6 months or under; 2 were whipped, 4 fined, and 1 discharged on sureties. Of the offenders, 381 were males, and 137 females. Of the whole number of offenders, 193 could read and write, 176 could read only, 122 could neither read nor write, and the degree of instruction of 27 could not be ascertained.

The number of persons qualified to vote for the county members of Devonshire is 18,835, being 1 in 26 of the whole population, and 1 in 6 of the male population, 20 years of age and upwards, as taken in 1831. The expenses of the last election of county members to parliament were to the inhabitants of the county 139*l.* 15*s.* 2*d.*, and were paid out of the general county rate.

There are five savings-banks in Devonshire. The number of depositors, and amount of deposits on the 20th November, were respectively in—

	1832.	1833.	1834.	1835.
Number of depositors	26,996	28,521	30,264	31,973
Amount of deposits	£863,290	897,028	947,326	1,001,62

The various sums placed in the savings-banks in 1834 and 1835 were distributed as follows:—

		1834.		1835.	
		Depositors.	Deposits.	Depositors.	Deposits.
Not exceeding	£20	16,968	£106,335	17,983	£113,7
„	50	7,396	228,941	7,739	240,46
„	100	3,543	246,202	3,757	260,5
„	150	1,347	163,072	1,402	169,31
„	200	680	119,499	738	129,1
Above	200	330	83,277	354	88,2
Total		30,264	£947,326	31,973	£1,001,62

Education.—The following particulars are obtained from the parliamentary returns on education made in the session of 1835:—

	Schools.	Scholars.	Total.
Infant Schools	117		
Number of infants at such schools; ages from 2 to 7 years:—			
Males		770	
Females		838	
Sex not specified		923	
			2,531
Daily Schools	1,772		
Number of children at such schools, ages from 4 to 14 years:—			
Males		14,163	
Females		19,596	
Sex not specified		18,681	
			52,440
Schools	1,889		
Total of children under daily instruction			54,971

Sunday Schools	599		
Number of children at such schools, ages from 4 to 15 and 16 years —			
Males		16,262	
Females . . .		17,952	
Sex not specified		9,128	
			43,342

Assuming that the population between 2 and 15 years increased in the same ratio as the whole of the population between 1821 and 1831, and has continued to increase in the same ratio since, the number between those ages living in Devonshire in 1834 must have been 163,256. A large number of the scholars attend both daily and Sunday schools Fifteen Sunday-schools, containing only 433 scholars, are in places where no other schools are established, but in all other places where schools are returned there are both Sunday and daily schools. Ninety-four schools are Sunday as well as daily schools, and are attended by 5788 children, and duplicate entry is known thus far to be created, but in what greater number cannot be well ascertained. Making allowance therefore for the probable great diminution of the number of children returned as receiving instruction, perhaps not more than half of the population between 2 and 15 are receiving instruction in Devonshire.

Maintenance of Schools.

Description of Schools.	By endowment.		By subscription.		By payments from scholars.		Subscrip. and payment from scholars	
	Schls.	Scholars.	Schls.	Scholars.	Schls.	Scholars.	Schls.	Scholars.
Infant Schools	1	10	6	261	98	1,648	12	612
Daily Schools	163	4756	140	7814	1308	33,776	111	6094
Sunday Schools	14	1069	526	39,181	14	390	45	2702
Total.....	178	5835	572	47,256	1420	35,814	168	9408

The schools established by Dissenters, included in the above statement, are:—

	Schools.	Scholars.
Infant Schools	2	50
Daily „	25	1026
Sunday „	171	17,270

The schools established since 1818 are:—

Infant and other daily schools	809	26,313
Sunday Schools	476	33,950

Eighty-three boarding-schools are included in the number of daily schools given above. No school in this county appears to be confined to the children of parents of the Established Church, or of any other religious denomination, such exclusion being disclaimed in almost every instance, especially in schools established by Dissenters, with whom are here included Wesleyan Methodists, together with schools for the children of Roman Catholic parents.

Lending libraries of books are attached to 100 schools in this county.

DEW is the moisture which, when the surface of the ground is colder than the atmosphere, is deposited from the air, in the form of minute globules, on the surfaces of bodies in contact with it. The difference of temperature which exists between day and night produces a variation in the quantity of water which the air contains. The water, when precipitated from the air instead of appearing as a vapour, is deposited on the earth in minute globules, and the air preserves its transparency; this constitutes a difference between fog and dew. When the air contains so little moisture that it can retain it during the lower temperature of the night, no dew is formed.

It is difficult to pronounce as to the whole of the causes which produce dew; but the principal cause is the cooling of the air: when the cold is extremely great the dew freezes and then produces what is called hoar-frost.

It is remarked by Aristotle* and by other writers that dew appears only on calm and serene nights. This observation, according to Dr. Wells, is not to be received in its strictest sense, as he has frequently found a small quantity of dew on grass, both on windy nights, if the sky was clear or nearly so, and on cloudy nights, if there was no wind. If, indeed, the clouds were high, and the weather calm, he has sometimes seen on grass, though the sky was entirely hidden, no very inconsiderable quantity of dew. Again, stillness of the atmosphere is so far from being necessary for the formation of this fluid, that its quantity has seemed to Dr. Wells to be increased by a very gentle motion in the air: but he says, 'I can aver, after much experience, that I never knew dew to be abundant, except in serene weather,' and 'dew has never been seen by me on nights both cloudy and windy.*'

Dr. Wells remarks that, during nights which are equally clear and calm, dew often appears in very unequal quantities, even after due allowance has been made for any difference in their lengths: thus it is more abundant shortly after rain than during a long season of dry weather. It is generally more abundant during southerly and westerly winds than those which blow from the north and the east; but this remark, of course, only applies to particular localities. To the greater or less quantity of moisture in the atmosphere, at the time of the action of the immediate cause of dew, are likewise to be referred several other facts respecting its copiousness; these are thus stated by Dr. Wells (p. 10):

'In the first place, dew is commonly more plentiful in spring and autumn than in summer; the reason is, that a greater difference is generally found between the temperatures of the day and the night in the former seasons of the year than in the latter. In spring this circumstance is prevented often from having a considerable effect by the opposite influence of northerly and easterly winds; but during still and serene nights in autumn dew is almost always highly abundant.

'In the second place, dew is always very copious on those clear and calm nights which are followed by misty or foggy mornings: the turbidness of the air in the morning showing that it must have contained during the preceding night a considerable quantity of moisture.

'Thirdly, I have observed dew to be unusually plentiful on a clear morning which had succeeded a cloudy night. For the air having, in the course of the night, lost little or no moisture, was in the morning more charged with watery vapour than it would have been if the night had also been clear.

'Fourthly, heat of the atmosphere, if other circumstances are favourable, which, according to my experience, they seldom are in this country, occasions a great formation of dew. For, as the power of the air to retain watery vapour in a pellucid state increases considerably faster, while its temperature is rising, than in proportion to the heat acquired, a decrease of its heat, in any small given quantity, during the night, must bring it, if the temperature be high, much nearer to the point of repletion before it be acted upon by the immediate cause of dew, than if the temperature were low.

'In the last place, I always found, when the clearness and stillness of the atmosphere were the same, that more dew was formed between midnight and sunrise than between sunset and midnight, though the positive quantity of moisture in the air must have been less in the former than in the latter time, in consequence of a previous precipitation of part of it. The reason, no doubt, is the cold of the atmosphere being greater in the latter than in the prior part of the night.'

With respect to the cause of dew different opinions have been entertained. Aristotle (*Meteor.* i. 10) supposed dew to be a species of rain formed in the lower atmosphere in consequence of the moisture which had been carried up during the day by evaporation being condensed by the cold of the night into minute drops. In 1788 Mr. Wilson of Glasgow published a paper on hoar-frost in the Transactions of the Royal Society of Edinburgh, in which he supposes that cold is occasioned by the formation of the dew. In the course of the same year Mr. Six communicated a paper to the Royal Society in which he imagines that dew proceeds partly from the low temperature of the air through which the dew already formed in the atmosphere had descended, and partly from the evaporation of moisture from the ground, on which his thermometer had been placed.

In a subsequent and posthumous work printed in 1794, the cold of the grass is however attributed, in agreement with the opinion of Mr. Wilson, altogether to the dew deposited upon it. Mr. Wilson and Mr. Six observed, that the production of dew is accompanied with cold on the surface of the ground greater than in the atmosphere a few feet above, the differences being frequently 5, 10, or even more degrees of Farenheit's scale. This cold, as has just been mentioned, was considered as the effect of the formation of the dew, though this conclusion involved a very considerable difficulty; for as the transition of a body from the state of vapour to the fluid or solid form is always accompanied with an evolution of heat, it might be expected that the surface on which the dew is deposited, and still more that on which the hoar frost is formed, would have its temperature raised, and no cause appears why it should be depressed.

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* Meteor. lib. i. c. x. et De Mundo, c. iii.

* Wells on Dew, 65.

Dr. Wells, however, after verifying the facts observed, ascertained by numerous observations and experiments, that the cold at the surface, compared with that of the air above, precedes the formation of dew, and often exists without dew being formed; and that bodies become colder than the neighbouring air before they are dewed. The cold therefore which Mr. Wilson and Mr. Six supposed to be the effect of dew was found by Dr. Wells to be the cause of it.

The question then naturally arises, what are the causes which produce this low temperature of the earth, while the incumbent air is at a higher temperature? This is shown by the experiments and reasoning of Dr. Wells to be caused by the radiation of heat without an equivalent return. The surface of the ground allows a portion of the heat which it receives from the solar rays to escape by radiation when their action is withdrawn· hence its temperature falls; and if the air, holding watery vapour dissolved, rest upon it without much agitation (a circumstance by which, as the constant renewal of warm air imparts heat, the effect would be counteracted), a portion of the vapour will be condensed on the surface, and if the temperature is still lower, will be congealed: thus it is that dew and hoar-frost are formed only when the atmosphere is clear, for the clouds return an equivalent portion of radiant heat.

Dew forms in very different quantities on different substances under the same circumstances; thus on metals it is sparingly deposited; on glass it forms abundantly, as it does also on straw, grass, cloth, paper, and other similar substances. Now as the metals radiate heat imperfectly, and the other bodies mentioned in a much greater degree, they become consequently colder than the metals, and hence condense more vapour into dew.

Animal substances are among those which acquire dew in the greatest quantity; among these Dr. Wells found that swan's-down exhibited the greatest degree of cold in general, and was also most easily managed, as it was used while adhering to the skin of the bird. On other occasions wool was employed, and the following statements are the results of Dr. Wells's experiments with respect to the influence which several differences in the situation, mechanical state, and real nature of bodies have upon the production of dew.

A general fact is, that whatever diminishes the view of the sky, as seen from the exposed body, occasions the quantity of dew which is formed upon it to be less than would have occurred if the exposure to the sky had been complete; two parcels of wool, each weighing ten grains, were placed, one on the middle of a board, and the other to the middle of the underside; the two parcels were an inch asunder, and equally exposed to the action of the air: on weighing the two portions, it was always found that the upper portion had acquired most dew, the greatest difference being twenty grains to four grains.

The following is a tabular view of observations with respect to temperature made by Dr. Wells on the evening of the 19th of August, 1813:—

	6h. 45m.	7h.	7h. 20m.	7h. 40m.	8h. 45m.
Heat of air 4 feet above the grass . . .	60¼°	60½°	59°	58°	54°
„ wool on a raised board . . .	53½	54½	51½	48¼	44½
„ swan's-down on the same . . .	54½	53	51	47½	42½
„ surface of the raised board . .	58	57	55½	..	..
„ grass plat .	53	51	49½	49	42

Sir Robert Barker and Mr. Williams have both given accounts of the process by which ice is formed in Bengal, while the temperature of the air is above 32°; and its production was attributed, by the former altogether, and by the latter in great measure, to cold produced by evaporation. Dr. Wells's experiments however show not only that the evaporation which occurs is insufficient to account for the effect, but that the cold produced by radiation alone will satisfactorily explain it. On the subject of cold produced by radiation, Dr. Wells makes the following curious statement:—'I had often,' he says, 'in the pride of half knowledge, smiled at the means frequently employed by gardeners to protect tender plants from cold, as it appeared to me impossible that a thin mat, or any such flimsy substance, could prevent them from attaining the temperature of the atmosphere, by which alone I thought them liable to be injured. But, when I had learned that bodies on the surface of the earth become during a still and serene night colder than the atmosphere by radiating their heat to the heavens, I perceived immediately a just reason for the practice which I had before deemed useless.' And he follows up this part of the subject by relating some extremely simple experiments in proof of the efficacy of the practice, and in explanation of the effect by the processes of radiation and reflexion of heat.

DEWBERRY, a kind of bramble, the *Rubus cæsius* of botanists, so named because its black shining fruit is covered over by a fine waxy white secretion resembling dew. It forms the type of one of the sections of the European part of the genus *Rubus*, the systematic character being digitate leaves, downy or hairy leafstalks or stems, leaflets green on the under side, and calyx standing erect about the fruit.

DEWSBURY a market-town, parish, and township in the West Riding of the county of York, in the wapentakes of Aggbrigg and Morley, and in the liberty and manor of Wakefield. It is 5 miles west of Wakefield, 8 miles south-west of Leeds, 33 south-west of York, and 187 north-west of London. The antient importance of Dewsbury is connected more with ecclesiastical than with civil history. In the time of the Saxons it was one of the most extensive parishes in England, and comprised an area of 400 square miles, including the present parishes of Thornhill, Burton, Almondbury, Kirkneaton, Huddersfield, Bradford, Mirfield, and Halifax. Dewsbury was the centre from which Christianity was diffused through this part of the island in Saxon times. The name is supposed by some to have been derived from its first Saxon proprietor; others consider that the success of the preaching of Paulinus, the first archbishop of York, caused the place of his residence to be called Duisborough, God's town. The remains of Saxon tombs are still to be seen in the vicarage garden, near the church. Other relics of the same people have also been found, the most remarkable of which exhibits the Saviour in the act of bestowing his benediction. At the east end of the chancel, placed on a cross on the outside of the church, is the following inscription: 'Paulinus hic prædicavit et celebravit, A.D. 627.' This is not the identical Saxon wheel-cross, but a fac-simile of it. The church is the mother-church of the district, several neighbouring parishes acknowledging their original dependence by their prescriptive payments. No appearance of Saxon architecture is presented in the existing edifice, which comprises a nave and aisles; a chancel; an octagonal vestry on the north side; and a tower finished with pinnacles at the west end. The living is a discharged vicarage; it is endowed with 200*l.* private benefactions, and 200*l.* royal bounty. Its average gross income is 238*l.* per annum; it is in the patronage of the crown. There is a second church in the township of Dewsbury, which was erected by the parliamentary commissioners in 1827; the dissenting places of worship in the township are, two for Wesleyan Methodists, one for the New Connexion Methodists, one for Primitive Methodists, one for Independents, and one for Quakers; there are several other dissenting chapels in the parish.

The public educational establishments at Dewsbury are Wheelwrights' Charity, a school recently erected under a decree of the Court of Chancery at an expense of 600*l.*, for the instruction of 100 boys and 100 girls on the national system; the Dewsbury charity school, containing 100 boys which has an endowment of 100*l.* per annum (the master's salary is 80*l.* a year); an infants' school; and several daily schools. The Sunday-schools of Dewsbury are attached to different places of worship, and instruct about 1500 children.

The town is pleasantly situated at the base of a hill rising from the river Calder. It has several good streets, and is lighted with gas. As a place of manufacture it is rising in importance, and its factories furnish large supplies of blankets woollen cloths, and carpets. Coal is abundant in the neighbourhood; and the water of the Calder has a high reputation for its fulling properties. The commercial facilities of the town are increased by good roads; and the communication by water is, eastward by the Calder navigation, and westward by the Calder and Huddersfield canal The access is obtained to Wakefield, Leeds, Selby, and Hull; and by Huddersfield to Manchester, Rochdale, Liverpool, and the other commercial towns in Lancashire. The population of the parish of Dewsbury is as follows: Dewsbury 8272; Osset 5325; Soothill 3849; Hartshead-cum-Clifton 2408; making a total of 19,854. The population of the parish in 1821 was 16,261. The market-day at Dewsbury is Wednesday. There are three fairs in the course of the year. Ossett is a large manufacturing township, midway between Dewsbury and Wakefield; it has a chapel of ease to Dewsbury, and several dissenting places of worship. In the township of Soothill are two villages, called Earls' Heaton and Hanging Heaton, each of which have churches which were erected in 1825-7 by the parliamentary commissioners. Hartshead-cum-Clifton is in the wapentake of Morley; it has a chapel of ease to Dewsbury, in a fine situation, commanding an extensive view of the vale of the Calder. In this township the tomb of the notorious freebooter, Robin Hood, is pointed out. Whether he was an outlaw of noble parentage or of humble birth is not clear; the epitaph upon his tomb designates him as 'Robert, earl of Huntingdon.' (Baines's *Directory of Yorkshire;* Allen's *History of Yorkshire.*)

DE WITT, JOHN, was born at Dort, in the province of Holland, in September, 1625. His father was burgomaster of his native town, and member of the states of Holland, in which capacity he was an opponent of the House of Orange, whose power and influence had been looked upon with jealousy ever since the time of Barneveldt by a considerable party in that province. [BARNEVELDT.] John de Witt, who inherited his father's principles, was made in 1652 grand pensioner of Holland, an office which gave him great influence over the deliberations of the States General or Federal Assembly of the Seven United provinces, in which the vote of the rich and populous province of Holland generally carried with it that of the majority. The time appeared favourable to the anti-Orange party. William II. of Orange, the last stadtholder, had died in 1650, and his posthumous son, afterwards William III. of England, was an infant. The object of De Witt and his party was to prevent in future the union of the offices of stadtholder, captain-general, and high-admiral in one and the same person, which had rendered the princes of the House of Orange almost equal to sovereigns, and which was certainly inconsistent with the title of a republic, assumed by the united provinces. It must however be observed, that each of these provinces, forming a separate state, was in fact governed by an aristocracy, the respective states or legislature of each consisting of the nobles, and the deputies of the principal towns, who were elected by the wealthier burghers; the great majority of the people having no share in the elections. Generally speaking then, the so-called republican party, at the head of which were successively Barneveldt and De Witt, struggled for the continuation or extension of their collective power against the House of Orange, whose influence tended to establish a form nearly monarchical. But that House was popular with the lower classes, and was supported by the majority of the clergy. The nature of the institutions of the United Provinces may be seen in the Act of Union of Utrecht, which was their declaration of independence. During the minority of William III., the office of stadtholder was considered as abolished, and the States General exercised the supreme authority: De Witt was the soul of their deliberations, and he managed, especially the foreign relations of the country, with great ability. He negotiated the peace with Cromwell in 1654, by a secret article of which it was agreed that no member of the House of Orange should be made stadtholder or high admiral. After the restoration of Charles II., De Witt dreading the family connexion between him and young William, sought the alliance of France in 1664. A war broke out between England and the United Provinces, which was at first favourable to the English, but De Witt, by his firmness and sagacity, repaired the losses of his countrymen; and while negotiations for peace were pending, he hastened their conclusion by sending an armament under Ruyter, which entered the Thames and burnt some of the English shipping in the Medway. This was followed by the peace of Breda, July, 1667. The encroaching ambition of Louis XIV., who aimed at taking possession of the Spanish Netherlands, now excited the alarm of De Witt, who hastened to form a triple alliance with England and Sweden, in order to guarantee the possessions of Spain. In his anxiety to secure his country against the approach of the French, he caused the treaty to be ratified by the States General at once, instead of first referring it, according to the provisions of the Federal Act, to the acceptance of the various provinces separately. This was a cause of violent obloquy against De Witt. While thus occupied with the foreign relations, he did not forego his plans concerning the internal policy of his country and the permanent exclusion of the Orange family from power. In 1667 the states of Holland, at his suggestion, passed 'a perpetual edict,' abolishing for ever the office of stadtholder De Witt at the same time introduced the greatest order and economy into the finances of the province of Holland. But all De Witt's calculations, both foreign and domestic, were baffled by the intrigues with which Louis XIV. contrived in 1672 not only to detach Charles II. from the Dutch alliance, but to engage him in a counter-alliance with himself against Holland. The French armies now suddenly invaded the United Provinces, Louis XIV. entered Utrecht, and his troops were within a few miles of Amsterdam. There appears to have been great neglect on the part of the officers, civil and military, of the United Provinces, in not having taken measures for resistance, and especially in not having placed their fortresses in a state of defence; and the blame was chiefly thrown upon De Witt. In this emergency, William, the young prince of Orange, was called to the command of the forces, both by land and sea, but this did not satisfy the popular clamour. Cornelius de Witt, John's brother, who had filled several important stations, both civil and military, was accused, evidently through mere malignity, of having plotted against the life of William of Orange, was thrown into prison at the Hague, and tortured; but as he could not be convicted of the charge, was sentenced to banishment. His brother John, whose life had been already attempted by assassins, resigned his office, and went to the Hague in his carriage to receive his brother as he came out of prison. A popular tumult ensued, the furious mob forced its way into the prison, and murdered both brothers with circumstances of the greatest atrocity. Such was the end of this distinguished statesman, whose private character and simplicity were as exemplary as his abilities were high. He wrote his Memoirs, which were published in his lifetime, and in which there is much information on the political and financial condition of Holland at the time. (Cerisier, *Histoire des Provinces Unies;* Sir William Temple, *Observations on the United Provinces*, *the Netherland Historian*, 8vo., Amsterdam, 1675, &c.)

DEXA'MINE, a genus of amphipodous crustaceans established by Dr. Leach.

Generic character.—Antennæ three jointed, the last segment composed of a number of minute joints; first segment shorter than the second; *upper antennæ* longest. *Eyes* oblong, not prominent, inserted behind the superior antennæ. *Legs* fourteen; first and second pairs monodactyle, with a small compressed hand; other pairs furnished with simple claws. *Tail*, on each side, with three double styles; above, with one small style on each side. *Body*, (including the head) twelve jointed. (Leach.)

Example. *Dexamine spinosa.* Body shining, the ninth, tenth, eleventh, and twelfth segments produced into a spine; front produced and bent downwards between the antennæ. The first joint of the upper antennæ beneath towards their tips, have a little spine-like process. Length three-quarters of an inch. (Leach.)

Locality.—Dr. Leach says that it is very common on the southern coasts of England, and is often taken by the shore-net, or beneath stones amongst the rocks at low tide. The legs, he observes, are easily broken, which will account for Montagu's having described and figured it (Cancer, *Gammarus spinosus*) without the monodactyle hands.

DEXIA'RIÆ, a family of Dipterous insects of the section Creophilæ. This family, established by M. Robineau Desvoidy, is composed chiefly of Meigen's genus Dexia The species may be distinguished from those of neighbouring groups by the greater length of their legs: the body is generally elongated and cylindrical, but sometimes thick, depressed, or rounded. The fore part of the head is, in most of the species, furnished with a ridge situated between the deep grooves in which the antennæ are placed: the antennæ are rather short, and the stylet is generally plumose: the eyes are separated in both sexes, and the males are usually larger than the females. These flies are of in offensive habits: they are usually seen on flowers, the juices of which afford them nourishment.

The chief characters of the genera contained in the Dexiariæ are thrown into a tabular form by M. Macquart, in the following manner:—

Proboscis long. Genus 1. PROSENA. *St. Fargeau.*
Proboscis short.
  Body cylindrical.
    First posterior cellule of the wings closed.
      Second and third joints of the antennæ of equal length.
        Genus 2. ZEUXIA. *Meigen.*
      Third joint of the antennæ longer than the second.
        Genus 3. DINERA. *Desvoidy.*
    First posterior cellule of the wings open.
      Antennæ not extending to the epistoma.
        Genus 4. DEXIA. *Meigen.*
      Antennæ extending to the epistoma. Legs very long.
        Genus 5. SCOTIPTERA. *Macquart.*
  Body tolerably broad, depressed.
    Fore part of the head arched (colours brilliant).
        Genus 6. RUTILA. *Desvoidy.*
    Fore part of the head flat (colours, black or yellow).
      Stylet of the antennæ naked.
        Genus 7. GYMNOSTYLA. *Macquart.*
      Stylet of the antennæ covered with fine hairs.
        Genus 8. OMALOGASTER. *Macquart.*

Of the genus *Prosena*, Macquart describes only two species, one of which inhabits Europe, and the other is from Brazil.

Of the genus *Zeuxia* but one species is known.

The genus *Dinera* contains five species, one of which inhabits Brazil, and the others are found in various parts of Europe.

The genus *Dexia* contains twelve species, almost all of which are European.

The genus *Scotiptera* contains two species; they are of considerable size, and inhabit Brazil.

Rutila.—The species of this genus appear to be confined to New Holland: they are generally of large size.

The genus *Gymnostyla* contains three species, two of which are from Brazil, and the third is from Surinam.

The last genus, *Omalogaster*, contains four species, all of which are inhabitants of Europe.

DEXTRINE, a name which has been given, but probably without sufficient cause, to a soluble portion of starch. [STARCH.]

DEY. The origin of the word dey is uncertain. Some have derived it from the Turkish *dâï*, 'a maternal uncle,' and have supposed that this designation was given to the chiefs of the states of Barbary to express their almost paternal authority in the Ottoman empire, and the high esteem in which they were held by the Porte. The name is at all events of more antient date than the Ottoman dominion in northern Africa, since we find it used as early as the end of the eleventh century as the title of the emissaries of the Assassins or Ismaelites. The dignity of dey in the states of Tunis, Tripoli, and Algiers, is not hereditary: on the death of a dey, his successor is chosen from among the highest civil and military authorities, with the concurrence of the Turkish troops stationed in each of the three states. He must be of a certain age and experience, and of acknowledged valour: formerly he was also required to be a Turk, and to have performed a pilgrimage to Mecca; but to this rule there have been many exceptions. On the election of a new dey, the mufti or high-priest of the state reminds him publicly of the duties of the office; and the sultan recognises his election by sending him a robe of honour and (since the beginning of the last century) by conferring the title of pasha upon him. Properly, the deys are vassals of the Porte; but greater privileges are conceded to them than to the governors of any other external province of the Ottoman empire, and in their conduct towards the Porte they have shown so much independence, that their allegiance to the grand seignior is almost nominal. In his own state the dominion of each dey is perfectly free from any control on the part of the Porte. He is elected for life; but the Porte pretends to reserve to itself the right of deposing him if he does not give satisfaction. In his administration the dey is assisted by a diwan, or privy council: but he frequently sets the advice of that body at defiance, and rules with despotic power. In the choice of a new dey much depends on the inclination of the army; and the election is seldom accomplished without bloodshed. The troops are the principal supporters of the dey; and if they are not paid punctually, or if any measure of the government gives them offence, they revolt, and the dey often loses both his throne and his life.

At Tunis we hear of an elective dey since about the year 1574, when Khâlif was invested with that dignity. Tripoli came into the possession of the Turks about 1551. It was till the end of the sixteenth century governed by pashas or lieutenants appointed by the Porte: from the year 1600 a line of elective deys commenced, the first of whom was Mohammed Beg, a Greek renegado. Algiers was subject to the Ottomans from 1516, and it continued to be governed by pashas sent from Constantinople till 1625. In the latter year a revolution ensued, which terminated, in 1628 in the recognition by the Porte of the first elected dey of Algiers, Haji Mohammed Aga. An officer appointed by the Porte, and bearing the title of pasha, continued to be sent by the grand seignior, in order to keep a watchful eye on the proceedings of the dey: but this system gave rise to constant jealousies between the two chiefs, and from 1710 both appointments became united, inasmuch as the Porte granted the rank of pasha to the dey himself, thus renouncing every right of interfering with the internal policy of the state. A similar arrangement was about the same time made in the state of Tripoli. [ALGIERS, TRIPOLI, TUNIS.]

DHALAC or **DAHALAC**, an island in the Red Sea, situate in 15° 53′ 50″ N. lat., and 40° 40′ 30″ E. long. Its extent from north-west to south-east is about thirty-five, and its breadth eighteen miles. It is the largest island in the Red Sea. It is low, and its surface level, being formed of coralline rocks covered with sand, but destitute of all herbage during the summer heat, except a small quantity of bent-grass just sufficient to feed the few antelopes and goats that are on the island. In many places there are large plantations of acacia trees, but they seldom attain above eight feet in height. There are no springs, and the rain water is preserved in cisterns. Bruce says there were 370 of them; Salt heard of 316, but it seems that their number is much smaller, though considerable, more than 120 having been seen by the officers of the Benares, during their late survey of the Red Sea. There are also some tanks. This island contains two harbours for small vessels, Dhalac el Kibeer and Dobelow. No kind of agriculture is carried on. According to Bruce, one-half of the male population of the island are always employed in work on the opposite shores of Arabia, and by their labour furnish their families with dhurra and other provisions; when their time is expired they are relieved by the other half. They are good seamen and fishermen. Very elegant baskets are made of the leaves of the doum-tree, and sent to Loheia and Jidda. The island contains twelve villages, of from 50 to 100 houses each. (Bruce; Lord Valentia; Welsted in the *London Geogr. Journal*, vol. v.)

DHAR, an antient and formerly a very extensive city in the province of Malwa, in 22 35′ N. lat., and 75° 24′ E. long. It covers a space three-quarters of a mile long, and half a mile broad, the whole surrounded by a mud wall thirty feet high, fortified with towers at intervals. The pettah or fort is detached from the city and stands on a rising ground. Dhar at one period covered a much greater extent of ground, and contained at least 20,000 houses: in 1820 they did not amount to one-fourth that number, but the town has somewhat increased since that time. The district in possession of the Dhar rajah comprehends about 400 square miles, and contains 179 villages, and about 40,000 inhabitants. When the English entered upon the occupation of Malwa in 1817, the whole revenue of the Dhar rajah, then a minor, was only 35,000 rupees, but in the course of a few years it was made to exceed 600,000. The most important article of cultivation is opium, but the soil is capable of yielding every kind of tropical production. A few of the villages are inhabited by Bheels; of the remaining population fifteen-sixteenths are Hindus, and the other sixteenth Mohammedans.

DIABE'TES, the discharge of a preternatural quantity of urine, the chemical composition of which is also essentially changed. In this disease the urine is not only unusually large in quantity, but it is either altogether destitute of several of its constituent principles, or it contains them only in very minute proportions, while it acquires a new ingredient, a quantity of sugar, which imparts to it a sweet taste. Medical writers are not agreed whether the impregnation of the urine with a sufficient quantity of saccharine matter to render it sweet to the taste be absolutely essential to the disease; it is therefore usually divided into two species, namely, *diabetes insipidus*, when there is discharged a preternatural quantity of urine which is perfectly insipid, and *diabetes mellitus*, when the unusual quantity of urine which is voided is sweet to the taste.

The discharge of a larger quantity of urine than natural, unaltered in its chemical constitution, may arise from numerous causes of a temporary nature, scarcely deserving the name of a disease, and certainly not forming a disease of a specific character. The term diabetes should therefore be restricted to that specific disease in which the secretion of urine is preternaturally increased, and its chemical composition at the same time essentially changed.

In diabetes, properly so called, the urine is generally so clear that it appears at first sight to be entirely without colour; but viewed in a certain light, it is seen to be slightly tinged with a yellowish green, or it is of a pale straw colour. Examined by the taste, it is almost invariably found to be more or less sweet; and when chemically analyzed, it is ascertained to contain, usually in considerable quantity, a saccharine matter, which is exactly of the nature of common sugar. Its odour likewise is peculiar; it is commonly compared to the faint odour of violets, or to that of sweet whey or milk. Its specific gravity commonly varies from 1,025 to 1,052. The principle peculiar to healthy urine, *urea*, is generally very much diminished in quantity, though the best chemists have never observed it to be altogether absent. There is, however, little or no lithic acid, it commonly contains the usual saline ingredients, but diminished in quantity; blood itself is sometimes, though very rarely, found in it; it far more frequently contains a considerable portion of one ingredient of the blood, albumen; though the albumen, when it exists in the urine, is in the state in which it is found in chyle rather than in blood. From a table given by Dr. Henry, it appears that ten pounds of diabetic urine, at the average specific gravity of 1,040, yields upwards of a pound and a quarter of solid extract.

The quantity of urine voided in this disease is sometimes enormous. In one case on record, it amounted to the prodigious quantity of 52 pounds in the 24 hours; but instances are by no means uncommon in which the quantity amounts to from 25 to 35 pounds every 24 hours for weeks or even months together. Although one of the most constant constitutional symptoms attendant on this disease is inordinate thirst, yet the urine daily voided almost always exceeds the quantity of liquids drank, and sometimes the whole of both solids and liquids; and even occasionally, as is stated, to have been nearly double the quantity of the whole injesta. Where can this quantity come from? Some physiologists think that the very solids of the body are melted down and carried off by the urine, whence, as they suppose, the progressive emaciation, notwithstanding the quantity of food and drink consumed; others with more reason suppose that the supply of fluid is obtained by the absorption of moisture from the air by the respiratory and cutaneous surfaces.

The diabetes commonly comes on slowly and almost imperceptibly, at least without any such disorder of the general health as to attract particular notice. It therefore sometimes exists a considerable time before it becomes known; and the change in the quality of the urine is at length discovered by accident; for its quantity may not at first be very much increased, or if increased to such a degree as to attract notice, the circumstance is usually attributed to some temporary cause. At length, however, the constitution manifestly suffers; the strength and vigour fail, the patient feels languid and indisposed to make any physical exertion, the mouth is dry, the tongue clammy; there is unusual thirst; a slight degree of fever is set up, indicated by alternate chills and heats; but the most remarkable circumstance is a change in the condition of the skin, which becomes dry, harsh, and sometimes even furfuraceous, or apt to peel off in scales. The thirst now increases to such a degree as to be evidently morbid; this is often, though not always, accompanied with voracious appetite; and the quantity of urine discharged not only decidedly but steadily increases. If the observation of these circumstances should lead to the examination of the urine, it is found to be sweet to the taste and of a light green or pale yellow colour. The patient meantime is commonly observed to have lost flesh, and is troubled with a sense of heat and pain in the region of the stomach, with aching in the back and loins, and uneasy sensations in the course of the urinary passages. The bowels are usually costive, the breathing short and oppressed, with a dry tickling cough, and the pulse is commonly frequent. As the disease advances, all these symptoms increase in intensity, the tongue becomes either loaded with a dark-coloured fur, or unnaturally clean and of a dark or purplish red colour: the thirst is more urgent; the appetite, formerly voracious, is now perhaps abolished or depraved; the bowels are more constipated; the skin more harsh and scaly; while the urine, increasing in quantity, becomes still more altered in quality. At length there come on headache, giddiness, occasional loss of vision, impaired memory, and diminished mental energy. The debility and emaciation steadily increasing, the patient sinks with many of the symptoms of hectic fever, or is suddenly cut off by consumption, dropsy, apoplexy, or some other incurable disease established in some vital organ.

From the preceding account it appears that this disease is generally of a chronic character; but it sometimes attacks in an acute form, the marked symptoms of the malady coming on suddenly in a previous state of apparent health, and proving fatal in a few days. This however is very rare. It seldom runs its course under some months, and it sometimes lasts several years. It frequently disappears for a while, especially under proper treatment, and then recurs after the lapse of a few months or years; so that the relief obtained is commonly only temporary, the disease resuming all its severity from a slight exposure to its exciting causes, or from any considerable deviation from the proper diet and regimen. Hence it is perhaps the prevalent opinion among physicians that it is absolutely incurable. Dr. Cullen says, 'In all the instances of this disease which I have myself seen, and in several others of which I have been informed, no cure of it has ever been made, though many instances of it have occurred, and in most of them the remedies recommended by authors have been diligently employed:' he adds, however, 'from the testimony of several authors, I believe the disease has been cured.' There cannot be a question that by appropriate remedies and great and persevering care on the part of the patient, it is capable of being very much relieved, and even of being altogether suspended for an indefinite number of years. The evidence of this is indubitable; but it is more doubtful whether it can be permanently and radically cured. Much of course will depend on the constitution and habits of the patient, and if any other disease be present, on the kind of malady with which it is complicated. It can never be considered as cured until the quality as well as the quantity of the urine is restored to a natural state.

How long the powers of life may be capable of sustaining such an abstraction of the nutritive fluid as is implied in the constant secretion of such an enormous quantity of urine as is commonly formed from the blood in this disease we do not know, because diabetes never consists in the disordered action of the kidney alone it is seldom, perhaps never, the only serious disease present. The skin is invariably in a diseased state; the lungs are never perfectly sound; some of the most experienced and observant physicians state that they have never met with a case in which there has not been manifest a greater or less degree of disease of the lungs. All writers on the subject record its frequent complication with and termination in consumption; and it is rare indeed that the indications of disease in the digestive mucous surfaces and in the liver are absent.

An inspection of the organs after death which has been made with great care does not throw so much light on the seat and nature of diabetes as might have been expected In several cases in which the symptoms were present in a very intense degree during life, no appearance of change of structure in the urinary organs could be detected after death. In general however the kidneys are larger than natural; more turgid with blood; more flaccid; softer, and more easily torn. Sometimes, though rarely, they are found in the contrary condition, smaller and harder than natural, and their membranous envelope and their cortical substance are of a cartilaginous firmness and density. Several observers have recorded the remarkable fact, that the organic nerves which supply the kidneys are greatly enlarged in size. The ureters are commonly dilated, and the urinary bladder is often thickened. It is obvious that these morbid states of the kidneys may be the effects of the disease, and not the causes of it. Next to the kidneys, the organs most commonly found in a state of disease are the mesenteric glands, which are enlarged and hardened. The absorbent glands in general are occasionally enlarged, softened, and more vascular than natural; the thoracic duct is sometimes dilated, and the lungs are constantly found studded with tubercles in all their stages of disease. Though the functions of the stomach, intestines, and liver are so often disordered during life, yet it is comparatively rare that any kind or degree of organic change is discoverable in these organs after death. There is reason to believe that during life the blood is in a morbid state, for when abstracted in the progress of the disease, the crassamentum is found loose, dark, containing a smaller portion of fibrin than natural, and the serum is of a whitish colour; and when examined after death, the blood is found to be more black and more fluid than natural, and to contain a quantity of chyle imperfectly mixed with it.

The true and invariable antecedents of diabetes, or its proper exciting causes, are still involved in obscurity. It has been observed to come on after exposure to several morbid agents, as the long-continued application of cold and moisture, especially after the body had been previously over-heated, implying a sudden check to the perspiration, and a corresponding determination of blood from the skin to the internal organs; exhaustion arising from excessive evacuations, or excessive fatigue, bodily or mental; in short, whatever greatly and suddenly depresses the powers of life: but such causes are applied in all their intensity to the human body many thousands of times for one in which they produce a case of diabetes. They can therefore only concur with some other cause to produce the malady. What that proximate cause is, is wholly unknown. It would seem however to be dependent on a constitutional, that is, an organic, conformation of some organ, or some system of organs; for there is decided evidence that it is an hereditary disease. In one instance on record, seven descendants of a diabetic patient died of the malady; and Dr. Prout states that he has observed it to descend from the parent to the offspring in four instances.

Whatever doubt may be raised about the perfect curability of diabetes, there can be none respecting the decided control which a judicious plan of treatment is capable of exerting over its progress. As the very seat of the disease is unknown, and much more the specific morbid action upon which it depends, it is obvious that no local remedy, applied with a view to produce any specific effect, can be employed with the least chance of success.

It has been stated that the nutritive fluid, the blood, is in a morbid condition, and the circulation itself is deranged. There are unequal determinations of blood to different parts of the system, in consequence of which some organs are deprived of their due proportion of nutrient matter, and others are oppressed by an overwhelming load of it. One of the most constant results of this change in the quality and distribution of the blood, is the excitement of fever, which, as has been stated, is among the very first of the signs by which the presence of this disease is denoted. General blood-letting is the most efficient remedy we possess in directly altering the constitution and the distribution of the blood, by altering the proportions of its constituent elements, and the degree of stimulus afforded to the heart and the capillary arteries. In the early or acute stage of the disease, when febrile symptoms are present, when there is perhaps severe pain in some organ, attended with a sense of heat, and when the pulse is frequent, full, and sharp, bleeding from the arm to the extent of subduing these symptoms and removing the febrile state, is a most efficient remedy, and highly conducive to the success of other remedies. The quality of the blood is found on examination greatly to improve under the judicious repetition and employment of this remedy, the proportion of fibrin increasing, and even the quantity of urea and of saline ingredients also increasing. Even in a more advanced stage of the disease, when the disordered circulation of the blood is rather local than general, when there is evidence of congestion or inflammation of the liver, and still more of the kidneys, cupping over the seat of the disease, and repeated according to the persistence of the symptoms, is both a safe and an effectual remedy. But when the pulse is rapid and weak, the emaciation considerable, and the powers of life decidedly impaired, blood-letting, either general or topical, can accomplish no rational indication, but must co-operate with the malady to hasten death.

There are few diseases in which the proper regulation of the diet is of such vital importance. As far as it is possible, by a collection and comparison of the morbid phenomena, to judge of the seat of the disease, it would seem to be principally in the digestive and assimilative organs. The stomach is at once irritable and weak. It is in a state of almost constant craving for food, yet its power of digestion is feeble This is precisely the case in which it is of the last importance to attend strictly both to the quality and the quantity of the aliment. Vegetable matters, more especially sweet and acid vegetables, or those which contain in the greatest proportion the elements of sugar, might well be supposed *à priori* to be bad, and experience shows that they are in the highest degree deleterious. Cases are on record in which, when the patient was in a fair way of recovery, and even when the disease was altogether suspended, the partaking of such vegetables in moderate quantity at a single meal has brought back all the symptoms. Animal food should form the main portion of the diet. Books have been written to show that it should constitute the sole diet; but it never can constitute the sole diet, for mortal resolution cannot long persist in the exclusive use of it; and if it could, the practice would defeat its own object, and still farther weaken the already enfeebled digestive organs. Physiology has demonstrated that life cannot be sustained by one kind of food alone, however nutritious, and that nothing is more conducive to the easy performance of the process of digestion than a due mixture of different kinds of aliment. In the present case experience has fully shown that all the curative effect which can be obtained from what is called the animal regimen, is accomplished by making animal matter the principal part of the diet, and combining with this a small proportion of the farinaceous vegetables. Animal food need not be taken oftener than twice a day, and of all kinds of animal food, beef-steaks or mutton-chops underdone and plainly cooked are the best. The quantity is second in importance only to the quality. The meals should not be at greater distances than five or six hours apart, and any solid food taken oftener than every three hours, however it may for the moment allay painful sensations, operates unfavourably on the progress of the disease. The best drinks are distilled-water, lime-water, alum-whey, and the Bristol hot-well and Bath waters. The latter especially tend powerfully to assuage the thirst; but moderation in the use of liquids is as indispensable as in that of solids, and unless the patient resolutely co-operate with the physician in controlling his inordinate desire for food and drink, no plan of treatment that can be devised will succeed.

The bowels, which are generally costive, require to be kept in a lax state; and even a decidedly purgative course, steadily persevered in, has tended, on obvious principles, greatly to lessen the urinary discharge. The best purgatives are rhubarb combined with senna, and the phosphate of soda; and sulphur forms a very excellent laxative.

Next to the condition of the alimentary canal the state of the skin requires attention, which is often permanently improved, with a proportionate improvement in all the symptoms of the disease, by the persevering and judicious employment of the vapour bath, the hot-air bath, the sulphur bath, the vigorous use of the flesh-brush, and warm flannel clothing, always in immediate contact with the surface of the skin.

As a part of the regimen, regular daily vigorous exercise in pure air is of great importance.

In addition to all this, numerous medicines have been employed with a view of acting directly on the secretion of the urine, as astringents, tonics, and sedatives, some of which experience has shown to be possessed of very considerable power, more especially opium, camphor, ammonia, the carbonate of iron, the mineral acids, &c. The judicious selection and administration of these powerful agents, according to the peculiar circumstances of the individual case in combination with the general plan of treatment which has been stated, will tend greatly to mitigate the urgent symptoms, and to increase the chance of a permanent cure.

DIACAUSTIC. [REFRACTION; OPTICS.]

DIA'COPE, a genus of fishes of the section Acanthopterygii, and family Percidæ, and belonging to that section of the family, in which the species have less than seven branchiostegous rays, and an interrupted lateral line.

This genus is allied to Serranus, but may be distinguished by there being a notch or emargination in the lower part of the preoperculum, into which is fitted a projecting tubercle.

Many large and beautiful species of this genus inhabit the Indian seas. *Diacope octolineata*, a very beautiful species, caught off the coast of the Mauritius, is of a brilliant reddish yellow colour, shaded into white on the belly, and is adorned with four longitudinal blue stripes on each side of the body; these stripes are margined with black. It is about ten inches in length.

Some of the species are known to have attained the length of three feet and upwards.

DIADE'LPHIA, the seventeenth class in the Linnæan system of arranging plants. Strictly speaking, it ought to contain no genera but those which have their stamens united into two equal or unequal parcels; but as it consists principally of leguminous genera it is customary to place in it all the papilionaceous plants which have united stamens, whether in one parcel or two. This and similar plans render the Linnæan system more natural, but destroy its use as an artificial guide to the determination of the name of a plant.

DIADE'MA (Zoology). [CIRRIPEDA, vol. vii. p. 210.]

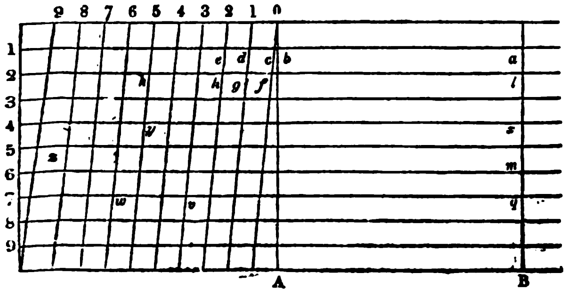
DIADUMENIA'NUS, MARCUS OPE'LIUS ANTONI'NUS, was the son of Macrinus, who was proclaimed emperor by the soldiers after the murder of Caracalla, A.D. 217. After his father's elevation, Diadumenianus, who was then at Antioch, was proclaimed Cæsar by the soldiers, and confirmed by the senate at Rome. He was not quite ten years of age, but is said to have been very handsome and graceful in his person. The reign of Macrinus lasted only fourteen months; a military insurrection, excited by Mæsa, the aunt of Caracalla, who wished to put on the throne her grandson Bassianus, also called Heliogabalus, led to the overthrow of Macrinus, who was defeated near Antioch, and afterwards made prisoner, but killed himself. Diadumenianus, who had escaped from Antioch, was also seized and put to death, A.D. 218. He has been numbered among the emperors, because his father in the latter days of his reign is said to have proclaimed him Augustus and his colleague in the empire. (Lampridius in *Historia Augusta*, Dion, *Epitome*, B. 78.)

M OPEL ANTONINVS DIADVMENIANVS CAES
PRINC IVVENTVTIS
SC

Coin of Diadumenianus.
British Museum. Actual Size. Copper. Weight 345¼ grains

DIAGONAL, a line drawn from corner to corner any line drawn from point to point of a figure, which is not part of its boundary, provided the two extreme points be in the intersection of boundary lines.

DIAGONAL SCALE. Equidistant parallel lines cut *all* lines drawn across them into equal parts. Consequently a set of equidistant parallels laid down upon a ruler, with oblique lines of various lengths drawn across them, give with the compasses, the means of immediately taking off various proportions of those lines. But the common diagonal scale is as follows, and facilitates the laying down of the hundredths of units in a scale of equal parts. A description of its use will immediately suggest the principle of it to any one slightly acquainted with geometry. A B is the unit of the scale (usually a quarter of an inch): the diagonal scale professes to determine the hundredth part of this, or the four-hundreth of an inch, and may perhaps, with care, be depended on within the two-hundredth of an inch. By taking off various lines, and writing their numerical designations opposite, we may show the use and meaning of the construction.



$ab = 1{\cdot}00$ $ae = 1{\cdot}21$ $lh = 1{\cdot}22$ $mz = 1{\cdot}96$
$ac = 1{\cdot}01$ $lf = 1{\cdot}02$ $lk = 1{\cdot}52$ $qv = 1{\cdot}37$
$ad = 1{\cdot}11$ $lg = 1{\cdot}12$ $xy = 1{\cdot}54$ $qw = 1{\cdot}67$

DIA'GORAS OF MELOS, known also by the name of the Atheist, flourished, according to Suidasin, the 78th Olympiad, 468—5 B.C. Mr. Clinton has adopted this date; but Scaliger (in Euseb. Chron. p. 101) placed him considerably later, fixing his flight from Athens in the year 415 B.C.; and he has been generally followed. The date which Mr. Clinton has taken is the more probable. The precise determination however of the time of Diagoras is not of much importance, as he is only known for his open denial of the existence of gods, and he cannot be said to have any part in the history of Greek philosophy.

Diagoras is said to have broached atheism on seeing a man who had stolen one of his writings and published it as his own go unpunished for the crime. (Sext. Empir. *adv Math*. p. 318.) On account of this atheism it is generally said that the Athenians put a price upon his head, offering one talent to any one who should kill him, and two to any one who should bring him alive; though Suidas, Athenagoras and Tatian attribute the indignation of the Athenians, and the consequent flight of Diagoras, to his having divulged the nature of some of their mysteries. It is not impossible however that this should have been one of the overt acts by which his character for atheism was established; in which case the two accounts, which seem to differ, would really coincide. He is said to have been bought as a slave by Democritus, and also to have met his death by shipwreck. (Athen. xiii. p. 611, B.) Aristophanes in his play of the Clouds, one object of which was to raise a religious outcry against Socrates, has maliciously fastened on him the odious name of the Melian. (*Clouds*, 830.)

Ælian (*Var. Hist.* ii. 23) says that Diagoras assisted Nicodorus in drawing up the laws of the Mantineans. Diagoras was also a lyric poet, though some, apparently without sufficient grounds, have attempted to separate the lyric poet from the atheist. (Bayle's *Dictionary;* Fabricii, *Bibliotheca Græca*, ed. Harles, vol. ii. pp. 119 and 655.)

DIAGRAM, a mathematical figure of any kind.

DIAL, an instrument for determining the hour of the day from the shadow of a point or line upon a graduated surface. The shadow may be that formed by the light of the sun or moon, and either direct or reflected. The dial, when the sun is used, is called a sun-dial; and when the moon, a moon-dial. The latter kind, as well as those in which the light is reflected, are mere objects of scientific curiosity, and no further notice will be given of them in this work; but the history and structure of the sun-dial will be found under GNOMON, HOUR-LINE, and SUN-DIAL.

DIALECT (*διαλεκτος, δια-λέγ-εσθαι, to converse*), an appellation given to a language when spoken of in contradistinction to some other language which it resembles in its general features, though differing from it more or less in the details. Almost all the languages which we are acquainted with may be arranged in distinct classes or families, and the relationship subsisting between the members is, generally speaking, pretty obvious. Sometimes the parent language from which they are all descended is still extant, and in that case it is frequently easy to trace the variations in orthography, inflexion, and conjugation from the parent stock, and to determine the principles which governed these changes. These inquiries, whenever they can be successfully prosecuted, are of the greatest importance, as well to the critical historian as to the philologer; for the language of a people points at once to their mental characteristics and the external changes to which they have from time to time been exposed. Thus the Dorian dialect of the Greek language, in the broadness and harshness of its vowel sounds, corresponds to the grave and austere character of the Dorian people: and whenever a warlike race has taken up its abode among a peaceful agricultural population, traces of this mixture of population are always found in the language, in which the military and political terms are mostly peculiar to the language of the conquerors, while, for the words referring to farming and domestic economy, the aboriginal language is retained. This is strikingly the case in the Latin and English languages. The two most widely diffused families of languages known to us are the Indian-Gothic and the Semitic; the former includes the Sanscrit, Zend, Armenian, Greek, Latin, Lithuanian, Sclavonian, Teutonic, and Celtic dialects, in which the resemblances, though sometimes rather distant, are still more or less perceptible. The Semitic family contains the Hebrew, Syriac, and Arabic tongues, with others less known to modern Orientalists. Many of these primary dialects are divided into several sub-dialects; for instance, the ancient Greek had at least three distinct dialects, the Æolian, Dorian, and Ionian.

The differences in the modes of speaking in England can hardly be called dialectical, in the sense in which the word dialect has been explained: such differences, generally speaking, are nothing more than peculiar words or phrases which the written language has not adopted, but which are not the less on that account genuine members of that Teutonic family of which the written language itself is only a part.

But so far as any of these varieties have been committed to writing, and are admitted by a large portion of the population to be a faithful representation of the language in daily use among them, so far such varieties may not inaptly be called dialects. Such are many of the poems of Burns and parts of the novels of Scott. In ordinary conversation in England, the words 'provincialism' and 'dialect' are often used as synonymous, and as expressing some usage of language which is at variance with the established language of the educated and that of the best writers. It is however only a vulgar mistake to consider such words as 'corruptions' of language, which they very rarely are. As a general rule, such words and phrases and such peculiar pronunciations as characterise nearly every county of England, are of the genuine Teutonic stock; and that language which is now the established language of literature, and which has rejected some of the so-called provincialisms and adopted others, might, under different political circumstances, have contained these elements in a different proportion. If the metropolis of England had been on the Severn, the Humber, or the Tyne, who can say how much the written language might have been affected by this circumstance?

DIALECTICS (διαλεκτικὴ τέχνη), the old name for the practical part of logic. The word properly signifies 'the art of conversation,' and its use as a name for the art of reasoning seems to have arisen from the fact, that Zeno the Eleatic, who was the first compiler of a system of logic, was also the first writer of dialogues. It is also to be remembered, that formal argumentation among the Greeks was generally carried on by means of question and answer, and Aristophanes uses the more common word *dialexis* (διάλεξις), to signify the logic of the Sophists. There were several systems of logic between Zeno and Plato, as, for instance, those of Protagoras, Polus, Gorgias, Euclid, and Eubulides. Socrates never committed any thing to writing; but if we take the representations given of his mode of reasoning by Plato and Xenophon, so far as they agree, we must look upon him as in some measure the originator of Plato's scientific method of arguing. (See Schleiermacher on the Worth of Socrates as a Philosopher, in the Transact. of the Berlin Acad. for 1815, transl. in the Philolog. Mus. vol. ii.) Plato considered dialectics as the science of definitions (*Sophist.* 253), and as every definition must include both genus and difference, he found it necessary to invent a theory of abstract ideas as the basis of his dialectics; for the ideas (ἰδέαι) and the genera (εἴδη) were, he considered, related merely as subject and object; and he thought that, without assuming the objective existence of the genera, he could have no real general ideas, and so his definition, and consequently his whole dialectical system, which he believed to be the only available means of finding out the truth, would fall to the ground. (Van Heusde, *Initia Philosoph. Platon.*; Cousin, *Fragmens.*) Aristotle's dialectics were based upon a scale of categories or predications, much the same with those of Archytas; he did not think it necessary to assume any *a priori* abstract notions, but conceived it was sufficient for all logical purposes to generalise after experience. (Facciolati's *Logica Peripatetica.*) The dialectics of the Stoics appear to have been little more than a system of grammatical rules. For the application of dialectics the reader is referred to the article LOGIC; and for the outlines of modern dialectical systems the articles FICHTE, HEGEL, KANT, LEIBNITZ, SCHELLING, and SCHLEGEL may be consulted.

DIALLAGE. [SCHILLER SPAR.]

DIAMETER, a word most commonly applied to the line drawn through the centre of a circle, and bounded on both sides by the circumference. But the most general meaning is as follows. Whenever any point is called a centre (meaning centre of figure, see CENTRE), any line drawn through the centre is called a diameter. And any point which bisects all lines drawn through it from opposite boundaries is called a centre. Thus the circle, the conic sections, the parallelogram, the sphere, cube, and parallelopiped, all have *centres*, and, by analogy, *diameters*.

DIAMOND, a crystalline gem, which, on account of its high lustre and extreme hardness, has always been regarded as the most valuable of the precious stones; the former of these qualities arises from its great refractive power, and on account of its hardness its lustre remains undiminished. The diamond usually occurs in imbedded octahedral crystals in alluvial ground, in the East Indies and Brazil, and of late years, it is said, has also been found in the Ural mountains. It is commonly colourless or greyish, but sometimes green, yellow, red, brown, blue, and black; the two last-mentioned colours are the rarest. Its lustre is adamantine; refraction single; transparent, but sometimes rendered opaque by foreign matter; hardness 10, exceeding that of any other, and scratching every other substance; owing to its hardness it can be cut, or rather worn down, only by rubbing one diamond against another, and it is polished by the friction of portions of the gem itself reduced to powder; it is broken without difficulty. The specific gravity of the diamond is 3·52; streak greyish; fracture conchoidal; cleavage parallel to the planes of the regular octahedron, which is its primary form, subject however to numerous varieties, and the faces are frequently curvilinear. When rubbed it phosphorises, and becomes positively electrical, and is therefore a non-conductor of electricity. When heated, without the contact of air, it suffers no change, but if ignited in contact with it, it is totally converted into carbonic acid gas, proving that it is carbon in a state of purity.

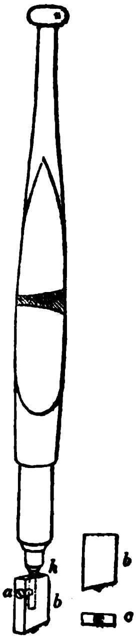
For ornamental purposes diamonds are cut into two shapes: namely, *rose diamonds* and *brilliants*, the former being, for the most part, made out of the octahedral crystals, and the latter from those with curvilinear faces. The weight and consequently the value of diamonds is estimated in carats, each of which is equal to 3.166 grains. In the formation of either a brilliant or a rose diamond so much is cut away that the weight of the polished gem is not more than half that of the rough crystal out of which it was formed.

Newton, considering the fact that transparent bodies which are uninflammable refract light nearly in the ratio of their density, while those which are inflammable have refractive powers that are greater than their density, was led to conclude that the diamond, on account of this great refractive power, was 'probably an unctuous substance coagulated.'

In 1695 experiments were made at Florence, which proved the diamond to be dissipated by intense heat in the focus of a burning lens. Several chemists proved that diamonds lost no weight when heated without the contact of air, and on the contrary, that they were dissipated when heated in it; but it was first shown by Lavoisier that carbonic acid was obtained by the combustion of the diamond, and he concluded that it contained carbon, and had great analogy with this combustible body.

These researches were not however sufficient to afford complete proof of the nature of the diamond; but this was accomplished by the succeeding experiments of Smithson Tennant, Guyton Morveau, Allen and Pepys, and Davy, who all arrived at the same conclusion, which is, that although there exists in many respects so great a difference between the properties of the diamond and charcoal, they are identical in their chemical nature. Thus, whenever, by combustion, 6 parts of charcoal, or an equal weight of diamond, are combined with oxygen, the quantity of oxygen absorbed always amounts to 16 parts, and the result of their combustion is 22 parts of carbonic acid.

DIAMOND. The pencil diamond used by glaziers to cut glass with is a small fractured piece of diamond. The part of the diamond used for cutting is of a trapezoidal shape, weighing about the 60th part of a carat, and is set in a wooden handle, which consists of a rounded piece of rose-wood flattened at the two sides to fit between the sides of the fore and middle fingers.



Two pencil diamonds are now in use, the old and the new or patent pencil. The old diamond is merely set fast in a conical shoulder. A difficulty is always experienced in cutting glass with this sort of pencil, owing to the uncertainty of placing it at once at the proper angle with the glass, so as to make it cut and not scratch. The patent diamond, of recent invention, overcomes this difficulty. The form is represented in the annexed figure. The peculiarity consists in the diamond being set in a parallelopiped shoulder, *b*, *b*, the right angle of the lower end of which is cut off and forms the correct angle at which the diamond when set will cut the glass. The upper end of the shoulder swivels at *h*, but is stopped from going too far by the screw *a*. The object of this is to prevent the necessity of shifting the handle in the hand when placed against the ruler laid on the glass. The lower end of the shoulder, showing the diamond, is represented at *c*. A large diamond is not so fit for the purpose of cutting glass as a small one. The diamond is usually about the size of an ordinary pin's head, and is set in a nipple of brass or copper. It is an error to suppose that diamonds will not wear out. In the shops of wholesale glaziers, where the diamond is in constant requisition, one of these instruments is worn down in a month or six weeks, so as to require resetting, after which, with the same wear, it usually lasts another month, and then becomes useless. It may be presumed that they travel over some miles of glass before they are worn out. In cutting the glass, care is taken not to press too heavily on the diamond, which is apt to scratch instead of cutting the glass; such heavy pressure also spoils the diamond.

The price of these useful instruments is, for a common pencil 12*s*. and for a patent pencil 18*s*.

DIAMOND HARBOUR, in the river Hoogly, about 35 miles in a direct line below Calcutta, is the place at which the large ships employed by the East India Company were accustomed to discharge their outward, and take on board the greater part of their homeward, cargoes, their loading being completed in Saugor Roads. Large warehouses for containing ships' stores have been built here, and an excellent raised road, or causeway, constructed between Diamond Harbour and Calcutta, passes through rice-fields in a state of high cultivation. The station is found to be very unhealthy, especially between July and September, owing, it is supposed, to the great quantity of vegetable matter brought down by the floods and allowed to stagnate upon the low swampy shore.

DIA'NA, a goddess who was worshipped in antient Rome and Italy. It has been already stated [Bellona] that the only safe authority for defining the attributes of the Roman deities is the etymological origin of the names; and in the same place it was pointed out that each element of nature supplied the Romans with two deities, a male and a female. Thus Dianus and Diana are properly two adjectives, derived from *dies*, 'day,' or, perhaps, originally 'light,' precisely as *quotidianus* from *quotidie*, and in this way they were the appropriate names of the god and goddess of light, the former representing the sun, or greater light, the latter the moon. Dianus, by an easy change, would become Janus, as Diana, we know, was corrupted by the rustic population into Jana in their hymns to the new moon, beginning *Jana novella*.

As the huntsman of Italy preferred the night for his sport—

> Manet sub jove frigido
> Venator, teneræ conjugis immemor—

Diana, or the moon, naturally became the patroness of the chase, and so of the wood. Again, in her character as goddess of light, her aid was invoked in parturition. In this latter office she was also called Lucina, a term of precisely the same import from *luc*, 'light;' and the identity of the two goddesses is established by the contracted form Luna, which, like Diana, is the name of the moon.

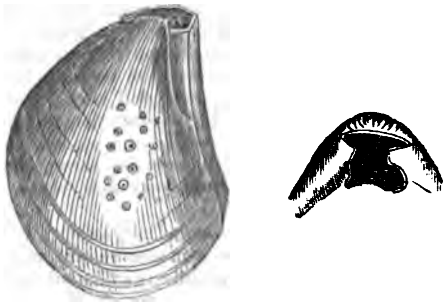
Diana had a temple on Mount Aventine, and another near Aricia. Indeed her worship belonged strictly to Latium and the plebeians of Rome. [Artemis.]

DIANÆA. [Medusa.]

DIA'NCHORA, a genus of fossil conchifers, established by Mr. Sowerby in his 'Mineral Conchology.'

Generic Character.—Shell delicate, adherent, regular, symmetrical, equilateral, subauriculated, inequivalve; one valve hollowed within, convex without; the other flat. Hinge consisting of two distant condyles.

Cuvier (Règne Animal) places the genus between *Pachytes* and *Podopsis*, M. De Blainville between *Plagiostoma* and *Podopsis*, and M. Rang between *Pecten* and *Pedum*. M. Deshayes, in his edition of Lamarck, after observing that *Pachytes* had been formed at the expense of *Plagiostoma*, states that his examination of the species had satisfied him of the identity of the genera, and that the same examination instituted with regard to *Dianchora* had convinced him that the characters of the last-named genus were identical with those of *Pachytes* and *Podopsis*. A further inquiry terminated in the conclusion that the so-called genera, *Podopsis*, *Dianchora*, and *Pachytes*, were only *Spondyli*, whose internal lamina had been dissolved, and had left naked the external or conical lamina. [Spondylus.] The subjoined cut will convey to the reader the form of one of the so-called species.



[Dianchora striata.]

DIA'NDRIA, the second class in the Linnæan system of arranging plants. It comprehends all genera with flowers having only two stamens, provided the stamens are neither united at their base, nor combined with the style and stigma, nor separated from the pistil.

DIANTHUS, a beautiful genus of Silenaceous Dicotyledonous plants, with a calyx closely covered at the base by two, three, or four, opposite pairs of decussating rigid sharp-pointed bracts. The petals are always more or less lacerated at the end, and in some species are divided into fine capillary segments. There are ten stamens, two styles, and the capsule is one-celled, with numerous black seeds containing a straight embryo. In all cases the leaves are long, narrow, one-ribbed, sharp pointed, and destitute of all lateral reticulated veining.

De Candolle enumerates 113 species, of which some must undoubtedly be reduced to simple varieties. They are found in all the temperate parts of Europe and Asia, from Ireland to the eastern coast of China and Japan; two have been met with in the United States of America, and four at the Cape of Good Hope. Most of them are perennial herbaceous plants with permanent leaves and stems, and hence they ought perhaps to be considered under-shrubs; a few become woody and form genuine bushes.

The most remarkable species are *D. barbatus*, or the Sweet William, a common and very beautiful hardy herbaceous plant, native of the south of Europe; *D. Caryophyllus*, or the Clove Pink, so called from its spicy fragrance; in its wild state a native of France and England, in its cultivated state the parent of the Carnation, Picotee, and Pink of the florists [Carnation], and *D. Libanotis*, the Syrian Pink, with the most lovely feathered petals; there are however few genera in which the species are so generally deserving of the gardener's care, for we do not know one that is otherwise than beautiful. The species are however seldom seen, in consequence of a difficulty in preserving them in a healthy state in the damp climate of Great Britain.

Although some of the species are indigenous to Great Britain, by far the greatest number are natives of the southern parts of Europe; abounding in Germany, Switzerland, Italy, and along the shores of the Mediterranean, Black and Caspian Seas, inhabiting rocks, mountains, and dry warm stony places most frequently, although occasionally living in sandy and damper places. Of our own wild kinds, *D. Caryophyllus* only occurs upon old crumbling walls, such as those which surround the city of Norwich, others in dry gravelly places or on limestone rocks.

It is therefore obvious that the gardener must pay special attention to this peculiarity, and guard by every means in his power against the access of wet, unless when the plants are in a state of free growth. In the winter, when they are at rest, they bear moisture very impatiently. It is therefore either upon rockwork or in pots housed in winter that the species of Dianthus are best preserved: we remember indeed to have seen a plant, either *D. deltoideus* or an allied species, growing by a single stem from a cleft in a hard wall near Bristol, where it had been established many years. The soil in which they are planted should consist of equal quantities of good fresh loam and vegetable mould, to which may be added a little horse dung and sand, the whole to be mixed well, and allowed to remain for a season before being used.

All the species may be propagated either by seeds or by the same processes that are employed for the Carnation and Picotee, namely, by layering or piping. Layering is decidedly the surest method, as the young shoot derives support from the parent plant until it has protruded rootlets of its own for nourishment. In this operation, gardeners generally practise a method technically called tongueing which is simply making a slit with a knife, from a little below the joint, up through its centre, and then carefully pegging the young shoot down as in the common way. Pipings are a sort of cuttings, and will root freely in a melon or cucumber frame, which can often conveniently be applied to this purpose in the end of the season; but as artificial heat is not essential to success, those who have not this convenience may succeed very well with a small hand-glass.

If the pipings are not in a shaded situation, it is necessary to shade them when the sun's rays are powerful; because the rootlets are for some time insufficient to supply the stem with fluid enough to counteract the effects of evaporation. It is the want of due attention to this which causes the result of propagating the Dianthus by pipings to be considered uncertain: if shade and moisture are supplied for a sufficiently long time, there is little risk of the pipings not forming young plants.

DIAPA'SON, in music (*διά, through, and πασῶν, of all*), the interval of the octave, so called because it includes all admitted musical sounds. It likewise signifies the compass of any voice or instrument; and the French employ it to express what in England is meant by the term *Concert-Pitch*. [CONCERT-PITCH.]

DIAPASON STOP, in an organ. [ORGAN.]

DIAPENSIA'CEÆ, a very small natural order of monopetalous Exogenous plants, formerly mixed with Convolvulaceæ, but in reality more nearly allied to Polemoniaceæ. Only two genera are known; they consist of small depressed half-shrubby species, with the habit of a minute-leaved Phlox. Their calyx grows in a broken whorl; the corolla has an imbricated æstivation with five lobes, and as many stamens growing from its margin in the sinuses; the anthers have a broad connective, and burst transversely. The ovary is three-celled, with a good many ovules growing upon central placentæ. Finally, the embryo lies across the hilum, in the midst of fleshy albumen. No use has hitherto been made of these plants. (See Lindley's *Natural System of Botany*, p. 233.)

DIAPENTE, in Greek music, the interval of the Fifth.

DIAPHANOUS. [TRANSPARENT.]

DIAPHORETICS, or SUDORIFICS, are agents which increase the natural exhalation of the skin, or restore it when suppressed. Nothing better exemplifies the doctrine that remedies are only relative agents than this class of medicines, as their power to produce perspirations depends invariably upon the state of the patient and the circumstances in which he is placed, such as the temperature and humidity of the air by which he is surrounded. Many medicines which cause a flow of perspiration when the patient is kept warm, will produce, when he is in a cool temperature, an increased action of the kidneys and an augmented secretion of urine.

Their effects as diaphoretics are attempted to be accounted for by reference to two principles; 1, by increasing the action of the cutaneous vessels; 2, by increasing the vascular action of the whole system. Those diaphoretic remedies which seem to act according to the first principle produce their effects either by external application, such as the stimulus of heat, especially as proved by the hot-air bath, or as medicinal substances which enter the circulation and stimulate the cutaneous vessels by contact, such as mercurial preparations, some saline diaphoretics, and, most markedly, sulphur, which is evidently carried undecomposed to the cutaneous vessels and excreted by them; or, lastly, by acting on the surface sympathetically through the medium of the stomach, such as warm drinks, antimonial preparations, &c.

Those diaphoretic agents which seem to act according to the second principle are:—violent muscular exercise, carbonate of ammonia, guiacum, alcoholic stimulants, &c.

Diaphoretics are in general used to restore the cutaneous discharge when, from the action of cold or wet upon the system, it has been suppressed, and accordingly they are useful in common catarrh, rheumatism, or diarrhœa proceeding from cold. They are likewise of great service in fevers, the restoration of the secretion of the skin, if it be warm and gentle, not cold and clammy, often proving critical, and the precursor of recovery. In many cutaneous diseases diaphoretics are valuable agents, and for this purpose baths, either the natural warm baths or vapour baths, are used; but in such diseases the perspiration produced by exercise, or during a course of training, is decidedly the best diaphoretic. Some forms of indigestion are relieved or cured by causing an increased action of the skin, to effect which exercise is likewise the best agent.

It is worthy of remark, that the profuse and wasting perspirations which accompany the hectic of consumption are frequently more effectually checked by diaphoretics, especially the compound ipecacuan powder, than by any other means. (Young *on Consumption.*)

DIAPHRAGM (διάφραγμα), *septum transversum, transverse partition, midriff*, a circular muscle, placed between the thorax and abdomen, forming a movable partition between these two great cavities. Its borders, which are broad and fleshy, are movable; its central portion, which is tendinous, is fixed and immovable. When not in action, its upper surface, or that towards the thorax, is convex, presents the appearance of an arch, which reaches as high as the fourth rib, and is covered by the pleura, the membrane which lines the cavity of the thorax. Its under surface, or that towards the abdomen, is concave, and is covered by the peritoneum, the membrane which lines the cavity of the abdomen. It is perforated by several apertures, through which important organs pass from the thorax into the abdomen, and from the abdomen into the thorax. In its tendinous portion, between what is called its crura or legs, there is an oval aperture through which the aorta, or great artery of the trunk, passes from the thorax into the abdomen, and the thoracic duct enters from the abdomen into the thorax. A little above this and to the left of it, in the fleshy portion of the diaphragm, is an aperture through which the œsophagus passes in its course from the mouth to the stomach. On the right side of the diaphragm, in its tendinous portion, is a third aperture, through which the inferior vena cava passes from the abdomen to the heart.

The diaphragm is a muscle of extreme complexity in its structure, and, next to the heart, performs the most important function of any muscle in the body. Its most important office is connected with the function of respiration, and it is the principal agent both in enlarging the cavity of the thorax in inspiration, and in diminishing it in expiration. These actions it performs by virtue of the power of alternate contraction and relaxation which it possesses in common with all muscles. When in the state of relaxation, as in expiration, its broad, lateral, movable borders present an expanded arch, the convexity of which reaches, as has been stated, as high as the fourth rib: when in action, as in the state of inspiration, the fibres composing the lateral borders contract, whence this movable partition descends, until, from the form of an arch, it presents a plane surface, increasing the capacity of the thorax by all the space that intervenes between the fourth rib and the lowest point to which the diaphragm is capable of descending. The fibres then relaxing, the movable borders are pushed up by the contraction of the powerful muscles of the abdomen, until the diaphragm again assumes the form of an arch, diminishing the capacity of the thorax by all the space that intervenes between the lowest point to which it descends and the fourth rib. These alternate actions, which are performed in regular and uninterrupted succession, day and night, during our sleeping and our waking hours, from the moment of birth to that of death, constitute the principal portion of the mechanical part of the function of respiration or breathing, by which air and blood flow to and from the lungs. During these actions the central portion of the diaphragm, on which the heart rests, and to which the pericardium is attached, never moves; so that though the diaphragm is in constant motion, it never disturbs the action of the heart, which it assists in supporting, and the function of the circulation is not disordered by the movements which are indispensable to the function of respiration.

There is a fixed relation between the action of the diaphragm and of the abdominal muscles. When the diaphragm contracts, the abdominal muscles relax; when the abdominal muscles relax, the diaphragm contracts. The diaphragm is the antagonist of the abdominal muscles in inspiration; but it acts in concert with them in vomiting, in the discharge of the contents of the bowels and of the urinary bladder, and in assisting the expulsion of the fœtus in parturition. To produce the respiratory movements, and to assist in the expulsion of the fæces, the urine, and the fœtus, may be considered the natural and regular offices of the diaphragm; but it conduces to the performance of many other actions. It is the principal agent in vomiting, yawning, coughing, laughing, crying, and in hiccup, which may be regarded as its more powerful and irregular actions.

DIARBEKR, more properly **DEY-A'R-BEKR** (the tents or dwellings of Bekr), a town in Al-jezírah (the peninsula), is situated about 38° N. lat. and 40° E. long. It stands at a short distance from the right bank of the Tigris, the intervening space being occupied by gardens. The area of the town is considerable; the walls are lofty and substantial, and surmounted by a castellated parapet. Formerly the town was inhabited by 40,000 families, had extensive manufactures, especially of cotton goods, and carried on a very active commerce with India, through Bagdad, and with Europe through Aleppo. But the fertile plain, 150 miles in length, on which it stands, has in later times been laid waste by the invasion of the Kurds; the commerce with Bagdad is annihilated, and that with Aleppo reduced to insignificance. Still it contains about 8000 families (1500 are Armenian, 85 Catholic, 70 Greek, 50 Jews, and 6300 Turkish), and some manufactures of cotton, silk, and leather, especially morocco. It is the seat of a Jacobite patriarch and a Nestorian archbishop. The Tigris cannot be used as a means of transport so high up as Diarbekr; but rafts of timber are sometimes floated down from the mountains above the town. It is conjectured that the antient town of Constantia stood on the site, or in the neighbourhood, of Diarbekr. (Brant, in *London Geogr. Journal*, vol. vi.)

DIARRHŒA (διάῤῥοια), flux, looseness, purging, the frequent discharge from the bowels of more liquid stools than natural. The most obvious and common cause of this disease is the direct application of some stimulating substance to the inner or mucous surface of some portion of the alimentary canal; as articles of food and drink of too stimulating a quality, or, though wholesome in kind, taken in too large a quantity. Undressed or indigestible vegetables, whether acid or sweet, cucumbers, melons, mushrooms, different kinds of salads, fruits, especially plums, stale and decayed vegetables, animal food approaching to the putrescent state, as stale fish, high game, &c., contain matters either not easily digested, or when digested of so stimulating a quality as to irritate the mucous surface of the intestine, and to produce diarrhœa. Water tainted with putrid vegetable or animal matters, or loaded with certain kinds of living or dead animalcules, is no uncommon cause of diarrhœa. When a great mixture of different kinds of food and drink, in large quantities, though wholesome in kind, is taken into the stomach at one meal, it often produces a sudden attack of diarrhœa. Even a draught of cold water, beer, or milk, especially if the individual be overheated at the time, will often almost immediately occasion the same result. Many medicines and poisons are substances which prove directly and powerfully irritating to the stomach and intestines. The large class of purgative medicines and the poisons called irritants are of this kind. Purgative medicines, given in a certain quantity and at certain intervals ascertained by experience, produce a certain degree of diarrhœa, which the physician purposely excites for the accomplishment of various objects. Given in very large doses, or in ordinary doses when the system is in a state of peculiar irritability, they sometimes occasion an excessive diarrhœa, which continues longer than usual, and so produce that species of diarrhœa which is called hypercatharsis.

In the state of health various fluids are poured into the stomach and alimentary canal for the purpose of dissolving the aliment and assisting in its assimilation. To accomplish the purpose for which they are secreted from the common mass of blood, these fluids must be in certain quantity, and must possess a certain degree of stimulating power. But in various states of the system, from being bland in their sensible properties, and only moderately stimulating in their physiological action, they become greatly increased in quantity, and highly irritating in quality. Of these fluids the principal are the gastric, the intestinal, the pancreatic, and the biliary. The secretion of the gastric juice may be altered in quantity and quality, in consequence of which it may be incapable of properly dissolving the aliment, which therefore may be sent from the stomach into the intestines in an acrid and irritating state, and so produce diarrhœa. The pancreatic juice may also be altered in quantity and quality, and become highly irritating; and the bile is sometimes poured out in greater quantity than usual, and of a more than ordinary acrid quality, and in both ways is a frequent cause of diarrhœa. Moreover, the entire surface of the stomach and intestines is crowded with secreting organs, mucous follicles, from which a quantity of fluid is constantly poured out, constituting the chief portion of the evacuations passed when little or no food has been taken, and which probably also affords the principal part of the matter of the liquid stools that occur in diarrhœa. In many states of the system, and from numerous irritating substances applied to their surfaces, the secretion of these bodies becomes excessive in degree, and highly acrid and irritating in its nature.

The quantity of matter from this source may be indefinitely increased by whatever is capable of occasioning a greater efflux of blood than natural to the mucous surface of the alimentary canal. Hence it may be superinduced by all the other causes of diarrhœa—indigestible food, wholesome food in too large a quantity, disordered states of the digestive fluids, &c., and from increased afflux of fluids from other parts of the system, as from cold applied to the surface of the body and suppressing perspiration, which may determine a greater quantity of fluids to the intestines. Great alternations of temperature will, in many constitutions, produce the same result. Suppressed evacuations, checked menstruation, the retrocession of eruptive diseases, as measles, scarlatina, &c., are often immediately followed by diarrhœa. Even mental emotion is capable of producing it in some irritable and nervous constitutions to a great degree; and when under the influence of such emotions, the slightest excess in food or drink, or the slightest quantity of irritating aliment, will be succeeded by numerous and liquid stools. Irritation in a distant part of the body often induces increased action of the intestines and occasions diarrhœa, as the irritation of the gum in dentition The mucous surface of the whole alimentary canal is highly sensitive and irritable in infants and children, and food improper in quantity or quality is exceedingly apt to induce diarrhœa in them, and if the irritation in the stomach and intestines from this cause be kept up long, irreparable and fatal disease is sure to be induced. Slight errors in diet on the part of the mother, and even an irritable state of mind, will disorder her milk to such a degree as to produce distressing diarrhœa in her infant. The excitability of the capillary arteries, the mobility of the muscular fibres, and the sensibility of the whole nervous system during the early periods of life, render the young much more susceptible to all the causes of diarrhœa than the adolescent and the adult, and the more tender the age the greater this susceptibility.

By whatever cause diarrhœa may be excited, it is seldom that the increased discharge of liquid stools from the intestines is the only symptom present. It is commonly preceded by nausea, and in general more or less uneasiness is felt in the stomach and intestines, which sometimes amounts to severe griping pain, often accompanied with flatulence In severe cases, the abdomen is distended, and even tender to the touch; the nausea passes into vomiting, and the pain, especially around the navel or in the course of the colon, becomes intense, somewhat relieved, perhaps, after each evacuation, but soon returning with undiminished severity. The number of evacuations may vary from three or four to twenty or thirty in the twenty-four hours. Of course the sudden loss of so large a portion of the more fluid part of the blood as is contained in these watery evacuations, deprives the system of a proportionate quantity of stimulating and nutritive matter, and accordingly there is often great prostration of strength, and a striking expression in the countenance and attitude of languor and debility. In slight cases, the pulse is little if at all affected; but when the pain is severe and the discharges copious, the pulse is quickened, and at an advanced stage of the attack is generally small, weak, and much increased in frequency. The tongue is loaded, and in certain forms of the disease is intensely red at the edges and tip, and the papillæ are large, prominent, and of a bright red colour, shining through a thick coat of fur. The urine is generally diminished in quantity. The skin, at first hot, towards the termination of the attack is unusually cold and chilly, and is peculiarly incapable of resisting the influence of a cold and damp atmosphere. Every observant physician must be able to recal instances which have occurred in his practice, in which inflammation of some vital organ was set up, or perhaps the foundation of consumption laid, from the patient having imprudently gone out on a cold and wet day after having taken purgative medicine; or when labouring under diarrhœa spontaneously induced.

The nature of the matters contained in the evacuations varies remarkably, and affords important indications of the seat and state of the disease. Several varieties of the disease have indeed been founded on those appearances, and diarrhœa has accordingly been divided into fæculent, bilious, mucous, serous, chylous, lienteric, &c., but the causes of the disease afford more fixed and determinate characters for its distribution into species. Of these there are commonly enumerated the following:—diarrhœa *crapulosa*, from food improper in quality or quantity; diarrhœa *biliosa*, from bile more abundant or more acrid than natural, as from the heat of summer and autumn, co-operating with errors in diet; diarrhœa *serosa*, from increased vascular action of the mucous surface of the alimentary canal, induced by whatever occasions a preternatural afflux of blood to the mucous surface; diarrhœa *mucosa*, from increased secretion of the mucous follicles, which may be induced by almost any of the ordinary exciting causes of diarrhœa; diarrhœa *lienterica*, the aliment passing in the evacuations almost unaltered, occurring principally in children about the first, and between the first and second dentition, and occasioned by the ordinary exciting causes of diarrhœa.

The duration of this disease must of course be materially influenced by the persistance of the cause that excites it. Its ordinary varieties being generally dependent on temporary causes, are of short duration; but the increased secretion of bile by the liver, and of mucus by the mucous follicles, and the irritation of the intestinal canal from dentition, may be protracted to an indefinite period; and the disease dependent on the excited state of these organs may consequently become chronic, continuing for months together to harass the patient and enfeeble the constitution. In these cases, when a cure is apparently effected, very slight causes are capable of bringing back the disease; and during the period of convalescence the utmost caution is always necessary to avoid errors in diet and any exposure to cold or wet.

The immediate danger from a very severe attack of diarrhœa, or from its passing from the acute into the chronic state, is, that it should terminate in acute inflammation of the bowels (enteritis); or chronic inflammation and ulceration of the bowels (dysentery); or intus-susception (the passing of one convolution of the intestines into another), induced by the increased peristaltic action of the bowels; or enlargement, hardening, and obstruction of the mesenteric glands, and the consequent wasting of the body (marasmus), one of the most common forms of disease by which the existence of infants and children is cut short.

There are several diseases with which diarrhœa may be confounded, from which it is important that it should be distinguished. From the far more serious malady termed dysentery it is distinguished by the absence of fever, by the absence of blood in the evacuations, and by the absence of the painful, distressing, and ineffectual desire to evacuate the contents of the bowels which is called tenesmus. It is distinguished from cholera by the absence of spasms of the muscles, so constant and distressing in the latter disease, by the slighter degree or the total absence of vomiting, and by the milder character and the much less rapid progress of the entire disease. But the bilious and even the pestilential cholera frequently commence with one or other of the preceding forms of diarrhœa. Life often depends on the clearness and promptitude with which the diagnosis is made between diarrhœa from irritation, constituting the crapulous and bilious forms of the disease, and the diarrhœa from inflammation, which often appears under the serous and mucous forms. The diagnosis is chiefly to be drawn from the marked difference in the constitutional symptoms when the diarrhœa is the consequence of an inflammatory state of the internal surface of the intestines. In this case there is always present a greater or less degree of fever; the skin is hot, or alternately hot and chilly; the pulse is more or less excited, and the strength prostrate. The pain in the bowels is obscure and dull rather than griping, the abdomen is tender on pressure, and it is in this case more especially that the tongue is preternaturally red at the edges and the tip, and that its papillæ are enlarged and red.

Though diarrhœa is often a trifling disease, and even a remedial means adopted by nature to prevent the occurrence of more serious evils, yet the serous and mucous forms of it, more especially when they pass into a chronic state, are apt to terminate in dangerous and fatal maladies, and their management requires great and persevering care. Instances are by no means unfrequent in which the ultimate event proves fatal, in consequence of their neglect, or of the medical treatment and the remedies being injudicious. Indeed the treatment of diarrhœa in general requires much discrimination, for a very trifling form of it is easily converted by mismanagement into a highly dangerous disease. The chief difficulty is to detect the exact nature of the exciting cause, and the exact condition of the excited organ, which alone can guide to the selection of one of two opposite plans of treatment, the administration of purgative or of opiate medicines. If the irritation arise from too large a quantity of stimulating food and drink, abstinence alone is sufficient to effect a cure; but if, notwithstanding the abstinence from food, the disease continue, it is necessary to ascertain whether the irritation be kept up by the retention of irritating matters, or whether the alimentary canal itself be in a preternaturally irritable and excited state. If the former, purgative medicine of some kind or other is indispensable, but the choice of the purgative is by no means a matter of indifference. It should have the power of evacuating the contents of the bowels without irritating the mucous surface. For this purpose castor oil is one of the best medicines; or, if a somewhat stronger purgative be required, infusion of senna with manna. It is often attended with the best effects to combine a few drops of laudanum with the aperient. When the irritating contents of the stomach and intestines are removed, a mild and frequently repeated sedative should be prescribed, one of the best of which consists of two drachms of almond oil with two drachms of mucilage of gum arabic in an ounce of rose or peppermint water, with from five to ten drops (according to the severity of the case) of laudanum or half a dram or more of the tincture of hyoscyamus. If the secretions are disordered, five grains of blue pill or of hydrargyrum cum creta, with the same quantity of the compound powder of ipecacuanha, taken every night, or every other night, at bed-time, with a tea-spoonful of castor oil, containing a few drops of laudanum, the morning following, will soon restore them to a healthy state. Of course the diet should consist only of the mildest alimentary substances; for as long as the alimentary canal continues irritable, food and drink, even of the ordinary stimulating properties, will keep up or re-excite the diarrhœa.

The exciting cause of the biliary variety of diarrhœa is often inflammation of the liver (hepatitis). When there are present any indications of this, blood-letting, or local bleeding by cupping or leeches, must precede all other remedies; and the abstraction of blood must be repeated at short intervals until the inflammatory state of the liver is removed; then mild mercurials, with mild purgatives, are necessary. This is by no means a variety of diarrhœa which can be cured by opiates. The exhibition of any remedies of this class, which, when judiciously managed, are sometimes highly advantageous, requires peculiar discrimination and skill. In the serous and mucous diarrhœa, when there is present no proper fæculent matter, all this having been previously discharged, it is absurd to give purgatives; such medicines can only still further irritate the over-excited organs. Leeches to the abdomen, the warm bath, demulcents with opiates, the chalk mixture, and the strictest regulation of the diet, are necessary.

The diarrhœa, so easily excited, so constantly present, in infants and young children, requires a peculiarly cautious management. When it is connected with dentition it is pregnant with danger to stop the discharge, or even to restrain it, unless it become excessive, and then it should be moderated, not stopped; and the mildest means should be employed to accomplish this object, which should never be attempted without at the same time paying the strictest attention to the diet, air, and exercise of the child. Death is often produced in infants at this critical period of the infant's life by the exhibition of opiates to stop this discharge. The proper remedies are the choice of the blandest articles of food, the avoidance of over-feeding, two or three grains of hydrargyrum cum creta at night, and the tepid bath.

It would swell this article much beyond our limits to enter into a full account of all the precautions which are necessary on the part of the mother and nurse, as well as of the medical practitioner, in relation to this very important subject. All that is possible is to direct attention to the points of essential importance.

DIARY, from the Latin *Diarium*, which again is from *Dies*, a day. The original and proper meaning of the word *Diarium* among the Romans was the daily allowance made to slaves for their sustenance, as *Menstruum* was their monthly allowance. *Diurnum* was another word for the same thing. [ACTA DIURNA.] In later times however either word came to be used for a note-book, or other register of daily occurrences, which had formerly been called (after the Greek) an ephemeris. It is only in the sense of a daily register that the word diary is used in English; and, naturally enough, it is commonly understood to imply specifically a register of occurrences in which the writer has had a personal share, or which have at least in some sort come under his own observation by having happened in his own time. For instance, although a history of the transactions of a former age, composed in a particular form, might be entitled annals, such a history, however minute, would scarcely in any case receive the name of a diary. A diary is etymologically the same thing with a day-book or journal; the latter word being a modernized form of diurnum, as diary is of the synonymous diarium of the same parentage. The French language has only the form *journal;* the Italian, like the English, has both forms, *diario* from *diarium*, *giornale* from *diurnum*, both ultimately from *dies*.

DIASCHI'SMA, a term employed in antient and in speculative music, but not in practical use among modern musicians. It is the half of a minor semitone or diesis. [DIESIS.]

DIASTO'PORA. [POLYPIARIA MEMBRANACEA.]

DIASTYLE. [CIVIL ARCHITECTURE, vol. vii., p. 220.]

DIA'STYLIS, a genus of crustaceans established by Mr. Say.

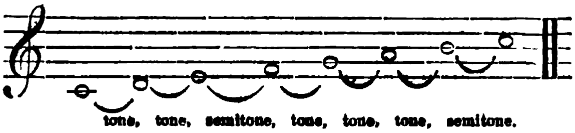
Generic Character.—Four *antennæ* placed nearly on the same line; the intermediate antennæ bifid, having a peduncle of three joints, the external simple, with the first joint long, and without a scale. External *jaw-feet* very large, pediform, very much approximated to the front, with the first joint long and compressed, and the others very small, cylindrical, and nearly equal. *Corselet* smooth, of six segments, of which the first, larger than all the others together, is terminated anteriorly by a short, obtuse, triangular rostrum, crenelated on its lateral edges. Six pairs of bifid *feet;* those of the first pair truncated at the end and shorter than the external jaw-feet; those of the second terminated in a point; those of the third, fourth, and fifth pairs raised, pointed, without a nail, and terminated by strong hairs. *Abdomen* narrower than the *thorax*, formed of six segments, the two last of which support the natatory feet. *Tail* biarticulated, provided on each side of the first segment with a single bifid style, and on the extremity of the second with a simple cylindrical style.

Example, *Diastylis arenarius:* length one-fifth of an inch. *Locality*, the coasts of Georgia and Florida.

Mr. Say is of opinion that the *Cancer scorpionides* of Montagu, from the English coasts, and the *Cancer Esca* of Gmelin, from those of Norway, ought to be referred to this genus.

DIATES'SARON, in Greek music, the interval of the Fourth.

DIATON'IC, in music (*διὰ, through*, and *τόνος, a tone*), a term applied to the first of the three antient genera, and of the three modern scales, but in both cases rather improperly, because the intervals of the Greek genus and of the scale now in use consist not only of tones, but also of semitones. The *Major Diatonic Scale* of the moderns proceeds thus:—



The Diatonic genus of the Greeks, as exhibited in their several *modes*, comprised five tones and two semitones, differently disposed: that of the Lydian mode, according to Sir Francis Styles (*Transactions of the Royal Society*, 1760), corresponded, as regards the position of the intervals, to our major diatonic scale. [SCALE.]

DIAZO'MA. [BOTRYLLUS, vol. v., p. 259.]

DIBDIN, CHARLES, in whose person the British bard may be said to have been revived, had his birth at Southampton in 1745, near which place his grandfather, a considerable merchant, founded a village that bears his name. When Dibdin was born, his mother had reached her fiftieth year, and he was her eighteenth child. He had a brother, Thomas, twenty-nine years older than himself, on whose death he wrote the beautiful ballad, 'Poor Tom Bowling.' This gentleman was captain of an East-Indiaman, and father of Thomas Frognall Dibdin, D.D.

The subject of the present notice was educated at Winchester, and originally designed for the clerical profession, but his love for music predominated, and after receiving some instruction from the celebrated Kent, organist of Winchester cathedral, he was sent to London, and commenced his career, as poet and musician, at the early age of sixteen, when he produced an opera at Covent Garden theatre, written and composed by himself, called *The Shepherd's Artifice.* A few years after he appeared as an actor, and was, in 1768, the original Mungo in his own *Padlock.* In 1778 he became musical manager of Covent Garden theatre, at a salary of ten pounds a week. About the year 1782 he built the Circus theatre (afterwards opened under the name of the Surrey), which continued under his management about three or four years. In 1788 he published his *Musical Tour*, in one vol. 4to.; and in 1789 presented to the public, at Hutchins's auction rooms, King Street, Covent Garden, the first of those entertainments whereby he so eminently distinguished himself,—and of which he was sole author, composer, and performer,—under the title of *The Whim of the Moment.* In this, among sixteen other songs, was the ballad 'Poor Jack,' an effusion of genius that immediately established his reputation, both as a lyric poet and melodist. The year 1791 saw Dibdin in his Sans Souci, an exhibition-room in the Strand, fitted up by him; and in 1796 he erected a small theatre in Leicester Fields, giving it the above-named title. This he sold in 1805, and retired from public life; but not having been provident while the means of making some provision for the future were in his power, his retreat was not accompanied by independence. This having been properly represented, government granted him a pension of 200*l*. per annum, an act evincing both a sense of justice and a right feeling. Of this he was for a time deprived by Lord Grenville, but a more liberal ministry restored it. Towards the close of the year 1813 he was attacked by paralysis, and died in the July following. Mr. Dibdin published one or two novels, and some smaller works, but his fame is built on his songs, of which—so prolific was his muse, and so great his facility in composition—he produced the amazing number of nine hundred! The character of these, and of their author considered as a writer, is thus given in the *Harmonicon* for April, 1824:—'Had Dibdin written merely to amuse, his reputation would have been great, but it stands the higher because he is always on the side of virtue. Humanity, constancy, love of country, and courage, are the subjects of his song and the themes of his praise; and while it is known that many a national foe, whether contending or subdued, has experienced the efficacy of his precepts, we are willing to believe that the sufferings which the lower orders of the creation are too commonly doomed to endure have now and then been a little mitigated through the influence of his persuasive verse.'

DICÆARCHUS, the son of Phidias, was born in the city of Messana in Sicily. He was a scholar of Aristotle, and is called a peripatetic philosopher by Cicero (*De Officiis*, ii. 5); but though he wrote some works on philosophical subjects, he seems to have devoted his attention principally to geography and statistics. His chief philosophical work was two dialogues 'on the Soul,' each divided into three books, the one dialogue being supposed to be held at Corinth, the other at Mytilene. In these he argued against the Platonic doctrine of the soul, and indeed altogether denied its existence. In the second and third books of the Corinthian dialogue, Cicero tells us (*Tuscul. Disput.* i. 10), he introduced an old Pthiote named Pherecrates, maintaining that the soul was absolutely nothing; that the word was a mere empty sound; that there was no soul either in man or beast; that the principle by means of which we act and perceive is equally diffused throughout all living bodies, and cannot exist separated from them; and that there is no existence except matter, which is one and simple, and whose parts are naturally so arranged that it has life and perception. The greatest performance of Dicæarchus was a treatise on the geography, politics, and manners of Greece, which he called 'the Life of Greece' (Ἑλλάδος βίος). Of this a fragment has come down to us, which is printed in Hudson's *Geographici Minores*, and also edited by Marx in Creuzer's *Meletemata e Discipl. Antiquitatis*, p. iii., p. 174. It has been conjectured, with great appearance of truth, that the citations from Dicæarchus, in which his treatises 'on Musical Contests,' 'on the Dionysian Contests,' &c., are referred to, are drawn from this comprehensive work, and that the grammarians have named them by the title of the subdivision to which these subjects belonged, instead of the leading title of the book. (See Näke in the *Rhein. Mus.* for 1833, p. 47.) Dicæarchus's maps were extant in the time of Cicero (*Ep. ad Att.* vi. 2); but his geography was not much to be depended upon. (Strabo, p. 104.) Cicero was very fond of the writings of Dicæarchus, and speaks of him in terms of the warmest admiration. (*Ep. Att.* ii. 2.) In the extant fragment Dicæarchus quotes Posidippus, and must therefore have been alive in 289 B.C. We must distinguish him from a Lacedæmonian grammarian of the same name, who was a pupil of Aristarchus (see Suidas).

DICÆ'LUS, a genus of Coleopterous insects. [Licinus.]

DICÆUM. [Creeper, vol. viii., p. 149.]

DI'CERAS. [Chamacea, vol. vi. p. 469.]

DICHELE'STHIUM. [Pœcilopoda.]

DICHO'LOPHUS. [Cariama, vol. vi. p. 291.]

DICHOTOMA'RIA. [Pseudozoa.]

DICHO'TOMY, a term in botany, employed to express a mode of branching by constant forking. The first stem or vein of a plant divides into two branches, each branch divides into two others, and so on. It is only in the veins of fern leaves, and of those of some of coniferous species, and in the stems of Lycopodiaceous plants, that this mode of division exists as a general character. It however does occur elsewhere; for example, the Doom Palm of Thebes is remarkable for its dichotomous branches, and the Screw Pines (*Pandanus*) have a similar habit.

DI'CLINOUS, an obsolete term in botany, signifying that a plant has its sexes in distinct flowers. It comprehends all the Monœcious and Diœcious plants of Linnæus.

DICOTYLE'DONS, a natural class of plants, deriving their name from the embryo having in general two seed leaves, or cotyledons; a character to which there are however some exceptions. The genus Ceratophyllum has several; Bertholletia appears to have none; in Tropæolum and many others they are consolidated into one; and Cuscuta is certainly destitute of them. Like all others, therefore, the character derived from the cotyledons, nearly universal as it is, has its exceptions. Hence botanists associate with the character derived from the embryo others derived from the mode of growth, leaves, flowers, &c., and the whole taken together give the real diagnosis of the class to which the name of Dicotyledons is applied.

The stems of dicotyledons are probably in all cases branched, except when a plant is, from its weakness and minuteness, unable to reach any development beyond that of the first stage from the plumule. In herbaceous plants that are called stemless, a sort of branching takes place by the formation of small short stems upon the crown of the axis of growth. They have the pith, wood, and bark distinctly separated, and the wood traversed by medullary rays. This wood, if more than one year old, consists of concentric circles, each of which is formed on the outside of that which immediately preceded it; the consequence of which is, that the oldest part of a branch will necessarily consist of the largest number of layers, and will therefore be the thickest: hence the branches of dicotyledons are always cones, although usually very long ones [Exogens], and not cylinders. But to some of these characters the exceptions are not a few. It is difficult to trace any distinction of pith, wood, and bark in the stem of the water-lily (Nymphæa); there are no concentric circles in the wood of Aristolochia, and several other genera; and it is impossible to show by measurement that the stems of many irregular tropical dicotyledonous climbers vary perceptibly in diameter for considerable distances.

The leaves of dicotyledons are articulated with the stem, so that at a particular time they are thrown off, and leave a clean scar behind them, as in all the trees, whether deciduous or others, which are found in the open air in England. Their veins are repeatedly branched, so as to form a netted apparatus within the parenchyma. But although by far the largest part of dicotyledons are thus constructed, yet we have contradictions to this also. For instance in Dianthus, and a great many other genera, the leaves have no veins except the midrib, and there are many herbaceous plants whose leaves never drop fairly off the stems.

The number of parts in the flower of dicotyledonous plants is four or five; that is, four or five sepals, four or five petals, and the same number of stamens, present in either a complete or imperfect state; or if the number is greater, it is some power of four or five. But in Ranunculus Ficaria, most Anonaceous plants, and several more, the parts in the flower are three.

Finally, when the seeds germinate, the embryo simply extends the point of its radicle in the form of a root, to seek for nourishment in the soil. [Exorhizæ.] But although this is, as far as is yet known, a character without exception, nevertheless it has been too little studied for us to assert that it is more free from anomalies than other characters.

Hence it is to be observed, that it is neither the two cotyledons, nor the exogenous stem, nor the concentric circles of wood, nor the reticulated disarticulating leaves, nor the quinary or quaternary flowers, nor the exorhizal germinations, which by themselves characterize the class of dicotyledons, *but the combination of those characters*; and that the absence of some one of them is immaterial; so that a plant may be essentially a dicotyledon, although it has any number of cotyledons except two.

The dicotyledons of Jussieu comprehended the plants now separated under the name of Gymnosperms, and, together with Monocotyledons and Acotyledons, constituted the whole vegetable kingdom. They probably consist of at least two-thirds of all known plants: in the state of trees, shrubs, or herbaceous plants, they are found wherever phænogamic vegetation can exist, and they and Gymnosperms together constitute exclusively the arborescent scenery of all cold countries.

DICO'TYLES. [Hog.]

DICRU'RUS. [Laniadæ.]

DICTAMNUS, the botanical name of the fragrant herbaceous plant called Fraxinella by gardeners.

DICTA'TOR was the highest extraordinary magistrate in the Roman republic. Though the name obviously contains the element *dic* (from *dico*), it was doubted by the Roman writers whether the title had reference to the mode of his nomination or to his power. He was also called by the old name of Magister Populi, and in Greek *διύπατος*, or 'double consul.' After the expulsion of the kings the nsulship was established. The two consuls possessed e same power as the kings in the administration of the ate and the command of the army, yet their authority was bject to some restrictions, and principally by the appeal at could be made from their decisions. [CONSUL.] The vo consuls, possessing equal authority, often differed in eir views and opinions; a circumstance which necessarily used jealousy and disunion, particularly in the command the army when on active service. In extraordinary nergencies, the republic therefore required a single magistrate, invested with ample authority. Such circumstances led to the establishment of the dictatorship. The st dictator was created about the year 253 A.U.C., or 501 c. (Liv. ii. 18.)

The dictator united in himself the power of the two nsuls; and the authority of all other magistrates, except that of the tribunes, ceased as soon as he was appointed. He possessed the whole administrative power the state, and the command of the army without any estrictions. (Dion Cassius, according to Zonaras, vii. 3, where a reference to a lost book of Dion is given. ion Halic., v. 70, 73.) He had the power of life and eath, and there was no appeal from his decision. oth within and without the city he was attended by venty-four lictors, with their fasces and axes. The dictators were not chosen, like the other magistrates, in the mitia, but they were appointed by one of the consuls, in nformity with a vote of the senate. Sometimes the senate itself appointed the dictator, and in some instances he as elected by the comitia. At first he was taken only from e patrician order, but afterwards (B.C. 356) also from the lebeians. After his election, the dictator nominated the aster of horse (magister equitum), who commanded under im. It was only when the state was menaced by sudden danger from within or without that a dictator was nominated; but n the course of time a dictator was elected to preside at he elections in the comitia, when the consuls were abroad, nd therefore could not preside; and also on some other ublic solemnities. (Liv. vii. 3; viii. 18 and 23.) The dictator continued in office for six months, but he commonly esigned as soon as the danger was over which had led to he nomination. The dictator was not allowed to leave taly, or to enter the city on horseback. Yet there are instances in which the dictator left Italy, as for example in he first Punic War, when a dictator commanded in Sicily. The rule that he should continue in office only six months was also neglected; Sylla and Julius Cæsar were nominated perpetual dictators, the former in the year 81 B.C., and the other after his victory at Pharsalus. The office seems never to have been filled from B.C. 202 to the time when Sylla, the head of the oligarchical party, was made perpetual dictator. J. Cæsar, who was the head of the democratic party, or perhaps rather chose that party merely that he might, by being at the head of one of the great divisions which distracted the state, prepare the way for his own unlimited power, after being dictator five times, became dictator for life. Augustus declined the office, though offered to him by the people (Suetonius, *Aug* 52), and the title of dictator was never assumed by the emperors of Rome.

These are the received opinions as to the Roman dictators; but in Niebuhr's Roman history we find other views of the subject, to which we shall briefly advert. According to him, the dictatorship was of Latin origin and was introduced from the Latins among the Romans. The object of the Roman dictatorship was to evade the Valerian laws, and to establish the power of the patricians over the plebeians; for the appeal granted by those laws was from the sentence of the consuls, and not from that of the dictator. The later Romans had but an indistinct knowledge of the dictatorship of the antient constitution. Dion Cassius is in error, when (without excepting the patricians) he asserts that in no instance was there a right of appeal from the dictator, and that he could condemn knights and senators to death without a trial. Dionysius is also in error, when he says that the dictator decided on every measure according to his own pleasure. It is incorrect to suppose that the appointment of the dictator in all cases rested with one of the consuls; for the conferring of kingly power (such as that of the dictator was) could never have been intrusted to a single person. The pontifical books have preserved so much as this, that the dictator was nominated by the senate, and that the nomination was approved by the people. As the plebeians increased in power, the dictatorship was seldom required, and then only for matters of less importance; and in such cases the nomination was left to the consuls.

For a general sketch of the dictatorial power, the reader may consult Creuzer, *Abriss der Römischen Antiquitäten, &c.*, Leipzig, 1824; Niebuhr's chapter *on the Dictator*, and his *Remarks on the Relationship of the Dictator and the Master of the Horse*, vol. i. Engl. Trans.

DICTIONARY, the English form of *Dictionarium*, a word of low or modern Latinity, which from its etymology should signify properly a book of phrases or modes of expression. The term however has been generally applied to any work which professes to communicate information on an entire subject, or entire branch of a subject, under words or heads digested in the order of the alphabet. This alphabetical arrangement appears to be the distinctive peculiarity of what is called a dictionary; but to constitute the work a dictionary, it should seem that there must also be attached to each of the terms, so arranged, some explanation or interpretation. Thus, an Index, in which words or titles are merely put down in alphabetical order, with nothing more than a reference to some page or passage appended to each, is not a dictionary. The alphabet itself is not a dictionary. Again, a dictionary, however arbitrary or artificial may be the order in which its parts are distributed, must profess some unity and completeness of design. It must profess, as has been said, to go over a whole subject, or field of knowledge, of greater or less extent. Thus a mere list of miscellaneous particulars, even with explanatory remarks or comments annexed, is not a dictionary, but a catalogue. A collection of plays or of pamphlets might be arranged in the order of the alphabet, but would not on that account make a dictionary. That name is not applicable, and is never given, even to the most extensive enumeration and account of things which are merely brought together, without constituting when collected a natural system or complete body of knowledge.

Within the limitations noted, the term dictionary is applied to works on all kinds of subjects, and with every diversity of object. Dictionaries have sometimes been divided into three classes or descriptions:—1. Dictionaries of words. 2. Dictionaries of facts. 3. Dictionaries of things. And although objections may be made to the principle of this distribution (as has been done by D'Alembert in the *Encyclopédie*, article *Dictionnaire*), it is sufficiently convenient for practical purposes, and we shall therefore adhere to it in what we have now to say.

I. Dictionaries of Words. This is the original application of the word dictionary, and the sense in which it is commonly understood when it stands alone. It answers in this sense to the Greek lexicon, and although etymologically that term, like the term dictionary, ought perhaps to signify a book of phrases or modes of expression, yet among the Greeks it seems rather to have denoted a book that explains words. A dictionary or lexicon indeed usually combines an explanation of phrases with an explanation of single words. When it contains nothing beyond an explanation or translation of single words, it is more distinctively called a vocabulary or word-book. The word vocabularium, we believe, is not found in the Latin of antiquity, any more than dictionarium. A glossary, in Latin *glossarium*, which is used by the later classics, from the Greek *glossa* (γλῶσσα), 'a tongue' or 'language,' is generally understood to mean, an explanation, more or less diffuse, of terms of unusual occurrence. Among the Greeks themselves indeed *glossa* was used for a foreign, or otherwise peculiar word or form of expression. (Aristot. *Poet.* c. 38.) As there is nothing in the etymology of the term glossary however to confine it to this explanation, many examples may be found of its employment in a more extended sense. Some dictionaries profess to have more peculiarly for their object the explanation or interpretation of phrases; such, for example, as the well-known volume on the Latin language entitled 'Phraseologia Generalis,' by William Robertson, 8vo. Camb. 1681. Some dictionaries and vocabularies apply only to some particular author or work; such as Damm's Lexicons or Concordances, as they are called, of Homer and Pindar, since combined into the Lexicon Homerico-Pindaricum, the Lexicon Ciceronianum of Marius Nizolius, &c. Such dictionaries, when well compiled, are among the most valuable aids the student can avail himself of. Nor are they of use only in studying the authors of antiquity; the works of some modern writers have been very ably illustrated in this way, as, for instance, by Mr. Tyrwhitt in his glossary to Chaucer, and by Archdeacon Nares in his glossary to Shakspeare and his Contemporaries, 4to. London, 1822. Even a mere verbal index, with little or no explanation of the meanings of the words, is often much more useful than a professedly interpreting dictionary, by merely bringing together or pointing out by reference the different passages in which each word is used, so that they may be compared with one another. Such mere indexes as those attached to the Delphin Classics are of great value in this way, in addition to their proper use of enabling any passage to be found of which even a single word is recollected. Few of our English classics have been illustrated by such complete verbal indexes; there is one to Milton's Paradise Lost, 12mo. London, 1741. Ayscough's Index to Shakspeare is only an index to the 'remarkable' passages and words; and although its professed design is 'to point out the different meanings to which the words are applied,' it is not very successfully compiled for that purpose. Still it is a useful book, as being the best verbal index to Shakspeare we yet possess. Indexes of this description serve in fact the same purpose with Concordances, although that term has been for the most part confined to works relating to the Scriptures. (CONCORDANCE.) Some works entitled dictionaries, indeed, comprehend concordances more or less complete; as, for instance, Schleusner's 'Novum Lexicon Græco-Latinum in Novum Testamentum,' and the Ionic lexicon of Schweighæuser, which is a sort of concordance to Herodotus, and that to Polybius by the same scholar.

Some of these dictionaries to particular authors, or works, have exclusively or principally in view the illustration of the style of the author, or his use of particular words. One of the best of these is Ernesti's 'Index Latinitatis Philologico-Criticus' to Cicero. This work in fact, although styled merely an index, is much more a dictionary of interpretation and commentary than the lexicon just mentioned of Nizolius, which however is much the more minute and extensive index of the two. The instance may serve to show with what latitude the two titles are applied. And the title of index, it may be added, has been sometimes given to works which are not really indexes in any respect, but simply dictionaries or vocabularies. We may mention as an example, 'Olai Vereli Index Linguæ Veteris Scytho-Scandicæ, sive Gothicæ, opera Olai Rudbeckii editus,' fol. Upsalæ, 1691, which is merely a vocabulary of the Gothic. Dictionaries of languages have also been published under many other titles. A Thesaurus, or Treasury, is a very common title of such a book. Thus Faber's Latin dictionary is styled 'Thesaurus Eruditionis Scholasticæ,' and H. Stephens' Greek lexicon is entitled 'Thesaurus Græcæ Linguæ.' Edward Philips entitles his English dictionary a 'World of Words.' In some cases an attempt has been made by means of a dictionary or index, not only to point out the writer's use of particular words, or their meaning in particular passages of his works, but also to give an abstract of his text. This has been done in the index to Hippocrates, by Fœsius, entitled 'Œconomia Hippocratis Alphabeti serie distincta, in qua Dictionum apud Hippocratem omnium, præsertim obscuriorum, usus explicatur, et velut ex amplissimo Penu depromitur, ita ut Lexicon Hippocrateum merito dici possit,' fol. Francf. 1688. Of dictionaries of words also, some are dictionaries of etymologies, some of the quantities of syllables (as the common Latin 'Gradus ad Parnassum,' and Morell's 'Thesaurus Græcæ Poeseos, sive Lexicon Græco-Prosodiacum,' improved and enlarged by Maltby); some of terminations (as in English, Walker's 'Rhyming Dictionary'), and Hoogeveen's 'Dictionarium Analogicum Linguæ Græcæ.' Some dictionaries of the oriental tongues and of the Greek tongue exhibit the words arranged according to their supposed roots; and some Latin dictionaries have also been constructed upon this plan. Of professed dictionaries of derivations one of the most elaborate, though it is far from being a correct or philosophical work, is the Etymologicon Linguæ Latinæ of G. J. Vossius. Others are the Dictionnaire Etymologique de la Langue Française, of Menage; the Origines de la Langue Italienne, of the same author; the Etymologicon Linguæ Anglicanæ, of Stephen Skinner, fol. 1671; and the Etymologicon Anglicanum of Francis Junius, fol. Oxon, 1743. A very ambitious attempt has been made by Mr. Whiter in his Etymologicon Magnum, or Universal Etymological Dictionary on a new plan, 3 vols. 4to., Camb. 1800—1822, to construct a dictionary of the elements of all human language. Mr. Booth, in his Analytical Dictionary of the English Language, has set an example of perhaps the happiest mode in which an account of words can be given according to their etymologies or affinities. By making each radical term the text of a short essay, in the course of which the history of all its derived and connected terms is traced and illustrated by quotations, references to manners and customs, and anecdotes of various kinds, the writer has rendered his dictionary as entertaining as it is instructive, and adapted it not only for occasional consultation but for continuous reading.

Any account of the dictionaries of particular tongues would be out of place here. There is a Table Alphabetique des Dictionnaires, by Durey de Noinville, published in 1758, which however is asserted to be very incomplete, even for that time. A very elaborate dissertation on lexicons and glossaries in general, and on those of the Greek language in particular, by P. J. Maussacus, is inserted in most of the editions of the Greek lexicon of Harpocration, entitled Lexicon Decem Oratorum; and the same subject has also been treated by several other writers who are enumerated in Morhoff's Polyhistor, lib. iv. cap. 7. In the portion of Morhoff's third book, from chapter 4th to chapter 9th inclusive (vol. i. pp. 743—830, edit. 1747), is given an account of the principal dictionaries of the modern European tongues, of the oriental tongues, of the Greek and of the Latin tongues. See also De Bure's Bibliographie Instructive, vol. iii., p. 1—86.

In some dictionaries the words are explained in the same language to which they belong; in many others the words of one language are interpreted by corresponding words in another language. In some the interpretation or translation is into several languages; as, for instance, in Minsheu's Dictionary of Eleven Languages, namely, English, Welsh, German, Dutch, French, Italian, Spanish, Portuguese, Latin, Greek, and Hebrew, fol. London, 1617; and in a dictionary printed at St. Petersburg in 3 vols. 4to., in 1785, in which the words and phrases are given in French, German, Russian, and Latin.

Although, as Maussacus in his Critical Dissertation just noticed has taken great pains to prove, books both of γλῶσσαι, or unusual words, and of λέξεις, or idioms, are frequently referred to or mentioned by the Greek and Latin grammarians and other writers, it does not clearly appear that all of these were what we should now call dictionaries, that is to say, were collections of vocables and phrases alphabetically arranged. The oldest extant Greek lexicographer is Apollonius the Sophist, a contemporary of Augustus; his work entitled Λέξεις Ὁμηρικαὶ, or 'Homeric Words,' though much interpolated, is very useful. All the other original Greek lexicons and glossaries we have, such as the Onomasticon (or Collection of Synonymes) of Julius Pollux, the lexicons of Suidas, Harpocration, and Hesychius, and the Etymologicon Magnum, sometimes attributed to Marcus Musurus, although of the authors of some of them the exact age is disputed, were undoubtedly compiled subsequent, and most of them probably long subsequent to the commencement of the Christian æra. It is supposed indeed that they were founded upon older compilations of the same kind; but of the form of those lost works we know nothing. It may be reasonably doubted if either the Greeks or Romans were in the habit of making use of dictionaries in studying a foreign language or dialect, as has been the general practice in modern times. They would seem rather to have uniformly followed what may be called the natural method of learning the language from conversation with those who spoke it, being the method by which we all learn the language we acquire both most easily and most perfectly, our mother tongue, and that by which alone a real knowledge and command of any language can be acquired. Although however, the utility of a general dictionary of a language as an instrument either for teaching the language to youth in schools, or for enabling a student to master it in any circumstances, may well be questioned, there are obvious considerations which make it desirable that we should possess such dictionaries of all languages. When a dictionary of a language professes to be more than a mere vocabulary, it is usual for it to contain along with the interpretation or explanation of the meaning of each word, some account of its etymology or derivation, and also of its grammatical usage. Except when the dictionary is exclusively etymological, perhaps all that ought to be attempted in regard to the foreign extraction of words is to note the language from which each may be supposed to have been immediately borrowed. But merely to append the supposed original word of the foreign language, as is generally done, conveys little valuable information in any case, and is very apt to lead to misconception. If it is desired to exhibit the nature of the change which the forms of the words have undergone in passing from the one tongue to the other, this will be better done by a short statement on the subject once for all, in which the several modes and incidents of the transference should be systematically arranged and illustrated by examples, and the principle of each explained. It would be of fully as much importance however that in every dictionary of a language the connection of each word with other words in the same language, or the native root from which each has sprung, should be distinctly marked whenever it is not obvious. This reference of each word to the proper family to which it belongs contributes more to make its meaning clear and to point out its correct use than any definition can do. And such a notice of the root of the word would naturally lead to, and should be followed by, as precise a statement as possible of its primitive and most simple meaning; after which should come a chronological deduction of the changes it has undergone, as far as they can be traced, both in signification and in form, the whole definition being concluded by an explanation of its metaphorical and other secondary or transferred meanings. If its use in each sense can be illustrated by an example, such quotations are, for various reasons, in the highest degree satisfactory and valuable. Any remarkable uses of the word in particular passages of standard authors ought at least to be adverted to and explained; and a notice of its peculiarities of construction, or the manner in which it is connected with other words in a sentence, should never be omitted. There are some dictionaries in which all this has been attempted, but perhaps scarcely one in which it has been quite satisfactorily executed. Among the most carefully compiled dictionaries of modern languages are that of the Italian, entitled Vocabolario degli Academici della Crusca, extended in the latest editions to 6 vols. fol.; and that of the French, entitled Dictionnaire de l'Académie Française. But in both these works, especially in the latter, the design principally kept in view has been to guard the purity of the language. There is also a Spanish dictionary of great reputation, entitled Diccionario de la Lengua Castellana, compuesto por la Real Academia Española, 6 vols. fol., Madrid, 1726, &c. In English, Johnson's Dictionary has been accounted the standard work of its class ever since its appearance, in 2 vols. fol., 1755; but although it was a great achievement for an individual, and its definitions in particular afford remarkable evidence of its author's ingenuity and command of expression, it is in many respects as far as possible from being what a dictionary should be. Its etymological part (as Horne Tooke has long ago shown) is little better than so much rubbish; and it is characterized throughout by a total want of method and philosophical views. Its author indeed was neither metaphysician, nor linguist, nor archæologist enough for the task he undertook. Some valuable matter has been added to the last edition of the English Dictionary (augmented to 6 vols. 4to.) by the Reverend Mr. Todd; but the philosophical character of the work has received no improvement in his hands. Perhaps the nearest approach that has been made to a philosophical English dictionary would be that given in the miscellaneous and lexicographical department of the Encyclopædia Metropolitana, if the execution were equal to the design, which is explained in the prospectus as being to exhibit 'the history of English words; the citations arranged according to the age of the works from which they are selected, yet with every attention to the independent beauty or value of the sentences chosen which is consistent with the higher ends of a clear insight into the original and acquired meaning of every word.'

II. Dictionaries of Facts. This class comprehends dictionaries of history, biography, mythology, geography, archæology, and all others that deal chiefly or exclusively with events that have happened, or are supposed to have happened, or with facts that exist or have existed. Many of the principal works of this description are enumerated in the article BIOGRAPHY: and under BIBLIOGRAPHY will be found an account of another large division of them. We may here observe that some of the old Greek lexicons already noticed were dictionaries of facts as well as of words; the lexicon of Suidas, for instance, is, in the greater part, made up of fragments of biography, history, and geography, and often contains large extracts from various writers both extant and lost. The work of Stephanus Byzantinus, sometimes entitled 'Εθνικά (the Ethnology), more commonly Περὶ Πόλεων (the Book of Cities, or rather of States), is chiefly a geographical and archæological dictionary, and is the oldest compilation of that description that exists. Its meagre details under each head assimilate it in some respect to an imperfect gazetteer. In modern times the number of dictionaries that have appeared, professing to present a view of a more or less extensive field of facts, has been very great. Besides the various historical, biographical, and geographical dictionaries, general and particular, and the bibliographical dictionaries, there are dictionaries of antiquities, of architecture, of heraldry, of painting, of music, of botany, of law, of legal decisions, of commerce, of medicine, of surgery, and of almost every other department of human knowledge. Human knowledge, however, or what is commonly called or reckoned such, in almost all its departments, is such a mixture of ascertained facts and of mere opinions or speculations, that there is hardly any of these dictionaries which is a dictionary of facts merely. Opinions, indeed, considered historically, are themselves facts, and as such ought to be recorded and arranged in dictionaries as well as other facts. Discussion also often places doubtful facts in a clearer light, and a dictionary may be as convenient a vehicle for such discussion as any other book. But a most useful class of books, of which we have yet scarcely a specimen, would be a set of dictionaries or tabular expositions of facts, and nothing else. They would serve, among other purposes, as maps of the extent and boundaries of the different departments of human knowledge, and most useful directories in the prosecution of all inquiries having in view the enlargement of those boundaries. As of facts some are completely ascertained, others only probable, and others doubtful, three divisions answering to these descriptions might be given under each head, and a fourth might perhaps be advantageously added for improbable or confuted statements, although these last might be more scientifically exhibited in the table or dictionary of the facts forming the history of opinions.

III. Dictionaries of Things. A thing, as seems to be indicated by the Latin *reor*, which apparently contains the same root as *res*, as well as by the English *think*, is properly any object of thought; and under this title may therefore be comprehended dictionaries of all other kinds, except those exclusively occupied with the explanation of words or the notation of facts. This division leaves to the third class of dictionaries all the abstract sciences, the mixed or applied sciences, the departments of criticism and the fine arts, and the whole range of metaphysical and moral speculation. It is true that some of these subjects cannot be treated of without a reference to facts; but the facts here are not viewed simply as such, but either as subordinate to principles or as modifying their operation. No very rigorous adherence to the limits of a definition however is to be expected in a dictionary of any kind, which must in all cases be a somewhat unsystematic performance, and accordingly we have few, if any, dictionaries which are exclusively dictionaries of things in the sense that has just been explained. Many of the dictionaries referred to under the last head are dictionaries of things as well as of facts that is to say, they contain, mixed up with their statements of facts, expositions or discussions of principles. On the other hand, dictionaries of things are generally also dictionaries of facts, and sometimes lexicons, or dictionaries of words and phrases, in addition. The most important works of this description have been published under the title of Dictionaries of the Arts and Sciences, or Encyclopædias. By the word ἐγκυκλοπαιδεία, encyclopædia, the Greeks seem to have understood the whole circle of learning or of the liberal arts, or instruction therein, the term being so applied under the notion that all the departments of human knowledge were naturally connected together so as to form a sort of circle or complete system. Pliny (*Nat. Hist. Præf.*) speaks of the encyclopædia of the Greeks as an expression for the whole field of knowledge: 'Jam omnia attingenda, quæ Græci τῆς ἐγκυκλοπαιδείας vocant.' Quintilian (i. 10) defines it as the orb or complete circle of human learning: 'Orbis illa doctrinæ, quam Græci ἐγκυκλοπαιδείαν vocant.' Vitruvius (vi. Præf.) describes the encyclios or ἐγκύκλιος παιδεία of the Greeks as the discipline of all the branches of learning: 'doctrinarum omnium disciplina.' It does not appear that the term encyclopædia was ever antiently used as meaning a work treating of all the various kinds of knowledge. It has, however, as just observed, become the common title for such works in modern times. Perhaps it was first so applied by some of the Arabian writers of the middle ages, one of whom at least, Alfarabius, who flourished in the tenth century, is stated to have compiled a general treatise on the sciences, still preserved, under this title. Several such treatises with the same title appeared in Europe about the end of the sixteenth and beginning of the seventeenth centuries, the most famous of which was that of John Henry Alstedius, which was first published in 2 vols. fol. in 1630. (See preface to Supplement to Encyclopædia Britannica, and Morhoffii Polyhistor, vol. i. lib. ii. chap. 7, for an account of this and other early encyclopædias.) But none of these works were dictionaries: they were merely collections of treatises, rather resembling such works as Dodsley's Preceptor than answering to the modern notion of an encyclopædia. A much nearer resemblance to the modern encyclopædia is presented by the 'Lexicon Universale Historico-Geographico-Chronologico-Poetico-Philologicum' of Joh. Jac. Hofman, first published at Basle in 2 vols. fol., 1677, and followed by a 'Continuatio' or Supplement, of the same extent, in 1683; or, the two publications incorporated in 4 vols. fol., Lug. Bat.,1698. The form at least of this work has been generally preserved in our more recent encyclopædias and dictionaries of the arts and sciences, although most of these, by including the principles of science as well as facts, have extended their scope somewhat beyond Hofman's design. His two supplementary volumes however embody a great deal of the natural science of his time; and the work altogether contains much curious learning not readily found elsewhere. Although not evidencing any very superior sagacity, penetration, or elegance of scholarship, it is a wonderful performance for an individual, and still remains a most useful book of reference.

The first English 'universal dictionary of the arts and sciences' was the 'Lexicon Technicum' of Dr. John Harris, of which the first vol. in fol. appeared at London in 1706, and the second, completing the work, in 1710. It was afterwards extended to three volumes. Harris's Lexicon enjoyed great popularity for a considerable time after its first appearance, as may be inferred from the fact that it passed through five editions in about thirty years; and in the mathematical and physical department especially it is admitted to have been very ably executed. It was not long however before it found a rival in Chambers's Cyclopædia, the first edition of which appeared in 2 vols. fol. in 1728. [Chambers, Ephraim.] The professed peculiarity of the new work was, that it proposed to 'consider the several matters not only in themselves, but relatively, or as they respect each other; both to treat them as so many wholes, and as so many parts of some greater whole.' This was attempted to be done by a system of references from one article to another, so as to connect the subordinate particulars among themselves, and to indicate the great division of knowledge to which each belonged. In this way the work, which, in the seventh edition (1778—85), was extended to 4 vols. folio, contained no complete treatises on any of the sciences, nor other articles of any considerable length. Various other works followed, compiled upon much the same plan, among which were Barrow's 'New and Universal Dictionary of Arts and Sciences,' in one vol. fol. 1751, with a supplemental vol., published in 1754; 'A new and complete Dictionary of Arts and Sciences, by a Society of Gentlemen,' (commonly, from the name of the publisher, called Owen's Dictionary,) 4 vols. 8vo., 1754; and 'The Complete Dictionary of Arts and Sciences,' in 3 vols. fol., 1766, by the Rev. Henry Croker, Dr. Thomas Williams, and Mr. Samuel Clark. (See, for an account of all these works, the preface to the Supplement to the Encyclopædia Britannica.)

A work upon a different plan had also appeared in 2 vols. fol. in 1745, by Dr. De Coetlogon, a native of France, naturalized in England, under the title of 'An Universal History of Arts and Sciences, or a Comprehensive Illustration of all Sciences and of all Arts.' This was in fact a dictionary, the subjects being treated in alphabetical order, and Mr. Macvey Napier, in the preface just referred to, considers it to have probably suggested the Encyclopædia Britannica, the first edition of which, in 3 vols. 4to., appeared at Edinburgh in 1771. It professed to be compiled 'by a Society of Gentlemen in Scotland, upon a new plan, in which the different sciences and arts are digested into distinct treatises or systems.' This plan however had been already adopted in Dr. Coetlogon's work. The proprietor and principal compiler of the Edinburgh work was Mr. William Smellie, the printer, a man of much ability and considerable literary attainments. For the subsequent history of the Encyclopædia Britannica, which in the fourth edition completed in 1810 was extended to 20 vols., and to which a supplement in 6 vols. was added in 1824, we must refer to Mr. Napier's preface. A seventh edition of the work, in which the supplement is incorporated, is now in the course of publication. Of the other modern English Cyclopædias, already completed, the two most deserving of notice are the Cyclopædia, or a New Universal Dictionary of Arts and Sciences, conducted by the late Dr. Rees, and commonly known by his name, although professing to be only a new edition of Chambers, begun in 1802, and completed in 45 vols. 4to. in 1819; and the Edinburgh Cyclopædia, edited by Dr. (now Sir David) Brewster, begun in 1810, and completed in 36 parts, or 18 vols. 4to. in 1830. The Encyclopædia Metropolitana was begun in 1818, being announced as a Universal Dictionary of Knowledge on an original plan; comprising the twofold advantages of a philosophical and an alphabetical arrangement. This work, which is still in course of publication, is arranged in four divisions; the 1st, comprehending the Pure Sciences; the 2d, the Mixed and Applied Sciences; the 3d, the Biographical and Historical articles; and the 4th, the Miscellaneous and Lexicographical articles. The Penny Cyclopædia of the Society for the Diffusion of Useful Knowledge was begun in 1833, and has ever since been published regularly in volumes and in numbers.

Of the foreign works of this class by far the most celebrated is the Encyclopédie, or Dictionnaire Raisonné des Sciences, des Arts, et des Métiers, of Diderot and D'Alembert, of which the first vol. fol. was published at Paris in 1751; the 17th and last of the original series in 1765, 11 vols. of plates being added to the text, of which the first was published in 1762, the last in 1772. A Supplement was afterwards added, consisting of four vols. of text and one of plates, fol., 1776-7; and there is besides a 'Table Analytique' of the whole work, compiled by M. Mouchon, in 2 vols. fol., Paris and Amsterdam, 1780. Editions of the work have also been printed in France and other parts of the Continent, both in quarto and octavo. But the more detailed history of this remarkable work must be reserved for a separate article. It has been followed in France by another Dictionary of Arts and Sciences of still greater extent, the Encyclopédie Méthodique, begun in 1782 and finished in 1832, in 201 vols. 4to., including 47 vols. of plates. In this last-mentioned work every art or science is treated of in a separate volume, or series of volumes; so that the whole is in fact merely a collection of dictionaries. Of other foreign Encyclopædias we may notice the German 'Conversations Lexikon' (as it was originally entitled), projected by Mr. Brockhaus, the bookseller of Leipzig, and first published there in 1812. A seventh edition of this work appeared at Leipzig in 1827–9, under the new title of Allgemeine Deutsche Real-Encyclopädie für die gebildeten stände. An English translation of it, including much additional matter, has appeared at Philadelphia; and the American work is at present in course of republication in this country, with additions and alterations. There is also now in course of publication the great work conducted by Professors Ersch and Gruber, entitled 'Allgemeine Encyclopädie der Wissenschaften und Kunste,' which began to be published at Leipzig in 1818, and of which 46 vols. 4to. have already appeared; viz. the portion from A to Drury, in 27 vols.; that from H to Hamburg, in 12 vols; and that from O to Otzenhausen, in 7 vols. Some account of the encyclopædias in various languages, but neither very clearly nor very accurately drawn up, and mixed with a great deal of superfluous and useless matter, may be found in a little book called 'Nouveau Système Bibliographique mis en usage pour la connaissance des Encyclopédies,' &c., 12mo., Paris, 1821.

DICTUOPHYLLIA. [Madrephylliæa.]

DICTYS, a Cretan who accompanied Idomeneus to the siege of Troy, and the reputed author of a history of the Trojan war, of which a Latin prose translation is still extant. This work was discovered in the reign of Nero, in a tomb near Gnossus, which was laid open by an earthquake. It was written in Phœnician characters, and translated into

Greek by one Eufraxidas, or Praxis, at the command of Nero this translation has not come down to us. the Latin version which we possess is attributed to Quintus Septimius, who lived in the third or fourth century A.D., and contains the first five books, with an abridgment of the remainder. The best edition is that by Perizonius (1702, 8vo.), to whose preliminary dissertation the reader is referred for further particulars respecting the historian and his translator.

DIDE'LPHIDÆ. [MARSUPIALIA.]

DIDERMUM. [SYNOICUM.]

DIDEROT, DENYS, was born at Langres in the province of Champagne, in 1713. His father, a master cutler, a worthy man, much respected in his native town, and comfortable in his circumstances, placed his son first in the Jesuits' College at Langres, and afterwards sent him to the College d'Harcourt at Paris to continue his studies. At one time young Diderot was intended for the church, but as he felt no inclination for the clerical profession, his father did not press the point. Diderot made some progress in the antient and modern languages, and still more in mathematics. On leaving college, his father placed him as a boarder with a Paris procureur, in order that he might study the law, but Diderot had no taste for that profession; he made no progress in its study, and he employed all the time he could steal from the office-desk in reading any books that fell into his hands. After two or three years, his father stopped his board wages, desiring him either to betake himself to some profession or to return home, and he several times repeated the offer of this alternative, but to no purpose, as Diderot replied that he felt no inclination for any worldly profession; that he loved reading, was happy, and wanted nothing more. For ten years from that time he lived obscurely in Paris, on his wits as the phrase is, and often, as it may be supposed, in very promiscuous company. Literature was not then a very marketable commodity, but Diderot had a facility in writing, and he undertook anything that came in his way, advertisements, indexes, catalogues, and even sermons for the colonies, which were bespoken and paid for by a missionary. He next began translating from the English for the booksellers. He also received indirectly assistance from home. At the age of 29, he married a young woman as poor as himself, who proved to him ever after a virtuous and affectionate wife, notwithstanding his subsequent neglect of her. In his drama 'Le Père de Famille' he has drawn from life some of the incidents of his courtship and marriage. His first original work was the 'Pensées Philosophiques,' 1746, a desultory and rather common-place production, which however met with great success among the partisans of the new philosophy, as it was then called. From that time Diderot ranked as one of the most strenuous assailants of the established systems in religion and politics. He saw many unseemly parts in the social edifice, and could devise no better mode of mending them than by pulling down the whole. That the state of France under the Regent and Louis XV. was such as easily to lead an impetuous mind to such a conclusion. is made sufficiently evident by the numerous memoirs of those times. In 1749 he published the 'Lettres sur les Aveugles,' for which he was imprisoned for three months at Vincennes, where however he was very indulgently treated, and allowed to receive the visits of his friends, among whom was J. J. Rousseau, to whom it is said that Diderot suggested the idea of his first literary paradox. They afterwards quarrelled upon some foolish ground, and the squabble was not creditable to either. [ROUSSEAU.] After editing, in company with others, a Universal Medical Dictionary, Diderot formed the project of a general Cyclopædia, to supersede the French version of Chambers's work, and he found a bookseller, Lebreton, willing to undertake the publication, under the title of 'Encyclopédie, ou Dictionnaire Raisonné des Sciences, des Arts, et Métiers.' Diderot and D'Alembert were joint editors, but D'Alembert withdrew after a time, and Diderot remained sole editor. The work began to appear in 1751, and was concluded in 1765, in 17 vols. fol. besides 11 vols. of plates. The publication was stopped two or three times by the government, and the last volumes were distributed privately, though the king himself was one of the purchasers. The most amusing part of the correspondence of Voltaire and D'Alembert was carried on while D'Alembert was joint editor of the Dictionnaire, and presents a lively picture of the various difficulties with which the editors had to contend. On this celebrated compilation Diderot himself passed a severe judgment. He said, 'that he had had neither time nor the means of being particular in the choice of his contributors, among whom some were excellent, but most of the rest were very inferior; that moreover the contributors, being badly paid, worked carelessly; that, in short, it was a patchwork composed of very ill-sorted materials, some masterpieces by the side of schoolboys' performances; and that there was also considerable neglect in the arrangement of the articles, and especially in the references.' Diderot complained likewise that the publisher, Lebreton, often took upon himself to scratch out of the proof-sheets any passages which he thought might endanger him, and then filled up the gap as well as he could. Notwithstanding all these deficiencies the Dictionnaire Encyclopédique met with great success for a time, but it has been since superseded in France by the Encyclopédie Méthodique, or great French Cyclopædia.

The works of Diderot are numerous, and many of them were not published till after his death. Among those published in his lifetime are: 'Lettres sur les Sourds et Muets,' 1751; 'Pensées sur l'Interpretation de la Nature,' 1754; 'Code de la Nature,' 1755. The principal faults of his didactic compositions are obscurity in the ideas, and a declamatory style. Among his tales, 'Jacques le Fataliste' and 'Le Neveu de Rameau,' a posthumous publication, are still popular. 'Les Bijoux Indiscrets,' are a series of obscene stories, which he sold to a publisher, and gave the money to his mistress, Mad. de Puisieux. He afterwards formed a connection with Mdlle. Voland, it seems, which lasted till his death. His letters to her form the principal part of the 'Mémoires, Correspondence, et Ouvrages Inédits de Diderot,' published in 1831, 4 vols., 8vo. Diderot's notions on the sexual connection may be seen in the article 'Marriage,' in the 'Dictionnaire Encyclopédique,' as well as in several of his 'Ouvrages Inédits.' He professed a strict sense of honour, and was generous and kind, though hasty, touchy, and suspicious. An estimate of his character may be formed not from the reports of his admirers or enemies, and there were many of both, but from his own works, and especially his correspondence, and also from a well written and apparently unsophisticated memoir of his life by his daughter, Mad. de Vandeul, which is printed at the head of the unedited correspondence above mentioned. A collection of his principal works was published by his disciple Naigeon, in 15 vols., 8vo., 1798, and reprinted since in 22 vols., 8vo., Paris, 1821, with a life of the author by Naigeon himself, which however is rather a dissertation on Diderot's writings and opinions than a real biography. His last work, a life of Seneca, of which he published a second edition enlarged, in 2 vols., under the title of 'Essai sur les Règnes de Claude et de Néron,' is considered by some one of his best compositions. It has been said of him that there are many good passages in all his works, though he never wrote a single entirely good work. Marmontel, Garat, and others of his contemporaries preferred his conversation greatly to his writings.

Diderot had not grown rich by his literary labours; he was getting old, and he thought of selling his library. Catherine of Russia hearing of his intention, purchased it at its full value, and moreover settled upon him a handsome pension as librarian to keep it for her, of which pension she paid him fifty years in advance in ready money. Full of gratitude. Diderot resolved to go and thank his benefactress in person. He went first to Holland, where he spent some months, and thence to Petersburg. He was delighted with his reception by the empress, and wrote to Mdlle. Voland that 'while in a country called the land of freemen (meaning probably Holland) he felt as a slave; but now in a country called the country of slaves, he felt like a freeman.' (*Correspondance Inédite*, vol. iii., lettre 138.) After a short stay at Petersburg, he returned to Paris, where the empress hired a splendid suite of apartments for him in the Rue Richelieu. 'He enjoyed his new lodgings only twelve days: he was delighted with them; having always lodged in a garret, he thought himself in a palace. But his body became weaker every day, although his head was not at all affected, and he was quite conscious that his end was approaching. The evening before his death he conversed with his friends upon philosophy, and the various means of attaining it. "The first step towards philosophy," said he, "is incredulity." This remark is the last which I heard him make.'—(*Memoir of Diderot*, by his Daughter.) Next day, 30th July, 1784 he got up, sat down to dinner with his wife, and afterwards expired without a struggle. Diderot was one of the principal members of the Holbach coterie, and the leader of that knot of literary men known in the last century by the name of Encyclopédistes. There are many particulars concerning Diderot in his friend Grimm's *Correspondance Littéraire*, Paris, 1812.

DIDIUS JULIA'NUS, of a family originally from Milan, and grandson of Salvius Julianus, a celebrated jurist, was born about A.D. 133. He was educated by Domitia Lucilla, the mother of Marcus Aurelius. He soon rose to important offices, was successively Quæstor, Prætor, and Governor of Belgic Gaul, and having defeated the Chauci, he obtained the Consulship. He was afterwards sent as governor to Dalmatia, and next to Germania Inferior. Under Commodus, he was governor of Bithynia: on his return to Rome, he lived in luxury and debauchery, being enormously rich. After the murder of Pertinax, A.D. 193, the Prætorians having put up the empire to auction, Didius proceeded to their camp, and bid against Sulpicianus, the father-in-law of Pertinax, who was trying to make his own bargain with the soldiers. Didius having bid highest, was proclaimed, and was taken by the soldiers into Rome. The Senate with its usual servility acknowledged him emperor, but the people openly showed their dissatisfaction, and loaded him with abuse and imprecations in the Circus when he assisted at the solemn games which were customary on the occasion of a new reign. He is said to have borne the insult with patience, and to have behaved altogether with great moderation during his short reign. Three generals at the head of their respective legions, Pescennius Niger, who commanded in the East, Septimius Severus in Illyricum, and Claudius Albinus in Britain, refused to acknowledge the nomination of the Prætorians. Severus being proclaimed Augustus by his troops, marched upon Rome, and found no opposition on the road, as the towns and garrisons all declared for him. The Prætorians themselves forsook Didius, and the Senate readily pronounced his abdication, and proclaimed Severus emperor. A party of soldiers making their way into the palace, and disregarding the entreaties of Didius, who offered to renounce the empire, cut off his head. He had reigned only sixty-six days. Severus soon after entered Rome, put to death the murderers of Pertinax, disarmed the Prætorians, and banished them from the city. (Spartianus in *Historia Augusta;* Dion, *Epitome*, B. 73.)

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Coin of Didius.

British Museum. Actual Size. Copper. Weight, 356 grains.

DIDO. [Æneas; Carthage.]

DIDUS. [Dodo.]

DI'DYMUS, a celebrated grammarian, the son of a seller of fish at Alexandria, was born in the consulship of Antony and Cicero, B.C. 63 (Suidas, sub v.), and lived in the reign of Augustus. Macrobius calls him the greatest grammarian of his own or any other time. (Saturn. v. 22.) According to Athenæus (iv. p. 139, C.) he published 3,500 volumes, and had written so much that he was called the forgetter of books (βιβλιολάθας), for he often forgot what he had written himself; and also the man with bowels of brass (χαλκέντερος), from his unwearied industry. To judge from the specimens of his writings given by Athenæus, we need not much regret the loss of them. His criticisms were of the Aristarchian school (Suid.): he wrote, among other things, an explanation of the Agamemnon of Ion (Athen. xi. p. 418 D.), and also of the plays of Phrynichus; (Id. ix. p. 371 F.) several treatises against Juba, king of Libya (Suid. 'Ιόβας), a book on the corruption of diction (Athenæus, ix. p. 368 B.), a history of the city Cabessus (Steph. Byz. sub v. 'Αγάθυρσοι), besides essays on the country of Homer, the mother of Æneas, and other equally unimportant subjects. The *Scholia Minora* on Homer have been attributed to him, but wrongly, for Didymus himself is quoted in these notes. The collection of proverbs extant under the name of Zenobius was partly taken from a previous collection made by Didymus, and about sixty fragments of his fifteen books on agriculture are preserved in the collection of Cassianus Bassus. [Geoponika.]

Suidas mentions several other authors of this name, and among them one surnamed Ateius, who was an academic philosopher, and wrote a treatise in two books on the solutions of probabilities and sophisms. We may also mention Didymus 'the blind,' an Alexandrian father of the church, who was born about the year 308 B.C., and was the teacher of St. Jerome, St. Isidore, Rufinus, and others. He died in B.C. 395. Of his numerous writings, four treatises have come down to us. I. 'On the Holy Spirit.' II. 'On the Trinity.' III. 'Against the Manicheans.' IV. 'On the Canonical Epistles.' A Greek Treatise on Farriery by another Didymus is also extant.

DIDYNA'MIA, the fourteenth class of the Linnæan system of arranging plants. It is the same as Tetrandria; that is, it has always four stamens, only two of them are a little longer than the other two. Under this class are comprehended a large part of the Lamiaceous, Verbenaceous, Scrophalariaceous, Bignoniaceous, and Acanthaceous plants of modern botanists. It is divided into two orders, Gymnospermia and Angiospermia. Gymnospermia includes the genera whose ovary is split into four small seed-like lobes, which in the time of Linnæus were taken for naked seeds; and Angiospermia those which have manifestly the seeds inclosed in a pericarp of some sort.

DIE. [Drôme.]

DIE' or DIEY, ST., an episcopal town of France, in the department of Vosges, on the river Meurthe, not far from its source, and on a road to Schelestadt and Colmar, which branches off from the great Paris and Strasburg road at Luneville. It is 252 miles from Paris; in 48° 17′ N. lat. and 6° 56′ E. long.

This town is of considerable antiquity: it had in the seventh century an abbey called the Abbey of Jointure: this abbey was secularized in the tenth century: the chief of the college of priests thus formed bore the title of *grand prevôt*, and exercised the functions of a bishop: he was also, in conjunction with the chapter, which consisted of twenty-four prebendaries, including three dignitaries, lord of the town. The list of the *grands prevôts* included one pope, nine princes of the house of Lorraine, and several other illustrious persons. St. Dié was walled in in the thirteenth century; the walls yet remain. It is situated at the foot of a mountain, and is small, but regularly laid out, and handsome. In the middle of the last century it suffered much from a fire, which consumed many of the houses. The population in 1832 amounted to 5560 for the town itself, or 7707 for the whole commune. The inhabitants are engaged in the manufacture of cotton yarn, printed calicos, and handkerchiefs, cotton counterpanes, flannels, and hosiery, and leather; and the bleaching of linen is carried on. There are two mineral springs near St. Dié; one impregnated with sulphur, the other with iron.

The bishopric of St. Dié was established in 1777: the diocese now comprehends the department of Vosges (population, in 1832, 397,987): the bishop is a suffragan of the archbishop of Besançon. St. Dié is the capital of an arrondissement, which had, in 1832, a population of 107,8[illegible]. The inhabitants of this arrondissement are much engaged in the manufacture of sabots (wooden shoes) and other wooden wares, and of cotton yarn. They make also the best cheese of any in the Vosges.

DIEMEN'S LAND, VAN. [Tasmania.]

DIEPPE, a town in France, on the coast of the Manche or English channel, at the mouth of a small river formed by the junction of the three streams, the Argues, the Bethaune, and the Eaulne; 92 miles in a direct line north-west of Paris, or 117 miles by the road through Meulan, Mantes, Vernon, Pont de l'Arche, and Rouen; in 49° 56 N. lat. and 1° 3′ E. long.

In the ninth century the site of Dieppe was occupied only by a few fishermen's huts; in the eleventh century it had increased to a small town, under the name of Bertheville. Henry II., king of England and duke of Normandy erected, in 1188, a castle at Dieppe, which was demolished by his son Richard I. In the sixteenth century the fisheries, and especially the herring fishery, furnished its inhabitants with their chief occupation and wealth: their vessels went as far north as Schonen, in Sweden, to take the fish, which, after curing, they exported to the Mediterranean in their own vessels, called 'druggers,' because they brought back from the Levant spices and drugs. In the middle of the sixteenth century the Dieppois undertook the expedition in which Canada was discovered, and in 1687 they formed the first French settlements on the banks of the Senegal. In 1694 the town was bombarded by the English, and, with the exception of the antient church, nearly destroyed.

The coast at Dieppe runs north-east and south-west, and the town extends about a mile along it, having the harbour at the north-east end, and the present castle near the south-west. The town was regularly rebuilt after the bombardment of 1694: the streets are tolerably wide, paved with round stones, without foot pavement, and the houses picturesque, built of brick and stone, with high slanting roofs. There are six *places* or squares and two churches, St. Jacques and St. Remy. The church of St. Jacques is of Gothic architecture, and was, for the most part, rebuilt in the 14th or 15th century; the architecture is richly ornamented, but not in the best taste. There are at Dieppe a theatre, assembly-rooms, and promenades; nearly seventy fountains adorn the streets, which are supplied by an aqueduct three miles long. The present castle is an irregular pile of considerable extent: when Expilly wrote (1763) it was furnished with artillery, and commanded the town and the roadstead: the town walls are yet standing, but Dieppe is not a place of strength. The port is sufficiently large and secure, but the entrance is narrow, and subject to be obstructed by the accumulation of sand. The entrance to the port is formed by two piers: vessels of more than 400 tons cannot enter. There is on the quay a crucifix, said to be the largest in France, and a light-house.

The population of Dieppe in 1832 was 16,016; but it has declined of late years; for Expilly (A.D. 1763) estimated it at 21,000, including that of the suburb of Pollet, to the east of the town. The men are chiefly engaged in fishing and navigation. In August the herring fishery is carried on upon the English coast and in the North Sea, and employs 60 to 80 vessels of 25 to 30 tons, and about 900 to 1200 men: in October it is carried on in 120 to 130 smaller vessels on the French coast: the fish caught in the August fishery are salted: those caught in the October fishery, which are of smaller size, are sent to Paris and the provinces to be eaten fresh. The mackerel fishery is carried on in decked boats of 20 to 50 tons, each manned with from 12 to 20 men, chiefly on the coast of Picardie. The vessels employed in the Newfoundland and other cod fishery are from 100 to 150 tons. The fisheries of Dieppe are not half so valuable as they were fifty years ago. Besides the persons actually engaged in them, these fisheries give employment to others engaged in boat-building, rope and sail making, and cooperage. Oysters are dredged on the banks opposite Dieppe, and there are beds in which the oysters of Granville and Cancale and Marennes, near Rochelle, are deposited. Lace-making was formerly carried on to a considerable extent; but this branch of manufacture has much declined. Trinkets in gold, horn, and ivory, are made, and pendulum clocks, at St. Nicolas, a village near the town. Dieppe has of late years risen into some repute as a bathing place. It has a high school and a royal school of navigation. Richard Simon, one of the Pères de l'Oratoire, and an eminent Heoraist and biblical critic, his nephew, Antoine Bruzen de la Martinière, compiler of 'Le Grand Dictionnaire Géographique Historique,' &c., and the celebrated French Admiral Du Quesne, were natives of Dieppe. (Dibdin's *Tour in France and Germany*; Mrs. Stothard's *Tour through Normandy*; Balbi; Malte Brun; Expilly.)

Dieppe is the capital of an arrondissement which contained, in 1832, 109,978 inhabitants.

DIERVILLA, a genus of Caprifoliaceous plants, consisting of a single North American species, by Linnæus considered a honeysuckle, and called Lonicera Diervilla. It is however obviously not of that genus, because its fruit is a dry capsule with a papery pericarp, with four cells and several seeds.

D. Tournefortii, or, as it is also called, *D. humilis, lutea*, or *canadensis*, is a common hardy shrub, growing from two to three feet high, in a spreading manner, and having small funnel-shaped irregular five-cleft yellow flowers, growing in stalked clusters of two or three from the axils of opposite ovate serrated leaves. It is found wild in rocky woods in the United States, from Canada to Carolina, flowering in June.

DI'ESIS, in antient music (δίεσις, *division*). The Greeks divided a tone into a major and minor semitone; the greater was called an apotome [APOTOME], the lesser a limma, or Diesis: to the difference between the two the name of comma [COMMA] was given. But it must here, once for all, be observed, that the Greek writers, if we really enter into their meaning, differ much in their definitions of musical intervals, and that the moderns are no less at variance in their interpretation of many antient terms of the art.

DIET. [FOOD.]

DIFFAREATION. [MARRIAGE.]

DIFFERENCE, the excess of one quantity over another. This fundamental meaning of the term is almost lost in the higher parts of mathematics, from the association of it with a methodized theory, derived from the consideration of the differences presented by successive quantities which follow a regular law. It is therefore a very wide branch of pure mathematics which must be considered under this term, namely, the method or calculus of differences. And the connection of this subject with the differential calculus (the results of the latter being, in one point of view, particular cases of the former) renders it impossible to treat of the two with that perfect separation which the alphabetical arrangement of a work like the present requires. Following the plan which we have laid down in other articles, we shall here describe the most important results connected with the term in question, referring for information on other matters to the following articles:—INTEGRATION, FINITE; GENERATING FUNCTIONS, THEORY OF; EXPONENTS, NOTATION OF; SYMBOLS OF OPERATION AND QUANTITY, SEPARATION OF; EQUATIONS OF DIFFERENCES; INTERPOLATION.

If we carry the hand along a sheet of paper, laying down points with a pen at various intervals, we get a number of points, through which an infinite number of curves may be made to pass: but generally speaking, there is one which is more simple than all the rest. If we also assign various numbers, we may conceive them all to be values of some function of a variable x, answering to $x = 1$, $x = 2$, &c. Thus we may ask the following question: what is that function of x of which 43, 47, 53, 61, 71, 83, &c., are the values, when x is successively made equal to 1, 2, 3, 4, 5, 6, &c.? This problem is indeterminate, with respect to common algebra merely, unless we can ascertain a law by which the series can be continued *ad infinitum*, and which it is allowable to assume: it then becomes determinate with respect to the expressions of common algebra only, but is again indeterminate if we are allowed to assume the transcendental expressions of trigonometry or the integral calculus. Confining ourselves to the expressions of common algebra, we may detect any law which prevails throughout the whole series by taking the difference between each term and the next, and thus forming a new series; and then by repeating this process again and again until the series so formed presents an easily perceptible law. Thus in the preceding case we have

Given series	43		47		53		61		71		83 ...
Series of First differences		4		6		8		10		12	
Series of Second differences			2		2		2		2		

We now see, that irregular as the first series may appear, the successive differences of the successive differences of its terms are always the same, and we may thus extend the series further. Thus we have—

83 97 113 131 151 173, &c.
12 14 16 18 20 22, &c.
2 2 2 2 2 2, &c.

But still this question remains; assuming the preceding law of continuation, and also that we have thus the values of some function of x answering to $x = 1$ (namely, 43), $x = 2$ (47), &c. What is the value of the function answering to fractional values of x, for instance when $x = 2\frac{1}{2}$? Considering that $x = 2$, gives 97, and $x = 3$ gives 113, it might seem at first sight that $x=2\frac{1}{2}$ should give 105. But a moment's consideration will show that this can only be in the series

81 97 113 129, &c.,

and that the irregularity of the progression from term to term will require a law to express it, such as will not allow of uniform progression between the terms. Such are the notions which might be made to suggest themselves, and the difficulties of which find their answers in the mathematical consideration of the subject.

Let any term chosen at pleasure in a series be called a, let the next term be a_1, the next a_2, and so on. That is, a_n means the nth term from a, not reckoning a. The succession of *first differences* (a more convenient way of expressing the *first succession* of differences) is—

$$a_1-a, \quad a_2-a_1, \quad a_3-a_2, \quad a_4-a_3 \;.\;.\;.\;.\;.\;.\;.$$

The succession of *second differences* (*second succession* of differences) is—

$$a_2-a_1-(a_1-a), \text{ or } a_2-2a_1+a$$
$$a_3-a_2-(a_2-a_1), \text{ or } a_3-2a_2+a_1, \text{ \&c.}$$

The succession of third differences, similarly derived from the preceding, is—

$$a_3-3a_2+3a_1-a,$$
$$a_4-3a_3+3a_2-a_1, \text{ \&c.}$$

From which it will be evident to any one who knows the binomial theorem and the law of its co-efficients, that the first term of the nth succession of differences is—

$$a_n-n\,a_{n-1}+n\frac{n-1}{2}a_{n-2}- \;.\;\;.\;.\;(n+1 \text{ terms}).$$

It is usual to denote this by $\Delta^n a$, the letter Δ standing for the operation of taking the difference, the exponent expressing that this operation has been repeated until it has been performed n times, and a being the term of the series used in the first operation. The symbol is called the nth difference of a.

If, then, we write the series and its successions of differences, not using the results of the operations, but their symbols, we have as follows—

$$\begin{array}{llllll} a & a_1 & a_2 & a_3 & a_4 & \ldots\ldots \\ \Delta a & \Delta a_1 & \Delta a_2 & \Delta a_3 & \ldots\ldots & \\ \Delta^2 a & \Delta^2 a_1 & \Delta^2 a_2 & \ldots\ldots & & \\ \Delta^3 a & \Delta^3 a_1 & \ldots\ldots & & & \\ \text{\&c.} & & & & & \end{array}$$

From which we find that $a_1=a+\Delta a$.

$$a_2=a_1+\Delta a_1=a+\Delta a+(\Delta a+\Delta^2 a)$$
$$=a+2\Delta a+\Delta^2 a$$
$$a_3=a_1+2\Delta a_1+\Delta^2 a_1=a+\Delta a$$
$$+2(\Delta a+\Delta^2 a)$$
$$+\Delta^2 a+\Delta^3 a$$

or, $a_3=a+3\Delta a+3\Delta^2 a+\Delta^3 a$.

Proceeding in this manner, and by the assistance of the binomial theorem as before, we find that—

$$a_n=a+n\Delta a+n\frac{n-1}{2}\Delta^2 a+\;.\;.\;.\;.\;.\;(n+1 \text{ terms}).$$

These two theorems are the fundamental parts of the whole theory of differences: and our limits will not allow us to go further into the subject. We shall only observe, that it is most desirable that this very elementary branch of pure mathematics should be taught as a part of common algebra, or at least with the first rudiments of the differential calculus. The almost universal practice of deferring this subject until the student is master of the integral calculus, is entirely subversive of all natural order, and is perhaps one of the reasons why the differential calculus is proverbially difficult. Various developments and applications are to be found in every work on the subject.

The term difference is continental; the older English term was *increment*.

DIFFERENCE, ASCENSIONAL. [ASCENSION.]

DIFFERENTIAL CALCULUS, the name given by Leibnitz to the science which was digested nearly about the same time by himself and Newton, independently of each other [FLUXIONS, COMMERCIUM EPISTOLICUM], and which has of late years almost exclusively prevailed in this country, to the exclusion of the name, notation, and (so far as they differ) methods of Newton's fluxions.

It is impossible, in the smallest degree, to exhibit the present state and uses of a science into which all others merge as the student approaches the higher applications of mathematics. The article DIFFERENTIAL COEFFICIENT will, so far as it goes, give some idea of the nature of its first step; but the following remarks must be considered as intended for the student who has made some progress in a modern elementary work.

The history of the differential calculus, at its first rise, is so connected with that of the Newtonian FLUXIONS, in consequence of the celebrated dispute as to the right of invention, that we have thought it best to refer the whole point to the last-named article. On the history of the science since the time of Newton, there is no work from which we can trace out a connected account of the various steps by which the present system has been formed. In fact, most of the new investigations have been made with reference to some particular points of physical science. It would be very difficult to write the history of this calculus without entering at the same time into that of mechanics, optics, astronomy, &c. &c., and of every subject to which it has ever been applied. An attempt at the former without the latter would be an account of the progress of language without mention of literature, oratory, or the drama.

In the meanwhile, seeing that notions as to the most proper and useful basis on which to build this science are far from being fixed, the most advantageous course which we can here adopt is to give a short account of the various systems which have been proposed, referring to such articles and treatises as will enable the student to obtain further information. These different systems all produce the same results, expressed in very similar manners: there is no question between them as to the truth or falsehood of any one deduction, and a practised intellect can always see how the principles of any one, *assumed as granted*, may be made to furnish demonstration of those of any other. It is therefore, with some exception, a metaphysical rather than a mathematical difference which agitates (or rather which did agitate) the mathematical world. We do not mean to say that opinions are now agreed; but it seems that the question is left open, it being admitted that the manner in which a student arrives at his knowledge of the subject in the first instance is not of the greatest importance, provided that, when it has been obtained, he give his attention to the comparison of the various methods by which he might have attained the same end.

The precursors of Newton and Leibnitz, namely, Archimedes, Cavalieri, Wallis, Barrow, Fermat, Roberval, and others, touched so near upon the differential calculus, that it is obvious any of them might have taken the place of either of the first, if they had possessed more powerful means of algebraical development. After Vieta, Descartes, Wallis, and Newton (considered only as the discoverer of the binomial theorem), the step to a formal calculus was comparatively small. The essential part of the difficulty had been removed, and by much the greater part of the distance between Archimedes and Leibnitz had been gained. This point once attained, *methods* sprung up with rapidity, and in little more than a century we find the introduction of the various schemes which it will be necessary to mention, namely—Leibnitz's method of infinitesimals; Newton's method of prime and ultimate ratios; Newton's method of fluxions; Landen's method of vanishing fractions, or residual analysis; D'Alembert's method of limits; Lagrange's method of derivation.

Many other forms have been proposed, which either coincide in principle with one or other of the preceding, or are without any independent claim to notice. Several of the preceding, indeed, are more distinguished from each other by historical notoriety than by essential difference of character. If we distinguish carefully between the first principles of a method and the manner in which those principles are applied to algebra, it would not be any great stretch of assertion to contend that all the methods except the last are different ways of expressing the same fundamental ideas; and that the last (Lagrange's) is a proof that, so long as the preceding methods employed the usual amount of algebraical assumption in the establishment of the connection between themselves and algebra, that sam quantity of assumption would have been sufficient for the basis of a purely algebraical science, equivalent to the differential calculus.

The method of Leibnitz assumes that quantities are made up of infinite numbers of infinitely small parts. [INFINITESIMAL CALCULUS, INFINITE.] It is a sort of atomic theory of pure magnitude, which is most obviously either false or obscure; for so far as infinitely small quantities can be definitely explained, it is obvious that there are no such things; and any obscurity left in their definition extends itself throughout the whole science. But the falsehood of the supposition is not absolute; for though magnitudes cannot be distinctly laid down to be composed of an *infinite* number of *infinitely small* parts, yet any magnitude can be divided into a number of parts *greater than any we may happen to name*, each of which parts shall be *less than any magnitude we may happen to name*. Thus it is perfectly obvious that a foot may be divided into parts more than a million in number, each of which shall be less than the hundred millionth part of an inch. If we may use such a phrase, the falsehood of the assertion may be made of as small an intensity as we please, and the consequence is, that its results turn out absolutely correct. All the difficulties of the science are concentrated into one single assertion; and when this assertion is once fairly understood and received in a correct sense, all that follows is more easily understood and remembered, and far more easily applied, than the results of any other method. Whichever of the systems a student pursues, it is our decided opinion that he should accustom himself to translate every result into the language of the infinitesimal calculus, and endeavour to demonstrate it by the methods of the same. It is usual to give a chapter on this method in elementary works; in addition to which we should strongly recommend to the student of principles, Carnot, 'Réflexions sur la Metaphysique du Calcul Infinitesimal,' Paris, 1813: a work which has been translated into English. But it must be understood not to recommend the peculiar method of explaining the difficulties of infinitesimals adopted in this work, but only the manner of stating the points of difficulty, and the comparison of the different systems.

The system of Newton, known by the name of prime and ultimate ratios, was set forth in the first section of the Principia, and is the method pursued throughout that work. It is in reality a method of limits, exhibited in a form which allows of a more ready application to geometry than to algebra, and accordingly it is abandoned by Newton himself in the method of fluxions. Instead of considering and comparing simultaneous increments of infinitely small magnitude, the ratios of small but finite increments are taken; and not these exactly, but the limits towards which they approach when the increments are diminished, which are called *ultimate* ratios, or *nascent* ratios, according as the increments are supposed to be *in the act* of growing from or diminishing towards nothing. The expression of Newton will justify us in using the three words in Italics: 'Objectio est, quod quantitatum evanescentium nulla sit ultima proportio: quippe quæ, antequam evanuerunt, non est ultima; ubi evanuerunt, nulla est.....Similiter per ultimam rationem quantitatum evanescentium, intelligendam esse rationem quantitatum, *non antequam evanescunt, non postea, sed quâcum evanescunt*. Pariter et ratio prima nascentium est ratio quâcum nascuntur?' The student must seek for the account of this method in the first section of the Principia already cited, and in the article RATIOS, PRIME AND ULTIMATE. It may be observed that in illustrating the preceding answer, Newton appeals to the fundamental considerations on which his other method (if it be really another method) is founded, to which we now come.

The method of fluxions was also given by Newton, and with a peculiar notation, which maintained its ground in this country until about the year 1816. [FLUXIONS.] It will be seen in the articles DIRECTION, VELOCITY, FORCE, &c. that there are many fundamental ideas, connected with sensible objects, which lead to a practical differential calculus, and might have happened to have been the means of suggesting a strict and mathematical theory. Newton adopted one of these, that of velocity, of which it may be said that its assumption as an answer to objections is a formal evasion of all the metaphysical difficulties of the subject. Since the proportions of all quantities may be represented by those of straight lines, the nature of the comparative changes which take place in continuously increasing or decreasing quantities may be referred to the velocities with which the terminal points of straight lines change their places. Velocity once clearly defined, in cases where it is variable, there is no further difficulty; but unfortunately a distinct conception of the measure of velocity is precisely equivalent to finding a meaning for the differential or fluxional coefficient independently of it. The theory of fluxions is best exhibited in the work of Maclaurin, 'Treatise on Fluxions,' 2 vols. 4to., Edinburgh, 1742, which, for rigorous and consistent application of its own principles, has, in our opinion, never been surpassed. It has the advantage of having been written in answer to acute objections of principle [BERKELEY], and is *the* work on fluxions.

The method of limits of D'Alembert, which is now more frequently used than any other, was considered by the author himself as an explanation of Newton's prime and ultimate ratios. It is usual to attribute the exposition of this method to D'Alembert (and, considered as a formal application of limits, correctly), though several, previously to him, had made special applications of the principle. The articles in the Encyclopædia must be considered as the *pièces justificatives*. The following article, DIFFERENTIAL COEFFICIENT, will explain this method, which contains the point in which the principles of all the preceding unite, and which must more or less be all. See also the article LIMIT.

The two remaining methods (those of Landen and Lagrange) are attempts to establish the science upon purely algebraical principles. Previously to entering upon them, we must remark that none of the preceding theorists attempted to make his system furnish any additional security to the methods of the algebra already in use. Such as it was, correct or incorrect, clear or obscure, no one gave a moment's consideration to the fact that algebra already contained difficulties of precisely the same character as those which were matter of dispute in the differential calculus. Taking it for granted that algebra stood already upon as firm a basis in every part as the differential calculus could ever, on any supposition, be expected to do, it was a matter of some interest to make the latter a pure extension of the former.

The residual analysis of Landen is a technically algebraical exhibition of the theory of prime and ultimate ratios. The tract in which it was promulgated, 'The residual Analysis, a new Branch of the Algebraic Art, &c.' appeared in 1764. When it is considered that this new branch of the algebraic art was only old fluxions in a different dress, the title may excite surprise, if we remember how well Landen deserved his reputation. But it must be remembered that all the discussion of which this article is meant to elucidate the history, arose from a tendency to consider two methods as *mathematically* different, which were not the same in the method of enunciating their first principles. A something between Landen and D'Alembert, as to principle, published in 1748, was called the 'Doctrine of Ultimators, containing a new Acquisition, &c., or a Discovery of the true and genuine Foundation of what has hitherto mistakenly prevailed under the improper names of Fluxions and the Differential Calculus.' The difference between Landen and Newton will appear in the article FRACTIONS, VANISHING, and in the instances which we shall presently give. It is the LIMIT of D'Alembert supposed to be *attained*, instead of being a *terminus* which can be attained as nearly as we please. A little difference of algebraical suppositions makes a fallacious difference of form; and though the residual analysis draws less upon the disputable part of algebra than the method of Lagrange, the sole reason of this is that the former does not go so far into the subject as the latter.

The method of Lagrange, first given in the public lectures at the *Ecole Normale*, and afterwards published separately under the title, *Théorie des Fonctions*, is a deduction of the whole science from Taylor's Theorem, which being absolutely granted, undoubtedly all the rest may be made to follow. If $\phi(x+h)$ can be always expanded in a form of which the two first terms are $\phi x + \phi' x . h$, and if $\phi'(x+h)$ be related in the same manner to $\phi' x + \phi'' x . h$, and $\phi''(x+h)$ to $\phi'' x + \phi''' x . h$, and so on, it can be made to follow that

$$\phi(x+h) = \phi x + \phi' x . h + \phi'' x . \frac{h^2}{2} + \phi''' x . \frac{h^3}{2.3} + \&c.$$

upon principles as sound as those of algebra in the hands of Maclaurin, or Euler, or Clairaut, as elementary writers. It is our opinion that Lagrange has not been correctly understood, nor fairly dealt with, by those who have compared his theory of functions with the other methods. Undoubtedly any one who should maintain the unqualified admissibility of Lagrange's work must assert both the major and minor of the following syllogism.

Algebraical expansion (*théorie des suites* is Lagrange's phrase) as generally received A.D. 1790, was founded on sound principles: the *Théorie des Fonctions* is a logical and incontestable result of such algebra; therefore, &c.

All the attacks upon Lagrange have denied the major of this syllogism, whereas it appears to us that he never intended to assert more than the minor. Perceiving that the mathematical world was in the habit of calling in the aid of limits or infinitesimals, to help *a certain algebra* in deducing certain conclusions, he showed them how that very algebra, good or bad, was competent to the deduction of the same conclusions without either limits or infinitesimals; and he was correct. Notwithstanding any thing in the work in question, Lagrange might have admitted all that we shall find it necessary to say against his system, absolutely considered, in the article FUNCTIONS, THEORY OF.

A new question has arisen of late years, namely, whether the theory of limits be not absolutely necessary to the rigorous development of common algebraical forms, and whether this same theory of limits may not be applied to the establishment of the differential calculus, independently of any expansion. A tract of M. Ampère (as we believe), entitled 'Précis du Calcul Differentiel, &c.,' is the earliest writing we are acquainted with in which this is attempted to be done. A treatise on the subject, in process of publication by the Society for the Diffusion of Useful Knowledge, professes to have the same end in view. The work of M. Cauchy has much in it by which this object is promoted, but expansion is avowedly introduced.

We shall now state two propositions, one geometrical, the other algebraical, in the words of the several systems.

Infinitesimals.—An infinitely small arc of a circle is equal to its chord.

Prime and ultimate Ratios.—If an arc of a circle diminish, the ultimate ratio which it bears to its chord is one of equality; or, if it begin to increase from nothing, the prime or nascent ratio of the arc and chord is that of equality. Or the arc is *ultimately* equal to its chord.

Fluxions.—If an arc increase from nothing with a uniform velocity, the velocity with which the chord increases is, at the first moment, equal to that of the arc.

Limits.—If the arc of a circle (and therefore its chord) diminish without limit, the limit of the ratio of the arc to the chord is one of equality.

Residual Analysis.—When the arc of a circle = 0 $\frac{\text{arc}}{\text{chord}} = \frac{0}{0} = 1$, which is ascertained by clearing the numerator and denominator of a factor which vanishes when arc = 0.

Theory of Functions.—When the arc is expanded in the following series,

$$\text{Arc} = \text{A} \times \text{chord} + \text{B} \times (\text{chord})^3 + \&\text{c}.$$

then A = 1.

Infinitesimals.—If an infinitely small increment dx be given to x, then x^3 receives the infinitely small increment $3x^2dx$.

Prime and Ultimate Ratios.—The ratio which any increment given to x bears to the consequent increment of x^3 is ultimately that of 1 to $3x^2$.

Fluxions.—If x be a line which increases with a velocity x, then x^3 increases with the velocity $3x^2\dot{x}$.

Limits.—The limit of the ratio obtained by dividing an increment of x^3 by the increment of x which produced it, on the supposition that the latter increment diminishes without limit, is $3x^2$.

Residual Analysis.—Since

$$\frac{y^3 - x^3}{y - x} = x^2 + xy + y^2$$

it follows that when $y = x$ $\frac{x^3 - x^3}{x - x} = 3x^2$.

Theory of Functions.—If $(x + h)^3$ be expanded in a series of powers of h, the coefficient of the first power of h is $3x^2$.

DIFFERENTIAL COEFFICIENT. The expressions to which this term is applied are of a degree of importance in the science to which they belong, as great as that of the letters of the alphabet in writing. Without entering into the method of using them, which would be in effect to write a treatise on the differential calculus, we shall make some remarks on the manner of defining and understanding the term.

When two magnitudes are so related that either being given the other is also given, it follows that any change being made in the one, the consequent change in the value of the other can be found, and the two changes can be compared as to magnitude. By this means a rough notion can be formed as to the effect which a change of value in one produces in the other. In such articles as CURVATURE, DIRECTION, VELOCITY, FORCE, &c., it is sufficiently shown that this rough notion, obtained by making a sensible change in one magnitude and comparing it with that produced in another, though sufficient for practical purposes, does not afford any exact and mathematical measure of the thing sought for. In each of the articles cited, it is found necessary to diminish the change originally supposed without limit, and it is not the actual ratio of two changes which we have to consider, but the limit to which that ratio approximates as the changes are diminished without limit. We must distinctly refer the student to sensible objects for an illustration of the cause why it is convenient, and even necessary, to have recourse to the *limit of a ratio.* [See also LIMIT, RATIOS (PRIME AND ULTIMATE), and various articles cited in DIFFERENTIAL CALCULUS.]

Let ϕx be a function of x, called y, which when x is changed into $x + h$, becomes $y + k$, so that

$$k = \phi(x + h) - \phi x.$$

Divide k by h, ascertain the limit towards which this quotient approximates when h is diminished, and that limit is what is called the differential coefficient of y with respect to x. For instance, let $y = x^2 + x$; then

$$\begin{aligned} k &= (x + h)^2 + (x + h) - (x^2 + x) \\ &= 2xh + h^2 + h; \end{aligned}$$

and k divided by h gives $2x + h + 1$, which, when h is diminished without limit, has for the limit of its decrease, $2x + 1$, which is therefore the differential coefficient of $x^2 + x$ with respect to x.

The term *differential coefficient* arises thus. The method of Leibnitz [INFINITESIMAL CALCULUS] proceeds as follows. Imagine x in the preceding expression to be increased by an *infinitely small quantity* (see article just cited for remarks on this phrase) which call dx, the *differential* of x. Then the resulting differential of y is

$$\begin{aligned} dy &= (x + dx)^2 + (x + dx) - (x^2 + x) \\ &= (2x + 1)\,dx + (dx)^2 \end{aligned}$$

Now $(dx)^2$ is rejected as being an infinitely small part of the preceding term, so that $(2x + 1)\,dx$ is the *differential* of $x^2 + x$. The expression $2x + 1$ (which is our preceding result) is here the *coefficient* of the *differential* dx, and when a less objectionable method of obtaining it came into use, still retained the name of differential coefficient. It were exceedingly to be wished that some shorter term could be agreed on for the expression of a result which is so often required to be named.

In the method of Leibnitz the differential coefficient is actually dy divided by dx, and it is still expressed by $\frac{dy}{dx}$ in the more modern methods. But this notation must now be supposed to be obtained as follows. Let the change of x into $x + \Delta x$ be accompanied by that of y into $y + \Delta y$; then $\frac{\Delta y}{\Delta x}$ expresses the algebraical ratio of the change of y to the change of x. In making the convention that $\frac{dy}{dx}$ is to stand for the limit of $\frac{\Delta y}{\Delta x}$, obtained from the supposition that Δx diminishes without limit, we consider the first symbol, not as that of an algebraical fraction, but as one whose *whole* has a meaning, the *parts* having none. This is the case with all *simple* symbols, as distinguished from *compound* symbols: thus in the figure V, standing for five, the two sides of the letter have no independent meaning; while in 4 + 7, each of the three symbols, 4, +, and 7, has meaning contributing to that of the whole, and at the same time independent of it. Thus though we consider $\frac{dy}{dx}$ as pointing out that it is y which has been differentiated, and with respect to x, we do not, in this symbol, assign to dy and dx any independent share of meaning.

The advantage of the notation in question is the connexion which it preserves between the practical use of the method of Leibnitz, and the theoretical accuracy of that of limits. For instance, it is strictly true, according to our conventions, that

$$\text{when } y = x^2 + x \quad , \quad \frac{dy}{dx} = 2x + 1.$$

but, giving dy and dx separate meaning, it is *not* true that $dy = (2x + 1)\, dx$. Yet the latter equation, though never true, is of this kind, that it may be made as near to truth as we please, if dx may be made as small as we please. For the reason why it cannot therefore be said to be true in the case where $dx = 0$. [FRACTIONS, VANISHING.]

The differential coefficient of a differential coefficient is called the *second* differential coefficient; a repetition of the process gives the third differential coefficient: and so on. These, if the original method of notation were proceeded with, should be represented by

$$\frac{dy}{dx} \qquad \frac{d\left(\frac{dy}{dx}\right)}{dx} \qquad \frac{d\left(\frac{d\left(\frac{dy}{dx}\right)}{dx}\right)}{dx}, \text{ \&c.}$$

but a more convenient notation is derived as follows. Let the substitution of $x + \Delta x$ for x take place any number of times in succession, giving

$$\phi\,(x)\ ,\ \phi\,(x + \Delta x)\ ,\ \phi\,(x + 2\,\Delta x)\ ,\ \phi\,(x + 3\,\Delta x), \text{ \&c.}$$

Form the successive differences of the first term [DIFFERENCE] ϕx or y: then the following theorem can be proved. The nth difference of y, or $\Delta^n y$, divided by the nth power of Δx, or $(\Delta x)^n$, is an expression of which the limit, made by diminishing Δx without limit, gives the same result as arises from differentiating y, n times in succession. We may therefore (subject to the remarks already made on the *first* coefficient) represent the limit of $\frac{\Delta^n y}{(\Delta x)_n}$ by $\frac{d_n y}{(dx)^n}$, so that the function y and its successive differential coefficients are denoted as follows:—

$$y\ ,\ \frac{dy}{dx}\ ,\ \frac{d^2y}{dx^2}\ ,\ \frac{d^3y}{dx^3}\ ,\ \frac{d^4y}{dx^4}\ , \text{ \&c.}$$

It is usual to omit the brackets in the denominators.

DIFFERENTIAL EQUATIONS. [EQUATIONS, DIFFERENTIAL.]

DIFFERENTIAL THERMOMETER, &c. [THERMOMETER, DIFFERENTIAL, &c.]

DIFFLU'GIA. [POLYPIARIA DUBIA.]

DIFFRACTION OF LIGHT. The peculiar modifications which light undergoes when it passes by the edge of an opaque body are classed as phenomena of the *diffraction* or *inflexion* of light.

When a ray of solar light is transmitted through a very small hole in a card, or is collected in a point by means of a double convex lens, and then diverges from that point, if a small opaque plate of any outline be interposed in the course of the ray, the shadow of this object received on a parallel screen behind will be encompassed by a series of coloured bands or fringes of a similar outline with the body, except at its angular points; the order of the colours in each fringe, reckoning from the outside towards the shadow, or inside, is, as in the prismatic spectrum, from red to blue, but the intermediate colours are less distinctly isolated, partaking of a mixture of the extreme tints.

The actual shadow, or dark space within the innermost fringe, is also larger than the geometrical shadow which would have been cast if the rays had passed exactly by the edge of the body in straight lines and been received on the same screen; the space by which the actual shadow surpasses the geometrical in breadth, is independent of the linear dimensions, the form or the matter of the interposed body, and it will therefore be most sensible in very narrow bodies: hence arise the dilated shadows of hairs, threads of webs, &c. which must fall daily under every one's observation.

When the interposed body is very narrow but of sensible width, streaks alternately brighter and darker will be found *within the shadow*, and a white line along the middle, when the body is of a long and slender rectangular form.

If the incident light were homogeneous, such as pure red, blue, &c. as found in the spectrum, the colour of the fringes though differing in intensity from one another, would of course be the same as the incident, but the sun's light, and most artificial light, being compounds of several simple coloured lights, the fringes in such case are of various tints which predominate on their external or internal limits, according as they are differently subject to the causes which produce diffraction.

Sir I. Newton in his optics relates several modes in which he varied the experiments on the inflexion of light; when two perfectly straight knife-edges were made to meet at a very acute angle, the fringes formed between the shadows of the knives received on a screen at a considerable distance from them were hyperbolas, each having for asymptotes the shadow of the corresponding knife-edge and a right line perpendicular to that bisecting the acute angle and passing through the intersection of the shadows; they approached to rectangular hyperbolas as the inclination of the edges diminished, and mutually crossed without interfering, the points where they crossed being however differently placed as the screen was removed to different distances.

In his queries, he suggests an explanation that light may be subject to the action of forces sensible only at very small distances from the surfaces of bodies, that under their influence the rays in their course near the edge of the body, instead of passing straightforward, describe very sinuous paths, with many contrary flexures, and thus they are found some turned inwards towards the shadow, others outwards, forming coloured bands; the curve surface, which is the locus of the intersections of all these diffracted rays, forming the envelope of the visible shadow.

Objections have been taken to this theory, on the ground that the phenomena will vary when the positions of the object and screen being fixed, that of the luminous point is varied, and also that a force emanating from the body ought to be supposed variable with its density; these objections do not appear to the writer of this article of great weight. In the former case, the divergence of the pencil of rays within the sphere of action of the forces is altered *ab initio;* in the latter the superposition of two similar material systems of particles, though doubling the force, when effective, would leave all the points of evanescence of the force unchanged, would leave the asymptotes unchanged, and it does not at all appear necessary that it should alter any phenomena of which the limits are unvaried.

Explanations however are not wanting on the undulatory hypothesis of light, and Fresnel has with considerable simplicity, calculated the positions and breadth of the fringes merely as resulting from the propagation of the undulations of a whole wave of light, minus that portion of a wave surface subtending the same solid angle, at the origin of the wave, as the obstacle.

Dr. Young, by a very simple expedient, has converted Grimaldi's experiment relative to the light streaks within the shadow of a long rectangular body, into the basis of his very beautiful theory of interferences. Let the light at one edge of the body be altogether stopped by an intercepting body placed before or behind the rectangular one, while the light is allowed free passage as before at the other side; the streaks will notwithstanding be instantly obliterated, showing that those streaks are produced by the interference of waves passing on either side of the body, and having their length either equal or differing by a small multiple of the length of an undulation.

Many beautiful optical phenomena arising from diffraction have been produced by transmitting light through one or several small holes, or the interstices of fine wire work, and even by reflection between plane mirrors inclined at a very small angle. Persons desirous to be further acquainted with these phenomena may consult the memoirs of Young, Fresnel and Fraunhofer; some interesting facts on the same subject have also been supplied by Sir J. Herschel in his treatise on light.

DIGAMMA, or VAU, is the name given by grammarians to a letter which once belonged to the antient alphabet of the Greeks. It appears to have occupied the sixth place in that alphabet, for while *epsilon* is employed as the numerical symbol for *five*, the next letter, as that alphabet is now arranged, is the representative of *seven*. Moreover, this position of the digamma will correspond precisely with that of *vau* or *waf* of the Hebrew, and of *f* in the Latin alphabet, two letters of kindred power and form. A further argument may be found in the principles which would seem to have determined the arrangement of the Greek alphabet. [Alphabet, p. 380, col. 2.) The letter is still to be seen in many inscriptions. (Alphabet, p. 383, plate ii., Nos. 20, 21, and 26.) With regard to the power of the letter, it is now the general and well-established opinion that it is equivalent to our own *w*.

The use of the digamma prevailed more particularly in the Æolic dialect of the Greek tongue. In the other dialects it was commonly dropped, particularly the Attic; and as this became the favourite dialect of Grecian literature, the digamma at last escaped from the alphabet; and even the Homeric poems, which had been written in a dialect still possessing the digamma, were presented to the Athenians without that letter, to the serious injury of the metre. But though the form of the digamma was not admitted into the Attic alphabet, the vowel *o* was occasionally used, so as virtually to represent it, as in *οιδα*, *οικος*, *οινος*, equivalent to ϜΙΔΑ, ϜΙΚΟΣ, ϜΙΝΟΣ (comp. the Latin *video*, *vicus*, *vinum*); and it was altogether superfluous to prefix the digamma, ϜΟΙΚΟΣ, as was sometimes done. At other times the *upsilon* filled the place of the digamma, as in the nouns which terminate like *βασιλευς* (ΒΑΣΙΛΕϜΣ.)

The Latin language, being more closely connected with the Æolic dialect of the Greek, is abundant in the use of this letter; for the true pronunciation of the *v* or *u consonans* must have been the same as our *w*, or it could not have so readily interchanged with the vowel *u*. The Greek words *ωον*, *εαρ*, *εσπερος*, *εστια*, *ιον*, appear in Latin as *ovum*, *vēr*, *vesperus*, *vesta*, *viola*. In the last instance indeed there are two other points of difference, the Latin word being feminine, like *rosa* compared with the Greek *ῥοδον*; and secondly, a diminutive, which is well suited to the size of the flower. Sometimes a *b* appears in the Latin word, where the Æolic Greek must have had the digamma, as *probus* compared with *πραΰς*; or an *f*, as *Formiae* compared with *Ormiae*.

The disappearance of the digamma in one dialect and its retention in another is in perfect accordance with what is seen in modern languages. In our own we have ceased to pronounce the *w* in *who*, *whose*, *two*, *sword*, *answer*, *whole*; while in *one* and *once* we have the sound without the character, and yet drop it again in *only*. The Danish dialect of the Teutonic language is remarkable for throwing off the *w*, thus *word* in the mouth of a Dane is *ord*.

For the assertions of the grammarians and the opinions of the learned with regard to the digamma, see Kidd's edition of Dawes's *Miscellanea Critica*, pp. 175-335. The editor has given a list of the Greek words which he supposes once to have possessed this letter.

DIGBY, EVERARD, was born in 1581, of an antient, honourable, and wealthy family. His father, who was a Roman Catholic, and a man reputed for learning, died in 1592, leaving the estates at Tilton and Drystoke in Rutlandshire to his son, the charge of whose education he had committed to some priests of his persuasion. In 1596 Everard married the only daughter and heiress of William Mulsho or Moulsoe of Goathurst in Buckinghamshire, whose parents dying soon after the marriage, he acquired a large estate in right of his wife. In 1603 he was knighted by James I. at Belvoir Castle, which the king visited in his journey from Scotland to London to take possession of the throne.

The share which Sir Everard Digby took in the Gunpowder Plot is the sole cause of his celebrity. This conspiracy was projected when he was twenty-four years old: the oath of secrecy was administered, and the design communicated to him by Catesby about Michaelmas, 1605. When Digby first heard of the plot he was averse to it, but forbore to reveal it on account of his oath: afterwards, when he found that it was approved by Roman Catholic priests, the religious scruples which he had entertained were removed, and he united cordially in the project, contributing towards its execution a quantity of horses, arms, and ammunition, together with 1500*l*. in money. Digby was not concerned in the preparation of the vault; the share of the plot that was allotted to him was to assemble a number of the Roman Catholic gentry on the 5th of November, at Dunchurch in Warwickshire, under the pretence of hunting on Dunsmoor Heath, from which place, as soon as they had received notice that the blow was struck, a party was to be despatched to seize the Princess Elizabeth at the house of Lord Harrington, near Coventry. The princess was to be immediately proclaimed queen in case of a failure in securing the person of the prince of Wales or the young duke of York, and a regent was to be appointed during the minority of the new sovereign. Digby assembled his party, and rode to Lady Catesby's at Ashby Ledgers to hear the result of the scheme. In the evening five of the party arrived, fatigued and covered with dirt, with news of the discovery of the plot and the apprehension of Fawkes. A short consultation was held as to what was best to be done; and it was agreed to traverse the counties of Warwick, Worcester, and Stafford into Wales, where it was thought that they should find many adherents, exciting, as they went along, the Roman Catholic gentry to join them in a general insurrection. They carried off fresh horses in the night by stealth from the stable of a breaker of cavalry horses in Warwick; they seized arms at Lord Windsor's residence at Whewell; and on the 7th occupied a house at Holbeach belonging to Stephen Littleton. But all hope of accession to their numbers was at an end. 'Not one man,' says Sir Everard Digby in his examination, 'came to take our part, though we had expected so many.' The Roman Catholic gentry drove them from their doors, reproaching them with having brought ruin and disgrace on the Catholic cause by their ill-advised enterprise; while the common people stood and gazed upon their irregular train, and evinced anything but a disposition to join them. Sir Everard Digby forsook his companions at Holbeach, with the intention, as he stated, of hastening some expected succours: he was overtaken at Dudley, apprehended, and conveyed to London. On Monday, the 27th of January, 1605-6, he was tried, with his fellow-conspirators. No doubt of their guilt was entertained; though written depositions only were given in by the prisoners, and no witness was orally examined: Digby alone pleaded guilty. They were executed on the following Thursday. Sir Everard Digby has been described by Greenway as profound in judgment, and of a great and brilliant understanding: but we distrust this partial writer; he appears throughout this transaction rather as a weak and bigoted young man, never acting upon his own judgment or impulses, but submitting himself entirely to the control and guidance of the Jesuits. (Abridged from the *Library of Entertaining Knowledge*, 'Criminal Trials,' vol. ii.)

DIGBY, KENELME, the son of Sir Everard Digby, was born in 1603, three years before his father's execution. He was educated in the Protestant faith, and sent to Oxford at the age of fifteen, having been entered at Gloucester Hall. His ability was early apparent, and when he left the university in 1621 with the intention of travelling, he had acquired considerable reputation. After having spent two years in France, Spain, and Italy, he returned to England in 1623, and was knighted at Lord Montague's house, Hinchinbroke, near Huntingdon, in October in the same year. Under Charles I. he was a gentleman of the bedchamber, a commissioner of the navy, and a governor of the Trinity House. In 1628 he obtained the king's permission to equip, at his own expense, a squadron, with which he sailed first against the Algerines, and afterwards against the Venetians, who had some dispute with the English. His conduct as a commander was creditable to him. Upon the death of Dr. Allen of Gloucester Hall in 1632, Sir Kenelme Digby became possessed of a valuable collection of books and manuscripts, which were bequeathed to him by his former tutor. The religious principles that he had imbibed under this learned man could not have been deeply rooted; for when Digby returned to France he was converted to Catholicism (1636), the religion of his parents. His conversion was the subject of a long correspondence with Archbishop Laud, who had always taken an interest in Digby on account of his unusual ability and learning.

He returned to England in 1638. On the breaking out of the civil war, he was imprisoned as a Royalist in Winchester House: during his confinement he wrote a refutation of Brown's 'Religio Medici,' which occupied him until the petitions made by the queen of France for his relief were granted, and he was allowed to retire to that country. At Paris he was kindly treated by the court· and he became familiar with the celebrated Descartes, and associated with the principal men of learning. When the Royalist party had broken down, and had ceased to be formidable, Digby went home to England, with the intention of residing upon his estate, but the parliament hearing of his return, forbade him the kingdom under penalty of death. The cause of this severity was the zeal that his eldest son had shown in the king's service, when, in 1648, with the duke of Buckingham and others, he made a stand near Kingston in Surrey. Young Digby was afterwards killed by Colonel Scroop in Huntingdonshire. Sir Kenelme now again travelled in France and Italy, and was everywhere received as a man of extraordinary merit. In 1655 his personal affairs required his presence in England; and during his stay, his frequent attendance at the Protector's court was in no small degree inconsistent with his prior conduct. The feelings which had led him to fight the duel in which he killed Lord Mount le Ros, because he had drank Charles's health as the 'arrantest coward upon earth,' must have now been totally obliterated. During a subsequent residence in the south of France he read many papers on different philosophical questions before literary societies, of which he was a member. This course he afterwards followed in England, whither he returned in 1661, and passed the remainder of his life. He died of the stone in 1665. Sir Kenelme Digby married Venetia Anastasia Stanley, daughter of Sir Edward Stanley of Tongue Castle in Shropshire. This lady was more celebrated for her beauty than her virtue. Before her marriage she had borne more than one child to her lovers, among whom was the duke of Dorset, who had settled 500*l.* a year upon her. Sir Kenelme showed great anxiety to preserve her beauty: he invented cosmetics for that purpose, and made her the subject of several strange experiments. There are pictures of her by Vandyke, one of which is now in Windsor Castle. She died suddenly, leaving one son by her husband.

Sir Kenelme Digby, though he fell into the errors of philosophy and many of the wild dreams which were common in his day, was certainly possessed of no ordinary talents: for his character we must refer our readers to Lord Clarendon (*Life*, vol. i., p. 34), who has ably described it. The following is a list of his writings:—'A Conference with a Lady about the choice of a Religion,' Paris, 1638; 'Letters between Lord George Digby and Sir Kenelme Digby concerning Religion,' Lond. 1651; 'Observations on Religio Medici,' Lond. 1643; 'Observations on part of Spenser's Fairy Queen,' Lond. 1644; 'Treatise on the Nature of Bodies,' Paris, 1644; 'A Treatise on the Soul, proving its immortality,' Paris, 1644; 'Five Books of Peripatetick Institutions,' Paris, 1651; 'A Treatise of adhering to God,' Lond. 1654; 'Of the Cure of Wounds by the Powder of Sympathy,' Lond. 1658; 'Discourse on Vegetation,' Lond. 1661. Sir Kenelme Digby's valuable library, which had been removed to France at the out-breaking of the civil wars, became, on his death, by Droit D'Aubaine, the property of the French king.

DIGEST. [CORPUS JURIS; JUSTINIAN'S LEGISLATION.]

DIGESTION, the process by which the food is converted into nutriment. Taken in its whole extent the process of digestion comprehends the entire series of changes by which the crude aliment is assimilated into arterial blood. These changes are effected by organs which viewed collectively, comprise a most extensive apparatus commencing at the mouth and ending at the lungs.

The first changes upon the food are effected in the mouth where it is mixed with mucus and saliva. Torn to pieces by the teeth in the operation of mastication and softened by the secretions of the mouth until it is reduced to a pulp, it is then collected by the tongue and formed by that organ into a mass called a bolus. The bolus of food thus prepared is carried by the tongue to a muscular membranous bag called the pharynx, situated at the back part of the throat. The pharynx as soon as it receives the bolus contracts firmly upon it, and by a proper muscular action delivers it to the œsophagus, a long muscular tube which extends from the pharynx to the stomach. The bolus of food does not descend along the œsophagus by its own weight, for a person can swallow while standing on his head, and many animals have obviously to convey their food along the œsophagus against gravity. The food when it enters the œsophagus is transmitted along the tube by a powerful contraction upon it of the strong fasciculi of muscular fibres of which it is composed.

By the œsophagus the food is conveyed into the stomach where it is converted into a fluid termed chyme. The chyme when duly prepared in the stomach is transmitted to the small intestines, in the first portion of which it is converted into a new substance called chyle. In its passage along the second portion of the small intestines the chyle disappears, being taken up by a set of vessels named lacteals, which convey it through a double series of glands called the mesenteric glands, to the thoracic duct. By the thoracic duct it is conveyed through the abdomen into the thorax, where it is poured into one of the large veins, the subclavian, which returns the blood from the upper parts of the body to the right side of the heart to be, by the right heart, propelled into the pulmonary artery. By the pulmonary artery the chyle now mingled with venous blood is conveyed to the lungs, where it undergoes its ultimate change and is converted into arterial blood. The large intestines meantime carry out of the body that portion of the food which has not been converted into chyle.

The structure of the different parts of the extensive apparatus concerned in carrying on this series of changes, a structure fitting them in the most admirable manner for performing the specific offices assigned them, will be described under the names of the respective organs; at present we shall confine ourselves strictly to an account of the phenomena of digestion.

The food torn, as has been stated, into minute fragments by the operation of mastication, softened and brought into the state of a pulp by its admixture with mucus and saliva, and raised nearly to the temperature of the blood by the warmth of the mouth, is received into an extensive chamber, the stomach, where it is constantly maintained at a temperature of 100° of Fahrenheit, and kept in a state of gentle but almost unceasing agitation by a peculiar motion of the stomach, effected by its muscular fibres and called from its striking resemblance to the motion of the earthworm, peristaltic. The essential phenomena which take place on the introduction of the food into the stomach are the following.

The food on entering the stomach is not arranged indifferently in any part of the chamber, but is detained in the great extremity, or that portion of the stomach which is near the entrance of the œsophagus, termed the cardiac extremity. This portion of the stomach during the actual process of digestion appears to be cut off from the rest by a contraction of the circular fibres of the muscular coat, called the hour-glass contraction, by which about a third of the length of the stomach towards its small or pyloric extremity is separated from the great or cardiac extremity. The food received in the cardiac extremity is slowly dissolved; this solution takes place at the surface; 'in proportion as it proceeds the dissolved part is rolled off the rest by the peristaltic action of the fibres of the stomach and carried to the pyloric portion,' where it accumulates. Thus the undissolved and the dissolved portions of the food are in different parts of the stomach; the undissolved portion in the cardiac, and the dissolved portion in the pyloric extremity.

A remarkable change takes place on the inner or mucous surface of the stomach, the moment a portion of food comes in contact with it. This change has been seen to take place in the stomachs of animals, laid open during the process of digestion for the purpose of affording an opportunity to observe the phenomena, and even in the human stomach, which, in more than one instance, has been completely exposed to view in consequence of wounds accidentally inflicted. The mucous coat of the stomach, which is of a pale pink colour when the stomach is empty becomes of a bright red colour when excited by the contact of food. Over this reddened surface are visible, more especially when it is examined through a magnifying glass, innumerable minute lucid points, from which distils a pure limpid and colourless fluid. This fluid, as it is discharged, is absorbed by the aliment in contact with the surface of the stomach, or collects in small drops and trickles down the sides of the stomach to the more depending parts, and there mingles with the food and dissolves it. This fluid, the true solvent of the food, is termed the gastric juice. It has been ascertained to be the efficient agent in digestion, and its solvent power has been demonstrated by a series of most decisive experiments long ago performed by Spallanzani and others. This distinguished physiologist swallowed a metallic tube perforated with holes and filled with flesh; he allowed the tube to remain in the stomach four hours, and then contrived to throw it up by exciting vomiting mechanically. The flesh in the tube was found to be thoroughly soaked with the fluid of the stomach; its surface was in a dissolved state, being soft and gelatinous, and moreover it had wasted from fifty-three to thirty-eight grains. Subsequently Dr. Stevens induced a person practised in swallowing pebbles, to swallow a hollow silver sphere, containing raw or cooked flesh, or vegetables, and perforated with holes that would admit a crow quill; the sphere was voided in about forty hours perfectly empty. Next Mr. Hunter observed that the great extremity of the human stomach is sometimes found after death in a softened state and even in a state of partial solution, the coats of the stomach being dissolved by its own gastric juice and the edges of the opening appearing pulpy, tender and ragged, and even the parts adjacent to the stomach, as the spleen, the diaphragm, and the lungs, being in like manner softened.

This solution of the food is wholly different from the spontaneous resolution which warmth and moisture tend to produce in it. Exposure of the food to warmth and moisture decomposes it by the process of putrefaction; but the gastric juice is antiseptic, and stops the putrefying process even after it is considerably advanced. The solution of the food by the gastric juice is a chemical operation, and the gastric juice is a chemical agent, the exact nature of which is now clearly ascertained. Spallanzani discovered that the gastric juice is of an acid nature. Some years ago Dr. Prout ascertained that this acid is the muriatic. Dr. Prout's experiments were repeated by some distinguished chemists in France with different results; but the accuracy of Dr. Prout's conclusions was afterwards confirmed by the experiments of Tiedemann and Gmelin, and they have received a fresh confirmation by the more recent experiments of Bracconnot and Blondelot, so that it may be now considered as established that the agent by which the solution of the food in the stomach is effected is muriatic acid or chlorine. If meat and gastric juice be enclosed in a glass tube, and kept at the temperature of the human body, a product is obtained closely resembling the fluid formed by the solution of the food in the stomach. If meat be enclosed in a glass tube with dilute muriatic acid, and kept at the temperature of the blood, a perfectly similar product is obtained.

The muriatic acid constituting the essential ingredient of the gastric juice is conceived to be derived by an act of secretion from common salt, muriate of soda, contained in the blood. The alkali, the base of the salt, is retained in the blood to maintain the alkaline condition essential to its healthy constitution, while the acid is liberated and poured, in the form of gastric juice, into the stomach to accomplish the solution of the food.

After the food has undergone the action of the gastric juice, it loses its sensible properties, and is converted into the homogeneous semi-fluid mass which has received the name of chyme. Specific differences are distinguishable in chyme, according as the food from which it is formed has consisted of vegetable or animal matter, and according as it has contained fatty or oily substance, or has been destitute of them. Usually however it consists of a pultaceous mass, of a greyish colour; it has a sweetish taste, and is slightly acid. The character common to it, from whatever kind of food it may have been produced, and therefore distinctive of it, is its acidity.

Gradually as it is formed, the chyme accumulates in the pyloric extremity of the stomach. When the accumulation amounts to a certain quantity, the pylorus relaxes, and allows the chyme to flow from the stomach into the first portion of the small intestines, the duodenum. Here it is mixed with the mucus of the intestines, with the pancreatic juice, and with the bile. The bile slowly and at intervals, a drop about twice in a minute, flows into the duodenum, and diffuses itself over the neighbouring surface. On coming in contact with the chyme, the bile imparts to it its sensible qualities, its colour and bitterness. But in a short time a spontaneous change takes place in the chyme. It separates into a whitish tenacious fluid termed chyle, and into a grey pulp: the first is the nutritive part of the food, the second is its excrementitious portion. If fat or oil, whether of vegetable or animal matter, have formed part of the aliment, the chyle is of an opaque white colour; if not, it is of a greyish colour. It differs in its chemical character from chyme; for chyme is acid: chyle, on the contrary, is alkaline.

The chyle, together with the excrementitious portion of the food, is slowly transmitted along the small intestines. The progress of the chyle is rendered slow, partly by its own tenacity, in consequence of which it adheres with some degree of firmness to the villi, and its progress is still further retarded by the *valvulæ conniventes*, which act as partial valves. [INTESTINES, SMALL.] In its course through the small intestines the chyle gradually disappears, being absorbed by the lacteal vessels, so called from the milk-like fluid they contain. The lacteals commence by open mouths on the surface of the villi. [LACTEALS.] Loaded with chyle, the lacteals penetrate the coats of the intestine, pass between the layers of the mesentery [MESENTERY], and enter the first order of mesenteric glands. In the mesenteric glands the lacteals unite freely with each other, and become exceedingly convoluted. On emerging from these glands the lacteals pass, still between the layers of the mesentery, on to the second order of mesenteric glands, which they enter, and in which they present the same convoluted appearance as in the first order. On emerging from the second order of mesenteric glands, the lacteals pass on to the receptacle of the chyle, which forms the commencement of the thoracic duct. [THORACIC DUCT.] In the receptacle of the chyle terminates another system of absorbent vessels, termed lymphatics, from the colourless and pellucid fluid, called lymph, which they contain. From the receptacle of the chyle, the chyle and lymph commingled flow into the thoracic duct, by which tube they are transmitted through the abdomen and thorax to the left subclavian vein, where they are mixed with venous blood. Together with the blood contained in this great vein, the chyle and lymph are sent by a direct and short course to the lungs.

The result of the successive changes thus wrought upon the food by these progressive steps of the digestive process, is to approximate the crude aliment more and more nearly to the chemical condition of the blood. 'This is accomplished partly by the gastric and intestinal juices, and partly by matters combined with the food, highly animalized in their own nature, and endowed with assimilative properties, as the salivary secretion mixed with the food during mastication; the pancreatic and biliary secretions mixed with the food during the conversion of chyme into chyle; the mesenteric secretions mixed with the elaborated chyle of the mesenteric glands; and, lastly, organized particles, which have already formed a part of the living structures of the body, mixed with the chyle under the form of lymph in the thoracic duct.'

In the stomach, by the agency of the gastric juice, a superfluity of water is chemically combined with the original element of the nutritive matter contained in the food by which the solution of the food is effected. This Dr. Prout terms a reducing process, because, by its combination with water, the nutritive element is reduced to a weaker state. This element Dr. Prout conceives to be albumen, although he states that he has been unable to detect true albumen in the stomach when none has been present in the food. 'Though the proportions,' he says, 'of the different ingredients of the chyle, as ultimately formed, are liable to be much varied, according to the nature of the food, yet whatever the nature of the food may be, the general components and character of the chyle remain always the same. The stomach must therefore be endowed with a power or faculty the agency of which is to secure the uniform composition of the chyle by appropriate action upon such materials as circumstances may bring within its reach. For indeed the chief materials from which chyle is formed, namely, the albuminous and oleaginous principles, may be considered as already fitted for the purposes of the animal economy, without undergoing any essential change in their composition. But the saccharine class of aliments, which form a very large part of the food of all animals (except of those subsisting entirely on flesh), are by no means adapted for such speedy assimilation. Indeed, one or more essential changes must take place in saccharine aliments previously to their conversion either into the albuminous or into the oleaginous principles. Most probably, under ordinary circumstances, these essential changes are altogether chemical, that is to say, they are such as do take place, or rather would take place, if the elements of the substances thus changed in the stomach could, out of the body, be so collocated as to bring into action the oppositions necessary to produce these changes. Thus the saccharine principle spontaneously becomes alcohol, which is merely an oleaginous body of a weak kind. When therefore in the stomach it is requisite that sugar be converted into oil, it is probable that the sugar passes through precisely the same series of changes it undergoes out of the body, during its conversion into alcohol. We cannot trace the conversion of sugar into albumen, because we are ignorant of the relative composition, and of the laws which regulate the changes of these two substances.'

If the indications of albumen in the chyme be not well marked, albumen is largely developed in the chyle of the small intestines, while, in that of the mesenteric glands and the thoracic duct, a large portion of the watery particles in the chyme of the stomach and the chyle of the intestines is removed, so that the action of the mesenteric glands seems to be the converse of that of the stomach, namely, a completing power by which the albumen is progressively brought nearer and nearer the condition in which it exists in the blood.

It is the office of the large intestines into which only a very small portion of chyle enters, to prepare the excrementary part of the aliment for its expulsion, and to generate the force by which, when duly prepared, it is conveyed from the body. These organs possess a modification of structure adapting them in the most admirable manner for the performance of this two-fold office. A concise description of the apparatus of digestion, and a more minute account than could be given here of its phenomena, will be found in the chapter on digestion in the 'Philosophy of Health,' and the details of all that is known upon the subject up to the present time are contained in Mayo's 'Physiology;' Bostock's 'Elements of Physiology;' Elliotson's 'Blumenbach,' and Tiedemann's 'Physiology of Man;' the first volume of which is translated by James Manby Gully, M.D., and J. Hunter Lane, M.D., F.L.S.

DIGESTION, in chemistry, and especially in pharmaceutic chemistry, is the exposure of any substance to partial or total solution in a fluid, either at common temperatures or with a gentle heat: thus in the preparation of tinctures, the substance whose virtue is to be extracted is said to be *digested* in alcohol or spirit of wine, generally diluted with water. It is commonly performed in a glass matrass, which should not be more than half filled, and covered with a piece of wet bladder, so that the evaporation of the menstruum or spirit may be prevented as much as possible; if the heat be so great as to endanger the bursting of the vessel or the bladder, the latter should be pierced with one or more small holes.

The matrass may be heated either by means of the sun's rays, of a common fire, or of the sand-bath, or a stove: when the heat is so great that it would occasion the loss of a valuable menstruum, as spirit of wine, without any provision for condensing it being employed, a distilling apparatus should be made use of. Formerly a method of digestion called *circulation* was resorted to; this consisted in luting a close head on the matrass, in which the vapour was condensed, and ran back out of the digester without loss, it being condensed in the head merely by exposure to the air.

DIGGES, LEONARD, a distinguished mathematician of the sixteenth century, was descended from an antient family in the county of Kent. He was born at Digges-court, in the parish of Barham, in the same county. He was educated at Oxford; but having an ample property, he retired to his own seat, devoting his life to the study of geometry and its practical applications, which he cultivated with great success. He died in 1574. His writings abound with invention, and his views are developed with great perspicuity and clearness; but the subjects on which he wrote, and the improvements which he made being now familiar to all practical mathematicians, any account of them beyond the titles of the works which he wrote would be superfluous here

1. 'Tectonicum; briefly showing the exact Measuring and speedy Reckoning of all manner of Lands, Squares, Timber, Stones, Steeples, &c.' 4to., 1556. This was enlarged and improved in a second edition by his son Thomas Digges, in 1592; and this again was reprinted in 1647.

2. A geometrical and practical treatise, under the title of 'Pantometria:' in three books; which he left in MS., and which was printed with improvements by his son; fol., 1591.

To this was added by the editor, 'A Discourse Geometrical of the Five Regular and Platonic Bodies, containing sundry Theoretical and Practical Propositions arising from the mutual Conference of these Solids, Inscription, Circumscription, and Transformation.' Before this time geometers had but little extended the investigations contained in the 15th book of Euclid; and this curious treatise contained the most ample collection of properties that appeared in any book before the time of the publication of Abraham Sharpe's 'Geometry Improved.'

3. 'Prognostication Everlasting of Right Good Effect; or Choice Rules to judge of the Weather by the Sun, Moon, Stars, &c.', 4to., 1555, 1556, and 1564. Also with corrections and additions by his son; 4to., 1592.

DIGGES, THOMAS, the only son of Leonard Digges. He was educated by his father with great care, and afterwards at Oxford, where he much distinguished himself; and ultimately became one of the first mathematicians of his age.

He chose the military profession, and was appointed muster-master-general to the forces sent out by Queen Elisabeth to succour the oppressed inhabitants of the Netherlands. Of his military career, however, no other evidence is known to exist, except his writings on the subject. These prove that he must have given considerable attention to the details of his profession, and therefore have been a considerable period on active service. The following is a list of his published writings, independently of editing his father's works:—

1. Alæ sive Scalæ Mathematicæ, 4to., 1573. A curious work.

2. A Letter on Parallax, printed in Dee's Parallacticæ Commentationis praxeosque nucleus quidam, 4to., 1573.

3. An Arithmetical Military Treatise, containing so much of arithmetic as is necessary towards military discipline, 4to., 1579.

4. An Arithmetical Warlike Treatise, named Stratioticos, compendiously teaching the science of numbers as well in fractions as integers, and so much of the rules and equations algebraical, and art of numbers cossical, as are requisite for the profession of a souldier. Together with the moderne militaire discipline, offices, laws, and orders in every well-governed campe and armie, inviolably to be observed, 4to., 1590.

5. A brief and true Report of the proceedings of the Earle of Leycester, for the Relief of the town of Sluice, from his arrival at Vlishing, about the end of June, 1587, untill the surrender thereof, 26 Julii ensuing, whereby it shall plainlie appear his excellencie was not in anie fault for the surrender of that towne. Published with the last, 1590.

6. A brief discourse what orders were best for repulsing any forraine forces, if at anie time they should invade us by sea in Kent or elsewhere. Published with the two last, 1590.

7. A perfect description of the celestial orbs according to the most antient doctrine of the Pythagoreans. This was published as a supplement to his edition of his father's Prognostication Everlasting, 4to., 1592.

8. A humble motive for Association to maintain the Religion Established, 8vo., 1601.

To this is added a letter to the Archbishops and Bishops to enforce the same object.

9. England's Defence: or a treatise concerning invasion; written in 1599, but not published. It is, essentially, a second edition of the tract already spoken of in the Stratioticos.

Digges wrote many other works which he left in MS., and which have never been published, on account, it is stated, of the perplexity created by lawsuits in which he was engaged. He died in 1595; but, except the accomplished politician and elegant writer, Sir Dudley Digges, none of his children claim a niche in the history of their times, though two others were authors of printed works.

DIGIT, a finger, a term employed to signify any symbol of number from 0 to 9. According to the original application of the term, the ten first numbers should be called digits, but universal practice employs the word to signify the ten symbols used in reckoning numbers. Thus ten (10) is a number of two digits.

DIGITA'LIA, a vegetable alkali procured from the *Digitalis purpurea*, or foxglove: but little is known of this substance; it is stated to have been obtained in minute prisms with a rhombic base. Digitalia resembles the other vegetable alkalis in restoring the blue colour of litmus which has been reddened, and in the bitterness of its taste, but it is much more soluble in water than they generally are. It has not been analyzed. Its therapeutic action is stated to be similar to that of the foxglove.

DIGITA'LIS, a genus of Scrophulariaceous plants, distinguished by its five-parted leafy calyx, its irregular funnel-shaped inflated corolla with an oblique limb, the upper lip of which is short and two-lobed, the lower three-lobed, and its ovate acuminate capsule, splitting into two many-seeded valves. The flowers in all the species are arranged in long racemes, are either yellow, purple or brown, and generally showy; the leaves alternate upon a round herbaceous stem.

Several species are known, the most complete account of which is in Lindley's 'Digitalium Monographia;' it is however probable that some of the so-called species in that work are mere varieties or hybrids. *D. lutea* is a common plant in the woods of France and Germany. *D. ochroleuca* and *grandiflora* are met with rather more to the eastward; while *D. ferruginea* and its allies, with short roundish rust-coloured flowers, occur not unfrequently in the south-eastern parts of Europe and in Asia.

Over all the west of Europe, but not in Asia, is found abundantly, especially in England and France, the *D. purpurea*, a very handsome species, with large purple or white flowers, to which the name of foxglove is popularly applied. It is a biennial, with oblong, stalked, scalloped, wrinkled leaves, grey with hairs, and a stem about two feet high, also covered with a close soft nap. The purple or white pendulous flowers are above an inch and a half long, and are arranged in one-sided racemes; in the inside of their corolla, on the lower lip, they are bearded with long hairs, and gaily spotted with blackish purple specks. There are four didynamous stamens shorter than the corolla, with large smooth anthers two-lobed at the base.

The energetic, stimulating, acrid, narcotic properties of this plant have caused it to be extensively employed medicinally.

DIGITA'LIS PURPU'REA, fox-glove, a biennial plant, of which the leaves and seeds are used. The leaves are sometimes accidentally confounded with those of different species of verbascum, and of the conyza squarrosa. The most powerful leaves are those procured from plants growing on the sunny sides of hills. They must be carefully dried, and protected from damp. The active principle appears to reside in an extractive substance, which by careful evaporation may be crystalized, and to which the name of Digitaline has been given. This principle is soluble in water, in alcohol, and possibly in æther. It is very poisonous. One grain dissolved in a little water killed a rabbit in a very short time. Digitalis is given in powder, made into pills, or in an alcoholic tincture. Diversity of opinion exists respecting its primary action on the system, some writers considering it as primarily a stimulant, and the sedative effect a consequence of the previous excitement; others regarding it as a direct sedative. It is most likely that it acts in both ways according to the dose, and frequency of administration. If a small dose be given, and repeated at short intervals, a stimulant action will be most obvious, followed at a considerable interval by a sedative effect. If on the other hand a large dose be given at first, the sedative action is immediately displayed. The effect varies also with the position of the person, being different according as he is standing, sitting, or reclining.

Digitalis is the most perfect example known of a cumulative poison, as it may be used for some time, if the doses be small, without producing any manifest effect for several days, when suddenly faintness, intermittent pulse, giddiness, and other alarming symptoms appear. These are best combated by vital stimulants, such as warm brandy and water.

Digitalis has the power of reducing in a remarkable degree the heart's action, bringing down the pulse from 120 or more to 50 or 40 beats in a minute, and causing it to become at the same time intermittent. On this power depends its medical value in some diseases. It is remarkable however that while it thus lowers arterial action, it excites the absorbents and the kidneys to increased action, and so proves a valuable diuretic in dropsy and some other diseases. It is most useful in organic affections of the heart, and in the latter stages of some inflammatory affections, such as pneumonia, in phthisis pulmonalis, chronic peritonitis, and irritative or nervous fever. In the inflammatory or turgescent stage of hydrocephalus acutus, along with calomel, Golis states it to be very valuable.

As a diuretic, it is, like most medicines of that class, uncertain in its effects: it seldom answers if much inflammatory action exist when it is exhibited. To render it more certain it is generally given along with calomel, and squils, or some other diuretic.

DIGITIGRADES. [CARNIVORA, vol. v., p. 307.]

DIGNE. [ALPES, BASSES.]

DIGNITIES [TITLES OF HONOUR.]

DIGY'NIA, a systematic name given by Linnæus in his artificial system, to such plants as have two styles, or a single style deeply cleft into two parts.

DIJON, in France, capital of the department of Côte d'Or, on the north-east bank of the river Ouche, a tributary of the Saône: 162 miles in a direct line south-east from Paris, and 183 miles by the road through Provens, Nogent sur Seine, Troyes, Bar sur Seine, and Châtillon sur Seine, in 47° 19′ N. lat. and 5° 2′ E. long.

Dijon existed, during the Roman dominion, under the name of Dibio or Divio. An antient legend, attested by Gregory of Tours, relates that the Emperor Aurelian made of Dibio a considerable fortress: other legends seem to confound Aurelian with Marcus Aurelius, who lived a century before. From the dominion of the Romans Dijon passed, in the fifth century, under that of the Burgundians [BURGUNDIANS], and subsequently of the Franks. Under the Carlovingian princes, Dijon was a lordship of the bishops of Langres, who often resided here; and in the ninth century was under counts of its own, who held it of the bishops as suzerains. In the eleventh century the lordship of Dijon was united to the duchy of Bourgogne. [BOURGOGNE.] In the twelfth century the dukes caused the city to be rebuilt after it had been burned down, and subsequently bestowed upon it a municipal constitution. In the fourteenth century new walls were erected, inclosing the Roman town and the greater part of the suburbs. Under the dukes of Bourgogne, of the first race, Dijon was erected into a viscounty, but this came to an end A.D. 1276: and the rights of the viscounts were subsequently bestowed on the municipality and citizens. The dukes of Bourgogne, both of the first and second races, usually resided here: and when Louis XI. of France took possession of Bourgogne, and established the *parlement*, or provincial tribunal, he fixed its sittings in this town.

The town is situated in a plain bounded on the west by the hills which connect the Cevennes and the mountains of Forez with the heights of Langres and the Vosges. The Suzon flows south-east and southward through this plain, and joins the Ouche under the walls of Dijon; at Val de Suzon, a few miles from Dijon, it is a tolerably copious stream, while at Dijon it is frequently dry. The streets of Dijon are not regularly laid out, but they are clean and cheerful. The houses, which are of freestone, are only of one or two stories. Of the public buildings the office of the prefect and the former palace or hall of the states of Bourgogne are the most worthy of notice: the latter contains a museum of painting and sculpture, antiquities, and subjects of natural history, and a library of 40,000 volumes; behind it is an old tower used as an observatory. In front of the palace of the states is the 'Place Royale,' an open space, surrounded by houses. There are no fountains in Dijon. The church of St. Benigne, the present cathedral, is a gothic edifice, the spire of which is admirable for its height (nearly 300 feet) and the lightness of its architecture; the interior of the church contains some fine marble tombs. The church of Notre Dame, the former cathedral, is also in the gothic style. The church of 'Les Orphelins-Sainte Anne' is an elegant modern structure, surmounted by a fine dome. The Chartreuse, or Carthusian monastery, which was outside the walls of the city on the road to Semur, and was adorned by the sumptuous tombs of the dukes of Bourgogne, has been demolished: some remains of these tombs have been preserved in the museum. There is a theatre, erected within a few years. An antient castle, flanked with immense towers, is said to have existed during the kingdom of the Burgundians, and it may be of yet higher antiquity, if we may identify it with the Roman walls which Expilly describes as remaining in his time (A.D. 1763). The ramparts of the town are kept up, and are planted nearly all round with fine trees. There are walks planted with trees round the town in its present extent, including the suburbs, which form a second circuit of promenades: and there are other promenades, in one of which (l'Arquebuse) is an immense poplar, 25 or 26 feet in circumference. (Vaysse de Villiers.) There are baths and a mineral spring.

The population of Dijon amounted in 1832 to 25,352 for the town, or 25,552 for the whole commune: this number very nearly coincides with the estimated population given by Expilly in 1763. The manufactures of Dijon include hosiery, blankets, coloured woollen-yarn, cotton-yarn, cotton velvets, printed calicoes, muslins, linen, leather, hats, vinegar, mustard, which last is in high repute with epicures, and starch; there are many breweries. Considerable trade is carried on in corn, wine, wool, and wax candles. There is a nursery for mulberry trees. Dijon is well situated for trade at the junction of several roads; the canal de Bourgogne, which unites the Yonne with the Saône, and thus opens a communication between the basin of the Seine and that of the Rhône, passes along the valley of the Ouche, close to the town.

Dijon has long been eminent for the cultivation of science and literature. It is the seat of an académie universitaire, comprehending faculties of law, sciences, and literature. There are also a collège or high school, a seminary for the priesthood, a school of the fine arts, a school of drawing, and a secondary school of medicine: courses of instruction are delivered on geometry and mechanics applied to the arts, and on botany. There are academies of sciences, belles lettres, and arts; and a society of jurisprudence; also a botanic garden. Dijon has produced a number of eminent men, as Bossuet, Larcher, Guyton-Morveau, Daubenton, Crebillon, and Piron. Two of the dukes of Bourgogne, Jean-sans-Peur and Philippe le Bon, were born here.

The bishopric of Dijon was established in 1731: the diocese was dismembered from that of Langres, with the addition of a few parishes from the diocese of Autun. At present it comprehends the department of Côte d'Or. The bishop is a suffragan of the archbishop of Lyon and Vienne.

Dijon is the seat of a 'Cour Royale,' the jurisdiction of which comprehends the departments of Côte d'Or, Haute Marne, and Saône and Loire, which have an aggregate population of 1,149,674: there is also a 'Tribunal de Commerce.' It is the head-quarters of the eighteenth military division, which comprehends the departments of Aube, Côte d'Or, Haute Marne, Saône and Loire, and Yonne. The arrondissement of Dijon had, in 1832, a population of 135,435.

DILAPIDATIONS. In its legal sense, this term is confined to the pulling down or destroying, in any manner, any of the houses or buildings belonging to an ecclesiastical benefice, or suffering them to run into ruin or decay, or wasting or destroying the woods of the church, or suffering any wilful waste in or upon the inheritance of the church. An incumbent is bound to keep the buildings in repair, restoring and rebuilding where necessary according to the original form, without addition or modern improvement, but he is not bound to supply or maintain anything in the nature of ornament, such as painting (unless necessary to preserve exposed timbers from decay), whitewashing, and papering. For damages calculated on this principle the successor may bring his action, either in the courts of common law or in the spiritual court, against his predecessor, or, if he be dead, against his executors.

The right to damages for dilapidations, as between other persons, is governed either by the laws relating to waste and repairs, or by special contract.

DILATATION. [EXPANSION.]

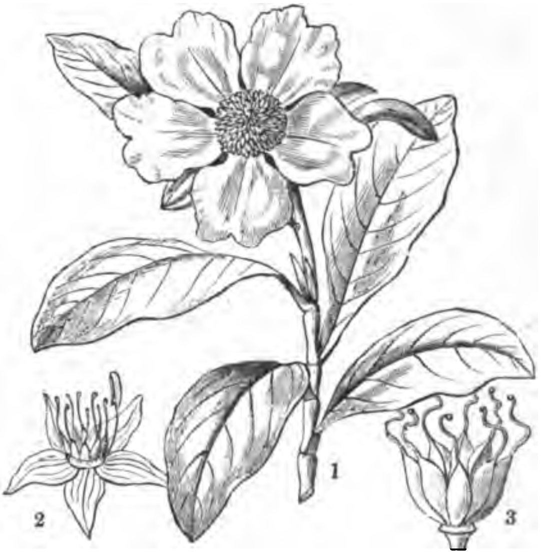
DILL, an aromatic umbelliferous plant, whose fruit is employed medicinally as a useful carminative. It is a Spanish biennial, and is called *Anethum graveolens* by botanists.

DILL. [CARMINATIVES.]

DILLENIA'CEÆ, a natural order of plants, belonging to Polypetalous Albuminous Exogens, and related on the one hand to Magnoliaceæ, on the other to Anonaceæ. They are briefly characterized by having five sepals in a broken whorl; five petals; an indefinite number of stamens; a definite number of ovaries, which are either quite distinct or more or less consolidated; berried, or capsular and two-valved fruits; seeds surrounded by a pulpy aril; and, finally, a minute embryo lying in solid fleshy albumen. Differentially considered, Dilleniaceous plants are distinguished from Anonaceæ by their flowers being arranged upon a quinary, not ternary, type, by their albumen being solid, and not ruminated, and by their want of aromatic properties; from Magnoliaceæ by their want of stipules, and the presence of a pulpy aril round the seeds.

The plants of this order are chiefly Asiatic trees or shrubs, and usually yellow-flowered. A few occur in America. The trees are found in the woods of Tropical India; the bushes inhabit New Holland, especially in the more temperate parts, and in China; the woods of Brazil contain several kinds, usually climbers or having a trailing habit. They appear to possess astringent properties, but nothing further of importance.

The species in cultivation in this country are almost all Australasian, and have something the appearance of yellow flowered Cistuses. Among these occur species of the curious genus Pleurandra, in which the stamens are developed on one side only of the flower, all those on the opposite side being abortive. There are few analogies to this in the vegetable kingdom. Hibbertia volubilis is a showy twiner, but its flowers are intolerably offensive in their smell.



1, A flowering shoot of Hibbertia volubilis; 2, the calyx and carpels, with one stamen only remaining; the other stamens cut away to show the carpels in the centre of the flower; 3, the ripe fruit.

DILLON. [ROSCOMMON, LORD.]

DILUENTS comprise those liquids which are used to dilute the fluids of the human body, and thereby modify their nature. They are employed when the secretions are too viscid, or the contents of the stomach, of the intestines, or any of the glands are too acrid, and also when the heat of the body, as indicated by thirst, &c., is too great, and causes a feeling of uneasiness. They manifest their beneficial effects most quickly when the contents of the stomach or upper part of the intestines require to be diluted, as in the case of many poisons; but they also reach the kidnies or skin in a very short time after their introduction into the system, and render less acrimonious the secretions of these organs. Their utility in allaying the thirst of patients affected with fevers and other inflammatory complaints is well known, and from such patients they ought never to be withheld, as they were at one time when erroneous notions on the subject prevailed, as they not only mitigate the sufferings of the invalid, but often determine to the skin, and cause a critical perspiration. It is equally cruel and injurious to withhold drinks of a mild kind from dropsical subjects, though they require to be used by such persons in greater moderation.

Water is the simplest and often the best diluent, but it may be rendered more agreeable in some cases by being made into toast-water, or by having acids or other substances added to it. Whey or butter-milk are also agreeable diluents in many cases. The excessive use of fluids at meal-times seems to be hurtful to digestion; and diluents appear to be less proper for persons of a soft and lymphatic constitution than for the robust and sanguine. Children of a scrophulous constitution do not prosper so well on a fluid as on a dry diet; they should therefore be allowed liquids in a very moderate degree, especially towards evening.

DIMENSION (algebra), a term which is used in the same sense as DEGREE. Thus x^2y is of three dimensions or of the third degree. In geometry, length is of one dimension, surface of two, and solidity of three. Thus geometry of three dimensions means solid geometry.

DIMYA'RIA. [CONCHIFERA, vol. viii., p. 431.]

DINAGEPORE, a district of Bengal, lying between 25°

and 27° N lat., and between 88° and 89° E. long., bounded on the north by Rungpore and Purneah, on the east by Rungpore and Mymunsingh, on the south by Mymunsingh and Rajishahy, and on the west by Purneah and Boglipore. The form of the district is triangular, the base being to the south; its greatest length from south to north is 105 miles, and its extreme breadth from east to west is 82 miles. A survey was made of the district in 1808 by Dr. Francis Buchanan, and its area was then found to comprise 5374 square miles, made up as follows:—

Rivers, tanks, water-courses, and marshes . .	353
Lands inundated during the rainy seasons . .	381
Red Clay	38
Light coloured clay	2441
Free soil	2161
	5374

The principal rivers by which the district is intersected are the Teesta, the Mahananda, and the Korotoya. During the rainy season, which usually sets in about the middle of June, and lasts for four months, these and many smaller tributary streams admit the passage of boats to almost every village in the district.

The surface of the country is undulating, but the greatest inequality of surface does not exceed 100 feet. The soil is generally light, and the principal cultivation being rice, the success of the harvest depends mainly upon the quantity of rain. Hemp, sugar, indigo, and a small quantity of cotton, are also cultivated, the first in order to prepare from its buds and leaves an intoxicating drug: several other fibrous plants are cultivated for the purpose of making cordage. The horses and oxen bred in Dinagepore are of very poor degenerate kinds; the former, which are not larger than ponies, may be bought at various prices from 2 to 6 rupees (4s. to 12s.) each. Tigers, bears, wild-buffaloes, and wild-hogs are very troublesome to the cultivators of land; the buffaloes and hogs run about in large herds, and commit great havoc in the fields. Otters are also very numerous, as well as the common porcupine. Wild water-fowl of various kinds are also seen in large flocks; the common wild-goose is most abundant, and is considered good eating. The natives also eat some kinds of lizards; but the chief part of the animal food consumed in this district consists of fish, which is so abundant that during the periodical inundation of the rice fields great numbers of small fishes are taken in them, and on the subsidence of the water many are left behind in the mud, and are taken without any trouble.

The principal towns are Dinagepore, the capital; Malda; Gour; and Raygunge; besides which the district contains a great number of villages. The whole population of Dinagepore was estimated by Dr. Buchanan in 1808 at 3,000,000: since that time it is believed that the numbers have somewhat increased. About seven-tenths of the inhabitants are Mohammedans, and the remaining three-tenths Hindus.

The district was formerly much infested by Dacoits or gang-robbers, but owing to the vigorous measures adopted by the English government in 1814 the evil was greatly checked, and has since entirely ceased.

Dinagepore, the capital of the district, is situated in 25° 37′ N. lat., and 88° 43′ E. long., about 100 miles N.N.E. from Morshedabad. The houses, computed at about 5000 in number, are mostly of a mean description, little better than huts; a few dwellings of European residents are large and commodious, but without any architectural beauty. The population of the town is computed at 30,000. (Buchanan's *Statistical Survey; Report of Committees of House of Commons*, 1832.)

DINAN, a town in France, in the department of Côte du Nord, on the slope of a hill on the left bank of the river Rance, a few miles above the mouth, 199 miles west, or west by south, from Paris in a strait line, or 220 miles by the road through Dreux, Alençon, Mayenne, Fougères, and Dol; in 48° 27′ N. lat., and 2° 4′ W. long. Dinan was in the middle ages the occasional residence of the dukes of Bretagne, who had here a castle, which still remains: antient ramparts of the town are standing, and are of vast height and thickness. The church contains the heart of the Constable du Guesclin. There are extensive and pleasant public walks and a concert-room. In a valley, a short distance north of the town, are the chalybeate waters of Dinan, which are in considerable repute for affections of the liver.

The population of Dinan, in 1832, was 8044: the inhabitants are engaged in an extensive trade in cider, beer, hemp flax, honey, wax, butter, tallow, skins, cattle, and horses. There are salt-works, and manufactures of linen yarn linen, cotton, flannel, shoes, and hats. The river is navigable, at high water, for boats of a considerable size up to Dinan; and the canal of the Ille and the Rance joins the river just above the town, opening a water communication with Rennes and the interior of Bretagne. The country round is fertile in corn and flax.

This town is the capital of an arrondissement which contained, in 1832, a population of 111,739.

DINANT, a very old town in the province of Namur, about 12 miles south of the city of Namur, in 50° 15′ N. lat., and 4° 54′ E. long. It is situated on the right bank of the Maas on a narrow strip between that river and a high rock. Part of it is on some islands in the Maas. The summit of this rock is defended by a strong fort. The population amounted in 1830 to 4337. The town contains several salt-refineries, four mills for sawing marble, some quarries of which are worked in the neighbourhood, several grist mills, paper-mills, breweries, and tanneries. Dinant formerly contained many extensive coppersmiths' works, but this branch of industry has almost entirely disappeared. A considerable quantity of gingerbread is made in the town and sent to different parts of the kingdom.

Dinant is conjectured to have taken its name from a temple dedicated to Diana, which once stood on the spot. In 559 it was enumerated among the possessions of the Bishoprick of Liege. In 870 it came into the possession of Charles the Bald. In the 12th century the town was fortified and considered a place of great strength. In 1466 Dinant was taken by the army under Philip the Good, and given up to pillage during three days. On this occasion 800 of the inhabitants were tied back to back and thrown into the Maas, and their houses were burnt. In 1554 the town was taken and pillaged by the French, and again in 1575 after a siege of eight days. At the treaty of Ryswick it was restored to the Bishop of Liege, but was again taken by the French in the war of the revolution, and constituted the chief place of an *arrondissement* in the department of the Sambre and Meuse. It was occupied by the allies in 1813. Dinant is on the high road between Namur and Givet. (Van der Maelen's *Dictionnaire Géographique de la province de Namur*.)

DINARCHUS, (Δείναρχος), one of the ten Greek orators, for the explanation of whose orations Harpocration compiled his lexicon. Dinarchus was a Corinthian by birth, who settled in Athens and became intimate with Theophrastus and Demetrius the Phalerian, a circumstance which combined with others enables us to determine his age with tolerable precision. Dionysius of Halicarnassus fixes his birth about the archonship of Nicophemus, B.C. 36. The time of his highest reputation was after the death of Alexander, when Demosthenes and other great orators were dead or banished. He seems to have got his living by writing speeches for those who were in want of them, and he carried on apparently a profitable business this way. After the garrison which Cassander had placed in Munychia had been driven out by Antigonus and Demetrius [ATHENS, p. 18] in the archonship of Anaxicrates, B.C. 307, Dinarchus, though a foreigner, being involved in a charge of conspiracy against the democracy, and having always been attached to the aristocratical party, and perhaps also fearing that his wealth might be a temptation to his enemies, withdrew to Chalcis in Eubœa. Demetrius afterwards allowed him to return to Athens with other exiles, in the archonship of Philippus, B.C. 292, after an absence of fifteen years. On his return Dinarchus, who had brought all his money back with him, lodged with one Proxenus, an Athenian, a friend of his, who, however, if the story is true, proved to be a knave and robbed the old man of his money, or at least colluded with the thieves. Dinarchus brought an action against him, and for the first time in his life made his appearance in a court of justice. The charge against Proxenus, which is drawn up with a kind of legal formality is preserved by Dionysius of Halicarnassus. Of the numerous orations of Dinarchus only three remain, and they are not intitled to very high praise. One of them is against Demosthenes touching the affair of Harpalus. [DEMOSTHENES.] Dionysius has taken great pains to distinguish the spurious from the genuine orations of Dinarchus. Of his genuine orations he enumerates 28 public orations and 31 private. This critic has passed rather a severe judgment on Dinarchus. He considered him merely as an imitator of Lysias, Hyperides, and Demosthenes, and though succeeding to a certain extent in copying the several styles and excellencies of these three great orators, yet failing, as all copiers from models must fail, in that natural expression and charm which are the characteristics of originality.

The few facts that we know about Dinarchus are derived from the Commentary of Dionysius on the Attic orators and the extracts which he gives from Philochorus. The three extant orations of Dinarchus are printed in the usual collections of the Attic orators.

DINDIGUL, a district in the Carnatic, bounded on the north by Coimbatore and Trichinopoly, on the east by the Bay of Bengal; on the south by Travancore and Tinnevelly, and on the west by Travancore and Coimbatore. The district is for the most part mountainous and woody, and the general surface of the country is 400 feet above the level of the sea. The Dindigul valley, inclosed by the Pilny mountains on the north, by the Travancore mountains in the west, by a range of hills on the east which extend from the town of Dindigul in the north to Sheragurry in the south, and on the south by the western ghauts, is a level tract of country 75 miles long from north to south, by about 20 miles broad. The district is watered by the Vyaur or Vaygaroo river, which rising at the base of the Alligherri hills south of the town of Dindigul, passes close to Madura, traverses the zemindaries of Shevagunga and Ramnad, and is almost wholly absorbed in a large tank about 20 miles south of Tondi, a considerable part of its waters having been previously diverted for the purposes of irrigation: except when the floods are more than usually great the bed of the river is altogether dry below Ramnad. The climate of Dindigul is reckoned much superior to that of most other parts of the south of India, the heat being much tempered by the showers caused by the interception of the clouds by the mountains, while in the cold season the thermometer seldom or never falls below 65°. The district was ceded to the English by Tippoo in 1792, and together with Madura, the Manapara pollams, Ramnad and Shevagunga has since been formed into a collectorate under the Madras presidency. The population of this collectorate was ascertained in 1822 to amount to 601,293 persons. The population of Dindigul alone has not been stated for a later period than 1811 when it amounted to 295,654 persons. Dindigul the capital of the district is situated in 10° 18′ N. lat., and 75° 2′ E. long.: 198 miles from Seringapatam and 275 miles from Madras, travelling distances. The town is clean and neat and contains about 7000 inhabitants.

DINEMOURA. [POECILOPODA.]

DINE'TUS, a genus of Hymenopterous insects, of the section Fossores. [LARRIDÆ.]

DINGLE, a corporate town on a bay of the same name, in the barony of Corcaguinny and county of Kerry, in Ireland; distant from Dublin 164 Irish or 208 English miles. The limits of the corporation embrace a circuit of two Irish miles by land and sea, measured from the parish church.

The antient name was Dangan-I-Cushy, or the fortress of Hussey, an adventurer of English descent, to whom one of the family of Desmond granted the tract of country on which the town stands. The name has been corrupted to Dangan-I-Couch and Dingle-I-Couch, in which latter form it is still commonly used. During the latter end of the sixteenth and beginning of the seventeenth century, Dingle enjoyed a considerable traffic with Spain, from which large quantities of wines and spices were annually imported here in return for its exports of tanned hides, Irish friezes, woollen stockings, salt beef, butter, and salmon. The town was erected into a corporation by Queen Elizabeth in 1585, at which time it sent members to the Irish parliament. About the same time it was walled in; but the walls being built of clay mortar, from the difficulty of procuring lime, soon fell to decay. It is now governed by charter of the 4th of James I. The corporation consists of sovereign, twelve burgesses, and an unlimited number of freemen. There are held a Tholsel court, court of conscience, and petty sessions once a fortnight; but the quarter-sessions which were formerly held here have been removed to Tralee, a distance of 27 miles, which is said to be productive of some inconvenience.

The town has an antique appearance. Some of the old houses are in the Spanish taste, with stone balconies, &c., and several bear date as early as the reign of Elizabeth. The vaults of the old castle built by Hussey were standing in 1780, and used as the town-gaol. The parish church, dedicated to St. James, is said to have been built at the charge of the Spanish who frequented the port; it was a large structure, but is now much decayed. The residence of the proprietor, the knight of Kerry, is the principal modern building, attached to which are some well laid out gardens. A new bridewell has lately been built here. There are also a market-house and small barrack.

The town is not lighted or watched; the streets, roads, and bridges are repaired by county presentments, and the duties of a police are performed by a portion of the constabulary force of the county.

The harbour, a land-locked creek on the northern side of the great æstuary called Dingle Bay, is capable of floating vessels of 300 tons up to the town, and is pretty well protected from the westerly winds which prevail on this coast. From the difficulty however of distinguishing the entrance, vessels bound for Dingle in a westerly gale run a risk of going to leeward on the dangerous shoals of Castlemain harbour at the head of the estuary. In 1765 a sum of 1000*l.* was voted by the Irish parliament in aid of the building of the quay. The town has improved very much within the last twenty years, although the linen trade, which formerly flourished here, has declined. The chief trade is an export of butter and corn to Liverpool. The foreign trade is confined to a single vessel. Average coasting tonnage for Great Britain, inwards, 550 tons; outwards, 500 do.; for Ireland, inwards, 200 tons; outwards, 100 do.

Population in 1821, 4538; do. in 1831, 4327: decrease in 10 years, 211. Total population within the limits of the borough in 1831, 9329. In the parish of Dingle there were, in 1834, 5 schools, educating 284 males and 106 females; of these two were small free schools. (Smith's *History of the County of Kerry; Reports of the Commissioners on Municipal Corporations, Ireland, &c.*)

DINGWALL. [ROSS, SHIRE OF.]

DINOPS. [CHEIROPTERA, vol. vii., p. 26.]

DINOTHE'RIUM, a genus of gigantic extinct herbivorous mammifers established by Professor Kaup. The remains have been found most abundantly at Epplesheim in Hesse Darmstadt, in strata of sand referrible to the second period of the tertiary formations (Miocene of Lyell). Fragments are noticed as occurring also in several parts of France, Bavaria, and Austria, by Cuvier, who, from the resemblance of their molar teeth to those of the tapirs, at first considered the animals to have been an enormous species of the last-named genus.

We select as an example *Dinotherium giganteum*, the largest species yet discovered, and which is calculated both by Cuvier and Kaup to have attained the length of eighteen feet. The bones of the head and the teeth are the principal remains hitherto found. A scapula in form resembling more nearly that of a mole than any other animal, is the principal bone of the body yet found, and this shoulder blade has been considered as indicating a peculiar adaptation of the fore-leg to the purposes of digging. In the autumn of 1836, an entire head of the animal was disinterred at Epplesheim, measuring about four feet in length and three in breadth, of which Professor Kaup and Dr Klipstein have given figures and a description*.

It will be seen from the cuts (which are copied from the works of Dr. Kaup and those of Drs. Kaup and Klipstein), as well as from the casts in the British Museum, that though the form of the molar teeth approximates to that of the tapirs, the tusks placed at the anterior extremity of the lower jaw and curved downwards somewhat after the fashion of those in the upper jaw of the Walrus, exhibit a remarkable deviation from this part of the dental formula in any other known animal, whether living or fossil. With this is combined a form of the lower jaw itself, which can not but arrest the attention of every observer.

Dr. Buckland, in the first edition of his Bridgewater Treatise, published before the appearance of the memoir of Dr. Kaup and Dr. Klipstein, giving figures and a description of the entire head, but after the publication of Dr Kaup's earlier publication,—when adverting to the mammalia of the miocene period of Lyell, observes, that the

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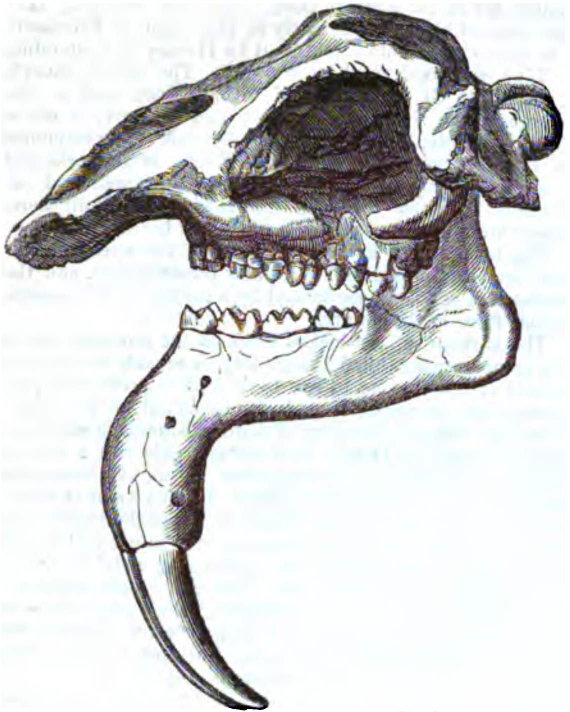
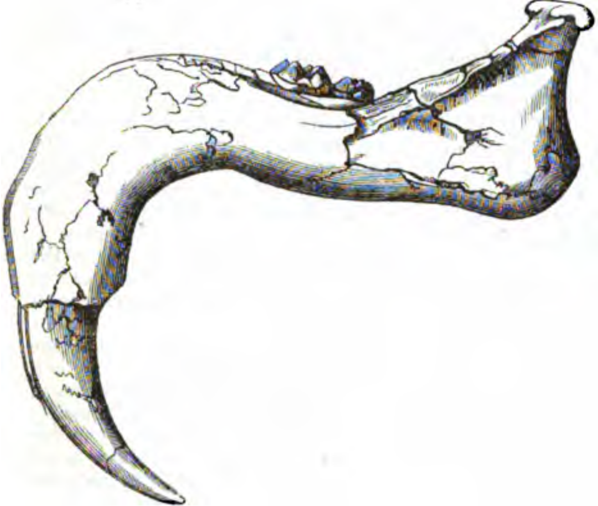
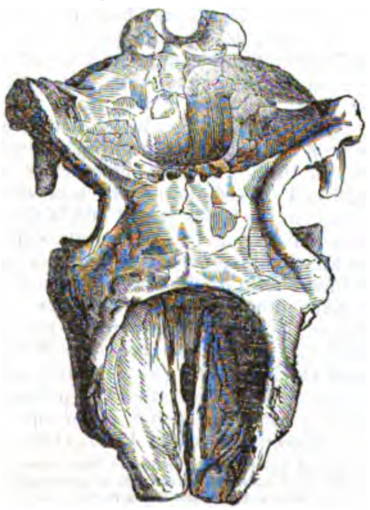
* Beschreibung und Abbildungen von dem in Rheinhessen aufgefundenen colossalen schedel des Dinotherii gigantei mit geognostischen Mittheilungen uber die knochenfürhenden Bildungen des mittelrheinischen Tertiärbeckens von Dr. J. J. Kaup, & Dr. A. v. Klipstein. 4to., Darmstadt, 1836.



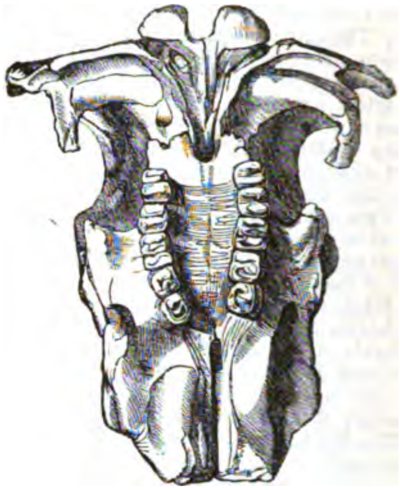
Profile of the skull of Dinotherium giganteum. The dotted line shows the edge of the coronoid process of left lower jaw, through the ramus of which the last molar tooth and a portion of the last but one are supposed to be seen. The zygomatic arch is fractured and the intermediate portion of it lost.



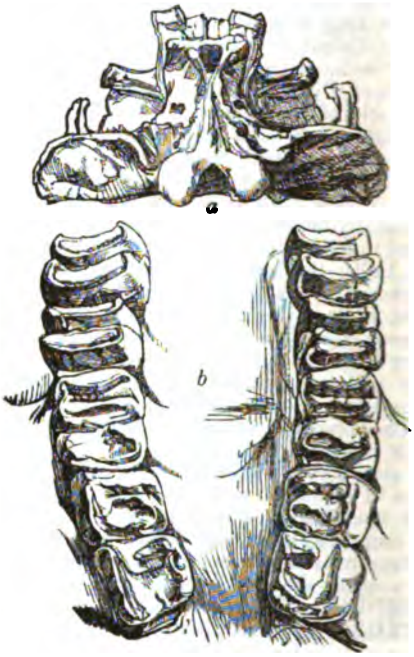
Profile of lower jaw of Dinotherium giganteum (another individual) with the coronoid process gone, and only two teeth in sight. The length of this, including the tusk, is nearly four feet.



Skull of Dinotherium giganteum seen from above.



Skull of the same seen from below



Portions of the skull of the same; *a*, posterior part of the skull seen from below, showing the occipital condyle and foramen, &c. &c.; *b*, roof of the mouth and molar teeth; the interval between the rows widening from before backwards.

second, or miocene system of tertiary deposits, contains an admixture of the extinct genera of lacustrine mammalia of the first or eocene series, with the earliest forms of genera which exist at the present time. This admixture, he adds, was first noticed by M. Desnoyers, in the marine formations of the Faluns of Touraine, where the remains of *Palæotherium*, *Anthracotherium*, and *Lophiodon*, which were the prevailing genera in the eocene period, are found mixed with bones of the *Tapir*, *Mastodon*, *Rhinoceros*, *Hippopotamus*, and *Horse*. These bones are fractured and rolled, and sometimes covered with *flustra*, thus giving indication of having been derived from carcases drifted into an estuary or sea. Similar admixtures, continues Dr. Buckland, have been found in Bavaria and near Darmstadt, and many of these animals also indicate a lacustrine, or swampy condition of the regions they inhabited. One of them (*Dinotherium giganteum*) is stated to have attained eighteen feet in length and to have been the largest of all terrestrial *mammalia* yet discovered, exceeding even the largest fossil elephant.

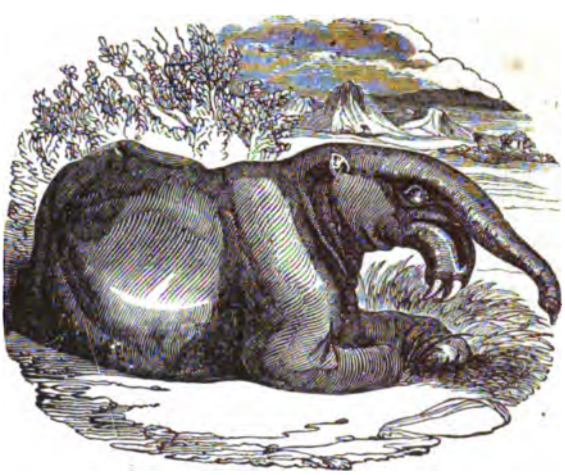
In this view of the subject, it becomes of importance to see what were the remains which were found in the strata of sand at Eppelsheim near Altzey, about twelve leagues south of Mayence, in company with those of the *Dinotherium*

Dr. Kaup in his 'Description d'ossemens fossiles (*Darmstadt*, 1832), gives the following number of species:—*Dinotherium* 2; *Tapirus* 2; larger than living species. *Chalicotherium* (allied to Tapirs) 2; *Rhinoceros* 2; *Tetracaulodon* (allied to Mastodon) 1; *Hippotherium* (allied to Horse) 1; *Sus* 3; *Felis* (some as large as a Lion) 4; *Machairodus* (allied to Bear, Ursus cultridens); *Gulo* (Glutton) 1; *Agnotherium* (allied to Dog, but as large as a Lion) 1.

Dr. Buckland in the work and in the edition above quoted, after giving a description of the tusks of the *Dinotherium*, thus proceeds, 'I shall confine my present remarks to this peculiarity in the position of the tusks, and endeavour to show how far these organs illustrate the habits of the extinct animals in which they are found. It is mechanically impossible that a lower jaw, nearly four feet long, loaded with such heavy tusks at its extremity, could have been otherwise than cumbrous and inconvenient to a quadruped living on dry land. No such disadvantage would have attended this structure in a large animal destined to live in water; and the aquatic habits of the family of Tapirs, to which the Dinotherium was most nearly allied, render it probable that, like them, it was an inhabitant of fresh-water lakes and rivers. To an animal of such habits, the weight of the tusks sustained in water would have been no source of inconvenience; and, if we suppose them to be employed as instruments for raking and grubbing up by the roots large aquatic vegetables from the bottom, they would, under such service, combine the mechanical powers of the pick-axe with those of the horse-harrow of modern husbandry. The weight of the head, placed above these downward tusks, would add to their efficiency for the service here supposed, as the power of the harrow is increased by loading it with weights. The tusks of the Dinotherium may also have been applied with mechanical advantage to hook on the head of the animal to the bank, with the nostrils sustained above the water, so as to breathe securely during sleep, whilst the body remained floating at perfect ease beneath the surface: the animal might thus repose, moored to the margin of a lake or river, without the slightest muscular exertion, the weight of the head and body tending to fix and keep the tusks fast anchored in the substance of the bank; as the weight of the body of a sleeping bird keeps the claws clasped firmly around its perch. These tusks might have been further used, like those in the upper jaw of the Walrus, to assist in dragging the body out of the water; and also as formidable instruments of defence. The structure of the scapula already noticed seems to show that the fore leg was adapted to co-operate with the tusks and teeth, in digging and separating large vegetables from the bottom. The great length attributed to the body would have been no way inconvenient to an animal living in the water, but attended with much mechanical disadvantage to so weighty a quadruped upon land. In all these characters of a gigantic, herbivorous, aquatic quadruped, we recognize adaptations to the lacustrine condition of the earth, during that portion of the tertiary periods to which the existence of these seemingly anomalous creatures appears to have been limited.'

In his description of the figures of the remains of *Dinotherium* in the same work, Dr. Buckland observes that they were found in a sand-pit containing marine shells at Epplesheim, near Altzey, about forty miles north-west of Darmstadt, where they are preserved in the museum. He adds, that bones of Dinotherium have lately been found in tertiary fresh water limestone, near Orthes, at the foot of the Pyrenees; and with them remains of a new genus allied to rhinoceros; of several unknown species of deer; and of a dog or wolf, the size of a lion. The following conclusion terminates the note appended to the description in Dr. Buckland's first edition: 'From the near approximation of this animal to the living tapir, we may infer that it was furnished with a proboscis, by means of which it conveyed to its mouth the vegetables it raked from the bottom of lakes and rivers by its tusks and claws. The bifid ungual bone (Kaup, Add., table 11), discovered with the other remains of Dinotherium, having the remarkable bifurcation which is found in no living quadrupeds, except the Pangolins, seems to have borne a claw, like that of these animals, possessing peculiar advantages for the purpose of scraping and digging; and indicating functions concurrent with those of the tusks and scapulæ.'

Upon referring to the view of the skull of *Dinotherium giganteum* seen from above, the width of the anterior portion of the cranium and the deep depression there visible will strike the observer as very remarkable; and we find that Professor Kaup has, in his restoration of the animal, furnished it with a considerable proboscis, and given its general form as a good deal resembling that of the tapir



[Restoration of Dinotherium giganteum.]

Dr. Buckland, in the supplementary notes to his second edition, has the following notice, with a reference to p. 135. 'The Dinotherium has been spoken of as the largest of terrestrial mammalia, and as presenting in its lower jaw and tusks a disposition of an extraordinary kind, adapted to the peculiar habits of a gigantic herbivorous aquatic quadruped.' The Dr. then alludes to the entire head found in 1836, and thus proceeds:—'Professor Kaup and Dr. Klipstein have recently published a description and figures of this head, in which they state that the very remarkable form and dispositions of the hinder part of the skull show it to have been connected with muscles of extraordinary power, to give that kind of movement to the head which would admit of the peculiar action of the tusks in digging into and tearing up the earth. They further observe that my conjectures (p. 138) respecting the aquatic habits of this animal are confirmed by approximations in the form of the occipital bone to the occiput of *Cetacea;* the Dinotherium, in this structure, affording a new and important link between the *Cetacea* and the *Pachydermata*.' Dr. Buckland, in this second edition, gives a copy of the profile of the entire head and of the restoration.

This head has been exhibited at Paris, and seems to have excited great interest among the French zoologists; for we find in the 'Journal des Débats' of the 21st of March in the present year (1837) that at the sitting of the Académie Royale des Sciences de Paris on the day before, M. de Blainville read a note detailing his particular views of the position which the animal held in the animal series—views which, it is there stated, were adopted both by M. Duméril and M. Isidore Geoffroy Saint-Hilaire. These views are detailed in 'L'Institut' of the 22nd of March; and the subject is so interesting, that we here present them to the reader, more especially as they are so much at variance with the restoration, a copy of which is above given.

'M. de Blainville read a note on the fossil head of the *Dinotherium giganteum*, recently exhibited at Paris by MM. Kaup and Klipstein. According to M. de Blainville, the *Dinotherium* constituted a genus of mammifers of the family of the *Dugongs* and *Lamantins*, which family makes a part of the order or of the degree of organization named by the last-mentioned zoologist *Gravigrades*, on account of their heavy progression, and of which the first family is formed by the *Elephants*. The following were the grounds stated for this opinion.

'As regards the teeth, the molars, five in number on each side of each jaw, have their crown squared and deeply traversed by two transverse elevations, the same as in the *Lamantins*. But as this character occurs also in the *Tapirs* and *Kangaroos*, and even in the *Lophiodons*, it would be far from sufficient for deciding the question, if it were not joined with the absence of false molars and canines (a formula which produces a considerable space between the first molar and the incisors), and with the number and form of these last, which entirely resemble small tusks; only they are implanted at the extremity of the lower jaw, and are directed downwards. Whether or no there existed a pair of incisors in the upper jaw, is an uncertain point, the two extremities of this jaw, which have been found, being more or less truncated. It may, however, be inferred, from the enlarged and thick form of a fragment found some years ago, that it is possible that the animal might have had upper incisors, but smaller than those below: perhaps only rudimentary.

'As to the form of the head and its parts, it corroborates what the dental system had established. In fact, the occipital condyles are entirely terminal, or in the direction of the longitudinal axis of the head, as in the lamantins and the cetaceous edentata, modified for existence in the water. The occipital surface is large, subvertical, and even inclined from before, backwards, with a profound mesial depression, for the insertion either of a very strong cervical ligament or powerful muscles for the elevation of the head, and the basilary part of the skull is narrow in its component parts, while the syncipitofrontal region is, on the contrary, very flat, very wide, as in the lamantins and dugongs, overplumbing the temporal fossa, which is extremely wide and extremely deep, indicating enormous levator muscles for the lower jaw, not only for the purpose of mastication, but adapted besides for the particular action of that jaw, with its rake-like incisor teeth. This disposition of the temporal fossa is perfectly in harmony with the zygomatic arch, which is wide, thick, robust, and complete, as far as may be inferred from the portion which is broken, but which nevertheless offers the articulating surface of the corresponding bone, exactly as in the lamantins: perhaps, however, without the great enlargement which may be remarked at the jugal apophysis of the temporal bone in the latter. The orbit is, as in the animals last named, very small and lateral, but very largely open in the zygomatic fossa. The auditory aperture is small, narrow, and rather oblique from below upwards. The face is wide and flattened, prolonged and enlarged a little, as in the *Cetacea*, anteriorly. It presents in its middle a very large aperture, the composition of which it has not been possible to study on account of the position of the head, which is upside-down, but which aperture, though evidently wider and greater than that of the dugong, has evidently the greatest analogy to what exists in that animal. The posterior orifice of the nasal cavity is, on the contrary, very narrow. The sub-orbital hole is very considerable, but even less, perhaps, than it is in the dugong. With regard to the lower jaw, that again exhibits the greatest analogy to that of the dugong, from the manner in which its branches are curved downwards towards the anterior third part of their length; only, that of the dinotherium being armed at its recurved extremity with a tusk, the ascending ramus offers, in its width and its condyle, which is as transverse as in the *carnivora*, a concordant disposition; so that the only motions permitted should be those of elevation and depression, as in those animals. The ethmoïd surface of the temporal bone, also, is, as it were, a portion of a hollow transverse cylinder, with an apophysary lamina, having an extremely strong ridge—"une lame apophysaire d'arrêt extrêmement forte." "With this element (says M. de Blainville) we may regard it as nearly beyond doubt that the *Dinotherium* was an animal of the family of the *Lamantins*, or *Aquatic Gravigrades*, its proper position being at the head of the family, preceding the *Dugong*, and consequently preceded by the *Tetracaulodon*, which ought to terminate the family of the *Elephants*. In a word, the animal, in our opinion, was a *Dugong with tusk-incisors*. We must, then, suppose that it had only one pair of anterior limbs, with five toes on each. As to the supposition that the animal was provided with a trunk, which might be presumed from the great nasal opening, the enlarged surfaces which surround it, and the size of the suborbital nerve, as far as it may be judged of from the size of the suborbital hole, we believe that that is at least doubtful, and that it is more probable that these dispositions bear relation to a considerable development of the upper lip and the necessary modification of the nostrils in an aquatic animal, as is equally the case in the dugong. We think even that the upper lip, by its immense development, embraced the lower one, and thus hid even the base of the tusks, and that the lower one was sufficiently small, as may be presumed from the chin-holes (trous mentonniers). After this, it is easy to perceive that, of the two principal opinions which have been broached and discussed concerning this singular animal, we are much further from considering it a great species of *Edentata*, near the sloths, with Dr. Kaup, than from considering it as a tapir, as G. Cuvier did, from an examination of the molar teeth, the only parts then known. In fact, there is in our opinion much less distance, in the natural method, between a dugong and a tapir, than between a dugong and a sloth." In this note M. de Blainville has not taken into consideration that the head of the *Dinotherium*, as well as a phalanx which was found in the same locality, are referred by Professor Kaup to the same animal: but M. de Blainville does not believe that this phalanx really belonged to the *Dinotherium*. "In fact (says he), M. Lartet found with these same phalanges a portion of a tooth, which evidently indicates a great pangolin."

'At the end of the reading, M. Duméril rose to confirm the views of M. de Blainville. He insisted particularly on the transversal form and great extent of the condyle of the lower jaw and of the articular fossa destined to receive it. He much regretted the loss of the zygomatic arch, the bases of which only remain on the jugal and temporal bones. "The curvatures of this arch," said he, "would have given ideas of the volume and force of the masseter and temporal muscles, which must have been considerable. It would be important to know them to compare them with those of the *Lamantin* on one side, and on the other with the *Megatherium*, whose skeleton is at Madrid. With regard to the phalanges, which are believed to be those of the *Dinotherium*, they are certainly analogous to those of the *Sloths*; but in the *Lamantin*, the ungual phalanx, which is in fact a double pulley with a mesial projection at the base, offers at its other extremity a single point with a sort of hood (capuchon) below: that is to say, inverse to that which is found in the great species of cats (*Felis*), and very different from those of the *Sloths* and the *Ant-eaters*."'

In this statement there is one position that is rather staggering; and, indeed, we cannot but think it probable that M. de Blainville has not been quite accurately reported. He is made to observe that the articulation of the lower jaw is such that the only motions permitted should be those of elevation and depression, as in the *Carnivora*. Now that with true grinding teeth, like those of the *Dinotherium*, the jaws should be limited to the motions of elevation and depression, so admirably fitted for working the cutting edges of the scissor-teeth of the *Carnivora*, is almost inconceivable. We shall wait with some anxiety for the arrival of the head in this country, when we shall be able to ascertain whether there be not a convex eminence anterior to the transverse depression or glenoïd cavity for the condyle, indicative of a horizontal motion of the jaw backwards and forwards, a mode of operation which would be well adapted to the transverse ridges of enamel on the molar teeth of *Dinotherium*. Without venturing to give any opinion as to the true position of this interesting genus in the animal series till an opportunity has been afforded of examining the skull itself, we may be permitted to observe, that the evidence on which M. de Blainville is stated to have rested for the cetaceous character of *Dinotherium* appears to us to be rather meagre, and hardly sufficient to warrant the conclusion.

DI'OCESE, (*διοίκησις*, *dioikêsis*, literally 'administration') in the time of Constantine and afterwards was used to designate one of the civil divisions of the empire, but it is now used only in reference to ecclesiastical affairs. A diocese is a district over which the authority of a bishop extends. It is equivalent to BISHOPRICK.

Since the articles BISHOP and BISHOPRICK were written a change has taken place in the diocesan divisions of England. The bishoprick of Bristol no longer exists. The county of Dorset, which, with the city of Bristol and a small district around, formed the diocese, is distributed between the sees of Salisbury and Exeter. The city of Bristol is annexed to the diocese of Gloucester, and the bishop of Gloucester is henceforth to be called bishop of Gloucester and Bristol. The former number of bishopricks being thus reduced, a new diocese has been formed for a new bishop whose style is the bishop of Ripon. This diocese consists of the town and borough of Ripon and all such parts of the deaneries of the Ainsty and of Pontefract as adjoin the western boundaries of the liberty of the Ainsty and of the Wapentake of Barkston Ash, Osgoldcross and Staincross and all that part of the county of York, which now forms part of the archdeaconry of Richmond and diocese of Chester; and also the whole of the parish of Aldborough. This diocese is thus formed out of the dioceses of York and Chester.

These changes have been made in pursuance of 'an act for carrying into effect the reports of the commissioners appointed to consider the state of the established church in England and Wales, with reference to ecclesiastical duties and revenues, so far as they relate to episcopal dioceses, revenues and patronage.' Other changes in respect of the diocesan division of the country have been made, and still further changes are contemplated. Among these is the erection of a new bishoprick, of which the collegiate church of Manchester is to be the cathedral.

DIOCLES, a Greek mathematician, who is chiefly known by his invention of the cissoid. [CISSOID.]

DIOCLETIA'NUS, CAIUS VALERIUS, was born at Dioclea, in Dalmatia, some say at Salona, about 245 A. D. according to some, but others make him ten years older. His original name was Diocles, which he afterwards changed into Diocletianus. He is said by some to have been the son of a notary, by others the freedman of a senator named Anulinus. He entered the army at an early age, and rose gradually to rank; he served in Gaul, in Mœsia under Probus, and was present at the campaign against the Persians, in which Carus perished in a mysterious manner. Diocletian commanded the household or imperial body guards when young Numerianus, the son of Carus, was secretly put to death by Aper his father-in-law, while travelling in a close litter on account of illness, on the return of the army from Persia. The death of Numerianus being discovered after several days by the soldiers near Calchedon, they arrested Aper and proclaimed Diocletian emperor, who addressing the soldiers from his tribunal in the camp, protested his innocence of the death of Numerianus, and then upbraiding Aper for the crime, plunged his sword into his body. The new emperor observed to a friend that 'he had now killed the boar,' punning on the word Aper, which means a boar, and alluding to the prediction of a soothsayer in Gaul who had told him that he would become emperor after having killed a boar. (Vopiscus in *Hist. Aug.*) Diocletian, self-composed and strong-minded in other respects, was all his life an anxious believer in divination, which superstition led him probably to inflict summary punishment upon Aper with his own hands. He made his solemn entrance into Nicomedia in September, 284, which town he afterwards chose for his favourite residence. Carinus, the other son of Carus, who had remained in Italy, having collected a force to attack Diocletian, the two armies met at Margum in Mœsia, where the soldiers of Carinus had the advantage at first, but Carinus himself being killed during the battle by his officers, who detested him for his cruelty and debauchery, both armies joined in acknowledging Diocletian emperor, A. D. 285. Diocletian was generous after his victory, and, contrary to the common practice, there were no executions, proscriptions, or confiscations of property; he even retained most of the officers of Carinus in their places. (Aurelius Victor.)

Diocletian on assuming the imperial power found the empire assailed by enemies in various quarters, on the Persian frontier, on the side of Germany and of Illyricum, and in Britain; besides which a serious revolt had broken out in Gaul among the rural population, under two leaders who had assumed the title of emperor. To quell the disturbance in Gaul, Diocletian sent his old friend Maximianus, a native of Pannonia, and a brave but rude uncultivated soldier. Maximianus defeated the Bagaudi, for such was the name the rustic insurgents had assumed. In the year 286, Diocletian chose Maximianus as his colleague in the empire, under the name of Marcus Valerius Maximianus Augustus, and it is to the credit of both that the latter continued ever after faithful to Diocletian and willing to follow his advice. Maximianus was stationed in Gaul and on the German frontier to repel invasion; Diocletian resided chiefly in the East to watch the Persians, though he appears to have visited Rome in the early part of his reign. About 287 the revolt of Carausius took place. [BRITAIN.] In the following year Maximianus defeated the Germans near Treviri, and Diocletian himself marched against other tribes on the Rhætian frontier; the year after he defeated the Sarmatians on the lower Danube. In the same year, 289, peace was made between Carausius and the two emperors, Carausius being allowed to retain possession of Britain. In 290 Maximianus and Diocletian met at Milan to confer together on the state of the empire after which Diocletian returned to Nicomedia. The Persians soon after again invaded Mesopotamia and threatened Syria, the Quinquegentiani, a federation of tribes in the Mauritania Cæsariensis, revolted, another revolt under one Achillæus broke out in Egypt, and another in Italy under a certain Julianus. Diocletian thought it necessary to increase the number of his colleagues in order to face the attacks in the various quarters. On the 1st March, 292, or 291 according to some chronologists, he appointed Galerius as Cæsar, and presented him to the troops at Nicomedia. At the same time Maximianus adopted on his part Constantius called Chlorus. The two Cæsars repudiated their respective wives; Galerius married Valeria, Diocletian's daughter adding to his name that of Valerianus; and Constantius married Theodora, daughter of Maximianus. Galerius was a native of Dacia, and a good soldier, but violent and cruel; he had been a herdsman in his youth, for which he has been styled, in derision, Armentarius. The two Cæsars remained subordinate to the two Augusti, though each of the four was entrusted with the administration of a part of the empire. Diocletian kept to himself Asia and Egypt; Maximianus had Italy and Africa; Galerius, Thrace and the Illyricum; and Constantius had Gaul and Spain. But it was rather an administrative than a political division. At the head of the edicts of each prince were put the names of all the four, beginning with that of Diocletian. Diocletian resorted to this arrangement probably as much for reasons of internal as of external policy. For nearly a hundred years before, ever since the death of Commodus, the soldiers had been in the habit of giving or selling the imperial crown, to which any general might aspire. Between thirty and forty emperors had been thus successively made and unmade, many of whom only reigned a few months. By fixing upon four colleagues, one in each of the great divisions of the empire, each having his army, and all mutually checking one another, Diocletian put a stop to military insolence and anarchy. The empire was no longer put up to sale, the immediate and intolerable evil was effectually cured, though another danger remained, that of disputes and wars between the various sharers of the imperial power; still it was a smaller danger and one which did not manifest itself so long as Diocletian remained at the helm. Writers have been very free of their censure upon this emperor for parcelling, as they call it, the empire; but this was the only chance there was of preventing its crumbling to pieces. Italy, and Rome, in particular, lost by the change: they no longer monopolized the wealth and power of the world, but the other provinces gained. The empire was much too large for one single man or a single central administration, especially under the dwindled influence of the Roman name, and amidst the numerous causes of local dissension and discontent, private ambition, social corruption, and foreign hostility, that had accumulated for three centuries, since the time of Augustus.

The new Cæsars justified Diocletian's expectations. Constantius defeated the Franks and the Alemanni, and soon after reconquered Britain. Galerius subjugated the Carpi, and transported the whole tribe into Pannonia. In the year 296, the Persians, under their king Narses, again invaded Mesopotamia and part of Syria. Galerius marched against them, but being too confident was defeated by superior numbers, and obliged to retire. On his meeting Diocletian, the emperor showed his dissatisfaction by letting Galerius walk for a mile, clad in purple as he was, by the side of his car. The following year Galerius again attacked the Persians, and completely defeated them, taking an immense booty. The wives and children of Narses, who were among the prisoners, were treated by Galerius with humanity and respect. Narses sued for peace, which was granted by Diocletian on condition of the Persians giving up all the territory on the right or western bank of the Tigris. This peace was concluded in 297, and lasted forty years. At the same time Diocletian marched into Egypt against Achillæus, whom he besieged in Alexandria, which he took after a siege of eight months, when the usurper and his chief adherents were put to death. Diocletian is said to have behaved on this occasion with unusual sternness. Several towns of Egypt, among others Busiris and Coptos, were destroyed. Constantine, the son of Constantius, who was educated at Nicomedia, accompanied the emperor in this expedition. Diocletian fixed the limits of the empire on that side at the island of Elephantina, where he built a castle, and made peace with the neighbouring tribes, called by some Nubæ and by others Nabatæ, to whom he gave up the strip of territory which the Romans had conquered, of seven days' march above the first cataract, on condition that they should prevent the Blemmyes and Ethiopians from attacking Egypt. Maximianus in the mean time was engaged in putting down the revolt in Mauritania, which he effected with full success. For several years after this the empire enjoyed peace, and Diocletian and his colleagues were chiefly employed in framing laws and administrative regulations, and in constructing forts on the frontiers. Diocletian kept a splendid court at Nicomedia, which town he embellished with numerous structures. He, or rather Maximianus by his order, caused the magnificent Thermæ at Rome to be built, the remains of which still bear Diocletian's name, and which contained, besides the baths, a library, a museum, public walks, and other establishments.

In February 303 Diocletian issued an edict against the Christians, ordering their churches to be pulled down, their sacred books to be burnt, and all Christians to be dismissed from offices civil or military, with other penalties, exclusive, however, of death. Various causes have been assigned for this measure. It is known that Galerius had always been hostile to the Christians, while Diocletian had openly favoured them, had employed them in his armies and about his person; and Eusebius (*Hist. Eccles.* viii.) speaks of the prosperity, security and protection, which the Christians enjoyed under his reign. They had churches in most towns, and one at Nicomedia in particular under the eye of the emperor. Just before the edict was issued, Galerius had repaired to Nicomedia to induce Diocletian to proscribe the Christians. He filled the emperor's mind with reports of conspiracies and seditions. The imperial palace took fire, Constantine (*Oratio ad Cœtum Sanctorum*) says, from lightning, and Galerius suggested to the emperor that it was a Christian plot. The heathen priests on their part exerted themselves for the same purpose. It happened that on the occasion of a solemn sacrifice in presence of the emperor, while priests were consulting the entrails of the victims, the Christian officers in the imperial retinue crossed themselves; upon which the priests declared that the presence of profane men prevented them from discovering the auspices. Diocletian who was very anxious to pry into futurity, became irritated, and ordered all his Christian officers to sacrifice to the gods under pain of flagellation and dismissal, which many of them underwent. Several oracles which he consulted gave answers unfavourable to the Christians. The church of Nicomedia was the first pulled down by order of the emperor. The rashness of a Christian who publicly tore down the imperial edict exasperated Diocletian still more: the culprit was put to a cruel death. Then came a second edict, ordering all magistrates to arrest the Christian bishops and presbyters, and compel them to sacrifice to the gods. This was giving to their enemies power over their lives, and it proved in fact the beginning of a cruel persecution, whose ravages were the more extensive in proportion to the great diffusion of Christianity during a long period of toleration. This was the last persecution under the Roman empire, and it has been called by the name of Diocletian. But that emperor had little share in it, beyond issuing the two edicts, which he did reluctantly and after long hesitation, according to Lactantius's acknowledgment: he fell ill a few months after, and on recovering from his long illness he abdicated. Galerius who had instigated the persecution, was the most zealous minister of it; the persecution raged with most fury in the provinces subject to his rule, and he continued it for several years after Diocletian's abdication, so that it might with more propriety be called the Galerian persecution. The countries under the government of Constantius suffered the least from it. (Eusebius, *Hist. Eccl.;* Lactantius *de Mort. Persecut.;* and Constantine's *Oration*, above quoted, as given by Eusebius.)

In November of that year, 303, Diocletian repaired to Rome, where he and Maximianus enjoyed the honour of a triumph, followed by festive games. This was the last triumph that Rome saw. The populace of that city complained of the economy of Diocletian on the occasion, who replied that moderation and temperance were most required where the censor was present. They vented their displeasure in jibes and sarcasms, which so hurt Diocletian that he left Rome abruptly in the month of December for Ravenna, in very cold weather. In this journey he was seized by an illness which affected him the whole of the following year, which he spent at Nicomedia. At one time he was reported to be dead. He rallied however in the spring of 305, and showed himself in public, but greatly altered in appearance. Galerius soon after came to Nicomedia, and it is said that he persuaded and almost forced Diocletian to abdicate. Others say that Diocletian did it spontaneously. On the 1st of May he repaired with his guards to a spot, three miles out of Nicomedia, where he had thirteen years before proclaimed Galerius as Cæsar, and there addressing his officers and court, he said that the infirmities of age warned him to retire from power, and to deliver the administration of the state into stronger hands; he then proclaimed Galerius as Augustus, and Maximinus Daza as the new Cæsar. Constantine, who has given an account of the ceremony, which is quoted by Eusebius in his life of that prince, was present, and the troops fully expected that he would be the new Cæsar; when they heard another mentioned, they asked each other whether Constantine had changed his name. But Galerius did not leave them long in suspense: he pushed forward Maximinus and showed him to the assembly, and Diocletian clothed him with the purple vest, after which the old emperor returned privately in his carriage to Nicomedia, and immediately after set off for Salona in Dalmatia, near which he built himself an extensive palace by the sea-shore, in which he lived for the rest of his life, respected by the other emperors, without cares and without regret. Part of the external walls which inclosed the area belonging to his palace and other buildings still remain, with three of the gates, as well as a temple, which is now a church at Spalatro, or Spalato, in Dalmatia, a comparatively modern town, grown out of the decay of the antient Salona, and built in great part within the walls of Diocletian's residence, from the name of which 'Palatium' it is believed that 'Spalato' is derived. Descriptions of the remains of the palace are given in Spon, Fortis, Cassas, and Adams's splendid engravings, London, 1764. At the same time that Diocletian abdicated at Nicomedia, Maximianus, according to an agreement between them, performed a similar ceremony at Milan, proclaiming Constantius as Augustus, and Severus as Cæsar. Both Severus and Maximinus Daza were inferior persons, and creatures of Galerius, who insisted upon their nomination in preference to that of Maxentius and Constantine, whom Diocletian had at first proposed. Maximianus retired to his seat in Lucania, but not being endowed with the firmness of Diocletian, he tried some time after to recover his former power, and wrote to his old colleague to induce him to do the same. 'Were you but to come to Salona,' answered Diocletian, 'and see the vegetables which I grow in my garden with my own hands, you would no longer talk to me of empire.' In his retirement he used to observe to his associates how difficult it is even for the best-intentioned man to govern well, as he cannot see everything with his own eyes, but must trust to others who often deceive him: 'Bonus, cautus, optimus, venditur Imperator' (Vopiscus). Once only he left his retirement to meet Galerius in Pannonia for the purpose of appointing a new Cæsar, Licinius, in the room of Severus, who had died. Licinius however did not prove grateful, for after the death of Galerius, A.D. 311, he ill-treated his widow, Valeria, Diocletian's daughter, who then with her mother, Prisca, took refuge in the territories of Maximinus Daza. The latter offered to marry Valeria, but on her refusal exiled both her and her mother into the deserts of Syria, and put to death several of their attendants. Diocletian remonstrated in favour of his wife and daughter, but to no purpose, and his grief on this occasion probably hastened his death, which took place at his residence near Salona in July, 313. In the following year his wife and daughter were put to death by order of Licinius.

Diocletian ranks among the most distinguished emperors of Rome; his reign of twenty-one years was upon the whole prosperous for the empire, and creditable to the Roman name. He was severe, but not wantonly cruel, and we ought to remember that mercy was not a Roman virtue. His conduct after his abdication shows that his was no common mind. The chief charge against him is his haughtiness in introducing the Oriental ceremonial of prostration into the Roman court. The Christian writers, and especially Lactantius, have spoken unfavourably of him; but Lactantius cannot be implicitly trusted. Of the regular historians of his reign we have only the meagre narratives of Eutropius and Aurelius Victor, the others being now lost; but notices of Diocletian's life are scattered about in various authors, Libanius, Vopiscus, Eusebius, Julian in his *Cæsars*, and the contemporary panegyrists, Eumenes and Mamertinus. His laws or edicts are in the Code. Among other useful reforms, he abolished the frumentarii, or licensed informers, who were stationed in every province to report any attempt at mutiny or rebellion, and who basely enriched themselves by working on the fears of the inhabitants. He also reformed and reduced the number of the insolent Prætorians, who were afterwards totally disbanded by Constantine.

Coin of Diocletian.
British Museum. Actual Size. Copper. Weight, 167½ grains.

DIODATI, JEAN, was born in Geneva in 1576, of a family originally from Lucca. His progress in learning was so rapid, that Beza procured him to be appointed professor of Hebrew in the University of Geneva when he was but twenty-one years of age. In 1608 he was made pastor, or parish minister, and in the following year professor of theology. While travelling in Italy about 1608, he became acquainted at Venice with the celebrated Sarpi and his friend Father Fulgenzio, both antagonists of the Court of Rome, and there appears to have been some talk and correspondence between them about attempting a religious reform in Italy, but Sarpi's caution and maturer judgment checked the fervour of the other two. Diodati afterwards translated into French and published at Geneva Sarpi's History of the Council of Trent. In consideration of his theological learning, he was sent by the clergy of Geneva on several missions, first to the reformed churches in France, and afterwards to those of Holland, where he attended the Synod of Dort 1618-19, and although a foreigner, he was one of the divines appointed to draw up the acts of that assembly. He fully concurred in the condemnation of the Arminians, or Remonstrants as they were called. Diodati was also distinguished as a preacher; in his sermons he spoke with conscientious frankness, without any regard to worldly considerations. He published an Italian translation of the Bible in 1607, and afterwards a French translation which was not completed till 1644, having met with considerable opposition from the clergy of Geneva. Diodati died at Geneva in 1649. He wrote also, 'Annotationes in Biblia,' fol. Geneva 1607, which were translated into English, and published in London, 1648, and numerous theological and controversial works, among others, 'De Fictitio Pontificiorum Purgatorio,' 1619; 'De justa Secessione Reformatorum ab Ecclesia Romana,' 1628; 'De Ecclesia;' 'De Antichristo,' &c. Senebier, in his 'Histoire Littéraire de Genève,' gives a catalogue of Diodati's works. He also wrote an answer to the ecclesiastical assembly in London, in reply to letters addressed to him by some members of that assembly, and which was published in Newcastle, 1647. In it Diodati deplores the troubles both religious and civil which had broken out in England, and deprecates the continuation of a struggle in which men, 'having lost sight of the original causes that began the war, were excited by the new mutual injuries freshly done or received, the two parties being far more divided by an odious difference of reproachful names than really by the cause itself.' Diodati translated also into French Edwin Sandy's 'Account of the State of Religion in the West,' Geneva, 1626.

DIODO'RUS, a Greek historian born at Agyrium in Sicily. (*Biblioth. Hist.*, lib. i. c. 5.) Our principal data for the chronology of his life are derived from his own work. It appears that he was in Egypt about the 180th olympiad, 60 B.C. (*Bibl. Hist.* i. c. 44, comp. i. c. 83); that his history was written after the death of Julius Cæsar; that it ended with the Gallic war of that general, and that he spent thirty years in writing it. (*Biblioth. Histor.* i. c. 4, comp. v. c. 21 and 25.) In addition to this, Suidas mentions that he lived in the time of Augustus, and he is named under the year 49 B.C. by Jerome in the Chronicle of Eusebius. The title of the great work of Diodorus is the 'Historical Library' (βιβλιοθήκη ἱστορική) or 'The Library of Histories (ἡ τῶν ἱστοριῶν βιβλιοθήκη); and it would therefore seem to have been intended by the author as a compilation from all the different historical works existing in his time. It was divided by him into forty books, and comprehended a period of 1138 years, besides the time preceding the Trojan war (*Biblioth. Hist.* i. c. 5.) The first six books were devoted to the fabulous history anterior to this event, and of these the three former to the antiquities of barbarian states, the three latter to the archæology of the Greeks. But the historian, though treating of the fabulous history of the barbarians in the first three books, enters into an account of their manners and usages, and carries down the history of these people to a point of time posterior to the Trojan war; thus in the first book he gives a sketch of Egyptian history from the reign of Menes to Amasis. In the eleven following books he detailed the different events which happened between the Trojan war and the death of Alexander the Great, and the remaining twenty-three books contained the history of the world down to the Gallic war and the conquest of Britain. (*Biblioth. Hist.* i. c. 4.) Diodorus asserts that he bestowed the greatest possible pains on his history, and had travelled over a considerable part of Europe and Asia in order to prosecute his investigations with the greatest advantage. He resided some time at Rome, and, having made himself familiar with the Latin language, was enabled to consult the Roman historians in the originals. He objects to the custom so common among Greek and Roman writers of interlarding their narratives with fictitious speeches, to which he says (*Bib. Hist.* lib. xx. init.), they made the whole history a mere appendix, although he seems to have fallen into this fault in the xxi. book (Niebuhr, *Hist. Rom.* iii., note 848); but on the other hand he thought it the duty of an historian never to omit a suitable opportunity of pronouncing merited praise or blame. (*Bibl. Hist.*, lib. xi.) Of the forty books of Diodorus's History we possess only fifteen, namely books i.—v. and books xi.—xx., but we have many fragments of the twenty-five others, to which important additions have recently been made from MSS. in the Vatican library.

With regard to the historical value of the *Bibliotheca* and the merits of the author, the most discrepant opinions have been entertained by modern writers. The Spanish scholar, Vives, called him a mere trifler, and Jean Bodin accused him, in no sparing terms, of ignorance and carelessness, while, on the other hand, he has been defended and extolled by many eminent critics as an accurate and able writer. The principal fault of Diodorus seems to have been the too great extent of his work. It was not possible for any man, living in the time of Augustus, to write an unexceptionable universal history: indeed it may be doubted whether any one writer could, even at the present day, successfully accomplish so difficult a task, and Sir Walter Raleigh's 'History of the World' is a proof that men of the greatest ability are liable to failure in such an attempt. It is not, then, a matter of surprise that Diodorus, who does not appear to have been a man of superior abilities, should have fallen into a number of particular errors, and should have placed too much reliance on authorities sometimes far from trustworthy. Wherever he speaks from his own observations he may, perhaps, generally be relied on, but when he is compiling from the writings of others he has shown little judgment in his selection, and has in many cases proved himself incapable of discriminating between the fabulous and the true. In some instances, as in his account of Egypt (see Description of the Tomb of Osymandyas), it is impossible to say whether he is speaking as an eye-witness or upon the report of others. We must not blame him for giving a Greek colouring to the manners of other nations which he describes, for it was the common practice of Greek writers to do so, and he has not erred so much in this respect as Dionysius of Halicarnassus. Although he professes to have paid great attention to chronology, his dates are frequently and obviously incorrect. (See Dodwell's *Annal. Thucydid.* and Clinton's *Fasti Hellenici*, ii., p. 259 and elsewhere; Niebuhr, *Hist. Rome*, ii, and note 1281.) However, we are indebted to him for many particulars which but for him we should never have known, and we must regret that we have lost the last and probably most valuable portion of his works as even by the fragments of them which remain we are enabled in many places to correct the errors of Livy. The style of Diodorus, though not very pure or elegant, is sufficiently perspicuous, and presents few difficulties, except where the MSS. are defective, as is frequently the case. (Niebuhr, *Hist. Rome*, vol. iii. note 297 and elsewhere.)

The best editions of Diodorus are Wesseling's, Amstel., 1745, two vols. fol.; that printed at Deux-Ponts, 1793—1801, and Dindorf's, Lips., 1829—33, five vols. 8vo., which contains the Vatican Excerpta. There is also a smaller edition by Dindorf in four vols. 12mo., Lips., 1826. Diodorus has been translated into French by Terrasson, and two or three years ago a new translation by Miot appeared at Paris. A German translation of Diodorus was begun by F. And. Stroth (1782-1785), and finished by T. F. Sal. Kaltwasser (1786-1787). Amyot translated into French books xi. to xvii. of Diodorus's History.

DIŒCIA, the twenty-second class in the artificial method used by Linnæus in arranging plants. It comprehends such genera as have male or stamen-bearing flowers on one plant, and female or pistil-bearing flowers on another, as willows. Hence all plants having the sexes thus distinguished are called diœcious.

DIO'GENES, the Cynic philosopher, was the son of Hicesius, a money-changer of Sinope. His father and himself were expelled from their native place on a charge of adulterating the coinage, or, according to another account, Hicesius was thrown into prison and died there, while Diogenes escaped to Athens. On his arrival at that city, he betook himself to Antisthenes, the Cynic, who repulsed him rudely according to his custom, and even on one occasion threatened to strike him. 'Strike me,' said the Sinopian, 'for you will never get so hard a stick as to keep me from you while you speak what I think worth hearing.' The philosopher was so pleased with this reply that he at once admitted him among his scholars. Diogenes was soon distinguished for his extraordinary neglect of personal conveniences, and by a sarcastic and sneering petulance in all that he said. He was dressed in a coarse double robe, which served him as a cloak by day and a coverlet by night, and carried a wallet to receive alms of food. His abode was a cask in the temple of Cybele. In the summer he rolled himself in the burning sand, and in the winter clung to the images in the street covered with snow, in order that he might accustom himself to endure all varieties of weather. A great number of his witty and biting apophthegms are detailed by his namesake and biographer (Diog. Laërt., vi., c. 2). He became acquainted with Alexander the Great, who bade him ask for whatever he wanted. 'Do not throw your shadow upon me,' was the Cynic's only request. It is reported that Alexander was so struck with his originality that he exclaimed, 'Were I not Alexander, I would wish to be Diogenes.' Being taken by a piratical captain named Scirpalus, while sailing from Athens to Ægina, he was carried to Crete, and there sold to Xeniades, of Corinth, who took him home to educate his children. He discharged the duties of this situation so faithfully and so successfully, that Xeniades went about saying that a good genius had come into his house; and he was so well treated by his master that he refused an offer on the part of his friends to ransom him from slavery. He spent his time principally in the Cranium, a gymnasium near Corinth, where he died in the same year, and, according to one account, on the same day with Alexander the Great (323 B.C.), at the advanced age of 90 years. A number of works attributed to him are mentioned by Diogenes Laërtius, but none of them are extant. For the general doctrines of the sect to which Diogenes belonged, the reader may consult the article CYNICS. The following are a few of the particular opinions ascribed to him by his biographer. He thought exercise (ἄσκησις) was indispensable, and able to effect anything; that there were two kinds of exercise, one of the mind and the other of the body, and that one of these was of no value without the other. By the cultivation of the mind he did not mean the prosecution of any science or the acquirement of any mental accomplishment; all such things he considered as useless; but he intended such a cultivation of the mind as might serve to bring it into a healthy and virtuous state, and produce upon it an effect analogous to that which exercise produces upon the body. He adopted Plato's doctrine, that there should be a community of wives and children, and held with the Dorian lawgivers, that order (κόσμος) was the basis of civil government.

DIO'GENES of Apollonia, so called from his birthplace, a town in Crete, was a pupil of Anaximenes and a contemporary of Anaxagoras. The years in which he was born and died are not known, as is the case also with his master Anaximenes. But the birth-year of his contemporary and fellow-pupil Anaxagoras is known to be 500 B.C.; and Diogenes would most probably be about the same age, or perhaps rather younger. Sidonius Apollinaris (xv. 91) speaks of Diogenes as younger than Anaxagoras, — '*junior collega Anaxagoræ.*' Schleiermacher who is followed by Schaubach, the editor of the fragments of Anaxagoras, affirms from the internal evidence of the fragments of the two philosophers, that Diogenes preceded Anaxagoras. But Diogenes might have written before Anaxagoras, and yet have been his junior, as we know was the case with Empedocles. (Aristotle *Met.* i. iii., p. 843 B.)

Diogenes followed Anaximenes in making air the primal element of all things, that out of which the whole material universe was formed; but he invested this air with the property of intelligence, or with what is called by St. Augustin a divine virtue, thus approximating but not attaining to the system of Anaxagoras. It was reserved for this last philosopher to separate mind from matter. 'As the contemplation of animal life,' says Mr. Thirlwall, 'had led Anaximenes to adopt air as the basis of his system, a later philosopher, Diogenes of Apollonia, carried this analogy farther, and regarded the universe as issuing from an intelligent principle, by which it was at once vivified and ordered —a rational as well as sensitive soul—still without recognizing any distinction between matter and mind.' (*Hist. of Greece*, vol. ii., p. 134.) Cicero (*de Nat. Deor.*, i. 12) represents Diogenes as making air his deity.

He wrote several books on Cosmology (περὶ φύσεως); and the first sentence of his work is given by Diogenes Laertius in two places (vi. 81; ix. 57). The fragments which remain have been recently collected and edited by Panzerbeiter.

There is an essay on the philosophy of Diogenes, by Schleiermacher, in the Memoirs of the Berlin Academy for 1815; and a contribution to the chronology of his life in an article on the early Ionic philosophers, by Mr. Clinton, in the Philological Museum, vol. i., p. 92. For general information concerning him the reader is referred to Diogenes Laertius, ix. 9; Bayle's *Dictionary;* and Fabricii *Bibliotheca Græca*, ed. Harles, vol. ii., p. 656.

DIO'GENES, surnamed Laërtius, because he was born at Laërtes, in Cilicia, is well known as the biographer of the Greek philosophers. But though he has described the lives of others, he has given us no account of himself, and we know nothing about him. It is supposed that he lived in the reign of Severus or Caracalla, and that he was an Epicurean. The work by which Diogenes is known is a crude contribution towards the history of philosophy. It contains a brief account of the lives, doctrines, and sayings of most persons who had been called philosophers: and though the author is evidently a most unfit person for the task which he imposed upon himself, and has shown very little judgment and discrimination in the execution, the book is useful as a collection of facts which we could not otherwise have learned, and entertaining as a sort of *omniana* on the subject. The article on Epicurus is valuable as containing some original letters of that philosopher, which comprise a pretty satisfactory epitome of the Epicurean doctrines, and are very useful to the readers of Lucretius. The most convenient edition of Diogenes is that by H. G. Hübner, Lips., 1828-31, in two volumes octavo.

DIOIS, the territory in France of which Die was the capital. [DAUPHINE; DRÔME.]

DIOME'DEA. [ALBATROSS.]

DION, of Syracuse, son of Hipparinus, one of the chief men in that city, lived under the reigns of both the Dionysii. He was originally introduced to Dionysius the elder, by his sister Aristomache, one of the king's wives, but his own merit appears afterwards to have gained him so much favour at court, that he could speak to Dionysius with the freedom of an equal. He had early become the disciple of Plato whom Dionysius had invited to Syracuse, and Plato is said to have considered him the most ardent of his pupils. Soon after his accession, the younger Dionysius began to show the effects of an imperfect and vicious education, while in private he abandoned himself to all kinds of excesses. The prospects of his country roused Dion, and he endeavoured to counteract the errors and to supply the deficiencies of the tyrant by prudent counsels and exhortations. Among other things he advised him to invite Plato to revisit the Syracusan court, setting forth the advantages which he would derive from his conversation and knowledge. Dionysius wrote a letter of invitation, but the philosopher had not forgotten the treatment which he had received from the tyrant's father, and it was with the utmost difficulty that he was prevailed on to go. The presence of Plato was dreaded by the dissolute courtiers who surrounded Dionysius, and to counteract any influence he might have, they obtained the recall of Philistus, whose talents and tyrannical tendencies they thought were likely to be a match for the philosopher. The enemies of Dion availed themselves of the same opportunity to insinuate suspicions of Dion's loyalty, and succeeded in procuring his banishment. He went first to Italy and then to Greece, where he received the highest honours. Dionysius however endeavoured to embitter his exile, and soon confiscated his lands and effects, and forced his wife to marry another person. Dion no sooner heard of this outrage, than he determined to make an effort to expel the tyrant. Though dissuaded by Plato, he began to raise troops privately, and at last assembled his forces to the number of about eight hundred in the island of Zacynthus, whence he sailed to Sicily. On landing, he found that Dionysius was absent in Italy, and he was accordingly received by the people with great joy. Dionysius on his return to Sicily, made some fruitless attempts to regain his influence, but after several defeats was forced to quit the island for Italy. Dion, however, did not long enjoy the favour of his countrymen, and by the influence of Heraclides, who estranged the minds of the people from him, he was obliged to leave Sicily; he was afterwards recalled, but was treacherously murdered, B.C. 354, at about fifty-five years of age, by his supposed friend Calippus, an Athenian. His death was generally regretted, and in honour of his high courage and patriotism a monument was raised to him at the public expense. (Diodorus Siculus xvi. 6—20; Plutarch, *Life of Dion;* Nepos, *Life of Dion.*)

DION CA'SSIUS COCCEIA'NUS, or Cocceius, was the son of Cassius Apronianus, a Roman Senator, and born at Nicæa in Bithynia about A. D. 155. On his mother's side he was descended from Dion Chrysostom, and it was from this branch of his family that he took the name of Dion. Thus though he was on his mother's side of Greek descent, and though in his writings he adopted the then prevailing language of his native province, he must be considered as a Roman. Under Commodus he lived in Rome, where he enjoyed the rank of Senator. After the death of Septimius Severus and Caracalla, under whom he held no public office, he was made governor of Smyrna and Pergamus by Macrinus. He was afterwards consul and proconsul in the provinces of Africa and Pannonia, probably under Alexander Severus (Suidas Δίων), who esteemed him so highly as to make him consul for the second time with himself. In his old age he is said to have returned to his native country. (Photius, *Dion Cassius.*)

Dion wrote a History of Rome in Greek, from the arrival of Æneas in Italy and the foundation of Alba and Rome to A.D. 229. To the time of Julius Cæsar his history was only a rapid sketch, but from that date and more particularly from the time of Commodus, when he is a contemporary writer, his narrative is very complete. Of the first 36 books there are only fragments extant: but there is a considerable fragment of the 35th book on the war of Lucullus against Mithridates, and of the 36th, on the war with the Pirates and the expedition of Pompey against Mithridates. The following books to the 54th inclusive are nearly all entire: they comprehend a period from B. C. 65 to B.C. 10, or from the Eastern campaign of Pompey and the death of Mithridates to the death of Agrippa. The 55th book has a considerable gap in it. The 56th to the 60th, both included, which comprehend the period from A.D. 9 to A.D. 54, are complete, and contain the events from the defeat of Varus in Germany to the reign of Claudius. Of the following 20 books we have only fragments, and the meagre abridgment of Xiphilinus. The 80th or last book comprehends the period from A.D. 222 to A.D. 229, in the reign of Alexander Severus. The abridgment of Xiphilinus, as now extant, commences with the 35th, and continues to the end of the 80th book: it is a very indifferent performance.

The fragments of the first 36 books, as now collected, are, 1, those called Valesiana, which were collected by Henri of Valois from various Scholiasts, Lexicographers and grammarians. 2, The Fragment a Peiresciana, taken from the great work or compilation of Constantinus Porphyrogennetus. [BYZANTIUM, p. 81.] 3, Fragment a Ursiniana, also taken from the same compilation of Constantinus Porphyrogennetus. 4, Excerpta Vaticana by Mai, which contain fragments of books 1—35 and 61—80, have been published in the second volume of the Scriptorum Veterum Nova Collectio, pp. 135—233. To these are added the fragments of an unknown continuator of Dion (pp. 234 — 246), which go down to the time of Constantine. Other fragments from Dion, belonging chiefly to the first 35 books, also published in the same collection (pp. 527—567), were found by Mai in two Vatican MSS., which contain a sylloge or collection made by Maximus Planudes.

The annals of Zonaras contain numerous extracts from Dion.

Dion as an historian is not characterized by any great critical power or judgment: indeed his own remarks are sometimes trifling. His style is generally clear, though there are occasionally obscure passages where there appears to be no corruption in the text. His diligence is unquestionable, and from his opportunities he was well acquainted with the circumstances of the empire during the period for which he is a contemporary authority, and indeed we may assign a high value to his history of the whole period from the time of Augustus to his own age. Nor is his history without value for the earlier periods of Roman history, in which though he has fallen into errors, like all the Greek and Roman writers, who have handled the same obscure subject [DICTATOR], he still enables us to correct some erroneous statements of Livy and Dionysius.

Other writings are attributed to Dion; among them a life of Arrian by Suidas (Δίων).

The first edition of the Greek text of Dion was by R. Stephens, Paris 1548, fol. from one MS., and that very incorrect and defective. Between this edition and that of Reimar there were several editions. J. Alb. Fabricius undertook a new edition of Dion, but dying before he had completed his labour, his papers came into the hands of H. S. Reimar, his son in law, who published the new edition at Hamburg 1751—1752, 2 vols. fol. with a Latin translation. The edition of Reimar is valuable, as he availed himself of the labours of all his predecessors, arranged the fragments in order, and improved the text and translation, to which he added notes. Some fragments were afterwards discovered in a MS. in the library of St. Mark, by Morelli, and published by him at Bassano in 1798, 8vo. They were reprinted at Paris in 1800, fol., in a form to accompany the edition of Reimar.

The small Tauchnitz print of Dion Cassius, 4 vols. 16mo., contains the fragments. The most recent and perhaps most useful edition is by F. W. Sturz, Leipzig, 1824, 1825, 8 vols. 8vo. There are several German translations of Dion Cassius: the most recent is by F. Lorentz, Jena, 1826, 4 vols. 8vo. There is an old French translation from the Latin, by Déroziers, 1542, fol.

DION, surnamed Chrysostomus, or the Golden-mouthed, on account of the beauty of his style, the son of Pasicrates, a man of consideration at Prusa in Bithynia, was a sophist and stoic. He was in Egypt when Vespasian, who had been proclaimed emperor by his own army, came there, and was consulted by that prince on the proper course to be adopted under the circumstances. Dion had the candour, or, as some may think, the want of judgment, to advise him to restore the republic. Afterwards he resided for some years at Rome, till one of his friends, having engaged in a conspiracy against Domitian, was condemned to death, and Dion, fearing for himself, fled to the modern Moldavia, where he remained till the tyrant's death, labouring for his subsistence with his own hands, and possessing no books but the *Phædon* of Plato and Demosthenes περὶ Παραπρεσβείας. Domitian having been assassinated, the legions quartered on the Danube were about to revolt, when Dion got upon an altar and harangued them so effectually that they submitted to the decision of the senate. Dion was in high favour with Nerva and Trajan, and when the latter triumphed after his Dacian victories the orator sat in the emperor's car in the procession. He returned to Bithynia, where he spent the remainder of his life. Accusations of peculation and treason were brought against him, but rejected as frivolous. Dion died at an advanced age, but it is not known in what year. We have eighty orations attributed to him, which are very prettily written, but not of much intrinsic value. The best edition is that of Reiske, 2 vols. 8vo, Lips., 1784. The name Cocceianus, which Pliny (Epist. x. 85, 86) gives to Dion, probably refers to his connection with the Emperor Cocceius Nerva.

DIONÆA, a most singular herbaceous plant, remarkable for the irritability of its leaves, which, when brushed against by an insect, will suddenly close upon it and hold it fast, whence it is often called Venus's Fly-trap and the Carolina Catchfly plant. It is botanically related to the Drosera, or sundew, which has also the property of seizing insects by its viscid hairs, but differs so much as to have led some botanists to doubt whether it really belongs to the same natural order. Its flower-branches, for example, are not rolled up before they unfold, but have a straight æstivation; the placentæ of the fruit are stationed at the base of the one-celled capsule; the stigma is a lacerated fringed brush, and there are other differences; but upon the whole, it is probably a genuine portion of the droseraceous order.

Dionæa has broad stalked leaves, spreading in a circle round the bottom of the flower stem. Its flower stem rises straight to the height of six or eight inches, and is terminated by a cyme of small greenish-white flowers, each of which has a calyx of five sepals, five wedge-shaped notched petals, ten hypogynous stamens, and an ovary shaped like some of the old German wine-bottles, round at the bottom, and tapering suddenly into a short neck or style. The best modern account of its habits has been given by Mr. M. A. Curtis, who thus speaks of it from his observations upon the plant in its native bogs. 'The Dionæa muscipula is found as far north as Newbern, N. Carolina, and from the mouth of Cape Fear River to Fayetteville. It is stated moreover to grow along the lower branches of the Santee, in S. Carolina; and it is not improbable that it inhabits the savannahs, more or less abundantly, from the latter place to Newbern. It is found in great plenty for many miles around Wilmington in every direction. The leaf, which is the only remarkable part, springs from the root, spreading upon the ground at a little elevation above it. It is composed of a broad stalk, like the leaf of an orange-tree, winged, and from two to four inches long, which at the end suddenly expands into a thick and somewhat rigid blade, the two sides of which are semicircular, about two-thirds of an inch across, and fringed round their edges with somewhat rigid ciliæ, or long hairs, like eye-lashes. The leaf, indeed, may be aptly compared to the two upper eyelids, joined at their bases. Each portion of the leaf is a little concave on the inner side, where are placed three delicate, hair-like organs, in such an order that an insect can hardly traverse it without interfering with one of them, when the two sides suddenly collapse and enclose their prey, with a force surpassing an insect's attempts to escape. The fringe or hairs of the opposite sides interlace, like the fingers of the two hands clasped together. The sensitiveness resides only in these hair-like processes on the inside, as the leaf may be touched or pressed in any other part without sensible effects. The little prisoner is not crushed and suddenly destroyed, as is sometimes supposed; for I have often liberated captive flies and spiders, which sped away as fast as fear or joy could hasten them. At other times, I have found them enveloped in a fluid of mucilaginous consistence, which seems to act as a solvent, the insects being more or less consumed by it. This circumstance has suggested the possibility of the insects being made subservient to the nourishment of the plant, through an apparatus of absorbent vessels in the leaves. But as I have not examined sufficiently to pronounce on the universality of this result, it will require further observation and experiment on the spot to ascertain its nature and importance.

'It is not to be supposed, however, that such food is necessary to the existence of the plant, though, like compost, it may increase its growth and vigour. But however obscure and uncertain may be the final purpose of such a singular organization, if it were a problem to construct a plant with reference to entrapping insects, I cannot conceive of a form and organization better adapted to secure that end, than are found in the Dionæa muscipula. I therefore deem it no credulous inference that its leaves are constructed for that specific object, whether insects subserve the purpose of nourishment to the plant or not. It is no objection to this view that they are subject to blind accident, and sometimes close upon straws, as well as insects. It would be a curious vegetable, indeed, that had a faculty of distinguishing bodies, and recoiled at the touch of one, while it quietly submitted to violence from another. Such capricious sensitiveness is not a property of the vegetable kingdom. The spider's net is spread to ensnare flies, yet it catches whatever falls upon it; and the ant-lion is roused from his hiding-place by the fall of a pebble; so much are insects, also, subject to the blindness of accident.' We may add, with reference to the American author's conjecture that the trapped insects may contribute to the nourishment of the leaf of Dionæa, that leaves have actually been fed with chopped meat, and have been found to become more healthy and vigorous in consequence of this artificial stimulus.

DIONY'SIA (**Διονύσια**), festivals held in honour of the god Dionysus, or Bacchus. The most important of such festivals, and those which alone deserve to be specially mentioned, were held at Athens and in Attica; and these are important by reason of their being the occasions on which all the dramatic exhibitions of the Athenians took place. Both the tragedy and comedy of the Athenians arose ultimately from parts of ceremonies, which prevailed in very early times among the Greeks, at the festivals of Dionysus (Aristot. *Poet.* 4. 14); and it is alike a consequence and a proof of this origin, that the dramatic exhibitions and contests among the Athenians, from the earliest to the latest times at which we can trace them, always took place at some one of the Attic Dionysia.

These Attic Dionysia were four in number. Enumerated in the order of time, according to the Attic year, they were 1, The Lesser or Rural Dionysia, held in the month Poseideon; 2, The Lenæa, held in the month Gamelion; 3, The Anthesteria, held in the month Anthesterion; and 4, The Great or City Dionysia, held in the month Elaphebolion. They were held in four consecutive months, the first of which, Poseideon, coincides with part of December and part of January, and the last, Elaphebolion, with part of March and part of April.

Until recently, the number of the Attic Dionysia was always supposed to be three; the fourth being made to disappear by identifying the Lenæa, the second which we have named, either with the Anthesteria or with the Rural Dionysia. But the incorrectness of both these opinions, and the separate existence of the Lenæa, have been established unanswerably by Boeckh, the author of the Public Economy of Athens, in an essay published in 1819 in the Transactions of the Berlin Academy of Sciences. It is not in our power to enter into any account of the argument contained in this essay; but the reader may see an abstract of the essay in an article on the Attic Dionysia by Mr. Thirlwall, in the Philological Museum (vol. ii. p. 273), and a very brief notice in Buttman's second *Excursus*, in his edition of Demosthenes's oration against Midias. Viewed in its relation to the Attic Drama, the question which is handled in Boeckh's essay, is not unimportant.

We proceed to speak of these festivals separately, and in the order in which they occurred in the Attic year.

1. *The Rural or Lesser Dionysia*, was a festival celebrated all over Attica, the other three being confined to Athens. It was a festival of the vintage, and though it may appear to have been held somewhat late in the year (in the latter part of December), was not held later than the vintage now takes place, in a more rigorous climate, in some of the vineyards producing the Tokay wine. (*Phil. Mus.*, vol. ii., p. 296.) The Rural Dionysia were celebrated by means of separate festivals in all the demes of Attica; the expenses of these separate festivals fell on the several demes; and the performances, processions, and banquets, of which the festivals consisted, were under the superintendence of the several demarchs. It is inferred from the law of Evagoras, cited by Demosthenes (Mid. p. 517), and an inscription contained in Boeckh's Public Economy of Athens (App. viii.), that Athens joined, on the occasion of the Rural Dionysia, in the festival celebrated at Piræus. At the dramatic performances of these rural festivals, plays that had before been represented either at the Lenæa or the Great Dionysia, used to be repeated. Of the procession, in which was carried the phallus, and in which was sung the phallic hymn, there is a sketch in miniature in the *Acharnians* of Aristophanes (v. 230, fol.).

2. *The Lenæa*, so called from a wine-press (ληνὸς), whose erection, in an inclosure called for the same reason *Lenæum*, lying originally a little out of the city and near a marsh (Λίμναι), it was supposed to commemorate, may, like the Rural Dionysia, be considered a vintage-festival. Boeckh thinks that a festival which went by the name of *Ambrosia* was the same with the Lenæa; and he supposes, in order

to explain the relation of this festival to the Rural Dionysia, that, after the general vintage had ended, the fruit of some vines was still reserved to a later season, and that from this fruit was extracted a nectar, which being used on the occasion of, and serving to distinguish, this festival, might have given rise to the name *Ambrosia*. (See *Phil. Mus.*, vol. ii., p. 297.) The Lenæa were celebrated also among the Ionian states in Asia Minor, they having carried over with them at their migration the custom of the mother-country; and the Attic month Gamelion, in which the Lenæa were held, received in the Ionian calendar the name Lenæon. In Athens, the Lenæa were under the superintendence of the king-archon, and were celebrated with a public banquet at the expense of the state, and with dramatic exhibitions. As regards these last, we find that they consisted chiefly of new comedies. There are, however, instances of tragedies represented at the Lenæa, as also of comedies at the Great Dionysia, in the performances at which festival tragedies greatly predominated. It will help to show the relation between the Lenæa and the Great Dionysia that at the former foreigners were not, as at the latter, excluded from choruses, and also that the resident aliens (μέτοικοι) might at the Lenæa serve as *choragi*, which again was not permitted at the Great Dionysia.

3. *The Anthesteria*, deriving its name from the time of year at which it was held, the month of flowers, is a festival differing materially from the other three, inasmuch as it appears to have comprehended no public dramatic performances. It is inferred however by Hermann, from a law mentioned in the Lives of the Ten Orators (Pseud. Plut. vi. p. 253), and from other stray allusions to contests taking place at this festival, that plays were now rehearsed before small audiences, which were to be performed at the Great Dionysia in the succeeding month. Neither was there at the Anthesteria, as at the Lenæa and Great Dionysia, a public banquet provided by the state; but a certain sum, it is supposed, was given to each citizen, with which he was to provide his own repast. (Plut. *Resp. Ger. Pr.* c. 25.) The festival lasted during three days, which respectively bore the names *Pithoegia*, *Choes*, and *Chytri*. On the first day, as is to be inferred from the name, the wine of the preceding vintage was broached and tasted, and on the second, we may suppose, the new wine was drunk. This was accounted a festival of great sanctity, and included many mysterious ceremonies for which none but the wife of the king-archon and a small number of priestesses (γέραιραι) were qualified. One ceremony was a mock marriage between the king-archon's wife and Dionysus. (Demosth. *Neær*, p. 1369.) The Anthesteria were, like the Lenæa, under the superintendence of the king-archon. As during the Roman Saturnalia, the slaves enjoyed a temporary freedom during this festival; it was a custom also to send presents, and, as at the Roman Quinquatria, to pay one's instructors on the occasion of the Anthesteria. (Athen. x. 437.)

4. *The City or Great Dionysia*, or *Dionysia* without any epithet, the most splendid of the four festivals, were under the superintendence of the chief archon (ἄρχων ἐπώνυμος). This festival was held at a time when Athens was filled with foreigners, those bringing the tribute from her dependent states, and others. (Aristoph. *Ach.* 474, &c.) It was celebrated with a public banquet at the expense of the state, and with dramatic performances, which consisted chiefly, as has been said in describing the Lenæa, of tragedies. Plays which had once won a prize were not allowed to be repeated, though a special exemption from this rule was granted to the plays of Æschylus upon his death, and subsequently to those of Sophocles and Euripides. And indeed, so far as we may conclude from instances, in the absence of any express mention of the regulation in the case of the Lenæa, we may say that it obtained at this festival also.

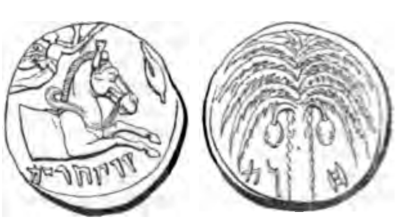
The times and occasions of the institution of these several festivals are wrapped up in obscurity. The Rural Dionysia, Lenæa, and Anthesteria, were connected with a rural worship of Dionysus or Bacchus, and were, it may be safely said, antecedent to the Great or City Dionysia; and it is, in comparison with this festival that Thucydides (ii. 15) calls the Anthesteria, more antient. The Lenæa and Anthesteria were festivals held in the deme Lenæus before it was inclosed within the city. The institution of the Great Dionysia seems to be referred to in a legend, which relates that Pegasus brought an image of Dionysus Eleuthereus from Eleutheræ to Athens. Boeckh connects this with an historical tradition of the migration of the Eleutherians from their town to Athens, and conjectures that the migration, and, as he supposes, consequent institution of the Great Dionysia, preceded by a little the return of the Heraclides (1124 B.C.). Welcker, who assigns to the epithet Eleuthereus and other epithets of Dionysus a political meaning, connects with the progress of his rites in the Athenian state the progress of political liberty. A short sketch of Welcker's views, which were propounded by him in his *Nachtrag* (*Supplement to the Treatise on the Æschylean Trilogy*), is given in the article in the Philological Museum which has been already referred to.

DIONYSIUS THE ELDER was born at Syracuse about 430 B.C. In the civil troubles of Syracuse, between the party of Diocles and that of Hermocrates, who was accused of aspiring to the supreme power, Dionysius took part with the latter and was wounded in an attempt which Hermocrates made to take possession of Syracuse. He afterwards married the daughter of Hermocrates. Meantime the Carthaginians had effected their second invasion of Sicily, and had taken Selinus, Himera, and Agrigentum. (Xenophon, *Hellenika*, ii. 2.) All Sicily was in danger of falling into the hands of the conquerors. In the assembly of the people of Syracuse, convoked after the fall of Agrigentum, Dionysius accused the commanders and the magistrates of neglect and treachery. In consequence of this charge he was condemned to a heavy fine, which Philistus, the historian, paid for him, and he then repeated his charges against those who were at the head of the commonwealth, until he persuaded the people to change the military commanders, and appoint new ones, among whom himself was one. His next measure was to obtain the recall of the exiles, to whom he gave arms. Being sent to the relief of Gela, then besieged by the Carthaginians, he effected nothing against the enemy, pretending that he was not seconded by the other commanders, and his friends suggested that in order to save the state the supreme power ought to be confided to one man, reminding the people of the times of Gelon, who had defeated the Carthaginian host and given peace to Sicily. The general assembly proclaimed Dionysius supreme chief of the republic about 405 B.C. when Dionysius was 25 years of age. He increased the pay of the soldiers, enlisted new ones, and under pretence of a conspiracy against his person, formed a guard of mercenaries. He then proceeded to the relief of Gela, but failed in his attack on the Carthaginian camp; he however penetrated into the town, the inhabitants of which he advised to leave it quietly in the night under the escort of his troops. On his retreat he persuaded those of Camarina to do the same. This raised suspicions among his troops, and a party of horsemen, riding on before the rest, on their arrival at Syracuse raised an insurrection against Dionysius, plundered his house, and treated his wife so cruelly that she died in consequence. Dionysius, with a chosen body, followed close after, set fire to the gate of Acradina, forced his way into the city, put to death the leaders of the revolt, and remained undisputed possessor of the supreme power. The Carthaginians, being afflicted by a pestilence, made proposals of peace, which were accepted by Dionysius, on condition that they should retain, besides their old colonies, the territories of Agrigentum, Selinus, and Himera; that Gela and Camarina should be restored to the inhabitants, who were to pay tribute to the Carthaginians, and that Messana, Syracuse, Leontini, and the whole eastern division of the island as well as the towns of the Siculi, in the interior, should remain independent. Himilco with the Carthaginian army returned to Africa, and Dionysius applied himself to fortify Syracuse, and especially the island Ortygia, which he made his strong hold, and which he peopled entirely with his trusty partisans and mercenaries, by the aid of whom he put down several revolts which broke out against him. He took, partly by stratagem and partly by force, the towns of Leontini, Catana, and Naxus, and subjected them to Syracuse. He next prepared for a new war against Carthage by collecting men from every quarter, manufacturing a large quantity of arms, and inventing new engines for besieging towns. The termination of the Peloponnesian war (B.C. 404) had filled the Greek towns of Sicily with emigrants and disbanded mercenaries, many of whom Dionysius enlisted in his service. In the year 397 B.C. he convoked a general assembly of the people and proposed the war, which was unanimously voted, and which was begun by the people plundering the houses and vessels of the Carthaginian traders. Dionysius sent a herald to Carthage, which was then afflicted by the plague, to declare war, unless all the Greek towns in Sicily were evacuated. He next laid siege to Motya, one of the principal Carthaginian colonies in Sicily, which his brother Leptines attacked by sea. In this siege he tried his new engines, which battered down the walls, and the town being taken, the inhabitants were either killed or sold, and an immense booty was made by the Syracusans. Dionysius reduced also the other towns belonging to the Carthaginians, except Panormos, Soloeis, and Egeste. Meantime the Carthaginians collected a large force under Himilco, who landed at Panormos, while his fleet took the island of Lipara; he then marched against Messana, which he took and destroyed; and thence advanced towards Syracuse. Most of the towns inhabited by the Siculi joined the Carthaginians. On arriving at Tauromenium Himilco found his way along the sea-coast, but was stopped by a great eruption of lava from Ætna, and was obliged to march round by the western base of the mountain. Meantime Mago with the Carthaginian fleet attacked the Syracusan fleet off Catana, and completely defeated it. Himilco encamped under the walls of Syracuse, while his victorious fleet entered the great harbour. Dionysius, on his side, received ships and men from Sparta. A dreadful pestilence breaking out in Himilco's camp, Dionysius availed himself of it to attack the Carthaginians, defeated them, and burnt most of their ships. Himilco with the remainder escaped to Carthage, having paid secretly a large sum to Dionysius for his forbearance.

Dionysius settled the disbanded mercenaries as colonists at Leontini and Messana, which latter city he caused to be rebuilt. Mago, with a new Carthaginian army, having landed in Sicily, 392 B.C., was compelled to reimbark on condition of paying the expenses of the war. Dionysius now proceeded against Rhegium, with which the other towns of Magna Græcia had formed an alliance, while he gained over to his side the Lucanians, and both together defeated the allies, devastated the territories of Thurii, Croton, Caulon, Hipponium, and Locri, and obliged the Greeks to sue for peace. About this time he is said by Justinus, xx. 5, to have received an embassy from the Gauls, who had just burnt Rome, offering him their alliance. In 387 B.C. he again attacked Rhegium, and took it after a long and obstinate siege. He sold the surviving inhabitants as slaves, and put their commander to a cruel death.

Dionysius was now feared both in Italy and Sicily, and he seems to have aspired at one time to the dominion of both countries. In order to raise money, he allied himself with the Illyrians, and proposed to them the joint plunder of the temple of Delphi: the enterprise however failed. He then plundered several temples, such as that of Proserpina, at Locri, and as he sailed back with the plunder with a fair wind, he, who was a humorist in his way, observed to his friends, 'You see how the immortal Gods favour sacrilege.' Having carried off a golden mantle from a statue of Jupiter, consecrated by Gelon out of the spoils of the Carthaginians, he replaced it by a woollen garment, saying that it was more suited to the vicissitudes of the seasons: he also took away a golden beard from Æsculapius, observing it was not becoming for the son of a beardless father (Apollo) to make a display of his beard. He likewise appropriated to himself the silver tables and golden vases and crowns in the temples, saying he would make use of the bounty of the Gods. (Cicero, *De Natura Deorum*, iii. 34; Ælianus, *Histor.*, i. 20.) He also made an invasion with a fleet on the coast of Etruria, and plundered the temple of Cære, or Agylla, of 1000 talents. With these resources he was preparing himself for a new expedition to Italy, when a fresh Carthaginian armament landed in Sicily, 383 B.C., and defeated Dionysius, whose brother, Leptines, fell in the battle. A peace followed, of which Carthage dictated the conditions. The boundary of the two states was fixed at the river Halycus, and Dionysius had to pay 1000 talents for the expenses of the war. This peace lasted fourteen years, during which Dionysius remained the undisturbed ruler of Syracuse and one-half of Sicily, with part of Southern Italy. He sent colonies to the coasts of the Adriatic, and his fleets navigated both seas. Twice he sent assistance to his old ally, Sparta, once against the Athenians, 374 B.C., and again in 369, after the battle of Leuctra, when the Spartans were hard pressed by Epaminondas. Meantime the court of Dionysius was frequented by many distinguished men, philosophers and poets. Plato is said to have been among the former, being invited by Dion, the brother-in-law of Dionysius; but the philosopher's declamations against tyranny led to his being sent away from Syracuse. The poets fared little better, as Dionysius himself aspired to poetical glory, for which however he was not so well qualified as for political success. Those who did not praise his verses were in danger of being sent to prison. Dionysius twice sent some of his poems to be recited at the Olympic games, but they were hissed by the assembly. He was more successful at Athens. A tragedy of his obtained the prize, and the news of his success almost turned his brain. He had just concluded a fresh truce with the Carthaginians, after having made an unsuccessful attack upon Lilybœum at the expiration of the fourteen years' peace; and he now gave himself up to rejoicings and feasting for his poetical triumph. In a debauch with his friends, he ate and drank so intemperately that he fell senseless, and soon after died; some say he was poisoned, 367 B.C., in the sixty-third year of his age, having been tyrant of Syracuse thirty-eight years. After the death of his first wife he married two wives at once, namely, Doris of Locri, and Aristæneta, daughter of Hipparinus, of Syracuse: by these women he had seven children, of whom Dionysius, his elder son by Doris, succeeded him in the sovereignty.

Dionysius was a clever statesman, and generally successful in his undertakings; he did much to strengthen and extend the power of Syracuse, and it was probably owing to him that all Sicily did not fall into the hands of the Carthaginians after the taking of Agrigentum. He was unscrupulous, rapacious, and vindictive, but several of the stories stated of his cruelty and suspicious temper appear improbable, or at least exaggerated. The works of Philistus, who had written his life, and who is praised by Cicero, are lost. Diodorus, who is our principal remaining authority concerning Dionysius, lived nearly three centuries after, and was not a critical writer. The government of Dionysius, like that of many others who are styled tyrants in antient history, was not a despotism; it resembled rather that of the first Medici and other leaders of the Italian republics in the middle ages, or that of the Stadtholders in Holland. The popular forms still remained, and we find Dionysius repeatedly convoking the assembly of the people on important occasions, when full freedom of speech seems to have been allowed.



Coin of Dionysius.

British Museum. Actual size. Silver. Weight, 263 grains.

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